

Emotion, Social Anxiety, and Social Interaction

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Abstract

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Socially anxious individuals experience intense anxiety during social interaction, which is associated with degraded social performance. For example, individuals with social anxiety recall negative events from their interactions more readily than positive, are more self-focused during interactions, and worry more about others' perceptions than do non-anxious individuals. Accordingly, research has shown that non-anxious individuals experience interactions with the socially anxious as more difficult.

How do the socially anxious communicate distress? The present study examined social interactions in dyads consisting of either 2 non-socially anxious (NSA) individuals or dyads comprised of one socially anxious (SA) and one NSA individual. Participants were screened for social anxiety. NSA individuals were randomly paired either with a same-sex, NSA stranger or a same-sex, SA stranger. All participants completed two

interactions with the same partner. Data consisted of verbal and nonverbal behavior and questionnaire measures of social interactions.

Both SA participants and their NSA partners rated their interactions together as being less smooth and coordinated than did participants in NSA-NSA dyads. Additionally, both participants in SA-NSA dyads perceived themselves more negatively and less positively than did members of NSA-NSA dyads.

In comparison with the interactions of NSA-NSA dyads, the interactions between SA and NSA participants were characterized by high levels of fidgeting, typically initiated by SA participants, less reciprocity in smiling behavior, more polite smiling, higher frequency of solicitations for support and supportive comments, and more self-focused talk on the part of SA participants and less from their NSA partners. Additionally, SA participants asked fewer questions about their partners' conversation topics, and produced less back channel communication.

High levels of self-focused talk, fidgeting, and solicitations for support are likely behavioral indicators of distress, and therefore unusual in "getting-to-know-you" interactions. SA participants engaged in more of these behaviors than NSA participants. For NSA participants who interacted with SA partners, these behaviors were likely highly salient, perhaps contributing to less pleasant perceptions of the study interactions than the interactions they experience in daily life.

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Emotion, Anxiety and Social Interaction

1. INTRODUCTION

Although most people find social interactions a positive aspect of daily life, to some they are a source of intense anxiety. The anxiety caused by anticipating and engaging in social behavior may lead these socially anxious individuals to compensate for their worries by behaving cautiously, displaying fear, and avoiding social interactions altogether (Rapee, 1995). Likewise, the experience of interacting with an anxious individual may prove unpleasant (Spurr & Stopa, 2002), leading the non-anxious to avoid future interactions with anxious individuals. Anxiety therefore has the potential to impact individual interactions as well as relationships, likely affecting individuals' well-being.

How might anxiety and other emotions shape social context? There is much evidence in the literature that emotions are socially adaptive (Ekman, 1992; Keltner & Gross, 1999; Keltner & Haidt, 2001; Levenson, 1999). However, when they occur in situations in which they are unnecessary, or when they are overly intense, they may disrupt interpersonal functioning (Kring & Bachorowski, 1999). The overarching goal of the present research was to investigate how the experience of anxiety affects the process of social interaction over time. I have examined how individuals with and without social anxiety respond, both verbally and non-verbally, to a same-sex stranger during a series of two social interactions. To aid in the interpretation of behavioral measures, participants' perceptions of their own and of their interaction partners' emotions and social interactions was assessed.

1.1. Emotion

Emotions are brief, subjectively experienced affective states that elicit behavioral responses, including facial displays; physiological changes, such as changes in heart rate and skin conductance; sets of cognitions, often related to the emotion-inducing stimulus; and subjective experience (Ekman, 1992; Keltner & Gross, 1999; Keltner & Haidt, 2001; Levenson, 1999). Darwin, the forefather of modern day emotion theorists, hypothesized that emotions serve to coordinate behavioral responses to environmental demands (Darwin, 1872), functionally decreasing an individual's response time to external stimuli (Levenson, 1999), and facilitating communication across individuals (Keltner & Gross, 1999).

The external behaviors that accompany emotion have communicative properties, allowing an alert observer to "read" the feelings of another. In social interactions, these signs, including facial expressions, changes in vocal tone and pitch, and gestures, have been shown to inform receivers of their interaction partners' emotion states (Darwin, 1872), social intentions (Fridlund, 1991), and social status (Conway, Di Fazio, & Mayman, 1999). Additionally, they serve appeasement functions (Keltner & Anderson, 2000), promote care giving and attachment (Keltner & Haidt, 2001), guide individuals in comfort seeking and giving behaviors (Barbee, Rowatt, & Cunningham, 1998), and promote social bonding (Cumberland-Li, Eisenberg, Champion, Gershoff, & Fabes, 2003; Keltner, Young, Heerey, Oemig, & Monarch, 1998) by serving as reinforcements and punishments for social actions (Esteves, Parra, Dimberg, & Oehman, 1994). For emotions to serve such a broad array of interpersonal functions, communication and subjective emotional experience are critical.

1.1.1. Communication of Emotion

How might emotional communication be important in social interaction? An individual's emotion displays have been shown to evoke complimentary emotions in others. For example, expressions of distress, including sadness, have been shown to elicit sympathy displays in observers (Smith, 1992), whereas anger expressions are related to expressions of fear in observers (Keltner, Moffitt, & Stouthamer-Loeber, 1995).

Appeasement displays, such as expressions of embarrassment or shame, have been associated with the facilitation of liking and affiliation, allowing for reconciliation of social transgressions (Keltner & Anderson, 2000). Evoking complimentary emotions in receivers may help to strengthen social bonds.

The communication of affective cues has been thought to improve social coordination across partners by serving as a form of behavioral reinforcement (Esteves et al., 1994). For example, parents' smiling responses to eye contact may reinforce eye gaze seeking behaviors among young children (Hains & Muir, 1996). Laughter is thought to reinforce verbal exchange by rewarding positive social behavior. Studies have shown that it typically occurs at the end of an utterance (Bachorowski, 1999). In similar vein, displays of anger and fear have been associated with the cessation of an anger provoking behavior and decreased likelihood of punishment respectively (Blair, Sellars, Strickland, & Clark, 1995), leading theorists to speculate that anger/fear displays are punishments or negative reinforcers for undesirable social behavior (Dimberg, Thunberg, & Elmehed, 2000). Social interactions that are experienced as more coordinated, generate more positive emotion and liking, and may be more likely to promote future social interaction (Cappella, 1997), whereas misperception and faulty signaling of affective cues may lead

to interactions that produce negative emotion and are less likely to promote future exchange (Cappella, 1985).

Consistent emotion communication during social interaction has implications for social outcomes. In one study, participants read vignettes in which individuals displayed either positive or negative emotion that was either congruent or incongruent with a positive or negative social action. The authors found that emotion displays congruent with behaviors were more positively evaluated, even for negative emotion/social behavior combinations, than were incongruent emotion displays. Even when behaviors were positive, incongruent displays lead to more negative social evaluations of senders (Robinson & Smith-Lovin, 1999). Interactions in which emotions are clearly communicated are likely to contain more consistent social reinforcements, and generate a greater degree of liking and positive emotion. Conversely, individuals who have difficulty coordinating emotion and social behavior may not send and receive the same types of social rewards, thereby affecting their social outcomes.

1.1.2. Emotional Experience and Social Interaction

Emotional experience is also intimately tied to emotion communication (Darwin, 1872; Dimberg et al., 2000; Hess, Banse, & Kappas, 1995; Keltner & Anderson, 2000), and has been shown to play a role in social perception. In one study, students were exposed to either a positive or negative film and were then asked to ascribe desirable and undesirable traits to an ambiguous personality description. Participants who viewed the positive film reported experiencing more positive emotion and attributed more positive traits to the individual, even though they rated some of those traits as being only marginally relevant to the personality description they had read. The converse was true

for participants who viewed the negative film (Fiedler, Asbeck, & Nickel, 1991). Another study demonstrated similar results. Participants interacted with a confederate trained to express either positive or negative emotions during a brief social interaction. Thereafter, participants were asked to perform a series of cognitive tasks, complete a rating of the confederate, and fill out a self-concept scale. Participants who interacted with the positive, as compared with the negative confederate, gave the confederate higher evaluations and expressed more positive self-concepts and emotions (Izard, 1964).

Social behavior is similarly influenced by emotional experience. Studies of altruism show that individuals in negative mood states are less likely than those in either positive or neutral mood states to engage in altruistic activities (Rosenhan, Salovey, & Hargis, 1981; Underwood & et al., 1974). Moreover, emotions associated with social rejection are related to negative social behavior. In one set of studies, participants were given information indicating that they had either been rejected by a social partner (social harm) or were likely to experience a negative life event (non-social harm). Participants were then asked to complete cognitive tasks, given the opportunity to engage in altruistic behavior, and allowed to provide punishment to a confederate. Even though there were no differences in self-reported emotional experience between the groups, compared with participants who received non-social harm feedback, socially rejected individuals had poorer cognitive performance, were less altruistic, and were more punishing, leading the authors to specifically link the experience of social rejection to social behavior (Twenge, Baumeister, Tice, & Stucke, 2001).

There is little doubt that emotions are an important part of the social context. The emotions experienced by an individual shape the way he or she perceives the social

environment and communicates affect. Moreover, an individual's emotion displays influence the emotions of a social partner, affecting the ways in which behaviors are coordinated across partners and shaping the social context. Emotions thus serve a variety of key functions in social interaction.

1.2. Social Anxiety

Unfortunately, emotions are not always associated with adaptive responding. In particular, emotions that would be appropriate in certain settings, such as fear in the face of a threat, may occur in settings in which no obvious threat is present, thereby instigating an unnecessary coping response that may be counterproductive to an individual's evolutionary goals (e.g., Barlow, 2001; Leary & Kowalski, 1995b). The experience of social anxiety is one example of an adaptive emotional response that can become maladaptive. It is related to concerns about performance and fears of negative evaluation (Rapee, 1995). At low levels, it has been shown to be functional, heightening awareness of social context and facilitating socially appropriate responding (Baumeister & Leary, 1995). At higher levels however, social anxiety has been associated with reactions ranging from intense discomfort in social settings to the phobic avoidance thereof (Rapee, 1995).

Subjectively, socially anxious individuals experience high amounts of anxiety both during interaction and when anticipating future social interaction (Leary, Kowalski, & Campbell, 1988). Like those with other anxiety disorders, the experience of the socially anxious involves physiological symptoms, such as a racing heart, sweaty palms and trembling; cognitive symptoms, including worries about self-presentation or the belief that one is being negatively evaluated; and the experience of negative emotions,

such as apprehension and fear (Rapee, 1995). These experiences often draw one's attention to one's internal state (Wells & Papageorgiou, 2001), leading to the perception that others take notice (Rapee, 1995; Rapee & Lim, 1992). The idea that others are seeing one's weaknesses, emotions, or nervousness may serve to increase the anxiety related arousal and exacerbate the experience of social anxiety (Asendorpf, 1990).

1.2.1. Fear or Anxiety

Social anxiety has been described in terms of both fear and anxiety (Clark & Wells, 1995; Leary & Kowalski, 1995b; Rapee, 1995), necessitating the differentiation between these affective states. The neural circuitry and physiological responses underlying both states are thought to be similar, involving the amygdala (Nader & LeDoux, 1999, but see Lang, Davis, & Oehman, 2000). Experientially, socially anxious individuals report feeling fear. They experience physiological signs such as racing heart, sweaty palms, or dizziness (Nader & LeDoux, 1999), show fear related cognitions, including heightened sensitivity to threat related stimuli (Mogg & Bradley, 2002), and bias in memory recall (Amir, Bower, Briks, & Freshman, 2002).

According to Barlow (Barlow, 2001) and others (e.g., Lang et al., 2000; LeDoux, 1989; Nader & LeDoux, 1999), the key difference between anxiety and fear is the proximity of the threatening stimulus. Anxiety is elicited during indirect threat, when an individual *expects* to experience a negative outcome but the threat is neither explicit nor certain. For example, an individual expecting to receive bad news would experience anxiety when awaiting the outcome, regardless of whether the outcome matched the expectation. Fear is experienced when danger is immanent, as in the presence of an objectively dangerous, directly threatening stimulus, such as encountering a bear in a

forest. In the case of social anxiety, the danger is the *expectation* of a social threat, usually an unfavorable evaluation of the self (Rapee, 1995), which may or may not occur. Despite self-reported experience then, anxiety, not fear, seems primary to social anxiety.

1.2.2. Functional Consequences Anxiety

Anxiety has been thought to coordinate interpersonal responding in a number of ways, including enhanced attention to threat related stimuli within the environment (Vroomen, Driver, & de Gelder, 2001). For example, researchers examined anxious and non-anxious individuals' abilities to detect the location of a stimulus. They found that among anxious participants, threat words and faces presented in one portion of the visual field detracted from participants' abilities to detect subsequently presented stimuli in other portions of the visual field (Fox, Russo, Bowles, & Dutton, 2001).

The experience of social anxiety is associated with selective attention to negative information during interaction. Studies have demonstrated that compared with non-socially anxious individuals, socially anxious individuals remember more negative information during social interactions (Amir, Coles, Brigidi, & Foa, 2001), are more likely to interpret ambiguous events negatively (Stopa & Clark, 2000), and are biased to attend to negative cues in the social environment (Clark & McManus, 2002). This over-reliance on mood congruent cues is hypothesized to relate to limited processing of the social environment and hypersensitivity to negative feedback (Perowne & Mansell, 2002).

1.3. Social Anxiety and Social Interaction

Socially anxious individuals do not experience excessive anxiety during other activities or when faced with non-social stimuli—their experience is specific to social

interactions. The literature has postulated several explanations for social anxiety. Broadly, these consist of social skills deficits and concerns with self-presentation.

1.3.1. Social Anxiety and Social Skill

Individuals with social anxiety have been thought less socially skilled than non-anxious individuals, however the evidence for this idea is mixed. Few studies have demonstrated consistent social skills deficits among the socially anxious (Leary & Kowalski, 1995b; Rapee, 1995). Moreover, regardless of whether or not one is socially anxious, experiencing high levels of anxiety has been shown to degrade performance in a number of situations such as taking tests, performing manual and cognitive tasks, playing musical instruments, and participating in sports (Leary & Kowalski, 1995b; Rapee, 1995). Thus, the fact that anxiety is a salient feature of social interaction for anxious individuals is likely to contribute significantly to their poor social functioning.

Socially anxious or shy children may have more difficulty than their peers at interpreting social cues. In one study, socially anxious children who tended to avoid social interactions performed more poorly than non-anxious children on an emotion recognition and interpretation task (McClure & Nowicki, 2001). However, this finding was confounded by participants' emotional experience. That is, study participants who experienced poorer performance also reported higher levels of negative emotion during the task (McClure & Nowicki, 2001). Although people with deficient social skills experience more social anxiety (see Rapee, 1995), it may also be true that the experience of anxiety inhibits the expression of existing social skills. For example, it has been suggested that the experience of anxiety may decrease an individual's ability to pay attention to and participate in a social interaction, thereby degrading social performance

(Strahan & Conger, 1998). A recent study of this phenomenon asked socially anxious and non-anxious women to either “get to know” a female confederate or to “find out as much information as possible” about her. In the less structured situation, independent raters rated the socially anxious participants as less socially skilled, although there were no group differences in the other condition (Thompson & Rapee, 2002). Thus, it may be the case that anxiety levels are responsible for differences in social performance.

1.3.2. Self-Presentation and Social Anxiety

For the socially anxious, the worry that their behavior may provoke negative evaluations from others is paramount. Self-presentational worries trigger anxiety, increase physiological arousal, and lead to an increase in self-focused attention, thereby undermining ability to actively engage in the social setting. Thus, the motivation to present as socially competent, and the worry that one may fall short of this goal is thought to be a central aspect of social anxiety (Leary & Kowalski, 1995a).

In line with this argument, socially anxious individuals may hold self-perceptions that are different from those of non-anxious individuals. In one study, socially anxious and non-anxious participants engaged in a series of role-plays with a confederate. Both self and observer ratings of anxiety and performance were obtained. Socially anxious individuals rated themselves as higher in anxiety and worse in performance than non-anxious individuals. Observer ratings and self-ratings were more discrepant for individuals with anxiety than those without, demonstrating that socially anxious participants showed poorer self-perceptions than non-anxious participants (Norton & Hope, 2001). Socially anxious individuals have likewise been shown to rate their voice

quality and speaking ability more negatively than non-anxious individuals (Lundh et al., 2002).

Negative self-perceptions have been thought to lead to the anticipation of negative evaluations from other individuals (Watson & Friend, 1969). For example, in one self-report study, socially anxious individuals reported more fear of negative evaluation, more self-focused awareness, and lower expectancy to achieve their goals during social interactions than non-socially anxious participants (Kocovski & Endler, 2000). A social interaction study found similar results. Socially anxious participants gave a speech with 3 other participants. The socially anxious individuals experienced more anxiety in the than non-anxious participants and believed their group members to have noticed the anxiety to a greater degree than the group members actually did (Marcus & Wilson, 1996). In a treatment study assessing cognitive therapy in anxiety disorders, patients with social phobia reported their fears of negative evaluation, including estimates of both the likelihood and social cost before and after treatment. At the end of treatment, socially anxious participants' symptom reductions were significantly related to decrements in both estimated likelihood of negative evaluation and estimated social cost (McManus, Clark, & Hackmann, 2000).

Self-presentational concerns may lead anxious individuals to worry about more about future interactions. In one study, patients with social phobia interacted with a confederate trained to make the patient believe the interaction was either successful or unsuccessful. Patients who believed their interactions had been successful experienced more negative emotion than unsuccessful patients, reported feeling as though their interaction partners would expect more of them in future interaction, and held more self-

protective future goals (Wallace & Alden, 1997). In light of their self-presentational concerns, successful interactions may be detrimental to future interactions for the socially anxious.

Research suggests that the expectation of negative evaluations may become associated with certain environmental cues and activated when those cues are present. This phenomenon was demonstrated in a sample of non-anxious individuals. During a lexical decision making task a group of non-socially anxious women, who were either low or high in impression management, heard distinctive tones paired with words indicating rejection, acceptance, or neutral evaluations. Participants then engaged in a conversation with a male confederate. Periodically, the conditioned tones were played during the conversation. For women high in impression management, listening to the tones produced increases in self-consciousness, anxiety, and expectation of negative evaluation. For those low in impression management, the tones did not make a difference in their self-reported emotions or social expectations (Baldwin & Main, 2001). For the socially anxious, simply participating in conversation may activate the anticipation of negative evaluations thereby precipitating anxiety.

Taken together, this evidence suggests that socially anxious individuals self-presentational concerns are activated in situations in which they hold negative self-perceptions. As self-perceptions become more negative, expectations of negative social evaluations increase, serving to heighten sensitivity to negative feedback (Rapee & Hayman, 1996) and preoccupation with self-focused cognitions and behaviors, thereby degrading ability to engage in social interactions (Perowne & Mansell, 2002). As a result,

the socially anxious may produce less skilled, more disjointed social performances that are in turn perceived negatively by their social partners.

1.4. Summary

Emotions influence social interactions in a variety of ways: emotion-related displays influence the thoughts, behaviors and emotions of others, and serve to reinforce social behaviors; emotion-related cognitions sway judgments of others and their behaviors. Therefore, the experience of anxiety during social interactions affects ability to send and receive emotion signals, shaping both interactions and relationships.

Although much is known about emotions, social interaction, and social anxiety, the literature falls short in a number of ways. First, few studies have undertaken the examination of emotion and social anxiety in true-to-life interactions. In most cases, individual participants have been asked to imagine social interactions, to recount social experiences, to rate videotapes of interactions, or to respond to questionnaires eliciting their beliefs about how they perceive and interact with others. In the few cases in which social behavior has been examined, participants have “interacted” with videotapes or with carefully trained confederates. Thus, the question of how socially anxious individuals respond in more naturalistic interactions remains relatively unstudied. Second, little research in the social anxiety literature has addressed the notion of familiarity or experience with a particular interaction partner during social interaction. Studies in this area have rarely involved more than one interaction. As a result, the ways in which socially anxious individuals adapt to social environments remain unknown. The present project sought to remedy these gaps and has implications for both basic research in emotion and psychopathology as well as implications for the treatment of social anxiety.

2. STUDY OVERVIEW AND HYPOTHESES

The overarching goal of the present research was to examine the social interactions of individuals with and without social anxiety and to develop an understanding of how interactions may be influenced by participants' emotional experience and expression. To that end, socially anxious and non-socially anxious college students participated in a series of two dyadic social interactions in which they "got to know" one another. Following each interaction, participants reported on their own emotions and perceptions of the interactions as well as those of their interaction partners. Interactions were captured on videotape, and verbal and nonverbal behavior was coded. The following hypotheses were tested:

2.1. Hypothesis 1: Self reports during social interactions

- A) Socially anxious (SA) participants will report experiencing more negative affect and less positive affect during social interaction than will non-socially anxious (NSA) participants.
- B) SA participants will report less favorable self-impressions and greater levels of effort during interaction than NSA participants. SA participants will rate their partners more favorably than NSA participants.
- C) Participants in SA-NSA dyads will report lower interaction quality than participants in NSA-NSA dyads.
- D) NSA participants who interact with SA participants will report less desire for future interaction (DFI) than will NSA participants who interact with other NSA participants.

2.2. Hypothesis 2: Verbal social behavior

- A) NSA participants in all dyads will display more conversational engagement than will SA participants, as indicated by questions soliciting details about a topic and the length of discussions about various topics.
- B) NSA individuals in NSA-NSA dyads will produce more self-relevant discussion topics and fewer self-relevant complaints than will either NSA individuals in SA-NSA dyads or SA individuals.
- C) NSA partners of SA participants will make more empathetic/sympathetic comments than will either SA participants or NSA participants in NSA-NSA dyads. SA participants will apologize more frequently for their behavior.
- D) NSA participants will engage in more back channel communications (e.g., “uh-huh,” “yeah,” “m-hmm,”) and comments (e.g., “Wow,” “Cool,” “Right-on,”) than SA participants.

2.3. Hypothesis 3: Nonverbal social behavior

- A) Participants in NSA-NSA dyads will exhibit more positive (polite and pleasurable smiles) and fewer unpleasant facial expressions than NSA participants in SA-NSA dyads. SA participants will exhibit fewer positive and more unpleasant facial expressions than their partners.
- B) Regardless of dyad, NSA participants will exhibit more nonverbal gestures such as communicative hand gestures and eyebrow raises than SA participants.
- C) SA participants will exhibit more fidgeting than will NSA participants. SA-NSA dyads will display more fidgeting than NSA-NSA dyads.

D) SA participants will exhibit more face and hair touching than NSA participants. Participants in NSA-NSA dyads will make more frequent physical contact with their partners than those in SA-NSA dyads.

