Social anxiety and physiological arousal during computer mediated vs. face to face communication

Jonathan G. Shalom, Haggar Israeli, Omer Markovitzky, Joshua D. Lipsitz

Department of Psychology, Ben-Gurion University of the Negev, Beer-Sheva, Israel

Abstract

Although survey results suggest that socially anxious individuals may use computer mediated communication (CMC) differently from others and feel differently about CMC relative to face to face (FTF) communication, little is known about their actual experience during CMC. Using an experimental interaction task, we assessed (N = 73) high and low social anxiety participants during CMC and FTF. In addition to self-reported social anxiety, arousal, and perception of success and control, we assessed heart rate and skin conductance, which are physiological indices of arousal. Both CMC and FTF interaction tasks were associated with significant increases in physiological arousal compared to baseline. Although subjective anxiety and arousal were higher in FTF compared to CMC, physiological arousal showed no significant differences across conditions. An interaction effect was found for perceived success such that those high in social anxiety perceived greater success in CMC than in FTF while those low in social anxiety showed no differences across conditions. Further experimental study of subjective and objective indices of anxiety will help elucidate the unique experience of CMC for those with high social anxiety.

1. Introduction

Computer mediated communication (CMC) has rapidly developed into a central conduit of human interaction. Individuals interact online through a range of modalities including email, chat, and an array of social networks (Lewandowski, Rosenberg, Jordan-Parks, & Siegel, 2011). Psychology is beginning to grasp the dramatic impact of CMC on our social–interpersonal realities (Stokols, Misra, Runnerstrom, & Hipp, 2009). Although CMC includes a range of modalities such as audio and video-conferencing, special consideration is warranted for text based communication due to its unique features.

A number of distinct characteristics of text-based CMC have been the subject of scientific attention. One prominent feature is anonymity, whereby internet users can share even intimate conversations without necessarily sharing identifying information (Mckenna & Bargh, 2000). A second characteristic is the lack of non-verbal cues that are found in face-to-face conversation (McKenna & Bargh, 2000) or vocal cues that are available in telephone communication. Anonymity and absence of nonverbal cues, may lead to changes in the quality and content of the interaction, including increased self-disclosure and intimacy (Nguyen, Bin, & Campbell, 2012; Tidwell & Walther, 2002) and these also provide more control over self-presentation (Caplan, 2005).

Although relevant for all CMC users, distinct aspects of CMC may have special importance for individuals with high social anxiety who experience difficulties with traditional modes of interaction, such as face to face and telephone contact (Reid & Reid, 2007). We undertook an experimental study with the goal of increasing understanding of the experience of CMC for those with high social anxiety.

1.1. Social anxiety

Among the most common psychological disorders (Kessler et al., 2005) social anxiety disorder is defined by a marked and persistent fear of social or performance situations in which embarrassment may occur, resulting in significant distress and difficulties in functioning (American Psychiatric Association, 2013). Social anxiety disorders causes considerable disability, including higher rates of suicide attempts, lower income, work impairment, and extensive economic cost to society (Lipsitz & Schneier, 2000; Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996; Stein & Kean, 2000).

The cognitive model of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997) suggests that socially anxious individuals have core negative beliefs about themselves such as “I am stupid.”
These beliefs influence appraisal of social situations as dangerous. Social experiences are filtered through negative biases, such as interpreting neutral social cues as signs of negative evaluation, which help perpetuate anxiety. Finally, socially anxious individuals focus attention inward, highlighting perceived negative aspects of their own appearance, performance, etc. and thus lack the capacity to appropriately process corrective information from the social experience others’ reactions (e.g., Clark, 2001). The strong concerns with self-presentation and frantic efforts to control it (Schlenker & Leary, 1982) make realistic processing of face-to-face interaction very challenging.

Since features of computer mediated communication allow for more ease of control of personal information and less openness to scrutiny, especially in terms of physical appearance and vocal sounds, the experience and effects of CMC interactions for those with high social anxiety may differ from their experience in FTF.