2.4. Hypothesis 4: Changes in Interactions Over Time

A) Participants in NSA-NSA dyads will report greater positive affect, higher interaction quality, and more desire for future interaction at Interaction 2 than they did at Interaction 1. Participants in SA-NSA dyads will report lower interaction quality and less desire for future interaction at Interaction 2 than they did at Interaction 1.

B) At interaction 2, NSA-NSA dyads will display more gesturing and pleasurable smiles than they did at interaction 1 and will report less effortful second interactions than first. SA-NSA dyads will show fewer gestures and pleasurable smiles.

C) NSA-NSA dyads will produce more self-relevant talk and more probing for details at interaction 2 than they did at interaction 1. SA-NSA dyads will not change with respect to these variables across the interactions.

2.5. Research Questions:

In addition to the primary hypotheses, several research questions were proposed. With respect to these topics there was insufficient empirical evidence upon which to base specific predictions. For this reason, the analyses below are exploratory and somewhat speculative. The conclusions that are drawn from these analyses will therefore require explicit follow-up study.

Research Question 1: Reciprocity in social interactions

Do SA individuals engage in verbal and nonverbal reciprocity as frequently as NSA individuals?

Research Question 2: Communication of social distress

What types of verbal and nonverbal behaviors are used to solicit offers of support, empathetic comments and reassurance?

Research Question 3: Gender differences

In what ways do the behaviors of males and females in NSA-NSA dyads differ? Similarly, are there gender differences in the verbal and nonverbal behaviors of SA individuals?

3. METHODS

3.1. Participants

One hundred twenty undergraduate students at the University of California, Berkeley completed the study in exchange for psychology course credit. Participants were recruited on the basis of their scores on the interaction anxiousness scale, a questionnaire measure of social anxiety (Leary & Kowalski, 1993). Individuals scoring in the top 20th percentile formed the socially anxious (SA) group of participants (n = 30), whereas those whose scores fell in the lower 20th percentile made up the non-socially anxious (NSA) participant group (n = 90). Participants were grouped into 30 same-sex female dyads and 30 same-sex male dyads. Half the female, and half the male dyads included one SA participant. Together, there were 30 NSA-NSA dyads and 30 SA-NSA dyads. Because participants were to be paired with a same-sex stranger, they were further

screened for sexual orientation to avoid potential confounding variables related to interacting with a member of the attractive sex.

Pre-selected participants were recruited via telephone. A researcher told each potential participant that the purpose of the study was to examine people's perceptions of their social interactions over time. Participants were told they would be required to complete two, 1-hour sessions, held 1 week apart, and that each session would consist of a brief interaction, followed by a set of questionnaires. Interested participants were then scheduled. Participants were recruited from a set of phone lists such that the researchers scheduling and running study sessions were blind to participants' social anxiety status.

Five additional dyads completed both study sessions but have incomplete data records due to a mechanical malfunction of the recording microphone (one group of females), or to the fact that participants positioned themselves in such a way that one of them was entirely invisible to the video camera (three groups of males; one group of females). Only the questionnaire data of these participants were utilized for statistical analyses. Thus data analyses on questionnaire items include a total of 130 individual participants (65 dyads) whereas analyses of verbal and non-verbal behaviors include only 120 participants (60 dyads).

Participants ranged in age from 18 to 22 and were primarily (81%) freshman and sophomore level students. There were no differences in age or year in school across anxiety status. The sample consisted of 49% Caucasian, 36% Asian, 7% Middle Eastern, 5% Latino/Latina, and 3% African American. Table 1 describes ethnicity and age across social anxiety status and gender. Intraclass correlations indicated that procedures for pairing participants to dyads were indeed random. Participants were neither more nor less

similar to their own partners than to the partners of other participants on age ($p = .697$) or ethnicity ($p = .792$).

In addition to the aforementioned group, 20 participants completed session one but not session two of the study. Of these participants, 10 individuals arrived as scheduled for the second study session but their interaction partner from the first study session failed to show up. These individuals received course credit for participation but did not complete the second study session. The remaining 10 individuals generally reported having forgotten about the appointment. These participants were as follows: 2 NSA females from NSA-NSA dyads; 1 NSA female from an SA-NSA dyad; 1 SA female; 1 SA male; and 5 NSA males from SA-NSA dyads. These participants did not differ from other participants of the same gender and anxiety status on either demographic variables or questionnaire items. None of these participants' data have been utilized for statistical purposes.

3.2. Procedure

Participants arriving for study session 1 were greeted by the experimenter and shown into a quiet waiting area. When both participants had arrived, they were introduced to one another and the experimenter ascertained that they were strangers. They were given a consent form that they read and signed. Participants were then asked to complete an emotional experience questionnaire indicating the degree to which they felt a variety of emotions. When both participants had finished the questionnaire, the experimenter escorted them to the interaction room.

The interaction room appeared to be a quiet reading lounge equipped with 2 bookshelves with books, a filing cabinet, a plant, and a comfortable two-person sofa.

Participants sat on the sofa, which was positioned opposite to the bookshelves and to a one-way mirror, behind which a hidden video camera had been placed. A microphone had been concealed in one of the bookshelves to record participants' conversations. With the permission of the University of California, Berkeley Committee for the Protection of Human Subjects, participants were not informed about the videotaping procedures until the completion of the second study session.

Participants were told that they should "get to know" their partner by talking with the partner about whatever they wished for a period of 5 minutes, which the experimenter would time using a stopwatch. They were told that if they had questions or wished to stop the interaction for any reason, the experimenter would be waiting in the hallway outside the room. Participants' questions were answered and the experimenter left the room and shut the door. The experimenter then started the video camera using a remote control device. When the interaction time had elapsed, the experimenter knocked on the door and re-entered the room to signal the end of the interaction. Participants were then given a packet of questionnaires about the interaction to complete. To protect participants' confidentiality and ensure that they did not feel as though their partners could see their responses, one participant remained in the interaction room to complete the questionnaires and the other did so in the waiting area. When the questionnaires were complete participants were instructed not to talk with their partners between sessions and dismissed from session 1. The second study session followed a similar procedure to the first, including the pre-interaction emotional experience questionnaire, the 5-minute interaction, post-interaction questionnaires, and a thorough debriefing.

During debriefing, participants described their impressions of the study and were asked whether they had been suspicious of the experimental set-up or the procedure in any way. Although a number of participants reported having been suspicious about the possibility of being videotaped during the first study session, most people reported that by the second study session they had not believed anything dubious was occurring. Participants were then told about the videotaping and rationale for having done so, along with the experimental goal of relating non-verbal behaviors to participants' perceptions of their social interactions. To protect the confidentiality of the socially anxious individuals, participants were not told about the social anxiety component of the study. Participants' questions about the procedure were answered and they were given a consent form allowing them to consent or decline to the use of the videotapes as part of the data record in the study. No participant declined consent. Participants were given course credit for participation and dismissed.

3.3. Materials

Study sessions were recorded using a Panasonic, professional grade, VHS video camera, connected to a small, wide range microphone. High-grade, Sony VHS tapes captured the verbal and non-verbal data from each session. All questionnaires were completed using paper forms that were then scanned to a computerized data file using a Hewlett-Packard desktop scanner and Proquest's Remark software package.

3.3.1. Questionnaires

Self-report data consisted of questionnaire measures of the following variables. Except where noted, these were administered following the completion of each of the two interactions (see Appendix A for complete versions of the questionnaires).

Positive and Negative Affect Scale (PANAS): The PANAS consists of a list of 10 positive and 10 negative emotion words (Watson, Clark, & Tellegen, 1988). Participants were asked to rate on a 5-point Likert scale the degree to which they were currently feeling each of the items. This measure was collected immediately before and after each interaction.

Perceived Self-Impression (PSI): Participants were asked to describe, using a list of adjectives (e.g., likeable, awkward, boring, assertive, etc.) rated on a 5-point Likert scale, the impressions they believed they had made during the interactions.

Interaction Quality (IQ): Participants rated their perceptions about the smoothness, coordination, and naturalness of their interactions as well as their satisfaction with those interactions on an 8-point Likert Scale. The measure used was adapted from previous studies of dyadic social interaction (Berry & Hansen, 1996), and similar measures have been correlated with liking among study participants (Cappella, 1997).

Desire for Future Interaction (DFI): DFI is an outcome measure assessing participants' willingness to participate in additional interactions with a particular social partner. Items are rated on a 6-point Likert Scale. This measure has been shown to be reliable and valid, and is correlated with liking (Coyne, 1976).

Self-Presentational Effort (SPE): The effort with which participants work to manage the impressions they make upon others has been related to both the experience of social anxiety and the outcome of social interactions among socially anxious individuals (Rapee, 1995). Participants were asked to rate the perceived ease with which they were able to control their own behavior and the degree to which they found impression management difficult using an 8-point Likert Scale.

The following trait and personality measures were administered only once. Except where noted, these were administered following the completion of the second interaction.

Interaction Anxiousness Scale (IAS): The IAS was used to identify participants' general level of anxiety when interacting with others and was administered in the context of a large, prescreening survey, prior to recruitment for the present study. The IAS is a 15 item, Likert scale assessing the degree of anxiety individuals experience in a variety of social situations. It has high test-retest and interitem reliabilities, and has been shown to correlate well with other measures of social anxiety. The IAS has been extensively used with college student populations to discriminate between those with and without social anxiety (Leary & Kowalski, 1993).

Beck Depression Inventory (BDI): The BDI was administered during prescreening and is a 21-item questionnaire measuring emotions, cognitions, and behaviors related to depression. Because social anxiety is correlated with depression, this measure was used to examine participants' levels of depression. It has been shown to have high internal consistency and construct validity and has been used extensively with both clinical and non-clinical individuals (for a review see Beck, Steer, & Garbin, 1988).

Fear of Negative Evaluation Scale (FNE): The FNE is a 30-item, true/false inventory assessing the degree to which individuals expect and worry about receiving negative evaluations from others. Because social anxiety has been related to anxiety about others perceptions, this scale provided a measure of the degree to which participants with and without social anxiety experience self-presentational concerns, and how these concerns relate to attitudes about social interactions and behaviors during interaction. This measure

has good internal consistency and test-retest reliability and is related to both anxiety and to the seeking of social approval (Watson & Friend, 1969).

Berkeley Expressivity Questionnaire (BEQ): To measure the expression of positive and negative emotions and the intensity with which emotions are experienced, the BEQ was used to examine the degree to which participants reported experiencing and expressing their emotions. The scale consists of 16 Likert-rated questions and has high interitem and test-retest reliabilities, as well as a clear, 3-factor structure (Gross & John, 1995).

Self-Monitoring Scale (SMS): The SMS measures individuals' perceived ability to monitor their own social behaviors and to adapt behavior to the social context. Perceived ability to monitor the self during social interaction has been linked to partner's perceptions of the self, expectations about how behavior is perceived by others, as well as actual social behavior. The SMS is a 25-item true/false inventory, with good consistency and test-retest reliability. It has been shown to be comparable with peer ratings of self-monitoring ability among a college student sample (Snyder, 1974).

Social Phobia and Anxiety Inventory (SPAI): To measure clinical distress associated with social anxiety, the SPAI was administered. The questionnaire consists of 45, Likert-rated questions asking that participants indicate the degree to which types of situations (e.g., public speaking) and interaction partners (e.g., authority figures) cause distress. The scale has been shown to have good test-retest reliability, and is highly related to both self-and observer rated levels of social anxiety. It is used in clinical settings to monitor symptoms of social phobia and anxiety (Turner, Beidel, Dancu, & Stanley, 1989).

To illustrate differences in levels of social functioning, descriptive statistics for trait measures are reported in Table 2 and discussed in the results section below.

3.3.2. Coders

Eight research assistants coded verbal and non-verbal behavior from videotapes of the study sessions. All were blind to the study hypotheses and participants' anxiety status. Three coders independently rated verbal behavior and 5 coders rated nonverbal behavior. Tapes were coded in a quiet laboratory in study carrels equipped with television monitors, VCRs with jog-shuttle features, and headphones. Headphones were used only by the verbal behavior coders. Non-verbal behavior coders viewed the tapes with the sound off. Coders rated 120 unique sessions from the 60 dyads whose data were complete. For the purposes of testing inter-rater reliability, 2 coders rated verbal and nonverbal behaviors for 60 sessions (including both dyad members).

Coder training was conducted in the following manner. The 3 verbal behavior coders met with the experimenter to learn, discuss, and review the coding system for verbal behavior (see below). When all coders expressed understanding of the coding system, the coders and the experimenter jointly coded "sham" study sessions that had been recorded for the purposes of training and practicing the coding system. When coders reached 95% agreement in these coding sessions, each coder independently coded 2 additional study sessions, both from groups whose data were incomplete. Coders agreed on 94% of their codes across these sessions. Coders were then assigned a set of tapes to code and told that random checks of reliability would be conducted on a portion of the sessions they coded. Coders of non-verbal behavior were trained in similar fashion. Across the 2 training sessions coded by all 5 coders, 91% agreement was reached. Complete information on coder reliability is reported for both verbal and non-verbal behavior codes in the appropriate sections below.

3.4. Verbal Coding

The goal of the verbal behavior coding was to delineate the verbal interplay of the 2 session participants and to develop a picture of the types of verbal exchanges that characterized sessions with and without socially anxious participants. Four broad areas of verbal behavior were examined: information seeking and giving (IS/IG); compliments and complaints, (C/C); apologies (AP); and empathy and support (E/S). IS/IG included behaviors such as question asking, designed to solicit new information (e.g., “Do you have any siblings?”) or build upon information relevant to the current topic (e.g., “Are your brothers older or younger?”); responding to questions (e.g., “I have 2 brothers.”); and unsolicited information giving, neither preceded by nor in response to a direct question either on a current topic of conversation (e.g., “I’m an only child.”) or a new topic. In addition, coders noted the presence of new topics and whether the talk was self-focused, partner focused or general. Self-focused conversation topics often included information about a participant’s hobbies, interests, family, romantic partner, etc. Partner focused topics were talk responses to the partners’ self-focused talk. General talk was classified as talk focused on objects, situations, or people not directly related to the self. For example, discussions of professors, courses, sports, the weather, etc., were designated as general topics. C/C included complementary statements toward the interaction partner (e.g., “That’s a cool shirt.”); complementary statements toward an individual not present or an event (e.g., “The professor for that class is really good.”); statements of preference about objects or places (e.g., “I like the coffee at the Free Speech cafe.”); complaints, including comments indicating an unpleasant affective state either directed at a situation (e.g., “The lectures from professor X make me really bored.”) or person (e.g., “She really

annoys me.”); and statements of distaste about objects (e.g., “The dorm food is really shitty.”) or places (e.g., “Blake’s is always way too crowded to be any fun.”). Coders noted whether or not the information was self-relevant. AP included apologies for behaviors (e.g., “I’m sorry,” “I didn’t really mean that.”). E/S included behaviors such as empathetic comments (e.g., “I feel the same way.”); defending (e.g., “I would have done the same thing.”); and advice (e.g., “You should go talk to the professor about that.”).

In addition to these broad dimensions, verbal coders also rated short verbal comments on a partner’s speech (e.g., “Wow!”, “Cool.”, “Really?”, “No way!”), back channel communications (e.g., “Uh-huh.”), and episodes of time in which the participant was silent. Because non-verbal coders rated tapes with the sound off, the verbal coders additionally coded for the presence of laughter, a traditionally non-verbal behavior. For complete descriptions of behaviors, see Appendix B.

Sessions were coded directly from the videotapes and coders were instructed to review segments of tape “as often as necessary” for the purposes of obtaining an accurate and complete set of codes. All videotapes had a time stamp visible in the lower right corner of the picture. The onset and offset times of each verbal behavior across interaction partners were linked using the time code. Behaviors were coded in 1-second windows, and coders were instructed to code, for each second, “the behavior that was most prominent” during that time segment. The codes for each of the behaviors above were defined as mutually exclusive—that is, no verbal code could occur simultaneously with another verbal code. Coders were therefore required to identify *which* behavior was most prominent during each second. Each second was characterized by one behavior from the 8 behavior areas noted above, including silent episodes. For example, if at

second 1 of the interaction, a participant said, "I'm Jennifer," the code for self-focused, unsolicited information, a component of IS/IG, would be assigned to second 1 in that participant's data file. If at second 2 Jennifer's partner said, "I'm Lisa," while Jennifer was silent, Jennifer would be coded as silent on second 2 and her partner would receive the code for IS/IG - self-focus, during second 2. If Jennifer spent seconds 3 and 4 asking, "Are you here to get Psych 1 credits or are you taking some other class?" she would receive a code extending over both seconds 3 and 4 indicating that she had asked a question to solicit new information, again under IS/IG, from her partner, for whom seconds 3 and 4 would be characterized by silence (for a complete description of this method of recording data, see Bakeman & Quera, 1995). Behavioral code changes indicated the start time of a behavior. For each onset-time of a particular behavior, a frequency counter was increased, generating the frequency with which that behavior was produced during the session. To calculate behavior durations, a time counter processed the number of seconds for which a code was active, before the code changed. Frequency and duration calculations were performed using Matlab. In this manner, frequency and duration of each behavior were recorded.

Tests of interrater agreement were conducted on the 60 sessions (including both partners) that had been coded by multiple raters. Three coders rated verbal data so there were 3 possible coder pairings for testing agreement (coder 1 with coder 2; coder 1 with coder 3; and coder 2 with coder 3). For each possible pairing, Cohen's kappas were computed to examine the proportion of agreement, corrected for chance agreement. These were computed using agreement matrices for each participant within each session. For example for participant A, session 1, coder 1 might appear on the X-axis and coder 2

on the Y-axis of a matrix. If coder 1 rated silence as occurring during a particular time point and coder 2 did likewise, a tally would be recorded on the diagonal, indicating that both coders had recorded the same behavior. If at another time point coder 1 coded a “new topic” question and coder 2 recorded the behavior as a “detail solicitation,” the tally indicating which items were coded would fall off the diagonal, indicating a lack of agreement. Agreement for each second of the session was tallied in this fashion, generating an agreement matrix with 300 tallies (five, 60-second minutes). These matrices were used to examine agreement. On the IS/IG area, kappas for coder pairings ranged from .82 to .93. For C/C, kappas ranged between .87 and 1.00. Kappas for AP indicated high rates of coder agreement, .96 to 1.00. On E/S, agreement scores fell between .85 and .97. Coder pairs agreed on bouts of laughter at rates of .89 to .91, short verbal comments between .74 and .90, back channel communication/comments between .77 and .84, and episodes of silence between .72 and .89. All coders demonstrated acceptable reliability with the other coders as evidenced by kappas of at least .70 (Bakeman & Gottman, 1997). For the purposes of data analysis, coder disputes were resolved as follows. Each coder was assigned a rank, based on the degree to which that coder agreed with each of the other coders. The coder with the best interrater agreement scores across all behaviors and coders was assigned a rank of 1, the coder with the second best interrater agreement scores was ranked 2, and so on. For sessions that had been coded by multiple coders, the data included in analyses were the codes generated by the highest ranking of that coder pair. For example, if coder 1 and coder 2 rated the same session, the data generated by coder 1 was used in analyses because coder 1 had higher indices of agreement overall than coder 2.

3.5. Nonverbal Coding

The aims in coding nonverbal behavior were 1) to examine different types of behaviors exhibited by session participants, and 2) to examine the nonverbal exchanges that occur across partners. Coders examined participants' faces for indications of polite smiles, pleasurable smiles, unpleasant expressions such as frowns and grimaces, brow movements (raising and lowering), and neutral "expressions" in which the upper face was relaxed and the lower face was either relaxed or engaged in talking, without evidence of obvious smiling, frowning, etc. Additionally, coders examined participants' hands for communicative gestures, fidgeting, face and hair touching, physical contact with partner, such as a handshake, and when the hands were still and resting. For complete descriptions of behaviors, see Appendix B.

Non-verbal behaviors were coded similarly to verbal behaviors. Each second in the session was coded as being "characterized" by one behavior, to the exclusion of all other behaviors. Non-verbal behaviors were somewhat difficult to code into 1-second blocks as many of these tended to be very fleeting, lasting as little as a 10th of a second. To help resolve problems in assigning only one behavioral code to each second, coders were instructed to ignore such subtle behaviors as would be "unrecognizable or not noticeable" to an interaction partner. Although it has been argued that such transitory or "micro" behaviors may be of critical importance to the process of social interaction (see Ekman, O'Sullivan, & Frank, 1999), the design of the present study precluded the reliable identification of such behaviors. This happened for 2 reasons: first, the study sessions were recorded using VHS technology, a format in which the signal to noise ratio is sub-optimal for making the fine-grained distinctions required in the coding of micro

behaviors. Second, the surreptitious filming procedure required the camera to be positioned about 15 feet from the participants, behind a one-way mirror. Therefore, participants were not filmed at close range nor could they be explicitly instructed to assume a particular position in the room. As a result, many participants adjusted their body positions on the sofa such that they were partly angled to face one-another, thereby obscuring as much as a third of their faces. This is a flaw of the present design and therefore limits the degree to which conclusions may be made about the interplay of micro-level nonverbal behaviors across partners.

As with verbal behavior, 2 raters coded 60 sessions, including both partners to check coder reliability. Five coders generated the nonverbal data, yielding a total of 10 unique coder pairings. Cohen's kappas were utilized to index agreement among the coder pairings. Both of the smile types generated high indices of agreement across coders, demonstrated by kappas between .94 and 1.00 (pleasurable smiles) and .83 to .95 (polite smiles), as did brow movements with kappas between .94 and .98. Unpleasant expressions generated kappas between .73 and .88 and kappas for neutral faces ranged from .76 to .85. Interrater agreement for communicative hand gestures ranged from .97 to 1.00, fidgiting from .93 to 1.00, and self-touch from .80 to .91, and episodes in which the hands were still or resting from .75 to .90. Touching of one's partner was infrequently coded. In all but 3 instances, this behavior consisted of a handshake and generated agreement indices between .98 and 1.00. Coder disputes were resolved in the same fashion as they were for verbal data. Frequency and duration calculations likewise.

4. RESULTS

Four major hypotheses were proposed in the present project, along with several research questions. Each hypothesis explores a different aspect of the data that comprise the current investigation: self-reports of social interaction, verbal social behavior, non-verbal social behavior, and change from time 1 to time 2. Due to the complexity of the present design and the fact that several hypotheses were not unequivocally confirmed, Except where indicated, the rationale for data analyses is explained below.

4.1. Rationale for data analytic strategy

There were 2 independent variables of interest in the present study, the type of dyad into which one was placed (NSA-NSA or SA-NSA) and participant type (NSA with NSA partner, NSA with SA partner, or SA with NSA partner). In addition, the random pairing of participants into dyads contributed unique variance to the design, creating a third source of variance. For example, the interactions of dyad 1 were different than those of dyad 2, even if dyads 1 and 2 were of the same dyad type. Individuals interacted within dyads therefore conversation partners' experiences in the interactions were not statistically independent. Although this variable was not of theoretical interest to the present investigation, it was tested in the context of each analysis. Significant tests of this variable, dyad number, indicate that interaction partners within dyads were more similar to one another than they were to other participants' interaction partners, despite the fact that within dyad type, participants were randomly assigned to dyads. Tests of dyad number are statistically identical to tests of the intraclass correlation (Kenny & Judd, 1996; Kenny & la Voie, 1985). The present design then, is one in which participant type is nested within dyad number, which itself is nested within dyad type.

To further complicate matters, at the level of dyad type, differences between groups existed at the outset of the study. Although NSA participants were randomly assigned to dyad type, and within dyad type to dyad number, SA participants, due to their levels of social anxiety, were not randomly assigned to dyad type—they always appeared in SA-NSA dyads. In particular, prior to any interaction, SA participants experienced significantly higher levels of negative emotion than NSA participants, along with more shyness, differences on other trait measures, and perhaps less conversational practice. These pre-existing differences may have impacted the ways in which conversations unfolded in SA-NSA dyads, making the results potentially difficult to interpret. An explanation of how pre-existing differences were controlled appears below in conjunction with the relevant analyses.

Except where indicated, analyses consisted of hierarchical, mixed-model ANOVAs, with the independent variables listed above. Dyad type was treated as a fixed factor and entered into the model at the first step; dyad number, which accounts for individual differences among the different dyads, was treated as a random factor and entered into the model at the second step; finally, participant type was treated as a fixed variable and entered into the model at the last step. No interactions were examined, as there was no error term for testing these (for a more detailed explanation of this analytic strategy, see Kenny & la Voie, 1985). Significant omnibus Fs obtained for participant type were further examined for differences between the 3 levels of this variable. Scheffe's correction for Type I error rates was used. Note that tests of dyad number (the intraclass correlation) are only reported and discussed where they are significant.

The present approach statistically accounts for non-independence in the data in a similar fashion to that of other repeated measures ANOVA designs. For each omnibus test the total variance is orthogonally partitioned such that the variance accounted for by the dyad to which one is assigned is separated from other sources of variance. In this way, the unique variance accounted for by dyad type and participant type can be examined with the effects of dyad pairing removed (Kenny, 1995; Kenny & la Voie, 1985). The general linear model, including expected sums of squares for these analyses, is represented in Appendix C. Appendix D contains a summary of the results of hypothesis tests 1 – 4.

4.2. Approaching interaction: Measures of personality and function

In addition to measures of anxiety (IAS and SPAI) and depression (BDI), Participants completed measures of traits including emotional expressivity (Berkeley Expressivity Questionnaire; BEQ), self-monitoring (SMS), and fear of negative evaluation (FNE). Although these questionnaires are measures of trait characteristics and general levels of functioning, it was of concern that participants' responses might have been biased by their interactions as these measures were completed following interaction 2. For this reason, a set of intraclass correlations was computed to determine whether participants' scores on these measures had been affected by their dyadic interactions. In no case did these correlations diverge significantly from zero. Correlations ranged from -.17 to .16 with corresponding *p* values ranging from .97 to .29. It is appropriate to assume, on this basis, that the differences between NSA and SA participants are representative of individual differences rather than the result of bias stemming from the preceding set of social interactions.

Participants were selected according to their scores on the IAS. As might be expected, scores differed significantly between anxious and non-anxious participants ($F(1, 128) = 1364.19, p < .000$; see Table 2). Likewise, the SPAI, a measure of anxiety-related distress generated significant group differences ($F(1, 128) = 217.06, p < .000$). The SA participants' mean on the SPAI was surprisingly high, similar to previously reported norms for patient samples (Turner et al., 1989). Given their high levels of distress, it is not surprising that the SA group experienced significantly more symptoms of depression as well, with average BDI scores indicative of mild depression ($F(1, 127) = 39.14, p < .000$). Taken together, SA participants appeared to be generally more distressed than NSA participants.

Measurement of emotional expressivity examined 3 dimensions: general intensity of emotional experience; degree to which experienced positive emotion is expressed; and degree to which experienced negative emotion is expressed. Research has shown that positive emotion is viewed as generally more acceptable to express than negative emotion (Gross & John, 1995). Interestingly, SA participants reported more inhibition of positive emotion expressions than did NSA participants ($F(1, 128) = 12.95, p < .000$). The groups did not differ in their reports of the degree to which they express their negative emotion ($F(1, 128) = .66, p = .42$) or in intensity of emotional experience ($F(1, 128) = 1.19, p = .28$).

It has been suggested that socially anxious individuals are more likely to carefully monitor their behavior due to self-presentational concerns (e.g., Rapee, 1995). As expected, SA participants experienced significantly more fear of negative evaluation ($F(1, 128) = 62.38, p < .000$). Surprisingly, SA participants in the present study reported

lower levels of self-monitoring than did NSA participants ($F(1, 128) = 13.49, p < .000$), suggesting that the SA participants, despite their concerns about self-presentation, may be less likely to monitor their own behaviors and attend to others' reactions.

Taken together, SA and NSA individuals likely approach social interactions differently. SA individuals experience more distress when participating in interactions, focused on fears of negative social evaluation. Despite these fears, they are lower in self-monitoring ability, more likely to inhibit expressions of positive emotion, and express negative emotions. As a result, their interactions are likely to be experienced as less rewarding and more unpleasant.

4.3. Hypothesis 1: Participants' self-reports of their social interactions

This hypothesis examines participants' self-reports across a variety of dimensions during both interactions 1 and 2. Although findings from both time points will be reported, changes across time will not be examined by this hypothesis (see hypothesis 4).

4.3.1. Hypothesis 1A: Positive and negative emotion

Differences in self-rated positive and negative emotion existed at the individual level prior to participants' initial interactions. NSA participants reported higher levels of positive emotion ($F(1, 64) = 19.34, p < .000$; see Table 3) and less negative emotion ($F(1, 64) = 7.68, p = .006$) than did SA participants. Participants had not yet engaged in any interaction and intraclass correlations at this time point were non-significant so these ratings are assumed to be independent. Prior to interaction 2, participants again reported differences in negative emotion ($F(1, 64) = 6.24, p = .02$) but not on positive emotion ($F(1, 64) = .00, p = .99$). Intraclass correlations were not significant prior to beginning the second interaction. Ratings of positive and negative emotion prior to interacting were

positively correlated with participants' ratings of positive and negative emotion following the first interaction (positive emotion, pre and post: $r = .71$, $p < .000$; negative emotion, pre and post: $r = .66$, $p < .000$). In order to examine hypotheses concerning positive and negative emotion after interaction 1, initial levels of both emotions must be controlled in some fashion.

Although the use of analysis of covariates (ANCOVA) has been proposed to deal with errors in random assignment (i.e., covariates) that result in group differences at the outset of a study, such a strategy is not appropriate in the present case. Lord's paradox (Lord, 1967), which refers to the presence of pre-existing group differences, is operating in these data. Were ANCOVA used with the present data, interpretation would be biased, as it relies on the assumption that the covariate statistically affects both groups to the same degree (Lord, 1969). When group differences in the mean of a covariate, or group differences in the relation between a covariate and a dependent variable exist, use of the covariate masks true trends in the data (for a full explanation of Lord's paradox, see Lord, 1967).

To control for emotion prior to study onset participants' post-interaction negative emotion scores were subtracted from their pre-interaction negative emotion scores. This was done at time 1 and again at time 2, creating a score indicating change in negative emotion after interaction 1 and a score for change in negative emotion after interaction 2. A similar set of difference scores were computed for positive emotion. Hierarchical, mixed-model ANOVAs were run on difference scores to examine dyad type and participant type differences in negative and positive emotion.

Did SA participants report higher levels of negative and lower levels of positive emotion after their interactions? After interaction 1, significant differences in negative emotion across participant types were found ($F(1, 64) = 5.70, p = .020$; see Figure 1). SA participants tended to report greater levels of negative emotion than NSA participants with NSA partners (NSA w/ NSA; $p = .065$), and reported greater levels of negative emotion than their own NSA partners (NSA w/ SA; $p = .040$). Differences between the two types of NSA participants, those with and those without SA partners, were nonexistent ($p = .983$). Interaction 1 negative emotion tended to differ at the level of dyad type ($F(1, 63) = 2.77, p = .101$), with SA-NSA dyads reporting slightly higher levels of negative emotion. At interaction 2, levels of self-reported negative emotion did not differ by dyad type ($F(1, 63) = .29, p = .592$), and only tended to differ at the level of participant type ($F(1, 64) = 2.60, p = .112$), with SA participants again reporting slightly greater levels of negative emotion.

Reports of positive emotion at interaction 1 were significantly different at the level of participant type ($F(1, 64) = 9.35, p = .003$) although not at the level of dyad type ($F(1, 63) = .47, p = .496$). As predicted, SA participants reported lower levels of positive emotion than NSA w/ NSA participants ($p = .013$) but not their own NSA partners ($p = .579$). NSA w/ SA participants reported lower levels of positive emotion than NSA w/ NSA participants ($p = .051$). Intraclass correlations were significant ($F(63, 64) = 1.69, p = .019$), indicating interdependence among participants within dyads. At interaction 2, differences in positive emotion were no longer significant for either participant type ($F(1, 64) = 1.96, p = .166$), or dyad type ($F(1, 64) = .01, p = .994$).

To summarize, participants differed in their levels of positive and negative emotion as expected. SA participants experienced more negative emotion at interaction 1 than did NSA participants, although NSA participants who interacted with SA partners also experienced more negative emotion than those who did not. At interaction 1, SA participants experienced less positive emotion than NSA participants with NSA partners but about the same degree of positive emotion as their own NSA partners. Dyad types did not differ in level of either positive or negative emotion. In the case of both positive and negative emotion, at interaction 2 group differences were no longer significant.

4.3.2. Hypothesis 1B: Perceptions of self and interaction partner

Data across three dimensions of self-reported interaction are examined: participants' perceived self-impressions (PSI), participants' ratings of their self-presentational effort during interaction (SPE), and discrepancies between self-ratings and partner ratings of PSI and SPE during the interaction. Table 4 describes group means and standard deviations for tests of this hypothesis.

Did SA participants perceive themselves less positively and more negatively than NSA participants? ANOVAs (model as previously described) indicated that they did. At interaction 1, SA participants perceived themselves less positively ($F(1, 64) = 13.25, p = .001$), than either NSA w/ NSA ($p < .000$) or NSA w/ SA participants ($p = .001$). The NSA w/ NSA participants did not differ from the NSA w/ SA participants ($p = .528$). In addition, a significant difference in dyad type appeared ($F(1, 63) = 12.08, p = .001$), indicating that SA-NSA dyads reported less positive self-impressions overall than did NSA-NSA dyads. At interaction 2, results tended to be similar at the both the levels of participant type ($F(1, 64) = 3.89, p = .064$) and dyad type ($F(1, 63) = 2.75, p = .102$).

That is, SA participants tended to report less positive self-impressions than NSA participants and SA-NSA dyads overall reported less positive self-impressions than NSA-NSA dyads.

With respect to negative self-perceptions, SA individuals at interaction 1 reported more negative perceptions ($F(1, 64) = 12.17, p = .001$) than either NSA w/ NSA ($p < .000$) or NSA w/ SA participants ($p = .004$). Of note, NSA w/ SA participants reported significantly more negative perceptions than NSA w/ NSA participants ($p = .015$). This effect was marked at the level of dyad type as well ($F(1, 63) = 35.57, p < .000$), indicating significantly lower levels of self-reported negative perceptions among the NSA-NSA dyads. At interaction 2, this effect remained consistent at the level of dyad type ($F(1, 63) = 14.62, p < .000$) and tended to hold for participant type as well ($F(1, 64) = 2.62, p = .111$), with mean differences between the 3 participant types occurring in the same patterns as at interaction 1.

In sum, SA participants perceived themselves less positively and more negatively than either their NSA partners or participants in NSA-NSA dyads. Interestingly, the NSA partners of SA individuals self-reported more negative self-perceptions than their counterparts in NSA-NSA dyads. At the level of dyad type, SA-NSA dyads held more negative and less positive self-impressions than did NSA-NSA dyads. These differences were strongest at the first interaction.

Did SA participants perceive themselves to have put forth greater self-presentational effort? Participants did not differ in self-reported effort by participant type ($F(1, 64) = 1.20, p = .277$) or dyad type ($F(1, 63) = .27, p = .609$), at interaction 1. Similarly, participants' reports of their efforts during their second interaction were neither

significant for participant type ($F(1, 64) = .27, p = .606$), nor dyad type ($F(1, 63) = 1.52, p = .223$). The intraclass correlation approached significance at interaction 2 ($F(63, 64) = 1.43, p = .079$), indicating that dyad partners increased in the similarity of their self-reports at the second interaction. Contrary to expectation, there were no self-reported differences in effort among participants.

Did SA participants rate their partners, relative to themselves, as having more positive self-impressions, less negative self-impressions, and higher effort during the interaction? To test this question, comparisons between participants' ratings of themselves and of their partners were examined on the above variables. Difference scores were computed by subtracting each participant's rating of his/her self from that of his/her partner for each of the variables in question. These difference scores were subjected to ANOVA. As expected, SA participants perceived their partners more positively than themselves during the first interaction ($F(1, 64) = 41.08, p < .000$; see Figure 2). This was true relative to both NSA w/ NSA ($p < .000$) as well as NSA w/ SA participants ($p < .000$). In addition, the discrepancies between the self and partner ratings of NSA w/ SA participants' tended to be greater than those of NSA w/ NSA participants ($p = .066$), suggesting that NSA w/ SA participants noted differences between themselves and their partners more so than did NSA-NSA dyad members. Discrepancies approached significance at the level of dyad type ($F(1, 63) = 2.77, p = .101$), indicating that individuals in NSA-NSA dyads rated themselves and their partners more similarly than did partners in SA-NSA dyads. After the second interaction, the participant type findings remained. That is, SA participants self-rated themselves less positively than their partners ($F(1, 64) = 18.76, p < .000$), relative to both NSA w/ NSA ($p = .033$) as well as NSA w/

SA participant types ($p < .000$). In addition, the discrepancies between the self and partner ratings of NSA w/ SA participants' at interaction 2 tended to be greater than those of the NSA w/ NSA participants ($p = .079$). Dyad type findings were not significant at interaction 2 ($F(1, 63) = .07, p = .786$).

In examining self-rating/partner-rating discrepancies for negative self-impressions, the above findings are mirrored. Following interaction 1, participant type differences were significant ($F(1, 64) = 19.81, p < .000$). SA participants showed greater self-partner discrepancies than either NSA w/ NSA ($p = .012$) or NSA w/ SA participants ($p < .000$). At interaction 2, participant type discrepancies remained ($F(1, 64) = 11.96, p = .001$). As before, SA participants differed from NSA w/ SA ($p = .004$), however they no longer differed from NSA w/ NSA participants ($p = .177$). Discrepancies between NSA w/ SA and NSA w/ NSA approached significance ($p = .120$).

Discrepancies in self-rated effort during the interaction and ratings of partner effort were additionally examined. At interaction 1, no significant differences appeared at any level of analysis. Following the second interaction however, marginal participant type differences emerged ($F(1, 64) = 3.55, p = .064$), with NSA w/ SA participants tending to rate their partners as having put forth more effort than themselves. Additionally, significant dyad type effects emerged ($F(1, 63) = 8.32, p = .005$), indicating that NSA-NSA dyads had less discrepancy between self/partner ratings of effort than did SA-NSA dyads.

In summary, SA participants' self-impressions versus partner impressions were significantly more discrepant with respect to both positive and negative perceptions than were those of NSA participants (with or without SA partners). Surprisingly, NSA

participants with SA partners had greater levels of self-partner discrepancy in ratings of negative impressions than did NSA w/ NSA participants. By interaction 2, discrepancies between SA participants' negative self- versus partner-impressions were no longer more discrepant than those of participants in NSA-NSA dyads, though SA participants' ratings were still more discrepant than those of their own NSA partners.

Self-versus partner perceptions of effort were significantly discrepant at the dyad level at interaction 2. Participants in SA-NSA dyads rated their partners more discrepantly than they rated themselves with respect to effort put forth in interactions than did individuals in NSA-NSA dyads.

4.3.3. Hypothesis 1C: Interaction quality

Interaction quality (IQ) specifically refers to perceptions of the process of social interaction between two individuals and therefore assumes interdependence across social partners. *Did dyad types differ with respect to ratings of interaction quality?* In examining participants' ratings of interaction quality, differences at the level of dyad type (NSA-NSA or SA-NSA) were predicted and found. At interaction 1, NSA-NSA dyads reported significantly higher levels of interaction quality than SA-NSA dyads ($F(1, 63) = 9.84, p = .003$). Following interaction 2, NSA-NSA dyads again reported higher levels of interaction quality ($F(1, 63) = 6.77, p = .012$; see Table 5).

4.3.4. Hypothesis 1D: Desire for future interaction

Was liking, as measured by desire for future interaction (DFI), greater among individuals who interacted with NSA participants than those who interacted with SA participants? No interaction 1 differences emerged at either the levels of participant type ($F(1, 64) = 2.27, p = .137$) or dyad type ($F(1, 63) = 1.60, p = .211$; see Table 6).

Significant intraclass correlations suggested correspondence among dyad partners ($F(63, 64) = 2.16, p = .001$). At interaction 2, the intraclass correlation was again significant ($F(63, 64) = 1.91, p = .005$), whereas differences in liking across dyad types remained non-significant ($F(1, 63) = 1.20, p = .278$). Following interaction 2, the predicted difference in liking approached significance ($F(1, 64) = 3.54, p = .064$), with NSA w/ SA participants tending to report lower levels of DFI than individuals who were part of NSA-NSA dyads ($p = .075$). Contrary to prediction, these analyses indicate that liking is more strongly related to random differences in partner pairings than to social anxiety status.

4.4. Hypothesis 2: Verbal social behavior

Similar to analyses of self-reported interactions, analyses of participant's verbal behaviors utilized hierarchical ANOVAs to examine differences at the levels of dyad type, dyad number, and participant type. As above, tests of dyad number are statistically identical to the intraclass correlation. Only the significant intraclass correlations are reported below.

4.4.1. Hypothesis 2A: Conversational engagement during discussion

To understand the degree to which dyad partners were active participants in their interaction 1 and interaction 2 conversations, two measures of engagement, coded as part of the information seeking/giving dimension (IS/IG) of verbal behavior, were examined. Both measures involved episodes in which one participant talked about a broad conversation topic, not including discrete speech acts such as verbalizing complaints, indications of agreement or disagreement, etc. These are referred to as "talk episodes" in the following sections and defined as the interaction over which one partner talked about a particular topic, allowing for short pauses of no longer than 1 second. The first measure

of engagement was the frequency with which talkers' partners asked questions to solicit additional detail about the current topic of discussion (e.g., "So your brothers, do they both still live in California?" "Then what did she do?"). Second, the frequency and average duration of each dyad's talk episodes was computed.

Did NSA participants probe their partners for details more frequently than SA participants? During the first interaction, SA participants tended to ask fewer questions during their partners' talk episodes ($F(1, 55) = 2.90, p = .091$; see Table 7), though there were no differences at the level of dyad type ($F(1, 54) = 1.99, p = .166$). The intraclass correlation was significant indicating that partners tended to match one another's frequency of questioning ($F(54, 55) = 1.69, p = .01$). During the second interaction, significant participant type differences emerged ($F(1, 55) = 9.53, p = .003$). SA participants asked significantly fewer questions than their NSA partners ($p = .013$), although not fewer than NSA w/ NSA participants ($p = .808$). NSA w/ SA participants generated the most detail probes, asking more of these than NSA w/ NSA participants ($p = .011$). Dyad level differences did not emerge ($F(1, 54) = 1.57, p = .215$).

The predicted difference, that SA participants would produce fewer probes than all NSA participants, failed to reach significance. Instead, whereas SA partners probed less frequently, their NSA partners increased the frequency of their probes. Thus, both dyad types probed with similar frequency but among the SA-NSA dyads, NSA participants bore much of the burden. Interestingly, SA participants did not differ in probe frequency from members of NSA-NSA dyads.

Did NSA participants engage in more and longer talk episodes than SA participants? At interaction 1, participant type differences in episodes of talk emerged

with respect to both frequency ($F(1, 55) = 5.60, p = .020$; see Figure 3) and duration ($F(1, 55) = 4.62, p = .034$; see Figure 4). NSA w/ NSA individuals tended to engage in longer ($p = .078$) and more frequent ($p = .070$) talk episodes than SA individuals. Differences between SA individuals and their partners reached significance for both duration ($p = .018$) and frequency of talk episodes ($p = .040$), with the NSA partners of SA individuals talking more. Dyad type differences failed to reach significance for frequency ($F(1, 54) = .12, p = .731$) and duration ($F(1, 54) = .94, p = .529$). During the second interaction, no differences emerged across participant type with respect to frequency of talk episodes ($F(1, 55) = 1.46, p = .229$). Differences in the duration of talk episodes remained across participant type ($F(1, 55) = 6.55, p = .012$). NSA w/ NSA individuals contributed longer talk episodes than SA individuals ($p = .042$) and tended to talk more than NSA w/ SA individuals ($p = .076$). SA participants did not differ from their partners at interaction 2 ($p = .19$). Again, no talk frequency ($F(1, 54) = .23, p = .659$) or duration differences were observed for dyad type ($F(1, 54) = 1.53, p = .196$).

At the dyad level, both NSA-NSA and SA-NSA dyads asked questions with about the same frequency and produced episodes of talk with similar duration and frequency. Participants in NSA-NSA dyads and their partners equally engaged in these behaviors. In SA-NSA dyads however, the NSA participants generated both more talk and more detail questions than did their SA partners, assuming the bulk of the responsibility for generating conversation.

4.4.2. Hypothesis 2B: Self talk versus commentary about likes and dislikes

Talk episodes always included broad conversation topics on which both dyad members could potentially have conversed. Talk was considered different from discrete

speech acts such as giving compliments, complaining, and offering statements about likes and dislikes. Talk episodes had greater potential for dyad members to ask questions and share their own experiences than other speech acts, which were more focused and circumscribed. In addition to talk episodes, other types of self-relevant speech were produced during sessions. Most frequently, these consisted of complaints and complements, and statements of preference or distaste regarding an individual, situation, or object. These tended to be discrete comments (e.g., “I like my Psych 1 TA.”) about which there was little opportunity for a discussion to open. Frequency and duration of self-talk episodes and self-relevant compliments and complaints were used to test hypothesis 2B.