In addition to subjective feelings of anxiety, social anxiety disorder is associated with a range of physiological symptoms, such as sweating, blushing, trembling, or palpitations (American Psychiatric Association, 2013), which may occur in social situations and, because some of these are detectable by others, often become an additional source of anxiety in face to face interactions. Although the specificity of this physiological response remains in question (Gerlach, Wilhelm & Roth, 2003; Hofmann, Ehlers, Newman, & Roth, 1995), a number of studies have identified patterns for social anxiety, including increased heart rate (HR) and systolic blood pressure (Matthews, Manuck & Saab, 1986), reduced heart rate variability (Chalmers, Quintana, Maree, Abbott & Kemp, 2014), and excessive blushing (Gerlach, Wilhelm, Gruber & Roth, 2001). A discrepancy has been noted between self-reported physiological arousal, for which consistent increases are found and objective physiological measures for which a more complex association with social anxiety is found (Mauss, Wilhelm, & Gross, 2004; Wilhelm, Kochar, Roth & Gross, 2001).

2. CMC and social anxiety

Some studies have examined aspects of CMC use among individuals with high social anxiety using survey methods. A number of surveys have found, for example, that those with high social anxiety tend to spend more time interacting on-line (Mazzolini & Moore, 2004; Pierce, 2009). In addition McKenna and Bargh (1999) found that those who are high in social anxiety are more inclined to form online relationships compared to those with normal levels. These patterns may be related to specific effects of CMC features of anonymity and absence of nonverbal cues for the socially anxious. High and Caplan (2009) suggest, based on results of their survey, that lack of immediate social context and unavailability of nonverbal cues in CMC help socially anxious individuals become less preoccupied with impression management. As a result, they may be perceived as less anxious than they would be in FTF situations. While these surveys suggest that social anxiety is associated with different patterns of use of CMC and perhaps different benefits from its use, little is known about the actual experience of CMC for the socially anxious and how this experience might differ in important ways from FTF. It is not known, for example, to what degree interactions in CMC also provoke subjective anxiety and physiological arousal symptoms which typify experiences of the socially anxious in FTF situations.

1.3. The current study

We conducted a comprehensive experimental study of anxiety and associated features in CMC vs. FTF, comparing individuals with high and low social anxiety. In addition to subjective reports of social anxiety and associated features, we measured two physiological indices of anxiety, heart rate and skin conductance during parallel interaction tasks in CMC and FTF. Several studies have examined physiological reactivity in social anxiety in FTF situations (Yoon & Quarta, 2012), but studies have yet to compare patterns of arousal in FTF to CMC. Understanding those patterns of anxiety response and physiological arousal among the socially anxious in the on-line environment may help us understand the appeal and also the function of CMC for those with high levels of social anxiety. This may have implications for understanding broader effects of CMC for a range of users. For the socially anxious specifically, this may reveal how CMC use can be optimized and how CMC can be best integrated into intervention strategies.

We hypothesized that, (1) both CMC and FTF tasks would be associated with increases in physiological arousal (heart rate and skin conductance) from baseline measures, (2) differences between conditions would be found across groups such that subjective anxiety, subjective and objective physiological arousal would be lower in CMC compared to FTF, and (3) an interaction would be found such that differences between CMC and FTF in subjective anxiety, subjective and objective physiological arousal would be more prominent in those high in social anxiety compared to those low in social anxiety.

2. Method

2.1. Design

The present study used a 2 × 2 mixed model design with repeated measures on one variable. The first factor, a between-subjects variable, is the participant’s general level of social anxiety as assessed prior to the experiment (high anxiety group/low anxiety group). The second factor, a within subjects variable, is the condition (CMC/FTF). The order of presentation of the two conditions (CMC and FTF) was counterbalanced so that half of participants conversed via CMC and then via FTF and the other half vice versa. The major dependent variables were (a) self-reported anxiety, (b) subjective physiological arousal, and objective ratings of (c) heart rate (HR), and (d) skin conductance level (SC) assessed continuously. Additionally, we tested other factors associated with social anxiety: (e) perception of success in the interaction, and (f) perceived control in the interaction.