Did members of NSA-NSA dyads produce more self-relevant talk about broad topics than members of SA-NSA dyads? There were no dyad type ($F(1, 54) = .68, p = .413$) or participant type effects on frequency during the first interaction ($F(1, 55) = 1.45, p = .232$; see Figure 3), although the intraclass correlation was significant indicating that partners matched the frequency of their self-talk episodes to one another ($F(54, 55) = 2.17, p < .000$). Similarly, neither dyad-type ($F(1, 54) = .03, p = .875$) nor participant type differences were observed in duration of self-talk episodes at interaction 1 ($F(1, 55) = .14, p = .711$; see Figure 4). At interaction 2 however, differences emerged. Participant type differences in frequency of self-talk episodes were significant ($F(1, 55) = 6.69, p = .011$), although dyad type differences were not ($F(1, 54) = .04, p = .843$). Surprisingly, SA participants had more episodes of self-talk than their partners ($p = .039$), although no other participant type differences emerged. As during interaction 1, significant intraclass correlations indicated that partners adjusted to one another in frequency of self-talk (F

(54, 55) = 2.27, $p < .000$). In examining duration of these episodes at interaction 2, SA participants engaged in longer episodes of self-talk than their partners who in turn tended to engage in the shortest bouts of self-talk in the study ($F(1, 55) = 3.91, p = .051$). As before, the intraclass correlation was significant ($F(54, 55) = 1.48, p = .041$).

The prediction that NSA-NSA dyads would engage in more self-talk was not supported. Instead, SA participants engaged in longer and more frequent episodes of self-talk than their partners. No dyad-level differences emerged.

Did participants in SA-NSA dyads center their self-talk on discrete complaints and statements of preference? For interaction 1, SA-NSA dyads produced more complaints and statements of preference than NSA-NSA dyads ($F(1, 54) = 3.98, p = .051$; see Table 7). The intraclass correlation was significant as well ($F(54, 55) = 1.86, p = .003$). Participant type differences were not significant ($F(1, 55) = .75, p = .390$). At interaction 2 however, participant type differences in frequency of complaints and statements of preference were found ($F(1, 55) = 4.89, p = .029$). SA participants produced the most of these statements ($p = .042$) and NSA participants did not differ from one another ($p = .294$). Dyad type effects approached significance ($F(1, 54) = 2.05, p = .058$) and the intraclass correlation reached significance ($F(54, 55) = 1.80, p = .005$). As expected, participants in SA-NSA dyads tended to produce more complaints and statements of preference than those in NSA-NSA dyads. The difference appears to relate to statements by SA participants.

4.4.3. Hypothesis 2C: Empathetic and supportive comments and apologies

Supportive comments such as empathetic remarks (e.g., “I understand how you feel.” “I would have done the same thing.”), were coded to examine the frequency with

which conversation partners made offers of reassurance to one another. The frequency with which participants made offers of apology was also examined. Table 7 presents descriptive statistics for the groups.

Did NSA partners of SA participants engage in more supportive verbal commentary? More empathetic and supportive (E/S) comments were offered, during interaction 1, in the SA-NSA dyads than in the NSA-NSA dyads ($F(1, 54) = 4.06, p = .050$). Among participant types, differences also emerged ($F(1, 55) = 8.25, p = .005$). NSA w/ SA participants offered more E/S either than SA participants ($p = .023$) or than NSA w/ NSA participants ($p = .006$). SA participants did not differ from NSA w/ NSA participants in frequency of E/S comments ($p = .572$). At interaction 2, neither dyad type ($F(1, 54) = .11, p = .746$) nor participant type differences were significant ($F(1, 55) = 1.55, p = .216$).

Did SA participants use apologies more than NSA participants in the course of their interactions? During session 1 SA-NSA dyads tended to make more frequent offers of apology than did NSA-NSA dyads ($F(1, 54) = 2.99, p = .090$). Although participant type differences were not identified ($F(1, 55) = .67, p = .415$), the intraclass correlation was significant ($F(54, 55) = 1.49, p = .039$). By the second interaction, however, participant type differences emerged ($F(1, 55) = 5.06, p = .027$). Contrary to prediction, NSA w/ SA participants offered more frequent apologies to their partners ($p = .041$) than SA participants ($p = .526$) or than NSA w/ NSA participants ($p = .317$). Dyad level differences were not significant at interaction 2 ($F(1, 54) = .05, p = .833$). Opposite to expectation, the anxiety status of one's partner, rather than one's self, was significantly associated with frequency of apologies.

4.4.4. Hypothesis 2D: Back channel communications

Individuals use back channel commentary (e.g., “um-hmmm.” “Really?,” “Wow.,” “No way!,”) to demonstrate attention and understanding and to solicit additional talk (McCarthy, 2003). The frequency with which participants produced these communications was examined to determine the degree to which participants differed in their tendencies to utilize this type of communication (see Table 7).

Did NSA participants engage in more frequent use of back channel communication than SA participants? At interaction 1, there were no differences with respect to frequency of back channel behaviors for either dyad type ($F(1, 54) = .04, p = .831$) or participant type ($F(1, 55) = .28, p = .597$). At interaction 2, participant types differed in back channel communication use ($F(1, 55) = 4.77, p = .031$) and dyad types tended to differ as well ($F(1, 54) = 2.98, p = .091$). SA participants used less back channel communications than NSA w/ NSA participants ($p = .022$) and tended to use less back channel communication than their partners as well ($p = .073$).

Generally speaking, tests of hypothesis 2 demonstrated that SA participants were less engaged in the interactions than were NSA participants. SA participants produced less general talk, more self-talk, made more simple statements about their likes and dislikes, asked about fewer details of their partners' conversation topics, made more solicitations for reassurance, and used less back channel commentary. Their NSA partners compensated for these differences by increasing the frequency of their questions, decreasing their own self-talk and offering more empathy, support, and apologies. In these ways, NSA w/ SA participants assumed the more active role in directing their conversations, an experience that may have differed from their typical interactions.

4.5. Hypothesis 3: Nonverbal social behavior

As with verbal behavior, nonverbal behaviors were examined using the same statistical model. The degree to which participants produced felt and polite smiles, unpleasant expressions, communicative gestures, and evidence of anxiety such as fidgeting, was examined at interaction 1 and interaction 2. Means and standard deviations for variables in the following analyses are reported in Table 8.

4.5.1. Hypothesis 3A: Positive and unpleasant facial expressions

The frequency and duration of positive facial expressions such as polite and pleasurable smiles, and unpleasant facial expressions, including frowns and grimaces, were examined to understand the degree to which different types of individuals and dyads used facial expressions during their interactions.

Did participants in NSA-NSA dyads produce more polite and pleasurable smiles than other participants? With respect to polite smiles at interaction 1, SA participants tended toward more frequent use of this behavior than the other participant types ($F(1, 55) = 2.77, p = .099$), and tended also to display these expressions longer than NSA participants ($F(1, 55) = 3.12, p = .080$). There were no dyad type effects for either frequency ($F(1, 54) = .06, p = .802$) or duration ($F(1, 54) = .01, p = .934$) although in both cases the intraclass correlations were significant (frequency: $F(54, 55) = 3.51, p < .000$; duration: $F(54, 55) = 4.00, p < .000$). Similar findings emerged with respect to pleasurable smiles. SA participants tended to display pleasurable smiles more frequently ($F(1, 55) = 3.18, p = .078$) and longer ($F(1, 55) = 3.46, p = .066$) than NSA participants. No dyad type effects were observed for either frequency of smiling ($F(1, 54) = .05, p =$

.820) or duration ($F(1, 54) = .01, p = .934$) but both intraclass correlations were significant (frequency: $F(54, 55) = 2.80, p < .000$; duration: $F(54, 55) = 3.92, p < .000$).

At interaction 2, pleasurable smiles were similar in frequency ($F(1, 55) = .49, p = .488$) and duration across participant type ($F(1, 55) = .83, p = .364$). The same held true for frequency ($F(1, 54) = .86, p = .357$) and duration at the level of dyad type ($F(1, 54) = 1.28, p = .262$). Interaction 2 intraclass correlations were significant, suggesting that individuals reciprocated the frequency ($F(54, 55) = 3.69, p < .000$) and duration of pleasurable smiles ($F(54, 55) = 4.89, p < .000$). Polite smiles at interaction 2 did not differ for dyad types with respect to either frequency ($F(1, 54) = 2.75, p = .103$) or duration ($F(1, 54) = .61, p = .440$). At the level of participant type, polite smile duration tended to be longer for SA participants ($F(1, 55) = 3.37, p = .069$). In addition, they produced polite smiles significantly more frequently than others ($F(1, 55) = 8.93, p = .003$), including both their NSA partners ($p = .014$) and participants in NSA-NSA dyads ($p < .000$). NSA w/ SA participants did not differ from NSA w/ NSA participants ($p = .999$). Individual dyad members displayed similar frequencies ($F(54, 55) = 4.013, p < .000$) and durations ($F(54, 55) = 2.95, p < .000$) of polite smiles as their partners, evidenced by significant intraclass correlations.

Contrary to prediction, SA participants produced more polite and pleasurable smiles than did NSA individuals, regardless of partner's anxiety status. This difference was particularly apparent with respect to polite smiles.

Were more unpleasant expressions produced among the SA-NSA dyads? Frowns, grimaces, and other facial cues of unpleasant affect were coded into a single category. This was done because low frequencies of unpleasant expressions were expected in

“getting to know you” interactions. With the exception of significant intraclass correlations for both frequency ($F(54, 55) = 5.56, p = .028$) and duration ($F(54, 55) = 1.92, p = .002$), no differences in unpleasant expressions appeared at all at interaction 1. Participant types ($F(1, 55) = .86, p = .355$) and dyad types ($F(1, 54) = .39, p = .538$) were similar with respect to frequency. Duration of these behaviors was also the same (dyad type: $F(1, 54) = .17, p = .683$; participant type: $F(1, 55) = 2.08, p = .153$).

At interaction 2, there were again no differences in unpleasant expressions. Tests of frequency did not uncover differences at either the level of dyad type ($F(1, 54) = .06, p = .803$) or participant type ($F(1, 55) = 1.98, p = .163$). Tests of duration were similarly non-significant for both dyad type ($F(1, 54) = .14, p = .710$) and participant type ($F(1, 55) = 1.76, p = .187$). Thus, contrary to prediction, SA and NSA participants displayed similar frequency of unpleasant expressions, and no differences were observed across dyad types.

4.5.2. Hypothesis 3B: Communicative aspects of nonverbal behavior

Nonverbal behavior serves important communication functions in social interaction. Communicative hand gestures while talking and brow rises while asking questions are two ways in which individuals may change the impact of their verbal statements. The frequency of these behaviors was examined across the different types of social interaction. See Table 9 for descriptive statistics relevant to the following analyses.

Did NSA participants produce more communicative gestures while talking than SA participants? Surprisingly, communicative hand gestures did not differ by dyad type ($F(1, 54) = 1.28, p = .226$) or participant type at interaction 1 ($F(1, 55) = 2.29, p = .133$), although within dyads participants gesture frequency matched that of the partner ($F(54,$

55) = 2.98, $p < .000$). Interaction 2 results were similar. As in interaction 1, the intraclass correlation was significant ($F(54, 55) = 1.87, p = .003$), but neither participant type ($F(1, 55) = .44, p = .507$) nor dyad type differences emerged ($F(1, 54) = .41, p = .524$).

Communicative facial gestures, such as brow raises while asking a question were generated significantly less frequently by SA participants during the first interaction ($F(1, 55) = 10.21, p = .002$) than either their own NSA partners ($p = .009$) or than NSA w/ NSA ($p = .047$). The two types of NSA participants did not differ from one another ($p = .417$). There were no dyad type differences in this behavior ($F(1, 54) = .21, p = .649$), although the intraclass correlation was significant ($F(54, 55) = 3.05, p < .000$). At interaction 2, dyad type differences remained non-significant ($F(1, 54) = .21, p = .647$) and differences in participant type disappeared as SA participants increased the frequency of this behavior ($F(1, 55) = 2.11, p = .149$). The intraclass correlation remained significant at interaction 2 ($F(54, 55) = 2.42, p < .000$).

In sum, whereas communicative hand gestures were produced with similar frequency across participants and dyad types, both types of NSA participants produced facial gestures, such as brow raises, more frequently. This difference was significant only at the first interaction.

4.5.3. Hypothesis 3C: Signals of anxiety

Fidgeting may signal psychomotor agitation and make individuals who engage in these behaviors appear more anxious (Okazaki, Liu, Longworth, & Minn, 2002). The frequency and duration of participants' fidgeting behaviors and was coded and examined.

Did individuals with SA display more and longer episodes of fidgeting than NSA participants? At interaction 1, frequency of fidgeting episodes that occurred was not

different at the levels of participant type ($F(1, 55) = .02, p = .903$; see Table 10) or dyad type ($F(1, 54) = 1.65, p = .205$). However, within dyads, participants displayed similar frequencies of fidgeting as evidenced by the intraclass correlation ($F(54, 55) = 1.55, p = .030$). Duration of fidgeting episodes did differ significantly across dyad types ($F(1, 54) = 5.72, p = .021$) with SA-NSA dyads fidgeting for longer periods of time than NSA-NSA dyads. There were no participant type differences in fidget duration ($F(1, 55) = .01, p = .972$).

During the second interaction, significant intraclass correlations showed that participants adjusted both the frequency ($F(54, 55) = 2.12, p < .000$) and duration ($F(54, 55) = 1.53, p = .030$) of their fidgeting to match that of their partners. As at interaction 1, there were no participant type differences for either frequency ($F(1, 55) = 2.15, p = .146$) or duration ($F(1, 55) = 1.01, p = .317$). At the level of dyad type, SA-NSA dyads engaged in fidgeting episodes that were both more frequent ($F(1, 54) = 5.01, p = .030$) and longer lasting ($F(1, 54) = 4.59, p = .037$). Although predicted participant type differences were not significant, participants in SA-NSA dyads fidgeted more than did those in NSA-NSA dyads.

Contrary to prediction, there were no participant type differences in fidgeting although SA-NSA dyads fidgeted more overall than did NSA-NSA dyads.

4.5.4. Hypothesis 3D: Touching of self and partner

Episodes of both face and hair touching were coded as self-touch. These behaviors were frequent across all interactions and their frequency was used to determine whether dyad types and participant types differed in these behaviors. Episodes of partner

touching typically involved handshakes at the beginning of sessions as the partners introduced themselves at interaction 1 or greeted one another at interaction 2.

Were participants with SA more likely to self-touch than NSA participants and were they also less likely to touch their partners? Frequency of episodes of self-touching at interaction 1 did not differ across participants ($F(1, 55) = .13, p = .72$; see Table 11) or dyads ($F(1, 54) = 1.03, p = .317$). The same was true at interaction 2. No differences were found at either the level of participant type ($F(1, 55) = .66, p = .432$), or dyad type ($F(1, 54) = .63, p = .430$). There were no significant intraclass correlations in self-touching behavior.

Shaking hands with one's interaction partner generated significant intraclass correlations at both interaction 1 ($F(54, 55) = 15.63, p < .000$) and interaction 2 ($F(54, 55) = 7.70, p < .000$), indicating that participants tended to shake a hand offered by a dyad partner. There were no differences in dyad type with respect to touching one's interaction partner at either interaction 1 ($F(1, 54) = .83, p = .367$) or interaction 2 ($F(1, 54) = .33, p = .575$). Both SA-NSA dyads and NSA-NSA dyads engaged in this behavior with similar frequency. NSA individuals were significantly more likely to initiate these interactions than were SA individuals at interaction 1 ($F(1, 55) = 4.66, p = .033$). This difference disappeared at interaction 2 as all participants decreased or eliminated their handshaking behaviors at the second interaction ($F(1, 55) = 2.03, p = .157$).

Tests of hypothesis 3 indicated that SA participants behaved differently from NSA participants with NSA partners as well as their own NSA partners. SA participants engaged in more smiling behavior overall, although this finding was particularly strong for polite smiling. They also made fewer facial gestures, engaged in more fidgeting, and

were less likely to initiate physical contact with their partners. With respect to fidgeting behavior, the NSA partners of SA participants differed from other NSA participants in that they displayed more fidgeting, equaling their partners' levels of fidgeting. Although differences between SA and NSA individuals in nonverbal behavior were subtle, they were likely noticeable to the NSA partners of SA participants.

4.6. Hypothesis 4: Change from the first to the second interaction

In order to examine changes over time, interaction 2 minus interaction 1 difference scores were computed. This type of analysis is most appropriate given the present data set. As noted previously, group differences existed between the SA participants and the NSA participants prior to recruitment and assignment to groups. Due to the nature of these differences, variables such as positive and negative emotion, quality of interaction, and desire for future interaction held different relationships with one another, depending on participant type. For this reason, regression models were inappropriate due to the high likelihood of suppression within the data. As above, the same hierarchical ANOVA model was applied to test differences among dyad types and participant types.

4.6.1. Hypothesis 4A: Changes in self-reported interaction experiences

Interaction 2 – interaction 1 differences in participants' self-reports of their interaction were examined on three dimensions, positive emotion, interaction quality, and desire for future interaction. Dyad level differences were predicted in participants' responses. Table 12 displays group means and standard deviations for the following analyses.

Did NSA-NSA dyads report more positive emotion after interaction 2, better interaction quality, and more desire for future interaction than SA-NSA dyads?

Interestingly, the answer on all three counts was no. For positive emotion, dyad level effects were not significant ($F(1, 63) = .09, p = .765$). Likewise interaction quality did not change over time for either type of dyad ($F(1, 63) = .01, p = .938$). Partners similarly adjusted their ratings of interaction quality to reflect dyad level differences in the interaction, evidenced by the intraclass correlation ($F(62, 63) = 2.43, p < .000$). For desire for future interaction the same pattern appeared. No observable change occurred over time ($F(1, 63) = .05, p = .830$), although the intraclass correlation was significant ($F(62, 63) = 1.81, p = .010$), indicating that partners tended to agree with one another about how much desire for future interaction they experienced.

4.6.2. Hypothesis 4B: Changes in nonverbal behavior and effort over time

During a first interaction, participants may be motivated to “make a good impression.” In order to do so, they may work effortfully to regulate their behavior and to behave appropriately (Jones, 1986). At a second interaction, individuals may be less guarded or polite than they were at an initial interaction, changing both their behavior, as well as their experience of effortful behavior regulation.

Did individuals in NSA-NSA dyads display an increase in smiling and gesturing at the second interaction, relative to any increase in these behaviors among SA-NSA dyads?

With respect to smiling, participant type differences indicated that polite smiles changed in frequency over time ($F(1, 55) = 4.30, p = .041$). SA participants increased polite smiling frequency relative to their partners ($p = .014$). No changes in pleasurable smiles were identified ($F(1, 55) = .27, p = .628$). No differences emerged relating to the degree

of change in gesturing over interaction for dyad type ($F(1, 54) = .08, p = .780$) or participant type ($F(1, 55) = .56, p = .455$).

Did NSA-NSA dyads experience a greater drop in the degree to which they put forth self-presentational effort than SA-NSA dyads? At the dyad level, a significant difference emerged, although not in the predicted direction ($F(1, 64) = 6.70, p = .012$). Participants in SA-NSA dyads reported putting forth significantly less effort at interaction 2 than they had at interaction 1, suggesting that these participants were less concerned about interaction 2 than they had been at time 1.

4.6.3. Hypothesis 4C: Conversational activity

Frequency and duration of self-talk at both interactions 1 and 2 were examined to determine whether participants increased or decreased their self-relevant talk over interaction. In addition, the frequency of detail soliciting questions during self-talk episodes was examined to look for dyad level differences in the degree to which participants encouraged self-talk.

Were NSA-NSA dyads increasing their self-talk and questioning behaviors more over time than SA-NSA dyads? No dyad level changes in frequency of talk about the self appeared over time ($F(1, 54) = .61, p = .439$). Surprisingly, participant type differences did ($F(1, 55) = 6.20, p = .014$). All participants decreased the frequency of self-talk over time but NSA w/ SA participants decreased talk about the self more so than other participants. NSA w/ SA talked less about themselves than either their SA partners ($p = .045$) or than NSA w/ NSA participants ($p = .015$). SA and NSA w/ NSA participants did not differ from one another ($p = .630$). In examining frequency of questions asked, there were no dyad level differences ($F(1, 54) = .05, p = .833$), although participant type

differences were significant ($F(1, 55) = 4.24, p = .042$). SA participants' decreased in probe frequency significantly more than their interaction partners ($p = .049$). There were no other differences over time.

Several significant changes were noted over time for participants. Specifically, SA participants engaged in more self-talk than other participants at the second interaction whereas their NSA partners talked least about themselves. SA participants also asked fewer questions than their partners over time and increased in frequency of polite smiling. Opposite to prediction, SA-NSA dyads decreased in self-presentational effort over time, suggesting that these participants became invested in their partners' perceptions of them over time.

4.7. Research Questions

Although of a priori interest, a solid evidence base upon which to formulate specific predictions was lacking for the following exploratory analyses. For this reason, the research questions examined below are focused upon questions that arose in the course of hypothesis testing in the present dataset. Although these analyses shed light on a number of interesting variables, it is important to remember that these research questions were generated in a post-hoc fashion. As with any post-hoc analyses, these results will require replication and a priori hypothesis testing before firm conclusions may be drawn.

4.7.1. Research Question 1: Reciprocity in social interactions

In order to examine social reciprocity in dyadic interactions, both verbal and nonverbal behaviors were coded according to their onset and offset times. This allowed for sequences of verbal and nonverbal behaviors to be examined at the dyad level for the

presence of reciprocal interaction patterns, such as one dyad member smiling in response to the other. In order to examine these statistically, verbal and nonverbal data channels were sequenced in time across interaction partners. Recall that behaviors were coded over periods of 1 second. Over the course of a 5-minute interaction there were 300 such “time bins” each of which contained a verbal behavior, a facial behavior, and a hand behavior for each dyad partner. In setting up the data in this fashion, it was possible to examine concurrent events within time bins as well as those occurring at specific time intervals, such as behaviors whose onsets happened one second after a behavioral precursor. Contingency tables were constructed in which cells indicated a set of observed and expected frequencies for target behaviors, based on a set of given behaviors. For example, the frequencies with which the smile of one dyad member followed that of the partner after a time lag of one second were computed for dyads with and without SA members. Chi-square tests examined the degree to which social “give and take” across different types of dyads fit an expected model.

In the hypotheses tested previously, a number of findings emerged that suggested the presence of patterns in verbal and nonverbal exchanges. Broadly, these relate to fidgeting onsets across dyad partners, smiling sequences, and patterns in question asking and self-relevant responding.

Research Question 1A: Is fidgeting contagious?

Contrary to prediction, both dyad types engaged in similar frequencies of fidgeting behavior across the interactions. The present analysis examines the likelihood that one dyad member will begin to fidget after the onset of a partner’s fidgeting behavior. There were no differences in patterns between interactions 1 and 2 so data were

pooled over sessions. It was frequently true that partners in both types of dyads fidgeted simultaneously, rather than during episodes in which a partner was still ($\chi^2_{\text{GFI}}(4) = 15.65$, $p = .004$; see Figure 6). Chi-square likelihood ratios confirmed that SA participants more frequently initiated bouts of joint fidgeting than did their NSA partners ($\chi^2_{\text{L}}(1) = 6.78$, $p = .009$). In NSA-NSA dyads there were no differences in which of the partners initiated fidgeting ($\chi^2_{\text{L}}(1) = 1.11$, $p = .285$). In sum, fidgeting appears to be transmitted across interaction partners. Not only does one partner influence the other's fidgeting behavior, an individual interacting with a person who fidgets more may actually increase in fidgeting behavior, to match the levels of the partner.

Research Question 1B: Do partners tend to reciprocate smiling?

It is a common occurrence that individuals smile in response to the smiles of others (Jakobs, Manstead, & Fischer, 2001). To examine this, the polite and pleasurable smile onsets of each participant, given the smiling behavior of his or her partner, were tallied at a lag of one second. Results are pooled over interaction, as there were no differences in patterns of results across the interactions. Across dyads, participants frequently smiled back at their partners rather than responding in other ways ($\chi^2_{\text{GFI}}(4) = 30.18$, $p < .000$). In SA-NSA dyads, SA participants were more likely to smile politely in response to both types of partner smiles ($\chi^2_{\text{L}}(1) = 1.54$, $p = .248$) whereas their NSA partners were more likely to respond with a matching smile ($\chi^2_{\text{L}}(1) = 7.02$, $p = .013$). Polite and pleasurable smile responses for both partners typically matched the partner's smile type in NSA-NSA dyads ($\chi^2_{\text{L}}(1) = 12.17$, $p < .000$; see Table 13).

Research Question 1C: Are question and answer sequences more likely to result in self-talk among SA participants than NSA participants?

SA participants have been hypothesized to avoid self-disclosure (Leary & Kowalski, 1995a; Leary et al., 1988; Rapee, 1995; Wells, Clark, Salkovskis, & Ludgate, 1995). Episodes of talk about the self were therefore expected to be less frequent among SA participants than NSA participants. As previously reported, SA participants engaged in more self-talk than did their NSA partners. To better understand the types of questions that lead to self-talk, differences in self- versus general talk in response to questions was examined. Detail probing questions were those that happened during the course of a discussion topic and pulled for additional detail about a conversation topic. Topic presenting questions asked for recipients' reactions to novel topics. Among SA-NSA dyads, SA participants were equally likely to respond to their partners' detail probes and topic probes with talk about the self ($\chi^2_L(1) = .50, p = .917$). Their partners responded differently. NSA participants in SA-NSA dyads spontaneously responded with self-talk to detail probes more frequently than to topic probes ($\chi^2_L(1) = 11.20, p < .009$). Participants in NSA-NSA dyads did the same ($\chi^2_L(1) = 12.38, p = .006$; see table 14). Whereas SA participants spontaneously produced self-relevant responses to both detail eliciting as well as topic presenting questions, NSA participants tended to engage in talk about the self only when probed to provide details about their talk.

4.7.2. Research Question 2: Support seeking behaviors and expressions of discomfort

Participants who interacted with SA participants produced more frequent supportive and empathetic comments and advice than did those who interacted with NSA participants. What types of events precipitated reassuring comments? Laughter,

complaints, and apologies were examined for their ability to evoke reassurance in the form of empathetic commentary or advice. Results have been pooled over interactions due to the presence of similar patterns at interactions 1 and 2. Patterns of responding were the same across dyad type so these were pooled as well. Laughter was significantly likely to elicit empathetic comments from a recipient ($\chi^2_{L}(1) = 5.00, p = .024$), as were apologies ($\chi^2_{L}(1) = 3.82, p = .047$). Complaints also produced supportive responses ($\chi^2_{GFI}(2) = 6.73, p = .009$) though these were similarly split between advice and empathetic comments ($\chi^2_{L}(1) = 2.01, p = .16$; see Figure 6). Participants responded to laughter, complaints, and apologies with reassurance, suggesting that these types of behaviors may be used to solicit empathy, reassurance, and advice, regardless of the presence of social anxiety.

4.7.3. Research Question 3: Gender differences in verbal and nonverbal behavior

The presence of gender differences was examined in both the NSA-NSA dyads as well as the SA-NSA dyads. In NSA-NSA dyads, a similar ANOVA model to that used previously highlighted the presence of gender differences, accounting for dyad level interdependence.

Research Question 3A: Did NSA women and men in NSA-NSA dyads behave similarly during their interactions?

Generally speaking, women were more expressive with their partners both nonverbally and verbally. Women produced more hand gestures than men ($F(1, 27) = 7.96, p = .006$; see Table 15), displayed more pleasurable smiles ($F(1, 27) = 4.58, p = .036$), and displayed more unpleasant facial expressions ($F(1, 27) = 4.20, p = .044$). With respect to verbal behaviors, women offered more empathetic comments ($F(1, 27) = 6.92,$

$p = .009$) and were to be more apologetic ($F(1, 27) = 3.79, p = .053$). They also engaged in more complaining ($F(1, 27) = 3.90, p = .050$) and were more likely to probe for details about a partner's conversation topic ($F(1, 27) = 9.50, p = .002$).

Research Question 3B: Does the presence of social anxiety relate to gender differences in communication during interaction?

In order to examine whether SA women and men behave differently than NSA women and men, participants in SA-NSA dyads were subjected to ANOVA so that gender by anxiety effects could be examined. As above, female dyads engaged in more gesturing ($F(1, 27) = 4.98, p = .027$; see Table 16), produced more pleasurable smiles ($F(1, 27) = 8.67, p = .004$), and displayed more unpleasant facial expressions than did male dyads ($F(1, 27) = 7.27, p = .008$). In addition, female SA-NSA dyads displayed more polite smiles than did male dyads ($F(1, 27) = 8.01, p = .005$) than did male dyads. Several gender by anxiety interactions occurred as well. SA females tended to fidget more ($F(1, 27) = 3.26, p = .073$) and displayed more polite smiles than did SA males ($F(1, 27) = 5.83, p = .017$). Communication patterns in the verbal spectrum were similar to those in NSA-NSA dyads. Women gave more advice than men ($F(1, 27) = 4.63, p = .033$), and were more apologetic ($F(1, 27) = 4.14, p = .044$). SA participants probed less often than NSA participants, regardless of gender ($F(1, 27) = 7.45, p = .007$) but among SA participants, this behavior was more frequently carried out by females ($F(1, 27) = 7.47, p = .007$). Male and female SA-NSA dyads did not differ with respect to empathetic comments ($F(1, 27) = 2.55, p = .112$).

Altogether, women dispensed more advice and empathetic comments, asked more questions, made more complaints, fidgeted more, and were more nonverbally expressive.

Gender by anxiety interactions indicated that SA females asked more questions and were more nonverbally expressive than SA males. Surprisingly, SA males sought reassurance as frequently as SA females, in contrast to reassurance seeking patterns among NSA males and females in which males engage in less reassurance seeking.

5. DISCUSSION

SA participants experienced significantly more negative and less positive emotion as they began their social interactions and their interactions differed in subtle ways. Relative to those of NSA participants with NSA partners, interactions between SA participants and NSA partners involved less talk about general topics and more self-focused talk on the part of the SA participants; more complaints and statements of preference; more fidgeting; and more polite smiling from SA participants. Did NSA participants notice the discomfort of their SA partners? It is likely that they did. They talked less about themselves and offered more empathetic comments, words of advice, and apologies than did either SA participants or members of NSA-NSA dyads. Although subtle, the verbal and nonverbal cues of the SA participants were both perceived and responded to by their NSA partners. As a result, their interactions unfolded differently from those of NSA-NSA dyads, indicating that verbal and nonverbal cues have significant power to shape social interactions.

5.1. Verbal Behavior and Distress Communication

Verbal communication is perhaps the most salient aspect of social interaction, consciously focused on and responded to (Fussell & Kreuz, 1998). Therefore, deviations from the norm in verbal behavior are particularly likely to have social consequences. SA participants appeared to be less engaged in their conversations and more self-focused

than either their partners or than members of NSA-NSA dyads, indicated by low frequency of questions asked, less back channel communication (e.g., “uh-huh,” “really,” “right”), and more self-focused discussion. In addition, they communicated more complaints. Their NSA partners responded to them differently than the ways in which members of NSA-NSA dyads responded to one another, talking less about themselves, and providing more supportive commentary.

Although there were no dyad level differences in the number of questions asked during interaction—both SA-NSA and NSA-NSA dyads queried with similar frequency, within SA-NSA dyads, the NSA members asked more of these questions thereby taking more responsibility for keeping the conversation moving. Their SA partners responded by talking about themselves, rather than about topics of general interest. This pattern may have emerged because the NSA partners of SA participants queried specifically about topics relevant to the SA participants’ selves. However, in NSA-NSA dyads this was not the case and there were few differences in the question-related behaviors of the NSA with SA participants and the NSA-NSA dyad members. To ascertain whether question-related differences exist, more work on participants’ specific question and discussion topics will be required.

A more likely explanation for the differences in self-focused talk centers on the anxiety experienced by SA participants. Although theories of social anxiety suggest that self-disclosure is likely to be avoided by the socially anxious (for a review see Rapee, 1995), this finding is consistent with recent research demonstrating heightened self-focused awareness as a consequence of social anxiety (Spurr & Stopa, 2002; Kocovski & Endler, 2000). If self-talk is indicative of self-focus, this was clearly demonstrated by the

SA participants. Moreover, the NSA partners of SA participants responded to their partners by soliciting details and actively engaging in the discussion, without generating much of their own self-talk. Due to their heightened self-focus, the SA participants may not have noticed that this focus was unequally centered upon themselves.

In both types of dyads complaints and apologies generated support, either in the form of advice, or empathetic commentary, with complaints being more powerful elicitors of empathetic comments than advice. Although NSA participants produced more apologies than SA participants at interaction 2, SA participants produced many more of these solicitations for support overall, which their NSA partners provided. It is likely that SA participants' reassurance seeking served to inhibit their NSA partners. Previous research has shown that individuals who converse with a distressed partner report lower feelings of engagement with the partner and more social restraint (Furr & Funder, 1998). In the present case, this may have been true as well. Inhibition in levels of talk about the self may have related to the reassurance seeking behaviors of social partners. Whereas the SA participants and the NSA participants in NSA-NSA dyads talked generally about themselves at similar rates, the NSA participants with SA partners may have been less likely to divulge personal information to their conversation partners, who frequently sought reassurance.

5.2. Nonverbal Communication

In addition to explicit conversation, nonverbal cues provide a significant amount of information in the course of a social interaction. For example, nonverbal signals may communicate liking (Keltner & Haidt, 1999), conversational involvement (Chovil, 1991), and pleasant emotion as well as unpleasant emotion (Buck, Savin, Miller, & Caul, 1972)

or the intent to harm another (Fridlund, 1992). Did SA participants communicate their distress nonverbally?

Fidgeting, a signal of psychomotor agitation associated with anxiety and discomfort (Okazaki et al., 2002), was present across both types of dyads. This behavior tended to be “transmitted” across partners such that once one partner began to fidget, the other typically joined in. Although both SA-NSA and NSA-NSA dyads fidgeted with about the same frequency, episodes of fidgeting lasted longer among the SA-NSA dyads. In the NSA-NSA dyads, both partners were equally likely to initiate episodes of joint fidgeting. In the SA-NSA dyads however, the SA participants were much more likely to initiate these episodes and to carry them on longer than their NSA partners, perhaps leading the NSA partners to feel agitation as well.

The pleasant smiles of positive emotion have been shown to be a form of social reward (O'Doherty et al., 2003). Receiving these types of smiles tends to lead to positive emotion and reciprocal smiling behavior (Fridlund, 1991). SA participants responded to their partners' pleasurable smiles with polite smiles, likely due to their own interaction-related anxiety. Although it may be socially appropriate to return a smile, when one's felt smiles are frequently returned with contrived, polite smiles, one may experience less positive emotion. Interestingly, NSA participants with SA partners were the only group in the present study that did not experience any rise in positive emotion from baseline, measured prior to interacting, to post interaction. This may relate to differences in smiling behavior on the part of the SA participants. By returning their partners' pleasurable smiles with polite smiles, the SA participants may have failed to provide the appropriate social rewards, leading their partners' to experience less positive emotion.

As a caveat to the preceding finding of differences in polite and pleasurable smiles, it is important to note that although every effort was made to accurately code the tapes, a precise facial coding system, such as the Facial Action Coding System (FACS; Ekman & Friesen, 1978) was not used. Based in the design of the study, it was not possible to code at close range making the use of FACS impossible. Therefore, it may have been true that slight pleasurable smiles were coded incorrectly by coders simply because they were unable to detect the corresponding eye-muscle movements on participants faces. For this reason, differences in smiling behavior must be interpreted with caution.

Expressions of unpleasant emotion such as grimaces, furrowed brows, or frowns, seem to be obvious markers of negative affect. In the present study, there were no anxiety related differences in these behaviors, and across anxiety status participants reported expressing negative emotion to a similar degree. It may also be true that little sharply unpleasant emotion was experienced in the study, aside from the anxiety of the socially anxious participants. Moreover, it is unclear that anxiety is associated with such expressions. Whereas fear has a distinctive facial expression, anxiety may not (LeDoux, 1993). Only among females, who tend to be more facially expressive than males (Kring & Gordon, 1998), were unpleasant expressions more frequent.

5.3. Reported Experience During Social Interaction

Across the dyad types, there were noticeable differences in verbal and nonverbal behaviors and responses during social interactions. To what degree were these differences perceptible to participants? Generally speaking, the interactions between SA participants and their partners were less positively perceived than those between pairs of NSA

members. The interactions of SA-NSA dyads were perceived by both members as being lower in interaction quality than were those of NSA-NSA dyads, meaning that participants in SA-NSA dyads viewed their interactions as having been less coordinated, smooth, and enjoyable, and more awkward than did participants in NSA-NSA dyads. For NSA participants with SA partners, the interactions experienced in context of the present study were likely perceived very differently than their typical daily interactions. Although participants in NSA-NSA dyads likely viewed study interactions differently than typical interactions as well, it is unlikely that the magnitude of the discrepancy was as great.

Participants' self-perceptions during interaction were different depending on dyad type. As expected, SA participants viewed themselves less positively than NSA participants overall. Unexpectedly, their NSA partners also viewed themselves more negatively, as having been less likeable, sociable, and pleasant, and more boring and awkward, than did members of NSA-NSA dyads. There were no differences in negative self-perceptions among SA participants and their partners. Discrepancies between self-ratings and ratings of the partner indicated more discrepancy on the part of the SA participants. SA participants reported their partners as having behaved more positively and less negatively than themselves and as having contributed slightly more effort towards the social process, even though there were no differences in self-ratings of effort across participants. Members of NSA-NSA dyads tended to view themselves similarly to the ways in which they viewed their partners. Experiencing interactions that do not progress as smoothly as is typical may lead to the perception that one has erred in some way. NSA participants may have attributed the lower interaction quality to themselves, thereby explaining their unusually negative self-perceptions.

Participants' self-reported emotion differed as predicted: SA participants experienced more negative emotion and less positive emotion than NSA participants. The two types of NSA participants did not differ significantly on self-reported negative emotion. Interestingly, the NSA participants in SA-NSA dyads did not differ from their SA partners in level of negative emotion. With respect to positive emotion, participants who interacted with NSA participants reported increases in positive emotion, relative to pre-interaction levels, following the interactions. In contrast, NSA participants who interacted with SA participants reported lower levels of positive emotion than did NSA individuals with NSA partners. Differences in the self-reports of NSA individuals who interacted with SA participants, relative to those who interacted with NSA participants, indicate that the verbal and nonverbal differences in dyad type across interactions were perceptible to interactants.

The accuracy of SA individuals' self-reports of their interactions has been questioned (Rapee & Lim, 1992). On the basis of the present results, these ratings may be more accurate than previous studies have suggested. Although slow to develop, interpersonal relationships between SA and NSA individuals exist and are viewed as rewarding by both members (Leary & Kowalski, 1995b). Because anxiety tends to decrease with prolonged exposure to a situation (Foa & Kozak, 1986), it is likely that SA participants' anxiety decreases over the course of multiple interactions. As they get to know the other, it is likely that their interactions become increasingly smooth. In the present case, SA participants may know that their anxiety hinders their ability to engage in interaction. Their low self-perception ratings and ratings of interaction quality, which

paralleled those of their NSA partners, may reflect this knowledge and not be inaccurately low as theories have suggested (e.g., Rapee & Lim, 1992).

5.4. Change over Time

Few of the expected findings were unequivocally confirmed across both interactions 1 and 2, and few significant changes emerged over time. This may relate to the tendency of individuals to habituate to the interaction context and to their partners. This explanation is partly supported as the data show that regardless of participant type, many behaviors prominent at interaction 1 decreased slightly over time. Moreover, numerous participants (about 38%), across anxiety status, spontaneously reported that they had “nothing in common” with their partners, either to the experimenter during debriefing or to their partner during the interaction. In fact, no differences were found in desire for future interaction (DFI), a measure of liking, across either types of dyads or types of participants. Levels of DFI appeared to be most related to individual dyad pairings. Significant intraclass correlations demonstrated that within dyads, partners tended to report similar levels of DFI, likely reflecting individual differences in liking across dyads. If it is true that participants in NSA-NSA dyads liked their partners about as much as members of SA-NSA dyads liked one another, neither may have been particularly invested in furthering social relationships, particularly because the second study interaction was likely to be the last interaction for many of the dyads. Knowing that one will not interact with one’s partner again may lead an individual to put forth less effort to maintain the quality of the interaction. For the NSA partners of SA participants this was certainly the case. They reported significantly less effort over time than did other types of participants.

The lack of differences over time may have also related to pre-interaction negative emotion on the part of the SA participants. Prior to interaction 1, they reported more elevated levels of negative emotion than they did prior to the second interaction. Their lower levels of pre-interaction 2 negative emotion, relative to the negative emotion experienced before interaction 1, may have had a less powerful influence on the interaction simply due to the fact that they were not as strong.

An additional explanation for the lack of differences found over time related to the length of the interactions relative to the time that elapsed between them. Each interaction period lasted 5 minutes and the interactions were separated by 1 week. Although a week was more time than would have been ideal for separating two such short interactions, this was necessary for participant scheduling purposes. The length of the interval between study sessions may thus have reduced the effects of repeated exposure.

Nonetheless, several changes in social process did appear over time for the SA-NSA dyads. SA participants decreased in the frequency with which they solicited details during their partners' conversation topics to match the levels of participants in NSA-NSA dyads. It is unclear what may have caused the change. It may relate to decreased interest or the easing of "politeness behaviors" that occurs over time (Brown & Levinson, 1987). The NSA partners of SA participants produced less self-relevant talk over time and were the group with the largest decrease in this behavior, perhaps indicating feelings of social inhibition. Among the NSA-NSA dyads, very little changed over time, likely owing to the contrived nature of the interactions and to the lack of common ground between participants. Although not statistically significant, all participants decreased in frequency

and duration of numerous behaviors over interactions. Interesting behavioral changes may have been masked due to this tendency of all participants to decrease in activity over time.

5.5. Social Reciprocity

Social “give and take” in the present set of interactions was demonstrated in the analyses of behavior across partners. Although these analyses were exploratory, several patterns emerged. First, behaviors such as smiling and fidgeting appear to be reciprocated across social partners. When one individual engages in these behaviors, the social partner is likely to respond in kind. These patterns may be important aspects of the social environment. Whereas fidgeting reciprocity may be unpleasant, reciprocity of smiling is likely a pleasant part of interaction. The aforementioned inconsistency in smiling reciprocity on the part of the SA participants may have interfered with the expected pattern of this behavior, leading to negative social perceptions.

In addition to reciprocity of smiling, another pattern emerged in these interactions: reassurance seeking and giving. In particular, several types of social behaviors were likely to lead to reassurance. These consisted of complaints or statements of displeasure, apologies, and what is likely to be nervous laughter. For generating these behaviors, participants were rewarded with advice and empathetic commentary. Similar patterns across dyad types and study sessions attested to the degree to which complaints and apologies may be important as implicit methods of seeking support. In both types of dyads, participants who expressed these were given advice or offered words of support. In addition, participants who laughed without being joined by their partners, typically received empathetic commentary. SA participants initiated many more instances of these

patterns than participants in NSA-NSA dyads, indicating the degree to which “getting to know you” interactions were distressing to SA participants.

5.6. Gender

In large part, female participants in the present study confirmed findings from previous research. They were more nonverbally expressive, displaying more hand gestures, pleasant smiles, and unpleasant expressions. They also verbalized more complaints, apologies, and empathetic comments, and asked their partners more questions than did members of male dyads. These findings were true for both SA-NSA dyads as well as NSA-NSA dyads. Over and above the effects of gender, anxiety may have contributed to 2 differences in social process between male and female SA-NSA dyads. First, SA participants generally asked their partners fewer questions than NSA participants. However, when SA participants did ask their partners questions, those questions were more frequently generated by females, meaning that the SA males asked many fewer questions than their partners may have expected to receive. Second, males in NSA-NSA dyads were less likely than NSA-NSA females to seek and offer support and advice in their interactions. Among SA-NSA dyads, no gender differences emerged, indicating that male and female dyads engaged in these behaviors with similar frequency. SA males then, were less likely to participate actively in conversation but spent relatively more time seeking reassurance. For the NSA partners of SA males, these interactions were likely experienced as more divergent from typical interactions than either the interactions of female SA-NSA dyad members or NSA-NSA interactions of either gender.

6. LIMITATIONS

Although the present work is one of the first to address actual social interactions between SA and NSA participants, it has important limitations. First, the target participants in the present study were socially anxious college students. Although the present participants experienced significant distress in social interactions, indicated by high IAS scores and SPAI scores near the mean for clinical populations, college students tend to be fairly high functioning. All study participants attended classes and lived with housemates, dormmates, or family members. Many participants also held jobs, and as such were likely to engage with others with some regularity, meaning that they likely have more practice with interaction than many individuals with social phobia. It has been argued that the differences between non-clinically identified socially anxious individuals and those with clinical diagnoses are more a matter of degree of intensity of distress and phobic avoidance, rather than differences in symptom quality (Leary & Kowalski, 1995b). It may be true then, that symptoms vary by degree and are not qualitatively different between the socially anxious and the socially phobic. The degree to which differences exist between the social interactions of individuals with social anxiety and social phobia are unknown. Therefore, it is unclear how well the present results apply to clinically distressed populations.

A second limitation of the study relates to the degree to which socially anxious participants are able to adapt to the social environment. Although two interactions were included in the study, many participants reported lack of commonality with their partners. If the study had more closely mirrored typical interactions, it is likely that no second interaction would have happened between those participants who did not find common

ground during interaction 1. Even participants who did like their partners may not have expected much future interaction outside the study context. Thus, participants may have lacked a sense of investment in their interactions, thereby obscuring social processes that influence the development of relationships. Moreover, participants interacted with only one partner and were not given the opportunity to engage for longer than 5 minutes each time or with multiple people, such as a stranger and a friend. Asking participants to interact with different types of partners or for longer time periods may have provided better insight into differences between the interactions of SA and NSA individuals.

Finally, the utilization of hidden camera certainly affected the collection of nonverbal data. Because participants did not know they were being taped, the experimenter was unable to explicitly direct them to seats or to control their positioning such that close-range, full-face videotapes could be made. Therefore, it was impossible to examine minute facial behaviors and draw conclusions about the role these may have in interactions. Although previous research has suggested that these are important aspects of emotional communication (Ekman et al., 1999), the present methods precluded this type of analysis.

7. CONCLUSIONS

For SA participants, the interactions experienced within the study are likely similar to their typical interactions with NSA strangers. Indeed, their self-report results tended to confirm previous research findings, at least for the first interaction. On the whole, they viewed themselves in more negative light than did NSA participants and rated their partners more generously than themselves. During interaction, they fidgeted more and were more likely to initiate joint fidgeting episodes with their partners; they

were more likely to respond to their partners' pleasurable smiles with polite smiles; they engaged in more complaining behaviors, to which their partners provided empathetic commentary; they asked fewer follow-up questions to their partner's remarks; and spent more time talking about themselves than did their partners, perhaps leading their partners to experience the interactions as subtly one-sided.

For NSA individuals, who carry on numerous interactions with other NSA individuals over the course of a day, interactions with SA individuals are likely experienced as being different from more typical interactions. In the present study, relative to participants in NSA-NSA dyads, NSA participants in SA-NSA dyads provided more reassurance and apologies to their social partners, talked less about themselves, asked more frequent questions, and heard more complaints from their social partners. They also fidgeted more and received more polite smiles from their partners, even in response to their own pleasurable smiles. These differences, although small, appeared to be noticeable to participants. They reported lower interaction quality, perceived themselves more negatively during the interaction, and experienced less positive emotion than the other NSA participants. When asked to explain their reactions, both SA participants and their partners tended to attribute this to themselves, reporting greater self- versus partner discrepancies.

The degree to which one is able to enjoy interaction likely impacts the development of personal relationships. Although providing support and reassurance to a social partner may feel altruistic in the short run, if a partner's distress is not comforted by these behaviors they are unlikely to be rewarding. For SA individuals in the present study, who engaged in high amounts of reassurance seeking, this has implications for

relationship development. By transmitting anxious arousal, not reciprocating positive affect, and remaining upset despite reassurance, the socially anxious may hinder the development of social support networks and personal relationships, as well as the diminishing the degree to which they are supported by their social partners.

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9. TABLES

Table 1: Ethnicity and age across social anxiety status and gender.

	Non-socially Anxious		Socially Anxious	
	Participants		Participants	
	Males	Females	Males	Females
N	50	48	16	16
Mean Age	18.84 (.93)	18.65 (.70)	19.38 (1.36)	18.56 (.73)
N Caucasian	30	22	8	8
N Asian	13	16	8	4
N Middle Eastern	2	3	0	2
N Latino/Latina	2	3	0	1
N Indian	1	2	0	1
N African American	2	2	0	0

Note: Table represents all participants who completed both study sessions.

Table 2: Mean anxiety, depression, and trait characteristics by anxiety status

	Non-socially Anxious	Socially Anxious
	Participants	Participants
IAS *	13.81 (4.64)	48.09 (4.29)
SPAI *	86.61 (25.74)	27.32 (19.09)
BDI *	4.43 (4.66)	11.32 (7.06)
BEQ—Intensity	25.42 (7.40)	26.63 (7.06)
BEQ—Negative	21.52 (6.93)	20.03 (5.99)
BEQ—Positive *	23.06 (3.94)	20.04 (4.70)
SMS *	13.81 (3.96)	10.94 (3.44)
FNE *	9.44 (6.21)	19.65 (6.43)

Note: Scores refer to group means. Standard deviations appear in parentheses.

* Comparison between SA and NSA participants significant at $p < .01$

Table 3: Ratings of self and partner emotion across study session by participant type

<i>Self-Rating</i>	NSA with NSA		NSA with SA		SA	
	Session	Session	Session	Session	Session	Session
	1	2	1	2	1	2
Pre Interaction						
Negative Emotion	19.92	18.30	21.03	18.84	26.09	22.03
	(6.11)	(3.72)	(6.23)	(4.88)	(7.46)	(7.87)
Positive Emotion	28.65	27.18	28.59	25.12	24.94	25.16
	(7.28)	(7.98)	(5.02)	(5.20)	(6.39)	(6.69)
Post Interaction						
Negative Emotion	17.26	16.64	18.56	17.63	20.41	19.19
	(3.54)	(2.59)	(5.75)	(4.28)	(6.73)	(6.99)
Positive Emotion	30.61	28.36	28.06	25.38	27.94	27.28
	(8.45)	(8.70)	(5.58)	(6.15)	(7.15)	(7.60)

Note: Scores refer to group means. Standard deviations appear in parentheses.

Table 4: Ratings of self and partner social perceptions across study session by participant type

	NSA with NSA		NSA with SA		SA	
	Session	Session	Session	Session	Session	Session
	1	2	1	2	1	2
<i>Self Rating</i>						
Positive Impressions	39.61 (6.74)	36.11 (8.14)	37.09 (6.70)	35.41 (7.68)	31.47 (6.39)	32.09 (6.00)
Negative Impressions	5.04 (1.49)	5.01 (1.77)	6.25 (2.24)	6.21 (2.31)	7.88 (2.24)	7.13 (3.17)
Effort	23.15 (5.55)	23.91 (7.05)	22.88 (6.50)	21.88 (6.67)	24.53 (6.67)	22.69 (6.85)
<i>Rating of Partner</i>						
Positive Impressions	38.14 (7.82)	36.68 (7.56)	32.44 (5.40)	31.97 (6.16)	39.94 (8.21)	37.38 (8.53)
Negative Impressions	5.34 (2.23)	4.98 (1.68)	7.78 (3.70)	7.41 (3.32)	6.34 (3.01)	5.88 (2.35)
Effort	27.44 (6.12)	25.55 (6.06)	29.50 (7.64)	27.97 (7.12)	29.13 (5.54)	25.97 (6.86)

Note: Scores refer to group means. Standard deviations appear in parentheses.

Table 5: Ratings of interaction quality across study session by participant type and dyad type

Participant Type	NSA with NSA		NSA with SA		SA	
	Session	Session	Session	Session	Session	Session
	1	2	1	2	1	2
Interaction Quality	41.97	39.92	35.79	34.72	36.21	36.13
	(7.12)	(7.78)	(8.18)	(8.05)	(8.45)	(10.02)

Dyad Type	NSA-NSA Dyads		SA-NSA Dyads	
	Session 1	Session 2	Session 1	Session 2
	Interaction Quality	41.97	39.92	36.00
	(7.12)	(7.78)	(8.32)	(9.02)

Note: Scores refer to group means. Standard deviations appear in parentheses.

Table 6: Ratings of self and partner liking across study session by participant type

	NSA with NSA		NSA with SA		SA	
	Session	Session	Session	Session	Session	Session
	1	2	1	2	1	2
DFI	18.09	21.91	19.78	18.87	18.81	19.06
	(6.61)	(7.29)	(6.99)	(6.99)	(6.01)	(7.57)

Note: Scores refer to group means. Standard deviations appear in parentheses.

Table 7: Frequency of verbal behaviors across study session by participant type

	NSA with NSA		NSA with SA		SA	
	Session	Session	Session	Session	Session	Session
	1	2	1	2	1	2
Detail Probes	6.68 (3.66)	5.46 (4.06)	8.59 (3.94)	8.55 (5.20)	5.03 (4.05)	4.89 (3.63)
Likes/Dislikes	1.74 (1.15)	2.54 (1.73)	2.38 (1.46)	2.26 (1.39)	2.72 (1.81)	3.42 (2.06)
Support	.86 (.43)	.43 (.58)	3.04 (1.19)	1.69 (.54)	1.04 (.42)	.89 (.52)
Apologies	.50 (.30)	.28 (.21)	1.61 (.48)	1.84 (.29)	1.00 (.82)	.94 (.44)
Back-channel	17.46 (4.87)	16.67 (5.11)	18.48 (4.93)	14.84 (4.64)	15.89 (5.25)	12.24 (5.71)

Note: Frequency represents average number of episodes per interaction. Standard deviations appear in parentheses.

Table 8: Positive and unpleasant expressions over time by participant type

	NSA with NSA		NSA with SA		SA	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
<i>Positive Expressions</i>						
Frequency—Polite	10.66	9.88	10.98	10.88	13.93	14.23
Smile	(3.51)	(3.87)	(4.32)	(3.99)	(4.09)	(4.58)
Duration—Polite Smile	56.71	54.89	53.40	55.21	69.39	71.24
	(17.92)	(18.75)	(16.85)	(20.46)	(19.11)	(22.83)
Frequency—Pleasurable	6.08	5.75	5.65	6.21	7.15	7.05
Smile	(3.76)	(3.84)	(3.14)	(3.54)	(3.32)	(3.24)
Duration—Pleasurable	21.06	19.85	21.25	25.25	28.09	28.92
Smile	(12.72)	(11.13)	(12.12)	(15.29)	(14.49)	(14.87)
<i>Unpleasant Expressions</i>						
Frequency	3.06	3.12	2.61	3.15	1.97	2.05
	(1.07)	(1.01)	(.90)	(1.72)	(.79)	(1.37)
Duration	5.56	6.25	4.59	6.40	3.29	3.87
	(3.46)	(4.16)	(3.19)	(3.69)	(2.67)	(2.48)

Note: Frequency represents average number of episodes; duration represents average number of seconds during which behavior occurred in a session. Standard deviations appear in parentheses.

Table 9: Gesture frequency over time by participant type

	NSA with NSA		NSA with SA		SA	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
<i>Gestures</i>						
Frequency—Hand	12.15	10.65	11.58	10.28	10.31	9.44
	(6.49)	(6.01)	(7.02)	(7.23)	(6.24)	(6.33)
Frequency—Brow Raise	5.59	5.63	5.00	5.87	3.16	4.23
	(2.46)	(2.29)	(2.23)	(2.02)	(2.01)	(2.35)

Note: Frequency represents average number of episodes. Standard deviations appear in parentheses.

Table 10: Fidgeting frequency and duration over time by participant type

	NSA with NSA		NSA with SA		SA	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
<i>Fidgeting</i>						
Frequency	8.47	7.68	11.08	11.35	10.17	9.59
	(4.17)	(4.78)	(4.87)	(5.31)	(4.61)	(4.39)
Duration	69.07	69.19	90.63	101.43	98.55	99.68
	(34.18)	(30.52)	(50.69)	(55.19)	(46.61)	(44.94)

Note: Frequency represents average number of episodes; duration represents average number of seconds during which behavior occurred in a session. Standard deviations appear in parentheses.

Table 11: Frequency of self and partner touching over time by participant type

	NSA with NSA		NSA with SA		SA	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
<i>Touch</i>						
Frequency—Self	9.05	9.13	7.91	8.26	8.56	10.82
	(4.56)	(4.22)	(4.10)	(4.85)	(4.27)	(5.67)
Frequency—Partner	.29	.08	.26	0	.18	0
	(.45)	(.97)	(.52)	(0)	(.38)	(0)

Note: Frequency represents average number of episodes. Standard deviations appear in parentheses.

Table 12: Change in behavior and self-report over time by participant type

	NSA with NSA	NSA with SA	SA
<i>Mean Change</i>			
<i>(Time 2 – Time 1)</i>			
Positive Emotion	.77 (7.54)	-.78 (7.10)	.88 (5.82)
Interaction Quality	-2.09 (7.71)	-2.50 (8.24)	-1.77 (7.91)
Desire for Future	.79 (4.93)	1.13 (4.23)	.25 (4.33)
Interaction			
Polite Smiles	-1.68 (4.98)	-1.03 (3.88)	1.05 (7.30)
Pleasurable Smiles	-.40 (5.05)	-.43 (3.20)	-.22 (4.92)
Gestures	-3.00 (8.53)	-3.40 (6.81)	-1.92 (6.18)
Effort	.63 (4.71)	-1.00 (4.99)	-1.64 (4.63)
Frequency—Self-Talk	-3.36 (5.94)	-5.17 (4.44)	-3.07 (5.05)
Frequency—Questions	-1.16 (4.13)	-.14 (6.28)	-2.54 (3.71)

Note: Values reported are average change across sessions. Standard deviations appear in parentheses.

Table 13: Percentages of polite and pleasurable smiles responded to with smiling across participant type

Stimulus Smile	NSA with NSA		NSA with SA		SA	
	Response Smile		Response Smile		Response Smile	
	Polite	Pleasant	Polite	Pleasant	Polite	Pleasant
Polite	68	4	71	0	43	29
Pleasurable	10	79	7	82	51	12

Note: Numbers refer to percentages. These do not add to 100 because participants did not respond to smiles with other smiles 100% of the time.

Table 14: Percentages of questions generating self-talk and general talk responses across participant type

Probe	NSA with NSA		NSA with SA		SA	
	Talk Response		Talk Response		Talk Response	
	Self-		Self-		Self-	
	Focused	General	Focused	General	Focused	General
Topic Question	11	59	8	57	46	30
Detail Question	47	24	34	19	42	25

Note: Numbers refer to percentages. These do not add to 100 because participants produced responses other than those listed here.

Table 15: Gender differences in verbal and nonverbal behaviors in NSA-NSA dyads

NSA-NSA Dyads		
	Male	Female
Hand Gestures	8.37 (5.44)	12.21 (6.44)
Pleasurable Smiles	5.74 (4.81)	8.51 (6.43)
Polite Smiles	13.13 (7.90)	14.69 (7.29)
Unpleasant Expressions	.34 (.66)	.97 (1.70)
Fidgeting	8.97 (6.27)	10.16 (6.29)
Empathetic Comments	.04 (.19)	.90 (.56)
Apologies	.41 (.11)	.57 (.26)
Complaints	1.86 (2.08)	2.47 (2.07)
Advice	.19 (.55)	.37 (1.20)
Detail Probes	5.27 (3.47)	7.02 (4.17)

Note: Scores refer to group means. Standard deviations appear in parentheses.

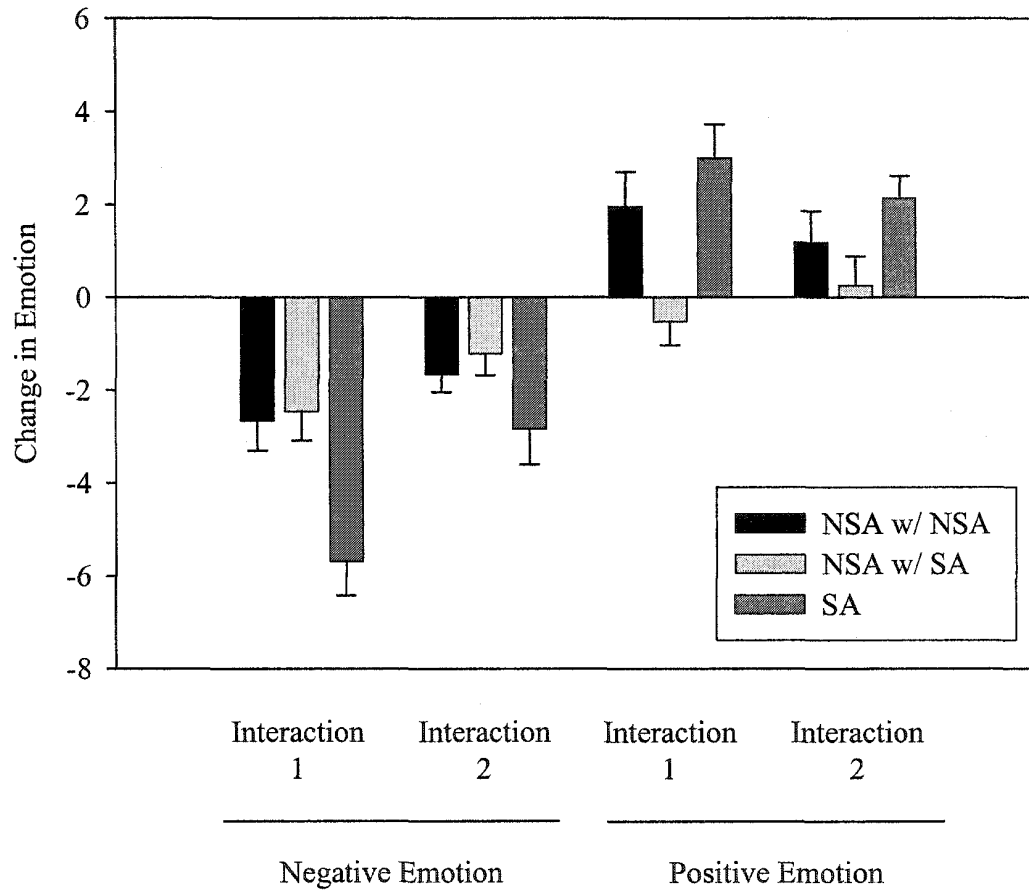
Table 16: Gender differences in verbal and nonverbal behaviors in SA-NSA dyads

	NSA Participants		SA Participants	
	Males	Females	Males	Females
Hand Gestures	11.15 (7.31)	12.03 (6.75)	8.37 (5.43)	12.20 (6.44)
Pleasurable Smiles	4.41 (3.97)	6.92 (6.68)	5.74 (4.81)	8.51 (6.43)
Polite Smiles	8.39 (6.26)	13.63 (8.52)	7.14 (5.83)	14.69 (7.29)
Unpleasant Expressions	.49 (1.04)	.34 (.67)	1.08 (1.79)	.95 (1.70)
Fidgeting	6.18 (3.62)	9.59 (6.34)	8.97 (6.27)	10.15 (6.29)
Empathetic Comments	.13 (.42)	.45 (1.10)	.12 (.41)	.19 (.71)
Apologies	.06 (.24)	.10 (.15)	.05 (.23)	.09 (.29)
Complaints	2.17 (1.89)	2.31 (2.47)	2.83 (3.28)	2.88 (2.33)
Advice	.15 (.71)	.31 (.60)	.03 (.17)	.29 (.64)
Detail Probes	7.12 (6.21)	9.71 (6.01)	5.07 (3.88)	7.13 (4.03)

Note: Scores refer to group means. Standard deviations appear in parentheses.

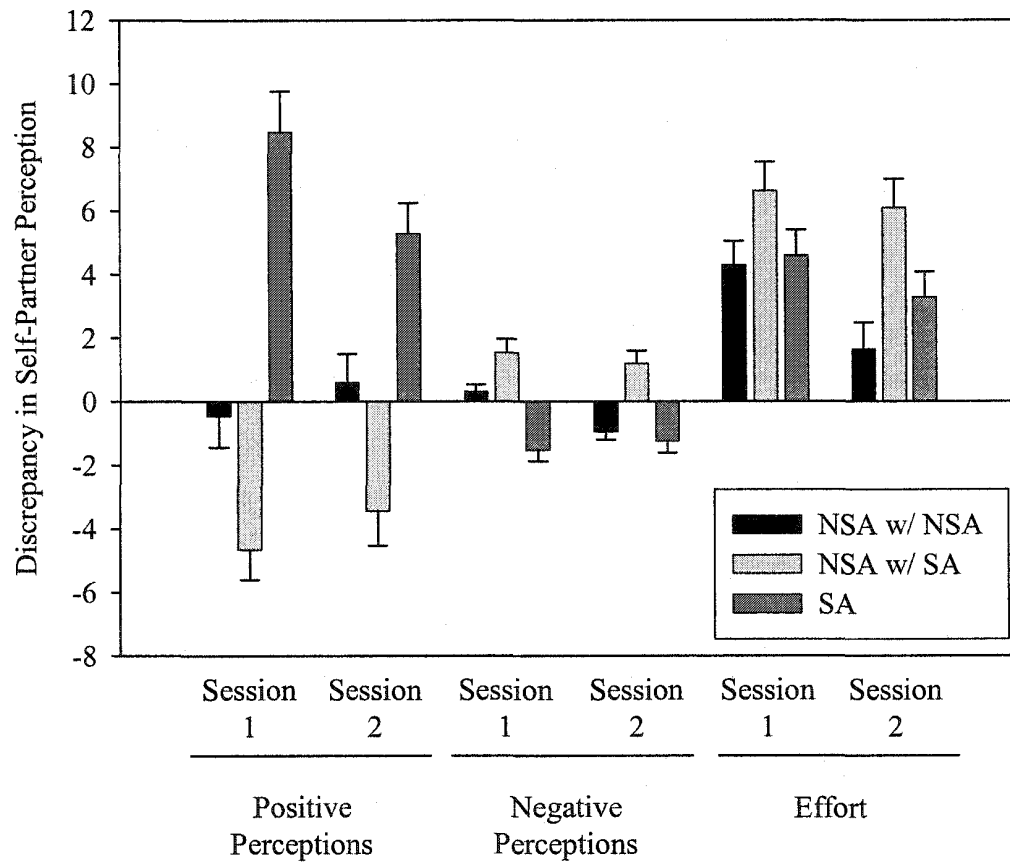
10. FIGURES

Figure 1: Change in negative and positive emotion from pre to post interaction by participant type



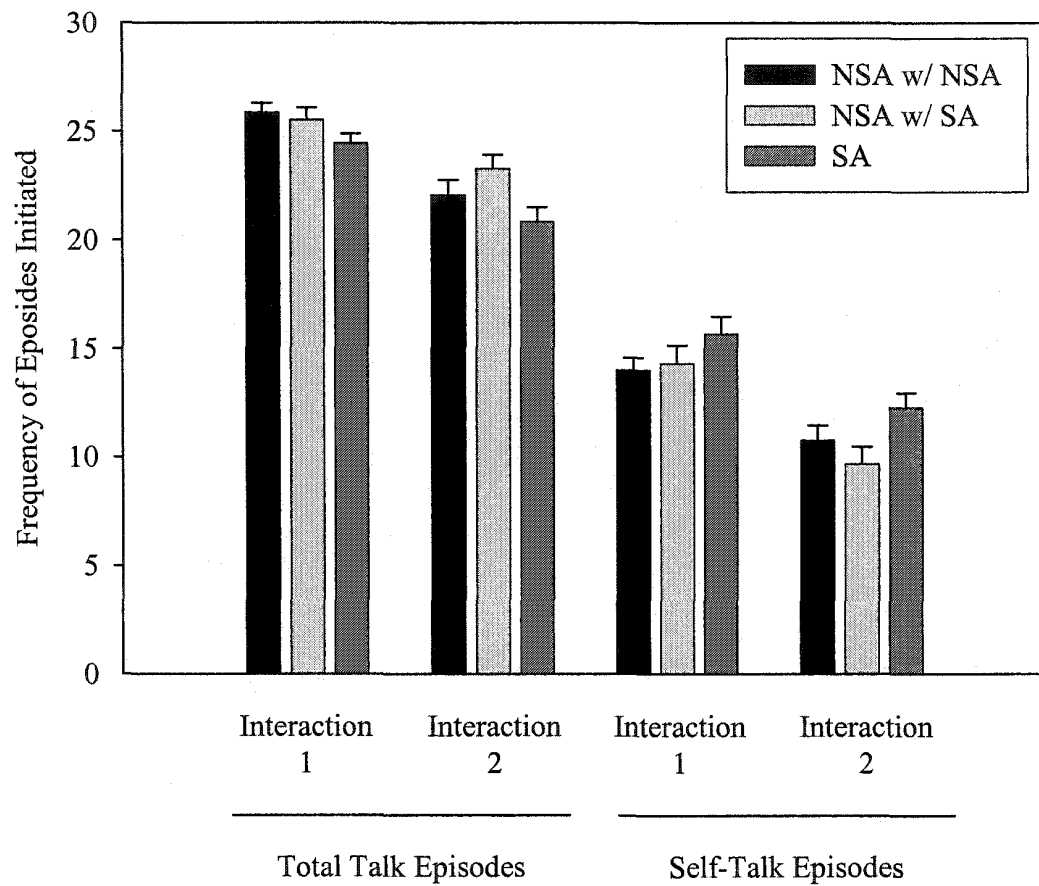
Note: Positive bars indicate that participants experienced increased emotion over the course of interaction. Negative bars indicate a decrease in emotion over the interaction.

Figure 2: Discrepancy in ratings of self versus partner social perceptions across study session by participant type



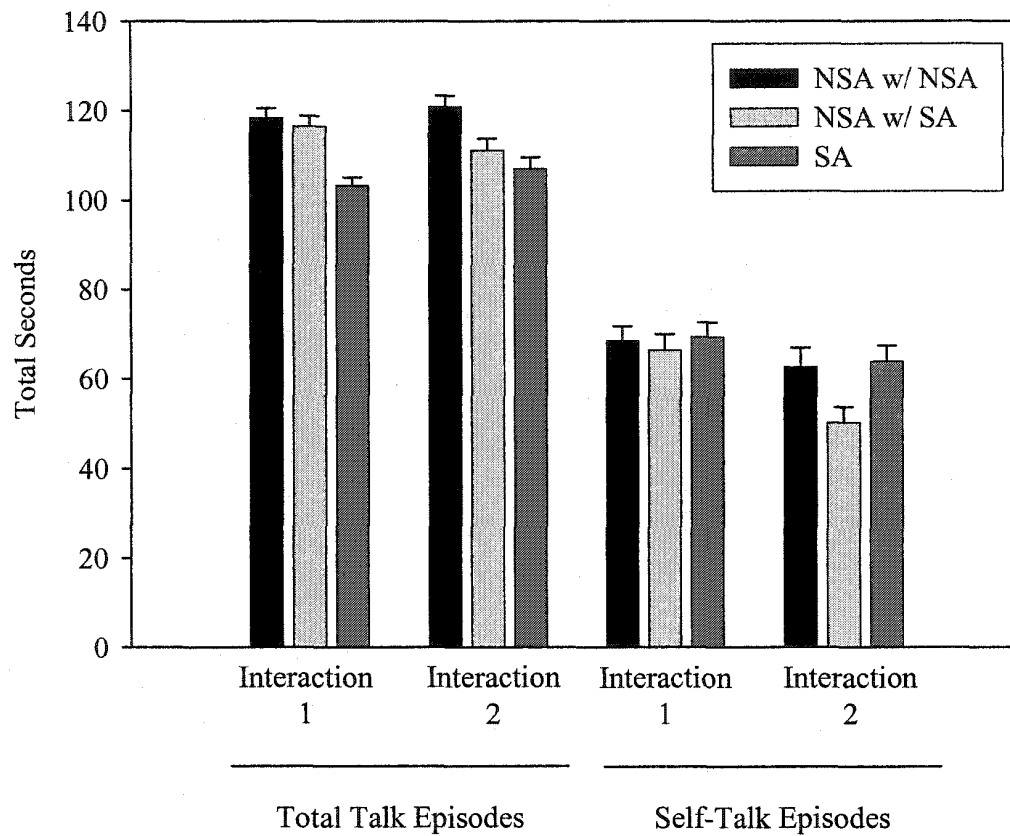
Note: Positive bars indicate the partner was rated higher than the self. Negative bars indicate that the self was rated higher than the partner

Figure 3: Frequency of total talk and self-talk across study session by participant type



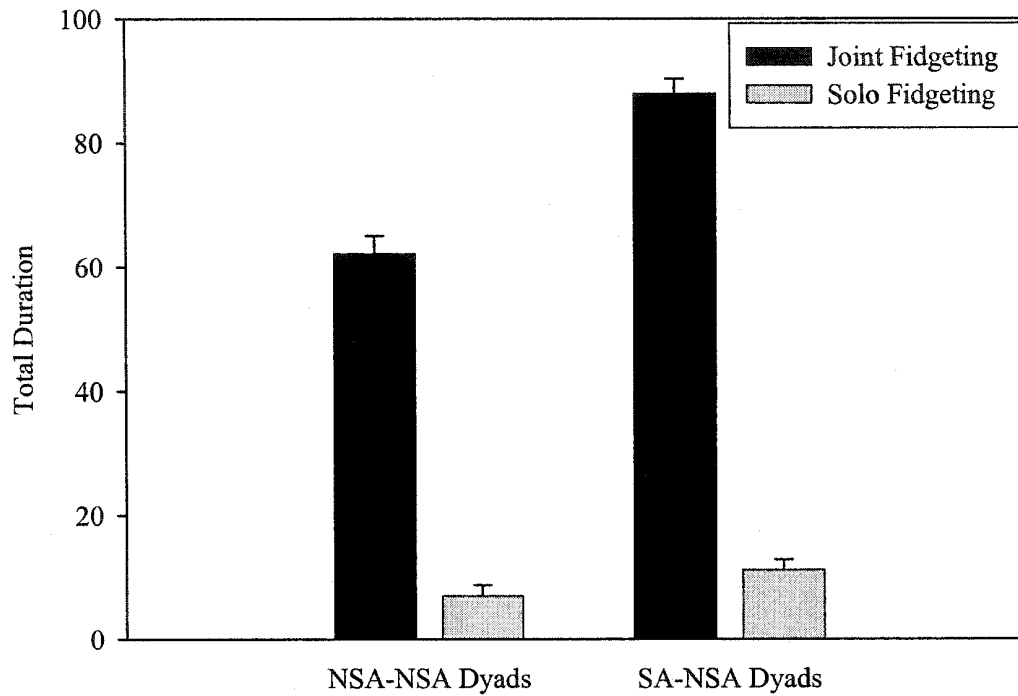
Note: Bars indicate average frequency of episodes across session. Self-talk episodes represent a portion of total talk episodes.

Figure 4: Duration of total talk and self-talk across study session by participant type



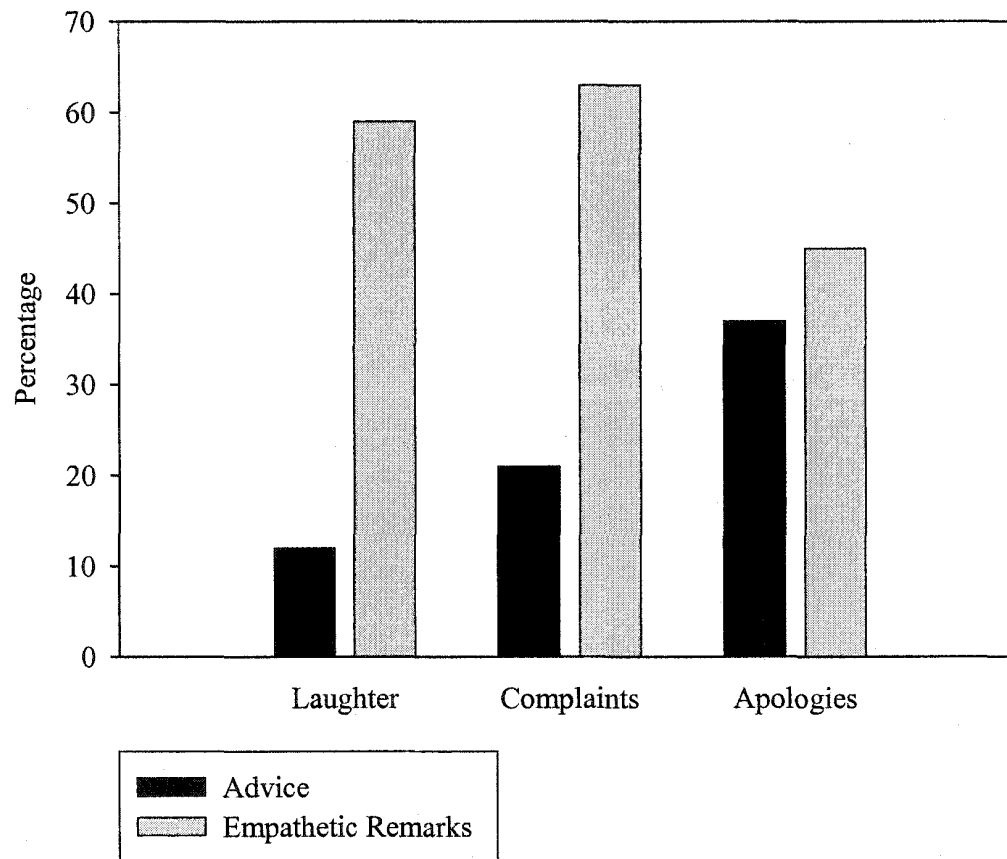
Note: Bars indicate average number of seconds participant engaged in behavior across session. Duration of self-talk represents a portion of total talk duration.

Figure 5: Episodes of joint and solo fidgeting by dyad type



Note: Duration represents average time spent per session, per participant fidgeting alone or during the partners' fidgeting episode.

Figure 6: Empathy and support solicitations



Note: Percentages refer to percent of laughter episodes, complaints and apologies elicited advice or empathetic comments from a partner.

11. APPENDICES

Appendix A: Questionnaire Measures

PANAS

This scale consists of a number of words that describe different feelings and emotions. For each emotion, think about **how you are feeling right now** and then mark the appropriate answer in the space next to that word.

1	2	3	4	5
Slightly or not at all	A little	Moderately	Quite a bit	Extremely

During the interaction, indicate to what extent **you felt**:

___ interested	___ distressed	___ excited	___ upset
___ strong	___ attentive	___ scared	___ hostile
___ enthusiastic	___ proud	___ irritable	___ alert
___ ashamed	___ inspired	___ nervous	___ determined
___ tense	___ jittery	___ active	___ afraid

Post-Interaction Rating Scale

Directions: Please read all of the directions carefully before beginning. This questionnaire consists of a number of items that relate to the preceding interaction. Read each item carefully, and then, using the scale provided, mark the appropriate answer in the space provided next to each item.

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word.

1	2	3	4	5
Slightly or not at all	A little	Moderately	Quite a bit	Extremely

PANAS: During the interaction, indicate to what extent **you felt**:

___ interested	___ distressed	___ excited	___ upset
___ strong	___ attentive	___ scared	___ hostile
___ enthusiastic	___ proud	___ irritable	___ alert
___ ashamed	___ inspired	___ nervous	___ determined
___ tense	___ jittery	___ active	___ afraid

Perceived Self-Impression: During the interaction, indicate to what extent **you thought your behavior was**:

___ likable	___ friendly	___ engaging	___ socially dominant
___ awkward	___ animated	___ humorous	___ self-disclosing
___ boring	___ charming	___ self-confident	___ shy
___ assertive	___ intelligent	___ active	___ anxious

Interaction Quality: The following items pertain to the interaction. Please use the following scale to answer the next seven questions.

1	2	3	4	5	6	7	8
Not at all							Very much

- 1 ___ To what extent did you enjoy the interaction?
- 2 ___ To what extent did you think the interaction felt natural?
- 3 ___ To what extent were you pleased with the interaction?
- 4 ___ To what extent did you think the interaction was forced, strained or awkward?
- 5 ___ To what extent were you satisfied with the interaction?
- 6 ___ To what extent were you concerned with making a good impression during the interaction?
- 7 ___ To what extent did you think the interaction was smooth and coordinated?

The following items pertain to **your interaction partner**

Use the following scale to answer the items below:

1	2	3	4	5
Slightly or not at all	A little	Moderately	Quite a bit	Extremely

Emotional Experience: During the interaction, indicate to what extent **you thought your partner felt**:

___ interested	___ distressed	___ excited	___ upset
___ strong	___ attentive	___ scared	___ hostile
___ enthusiastic	___ proud	___ irritable	___ alert
___ ashamed	___ inspired	___ nervous	___ determined
___ tense	___ jittery	___ active	___ afraid

Perceived Impressions: During the interaction, indicate to what extent **you thought your partner's behavior was**:

___ likable	___ friendly	___ engaging	___ socially dominant
___ awkward	___ animated	___ humorous	___ self-disclosing
___ boring	___ charming	___ self-confident	___ shy
___ assertive	___ intelligent	___ active	___ anxious

Interaction Quality: For the following items, indicate how you think **your interaction partner** experienced the interaction. Please use the following scale to answer the next seven questions.

1	2	3	4	5	6	7	8
Not at all							Very much

- 1 ___ To what extent do you think your partner enjoyed the interaction?
- 2 ___ To what extent do you think your partner found the interaction to be natural and relaxed?
- 3 ___ To what extent do you think your partner was pleased with the interaction?
- 4 ___ To what extent do you think your partner found the interaction to be forced, strained or awkward?
- 5 ___ To what extent do you think your partner was satisfied with the interaction?
- 6 ___ To what extent do you think your partner was concerned with making a good impression during the interaction?
- 7 ___ To what extent do you think your partner found the interaction to be smooth and coordinated?

IAS

DIRECTIONS: Please read these instructions carefully before beginning. This questionnaire contains 15 statements. Read each statement carefully and then select a number from the following scale that best indicates how characteristic each item is of YOU and place the number in the blank provided.

0	1	2	3	4
not at all characteristic of me				extremely characteristic of me

1. _____ I often feel nervous even in casual get-togethers.
2. _____ I usually feel uncomfortable when I am in a group of people I don't know.
3. _____ I am usually at ease when speaking to a member of the opposite sex.
4. _____ I get nervous when I must talk to a teacher or boss.
5. _____ Parties often make me feel anxious and uncomfortable.
6. _____ I am probably less shy in social interactions than most people.
7. _____ I sometimes feel tense when talking to people of my own sex if I don't know them very well.
8. _____ I would be nervous if I was being interviewed for a job.
9. _____ I wish I had more confidence in social situations.
10. _____ I seldom feel anxious in social situations.
11. _____ In general, I am a shy person.
12. _____ I often feel nervous when talking to an attractive member of the opposite sex.
13. _____ I often feel nervous when calling someone I don't know very well on the telephone.
14. _____ I get nervous when I speak to someone in a position of authority.
15. _____ I usually feel relaxed around other people, even people who are quite different from me.

BDI

On this inventory are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each 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.

BDI continued

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.
9. 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.
10. 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.
11. 0 I am no more irritated by things than I ever am.
1 I am slightly more irritated now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time now.
12. 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.
13. 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.
14. 0 I don't feel that 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.
15. 0 I can work about as well as before.
1 It takes an 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.

BDI continued

16. 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up one-two 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.
17. 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 five pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.
- I am purposely trying to lose weight by eating less.
Yes ____ No ____
20. 0 I am not 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 that I cannot 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.

FNE

DIRECTIONS: Please answer spontaneously to the following questions about how you see yourself as a person. Circle in **either** true "T" **or** false "F" for every item.

- | | | | |
|----|---|---|---|
| 1 | I rarely worry about seeming foolish to others. | T | F |
| 2 | I worry about what people will think of me even when I know it doesn't make any difference. | T | F |
| 3 | I become tense and jittery if I know someone is sizing me up. | T | F |
| 4 | I am unconcerned even if I know people are forming an unfavorable impression of me. | T | F |
| 5 | I feel very upset when I commit some social error. | T | F |
| 6 | The opinions that important people have of me cause me little concern. | T | F |
| 7 | I am often afraid that I may look ridiculous or make a fool of myself. | T | F |
| 8 | I react very little when other people disapprove of me. | T | F |
| 9 | I am frequently afraid of other people noticing my shortcomings. | T | F |
| 10 | The disapproval of others would have little effect on me. | T | F |
| 11 | If someone is evaluating me I tend to expect the worst. | T | F |
| 12 | I rarely worry about what kind of impressions I am making on someone. | T | F |
| 13 | I am afraid that others will not approve of me. | T | F |
| 14 | I am afraid that people will find fault with me. | T | F |
| 15 | Other people's opinions of me do not bother me. | T | F |
| 16 | I am not necessarily upset if I do not please someone. | T | F |
| 17 | When I am talking to someone, I worry about what they may be thinking about me. | T | F |
| 18 | I feel that you can't help making social errors sometimes so why worry about it. | T | F |
| 19 | I am usually worried about what kind of impression I make. | T | F |
| 20 | I worry a lot about what my superiors think of me. | T | F |
| 21 | If I know someone is judging me, it has little effect on me. | T | F |
| 22 | I worry that others will think I am not worthwhile. | T | F |
| 23 | I worry very little about what others may think of me. | T | F |

FNE continued

24	Sometimes I think I am too concerned with what other people think of me.	T	F
25	I often worry that I will say or do the wrong things.	T	F
26	I am often indifferent to the opinions others have of me.	T	F
27	I am usually confident that others will have a favorable impression of me.	T	F
28	I often worry that people who are important to me won't think very much of me.	T	F
29	I brood about the opinions my friends have about me.	T	F
30	I become tense and jittery if I know I am being judged by my superiors.	T	F

BEQ

The following statements deal with you and your emotions. Please select a number from the following scale that best describes YOU in each of the statements and place the number in the blank provided.

- | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|------------------------------|-------|---|---|---|---|---------------------------|---|
| Strongly
Disagree | | | | | | Strongly
Agree | |
| 1 | _____ | | | | | | Whenever I feel positive emotions, people can easily see exactly what I am feeling. |
| 2 | _____ | | | | | | I sometimes cry during sad movies. |
| 3 | _____ | | | | | | People often do not know what I am feeling. |
| 4 | _____ | | | | | | I laugh out loud when someone tells me a joke I think is funny. |
| 5 | _____ | | | | | | It is difficult for me to hide my fear. |
| 6 | _____ | | | | | | When I'm happy my feelings show. |
| 7 | _____ | | | | | | My body reacts very strongly to emotional situations. |
| 8 | _____ | | | | | | I've learned it is better to suppress my anger than to show it. |
| 9 | _____ | | | | | | No matter how nervous or upset I am, I tend to keep a calm exterior. |
| 10 | _____ | | | | | | I am an emotionally expressive person. |
| 11 | _____ | | | | | | I have strong emotions. |
| 12 | _____ | | | | | | I am sometimes unable to hide my feelings even though I would like to. |
| 13 | _____ | | | | | | Whenever I feel negative emotions, people can easily see exactly what I am feeling. |
| 14 | _____ | | | | | | There have been times when I have not been able to stop crying even though I tried to stop. |
| 15 | _____ | | | | | | I experience my emotions very strongly. |
| 16 | _____ | | | | | | What I'm feeling is written all over my face. |

Self Monitoring Scale

DIRECTIONS: For each of the following statements, use the letter "T" to indicate a statement is TRUE as a description of YOU or the letter "F" to indicate a statement is FALSE as a description of YOU.

1. _____ I find it hard to imitate the behavior of other people.
2. _____ My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.
3. _____ At parties and social gatherings, I do not attempt to do or say things that others will like.
4. _____ I can only argue for ideas which I already believe.
5. _____ I can make impromptu speeches even on topics about which I have no information.
6. _____ I guess I put on a show to impress or entertain others.
7. _____ When I am uncertain how to act in a social situation, I look to the behavior of others for cues.
8. _____ I would probably make a good actor.
9. _____ I rarely need the advice of my friends to choose movies, books, or music.
10. _____ I sometimes appear to others to be experiencing deeper emotions than I actually am.
11. _____ I laugh more when I watch a comedy with others than when alone.
12. _____ In a group of people I am rarely the center of attention.
13. _____ In different situations and with different people, I often act like very different persons.
14. _____ I am not particularly good at making other people like me.
15. _____ Even if I am not enjoying myself, I often pretend to be having a good time.
16. _____ I'm not always the person I appear to be.
17. _____ I would not change my opinions (or the way I do things) in order to please someone or win their favor.
18. _____ I have considered being an entertainer.
19. _____ In order to get along and be liked, I tend to be what people expect me to be rather than anything else.
20. _____ I have never been good at games like charades or improvisational acting.
21. _____ I have trouble changing my behavior to suit different people and different situations.
22. _____ At a party, I let others keep the jokes and stories going.
23. _____ I feel a bit awkward in public and do not show up quite as well as I should.
24. _____ I can look anyone in the eye and tell a lie with a straight face (if for a right end).
25. _____ I may deceive people by being friendly when I really dislike them.

SPAI

INSTRUCTIONS: Below is a list of behaviors that may or may not be relevant for you. Please read each item carefully. Based on your personal experience, please indicate how frequently you experience these feelings and thoughts in social situations. A social situation is a gathering of two or more people (e.g., a meeting; a lecture; a party; a bar or restaurant; conversing with one other person or group of people). Feeling anxious is a measure of how tense, nervous, or uncomfortable you are during social encounters. Use the following scale to make your ratings:

Never	Very Infrequent	Infrequent	Sometimes	Frequent	Very Frequent	Always
0	1	2	3	4	5	6
1.	I feel anxious when entering social situations where there is a small group.					_____
2.	I feel anxious when entering social situations where there is a large group.					_____
3.	I feel anxious when I am in a social situation and I become the center of attention.					_____
4.	I feel anxious when I am in a social situation and I am expected to engage in some activity.					_____
5.	I feel anxious when making a speech in front of an audience.					_____
6.	I feel anxious when speaking in a small informal meeting.					_____
7.	I feel so anxious about attending social gatherings that I avoid these situations.					_____
8.	I feel so anxious in social situations that I leave the social gathering.					_____
9.	I feel anxious when in a small gathering with:					_____
	Strangers					_____
	Authority figures					_____
	Opposite sex					_____
	People in general					_____
10.	I feel anxious when in a large gathering with:					_____
	Strangers					_____
	Authority figures					_____
	Opposite sex					_____
	People in general					_____

SPAI continued

- 11 I feel anxious when in a bar or restaurant with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 12 I feel anxious and I do not know what to do when in a new situation with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 13 I feel anxious and I do not know what to do when in a situation involving confrontation with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 14 I feel anxious and I do not know what to do when in an embarrassing situation with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 15 I feel anxious when discussing intimate feelings with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____

SPAI continued

- 16 I feel anxious when stating an opinion to:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 17 I feel anxious when talking about business with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 18 I feel anxious when approaching and/or initiating a conversation with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 19 I feel anxious when having to interact for longer than a few minutes with:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 20 I feel anxious when drinking (any type of beverage) and/or eating in front of:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 21 I feel anxious when writing or typing in front of:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____

SPAI continued

- 22 I feel anxious when speaking in front of:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 23 I feel anxious when being criticized or rejected by:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 24 I attempt to avoid social situations where there are:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 25 I leave social situations where there are:
- Strangers _____
 - Authority figures _____
 - Opposite sex _____
 - People in general _____
- 26 Before entering a social situation I think about all the things that can go wrong. The types of thoughts I experience are:
- Will I be dressed properly? _____
 - I will make a mistake and look foolish. _____
 - What will I do if no one speaks to me? _____
 - If the conversation lags, what can I talk about? _____
 - People will notice how anxious I am. _____
- 27 I feel anxious before entering a social situation. _____
- 28 My voice leaves me or changes when I am talking in a social situation. _____
- 29 I am not likely to speak to people until they speak to me. _____

SPAI continued

- 30 I experience troubling thoughts when I am in a social setting. For example:
- I wish I could leave and avoid the whole situation. _____
 - If I mess up again I will really lose my confidence. _____
 - What kind of impression am I making? _____
 - Whatever I say, it will probably sound stupid. _____
- 31 I experience the following prior to entering a social situation:
- Sweating _____
 - Frequent urge to urinate _____
 - Heart palpitations _____
- 32 I experience the following in a social situation:
- Sweating _____
 - Blushing _____
 - Shaking _____
 - Frequent urge to urinate _____
 - Heart palpitations _____
- 33 I feel anxious when I am home alone. _____
- 34 I feel anxious when I am in a strange place. _____
- 35 I feel anxious when I am on any form of public transportation. _____
- 36 I feel anxious when crossing streets. _____
- 37 I feel anxious when I am in crowded public places (e.g., stores, church, movies, restaurants, etc.). _____
- 38 Being in large open spaces makes me feel anxious. _____
- 39 I feel anxious when I am in enclosed places (e.g., elevators, tunnels, etc.). _____
- 40 Being in high places makes me feel anxious (e.g., tall buildings). _____
- 41 I feel anxious when waiting in a long line. _____
- 42 There are times when I feel like I have to hold onto things because I am afraid I will fall. _____
- 43 When I leave home and go to various places, I go with a family member or friend. _____
- 44 I feel anxious when riding in a car. _____
- 45 There are certain places I do not go because I may feel trapped. _____

Appendix B: Verbal and Nonverbal Behavior Codes

Verbal Coding:

Instructions: Each session is 5 minutes (300 seconds) and includes 2 participants. For each session, for each participant, code the behaviors below as follows:

- Each second during the session should be coded according to the behavior that best characterizes that window of time. For example, if participant 1 is talking about herself during second 45, second 45 in her/his record will be coded “21”.
- Only changes in behavior need be noted. For example, if participant 1 is talking about herself during second 45 and she becomes silent at second 51, code second 45 as “21,” code second 51 as “00” and leave seconds 46 – 50 blank instead of repeating code “21” for each successive second.
- Each second may only receive one code. If more than one occurs during a second, code the behavior that was most prominent during that time window. Back-channel comments and exclamations may only take up a portion of the second. Nonetheless, when these occur, the second should be coded as having been characterized by that behavior.
- Code “98” during seconds in which the participant’s speech is not classifiable into one to the behavior codes below. Please describe what you heard on the coding form. Code “99” during portions of the soundtrack that are inaudible.
- Code each participant separately.

Code	Behavior	Example
10	Back-Channel Verbal—verbal comment to mark engagement in partner’s talk (no content is inserted into conversation)	“uh-huh.”; “mm-hmm.”; “yeah.”; “right.”
11	Exclamation—makes a verbal exclamation, including swearing;	“Cool.”; “That’s great!”; “Wow!”; “Really.”; “Shit!”; “Fuck-that!”;
12	Complain—comments on an unpleasant state, experienced by self, and related to self, others, partner, or the world	“I hate that class.”; “The professor makes me so bored.”; “She really annoys me.”; “This interaction is weird.”
13	Complement: Partner—explicit comment related to positive quality of partner	“You must be really good at that.”; “Those are really cool shoes.”
14	Complement: Other—explicit comment related to positive quality of an individual who is not present	“The professor is really good.”; “He’s really cute.”; “I like the way she dresses.”
15	Statement of Preference—expresses preference or distaste for an object or thing (not complement or complaint)	“I like doing stuff like that.” “The dorm food is so shitty.”
16	Advise—provides advice to partner (whether solicited or not)	“I think you should talk to the professor.”

Verbal Coding Continued:

Code	Behavior	Example
17	Apology—apologizes to partner	"I'm sorry."
18	Empathy/Support/Defending—indicates similar or complementary feeling; offers emotional support; defends partner's feelings/state of being	"I know how you feel."; "Yeah, I feel the same way."; "I would feel like that too."; "That seems like a reasonable reaction."
19	Question: Elicits detail—asks question to elicit details or information about prior topic (DOES NOT CHANGE TOPIC)	"Then what?"; "What happened?"; "How long were you in Thailand for?"; "Why did he say that?"
20	Question: New—asks question to begin a new line of discussion (NEW TOPIC IS GENERATED IN RESPONSE TO QUESTION)	"So, what's your major?"; "Do you have any siblings."; "Do you live in the dorms?"
21	Talk: Self—discusses personally relevant information or events	"I got an A on the last test."; "I'm doing a semester abroad next spring."; "I use AT&T for my cell phone."; "I'm interested in Psychology."; "I'm pretty bad at racket ball."
22	Talk: Partner—discusses information or events relevant to the partner; not in question format; if partner and another person are both referenced, partner takes precedence	"So, you won the triathalon."; "You have the same cell-phone as my roommate."; "You look nervous."
23	Talk: General—discusses general topics/events without a specific protagonist; General response to a question with no specific reference to partner; may include a person not present	"This weather is amazing."; "The library's an OK place to study."; "That test was really hard."; "She's really nice."; "My brother has glasses just like that."; "She's from Russia."
24	Laugh—laughs	(laughs)
00	Not Talking—individual is silent, no verbal behavior	
98	Other (describe)—any verbal behavior not described above; code for valence and describe as appropriate	???
99	Voice track inaudible	

Nonverbal Coding:

Instructions: Each session is 5 minutes (300 seconds) and includes 2 participants. For each session, for each participant, code the behaviors below as follows:

- Each second during the session should be coded according to the behavior that best characterizes that window of time. For example, if participant 1 is politely smiling during second 45, second 45 in her/his record will be coded “71”.
- Only changes in behavior need be noted. For example, if participant 1 is politely smiling during second 45 and the smile changes to a neutral face at second 51, code second 45 as “71,” code second 51 as “74” and leave seconds 46 – 50 blank instead of repeating code “71” for each successive second.
- Nonverbal behaviors may happen quickly but each second may only receive one code. If more than one occurs during a second, code the behavior that was most prominent during that time window. When multiple behaviors occur, behaviors that are so small as to be unrecognizable or not noticeable to participants may be ignored.
- Codes ending in “9” may be used when a behavior not found on the list is recognized. Please describe what you saw on the coding form. Code “99” during seconds in which the participant’s behavior is not visible for some reason.
- Code each participant separately.

Face

Code	Behavior
70	Smile—pleasurable (in this type of smile, the muscles at the outer corner of the eyes contract, pulling the eye corners tighter and creating the appearance of wrinkles at the eye corners and/or an out pouching of skin under the eyes)
71	Smile—polite (no eye muscle contraction)
72	Frown/grimace: any expression of the mouth in which mouth corners are pulled downward/outward but not upward; may or may not involve eyebrow movement downward and toward center
73	Brows raised (brows are pulled up in the center making a arched shape)
74	Neutral: participant may talking or silent with none of the above facial expressions
79	Facial movement, not involving any of the above codes (e.g., yawn, cough)—Describe behavior on coding form
99	Face not visible due to lighting, participant’s position, etc.

Hands

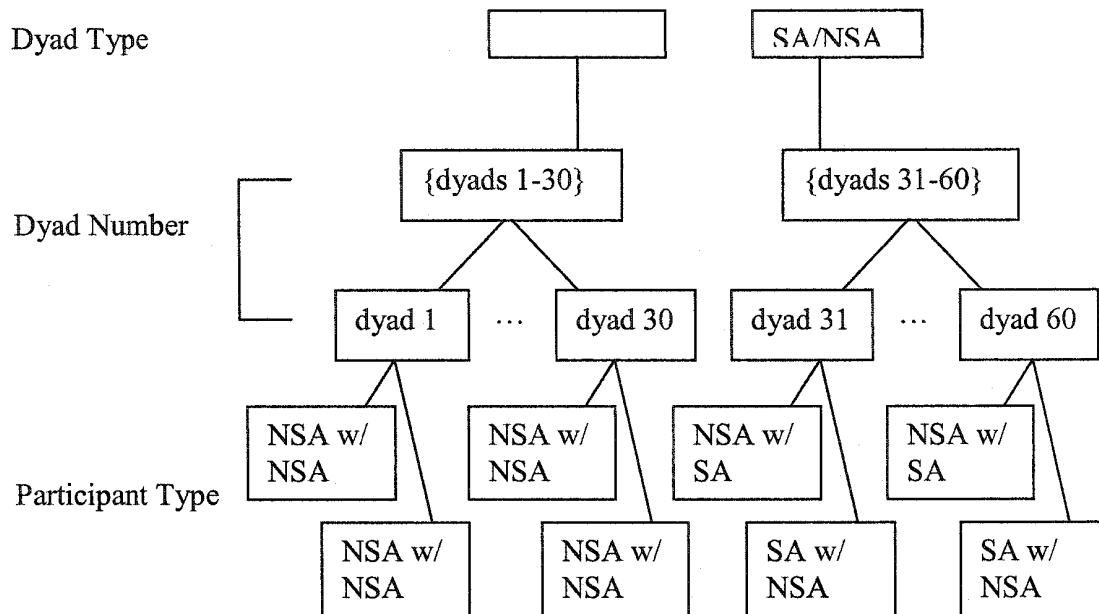
Code	Behavior
50	Hands engage in communicative gesture: movement occurs during speaking and appears to emphasize or express speaker’s point
51	Hands fidget: hands move in a restless manner, with or without making contact with some object (hands may touch one another as well as objects in vicinity or being worn, e.g., watch, ring, clothing, backpack, water bottle, etc.)
52	Face/hair touch: Participant touches hair, ears, face, or neck

Nonverbal Coding Continued:

Code	Behavior
53	Touch partner: handshake, shoulder pat, etc.
54	Hands still: Hands are still, resting on lap, couch, etc.
59	Hand movement, not involving any of the above codes (e.g., drinking from water bottle, etc.)—Describe behavior on coding form
99	Hands not visible due to lighting, or placement of hands (e.g., in lap under backpack; arms stretched out so hands are off screen, etc.)

Appendix C: Hierarchical linear model for nested, mixed effects

Schematic model examining effects of social anxiety by dyad and participant type *



* Based on model developed in Kenny and LaVoie, 1995.

Model: $Y_{ijk} = \mu + \alpha_i + \beta_{ij} + \gamma_{ijk} + \delta_{ijk}$

α_i : Dyad-type effect (NSA/NSA dyad; SA/NSA dyad)

n_a : Number of dyad types

β_{ij} : Dyad-number effect; randomly distributed with σ^2_β

n_b : Number of dyads consisting of person n_{b1} and n_{b2}

γ_{ijk} : Participant-type (t) effect (NSA individual in SA/NSA dyad; SA individual in SA/NSA dyad); this factor is not included in the part of the model describing NSA w/ NSA individuals as it is collinear with the dyad-type effect

n_c : Number of participant types

n_w : Number of members per group

δ_{ijk} : Participant effect; randomly distributed with σ^2_δ

Expected Mean Squares

	Degrees of Freedom	Expected Mean Squares
Intercept	1	$N\mu^2$
A: Dyad Type	$n_a - 1$	$n_{b1}n_w\alpha^2_1 + n_{b2}n_w\alpha^2_2 + n_w\sigma^2_\beta + \sigma^2_\delta$
B: Dyad number Dyad type	$n_b - dfa - 1$	$n_w\sigma^2_\beta + \sigma^2_\delta$
C: Participant type Dyad type, Dyad number	$n_c - 1$	$(n_{b1}n_w / n_c - 1) ((\gamma^2_1 + \gamma^2_2) + \sigma^2_\delta)$
D: Error (participant effect)	$N - dfa - df_b - df_c - 1$	σ^2_δ

Appendix D: Summary of Results

The following table contains a summary of the study hypotheses, the results, and the outcome of each test. Effect sizes (partial eta squared; η_p^2) are reported for each test. η_p^2 may be interpreted as the proportion of total variance in the dependent variable accounted for by the effect of the independent variable. For tests in which no significant differences were found at either interaction session, effect sizes have been averaged across interactions.

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Hypothesis 1: Self report measures			
Positive and negative emotion	Difference in pre-post interaction negative emotion, interaction 1	SA participants experienced more negative emotion than their NSA partners ($p = .040$) and tended to experience more negative emotion than NSA participants with NSA partners ($p = .065$). SA-NSA dyads tended to experience more negative emotion than NSA-NSA dyads ($p = .101$).	.09 .04
	Difference in pre-post interaction negative emotion, interaction 2	SA participants tended to experience more negative emotion than their NSA partners ($p = .112$).	.04
	Difference in pre-post interaction positive emotion, interaction 1	SA participants experienced less positive emotion than NSA participants with NSA partners ($p = .013$) but did not differ from their own partners ($p = .579$). NSA partners of SA participants experienced less positive emotion than NSA participants in NSA-NSA dyads ($p = .051$).	.13
	Difference in pre-post interaction positive emotion, interaction 2	No significant differences.	.00

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Perceptions of self and interaction partner	Positive perceptions of self, interaction 1	SA participants perceived themselves less positively than both their partners ($p = .001$) and NSA participants in NSA-NSA dyads ($p < .000$).	.17
		Overall SA-NSA dyads held less positive self-impressions than NSA-NSA dyads ($p = .001$).	.16
	Positive perceptions of self, interaction 2	SA participants tended to have less positive impressions than others ($p = .064$).	.06
		Participants in SA-NSA dyads tended to have less positive self-impressions than those in NSA-NSA dyads ($p = .102$).	.04
	Negative perceptions of self, interaction 1	SA participants held more negative self-perceptions than either their partners ($p = .004$) or than NSA participants in NSA-NSA dyads ($p < .000$). NSA participants with SA partners held more negative self-perceptions than other NSA participants ($p = .015$).	.16
		SA-NSA dyads held more negative self-impressions than NSA-NSA dyads ($p < .000$).	.36
Negative perceptions of self, interaction 2	SA participants tended to have more negative self-perceptions than NSA participants ($p = .111$).	.05	
	Participants in SA-NSA dyads perceived themselves more negatively than did those in NSA-NSA dyads ($p < .000$).	.20	
Perceptions of self-presentational effort	At both interactions, no significant differences emerged.	.02	

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Perceptions of self and interaction partner (cont.)	Discrepancy in ratings of self versus partner presentational effort, interaction 2	NSA w/ SA participants tended to rate their partners as having put forth more effort than themselves ($p = .064$).	.06
		SA-NSA dyads showed greater discrepancy in self versus partner effort ratings ($p = .005$).	.21
Interaction quality	Perceptions of interaction quality, interaction 1	SA-NSA dyads report lower levels of interaction quality ($p = .003$).	.14
	Perceptions of interaction quality, interaction 2	SA-NSA dyads report lower levels of interaction quality ($p = .012$).	.10
Desire for future interaction	Perceptions of desire for future interaction	No significant differences emerged at either interaction.	.03

Hypothesis 2: Verbal social behavior

Conversational engagement during discussion	Frequency of detail probes, interaction 1	SA participants tended to produce fewer detail probes ($p = .091$)	.09
	Frequency of detail probes, interaction 2	SA participants produced fewer detail probes than their NSA partners ($p = .013$) but not fewer than NSA participants in NSA-NSA dyads ($p = .808$). NSA w/ SA participants generated more detail probes than NSA participants in NSA-NSA dyads ($p = .011$).	.13
	Frequency of talk episodes, interaction 1	NSA participants in NSA-NSA dyads tended to talk more than SA participants ($p = .070$). SA participants also talked less than their partners ($p = .040$).	.05
	Frequency of talk episodes, interaction 2	No differences emerged.	.02

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Conversational engagement during discussion (cont.)	Duration of talk episodes, interaction 1	NSA participants in NSA-NSA dyads tended to talk longer than SA participants ($p = .078$). SA participants also talked less than their partners ($p = .018$).	.08
	Duration of talk episodes, interaction 2	NSA w/ NSA individuals talked longer than SA individuals ($p = .042$) and tended to talk longer than NSA w/ SA individuals ($p = .076$). SA participants did not differ from their partners ($p = .19$).	.09
Self talk versus commentary about likes and dislikes	Frequency of self-talk episodes, interaction 1	No significant differences emerged.	.01
	Frequency of self-talk episodes, interaction 2	SA participants had more episodes of self-talk than their NSA partners ($p = .039$).	.07
	Duration of self-talk episodes, interaction 1	No significant differences emerged.	.01
	Duration of self-talk episodes, interaction 2	SA participants engaged in longer episodes of self-talk than their NSA partners ($p = .051$).	.05
	Frequency of likes/dislikes commentary, interaction 1	SA-NSA dyads engaged in more likes/dislikes commentary than NSA-NSA dyads ($p = .051$).	.08
	Frequency of likes/dislikes commentary, interaction 2	SA participants produced the most of these statements ($p = .042$) and NSA participants did not differ from one another ($p = .294$).	.10
		SA-NSA dyads tended to engage in more likes/dislikes commentary than NSA-NSA dyads ($p = .058$).	.07
Empathetic and supportive comments (E/S) and apologies	Empathetic and supportive comments, interaction 1	NSA participants with SA partners offered more E/S either than SA participants ($p = .023$) or than NSA w/ NSA participants ($p = .006$).	.15
		SA-NSA dyads offered more E/S than NSA/NSA dyads ($p = .050$).	.10

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Empathetic and supportive comments (E/S) and apologies (cont.)	Empathetic and supportive comments, interaction 2	No significant differences emerged.	.02
	Apologies, interaction 1	SA-NSA dyads tended to produce more apologies than NSA-NSA dyads ($p = .090$).	.04
	Apologies, interaction 2	NSA participants with SA partners offered more apologies to their partners ($p = .041$).	.08
Back channel communication	Back channel comments interaction 1	No significant differences emerged.	.02
	Back channel comments interaction 2	SA participants used less back channel communication than members of NSA-NSA dyads ($p = .022$) and tended to use less back channel communication than their partners as well ($p = .073$). SA-NSA dyads tended to use less back channel communication than NSA-NSA dyads ($p = .091$).	.10 .04

Hypothesis 3: Nonverbal social behavior

Positive and unpleasant facial expressions	Frequency of polite smiles, interaction 1	SA participants tended to display more frequent polite smiles ($p = .099$).	.04
	Frequency of polite smiles, interaction 2	SA participants produced more polite smiles than their NSA partners ($p = .014$) and participants in NSA-NSA dyads ($p < .000$).	.11
	Duration of polite smiles, interaction 1	SA participants tended to display longer polite smiles ($p = .080$).	.05
	Duration of polite smiles, interaction 2	SA participants tended to display longer polite smiles ($p = .069$).	.06
	Frequency of pleasurable smiles, interaction 1	SA participants tended to display more frequent pleasurable smiles ($p = .078$).	.04

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Positive and unpleasant facial expressions (cont.)	Frequency of pleasurable smiles, interaction 2	No significant differences.	.02
	Duration of pleasurable smiles, interaction 1	SA participants tended to display longer pleasurable smiles ($p = .066$).	.05
	Duration of pleasurable smiles, interaction 2	No significant differences.	.03
	Frequency of unpleasant expressions	No significant differences.	.03
	Duration of unpleasant expressions	No significant differences.	.02
	Communicative aspects of nonverbal behavior	Frequency of hand gestures	No significant differences.
	Frequency of eye-brow raises, interaction 1	SA participants produced fewer brow-raises than their NSA partners ($p = .009$) and participants in NSA-NSA dyads ($p = .047$).	.09
	Frequency of eye-brow raises, interaction 2	No significant differences.	.02
Signals of anxiety	Frequency of fidgeting, interaction 1	No significant differences.	.04
	Frequency of fidgeting, interaction 2	Participants in SA-NSA dyads fidgeted more frequently than did those in NSA-NSA dyads ($p = .030$).	.15
	Duration of fidgeting, interaction 1	Participants in SA-NSA dyads fidgeted longer than did those in NSA-NSA dyads ($p = .021$).	.19
	Duration of fidgeting, interaction 2	Participants in SA-NSA dyads fidgeted longer than did those in NSA-NSA dyads ($p = .037$).	.16
Touching of self and partner	Frequency of self-touch	No significant differences.	.03

Hypothesis	Variables Tested	Results Interpreted	η_p^2
Touching of self and partner (cont.)	Frequency of partner-touch, interaction 1	NSA participants initiated handshakes more often than SA participants ($p = .033$).	.08
	Frequency of partner-touch, interaction 2	No significant differences.	.01

Hypothesis 4: Change from the first to the second interaction

Changes in self-reported interaction experiences	Change in positive emotion	No significant differences.	.01
	Change in interaction quality	No significant differences.	.03
	Change in desire for future interaction	No significant differences.	.02
Changes in nonverbal behavior and effort over time	Change in polite smiling	SA participants increased polite smiling frequency relative to their partners ($p = .014$)	.06
	Change in pleasant smiling	No significant differences.	.00
	Change in gesturing	No significant differences.	.01
	Change in self-presentational effort	Participants in SA-NSA dyads reported putting forth significantly less effort over time ($p = .012$).	.09
Conversational activity	Frequency of self-talk	NSA w/ SA talked less about themselves over time than either their SA partners ($p = .045$) or than NSA w/ NSA participants ($p = .015$). SA and NSA w/ NSA participants did not differ from one another ($p = .630$).	.07
	Detail probe frequency	SA participants' decreased in probe frequency significantly more than their interaction partners ($p = .049$)	.06