2.2. Participants

Participants were 73 undergraduate students from Ben-Gurion University in Israel, 34 of which had high level of social anxiety and 39 which had low levels of social anxiety. Ranking was based on screening thresholds described below. The high anxiety group’s (23 women, 11 men) mean age was 23.24 years old (SD = 1.39). The low anxiety group’s (29 women, 10 men) mean age was 22.59 (SD = 2.68). All participants were sampled from a larger pool (N = 250) recruited for a survey study that contained a brief social anxiety screening questionnaire, the Mini-Social Phobia Inventory (Mini-SPIN, Connor, Kobak, Churchill, Katzelnick, & Davidson, 2001; see below). High and low social anxiety groupings were further validated using two well validated social anxiety scales, the Liebowitz Social Anxiety Scale (Liebowitz, 1987, see below) and the Fear of Negative Evaluation Scale (Watson & Friend, 1969, see below). Participants received course credit or a small monetary payment to compensate for their time.

2.3. Measures

2.3.1. Measures of social anxiety

Mini-Social Phobia Inventory (Mini-SPIN; Connor et al., 2001): The Mini-SPIN is a self-administered screening tool derived from...
the Social Phobia Inventory (SPIN; Connor et al., 2000). It comprised of three items and has good test–retest reliability ($r = 0.70$) and construct validity ($r = 0.77–0.81$) (Seeley-Wait, Abbott, & Rapee, 2009). The Mini-SPIN has demonstrated high sensitivity, specificity, and diagnostic efficiency for the diagnosis of generalized SAD (Connor et al., 2001; Osório, Crippa, & Loureiro, 2007; Seeley-Wait et al., 2009). The questionnaire is comprised of three items that are evaluated on five-point (0–4) Likert scales, with items such as “I avoid activities in which I am the center of attention.” We used a total score of 7 (or higher) for the high anxiety group, a cutoff score which was found to have good overall diagnostic efficiency for social anxiety (Osório et al., 2007; Weeks, Spokas, & Heimberg, 2007). Participants who scored 0 or 1 were recruited for the low anxiety group. This scale was forward and reverse translated into Hebrew and validated as part of a previous study (Markovitzky, Anholt, & Lipsitz, 2012).

### 2.3. Procedure

Prior to their participation in the two conditions (CMC and FTF), we screened 250 undergraduate psychology students with a questionnaire containing the Mini-SPIN. Participants scoring 7 or higher on the Mini-SPIN were invited to participate in the high social anxiety group. Those scoring 0 or 1 were invited to participate in the low social anxiety group. All procedures of this study were approved by the departmental ethics committee. All participants provided written informed consent prior to participation.

Participants first completed the LSAS and FNE questionnaires as additional confirmatory measures of social anxiety. Next, participants were attached to the biofeedback device to record baseline measures of physiological arousal for 4 min. Next, they were assigned randomly to the two order options. Before each condition, participants were told briefly about the situation they are about to encounter (CMC/FTF). The experimenter said: “I would like you to take part in a (chat/face to face) conversation with another person. Your task is to try to acquaint yourself with this person, similar to what you would do when meeting someone for the first time” (following Dannahy & Stopa, 2007). Participants took part in a chat conversation with a confederate of the opposite sex using the “Google Chat” program. Confederates were instructed to avoid giving any positive/negative feedback or any kind of encouragement (Veljaca & Rapee, 1998). After completing the first condition (CMC or FTF), participants took part in a brief neutral task (reading Wikipedia entries) before moving on to the next condition (FTF or CMC). Participants filled out a self-report questionnaire before and after each task, in anticipation for the upcoming encounter (CMC/FTF) and in relation to their feelings during those tasks.

### 3. Results

#### 3.1. High and low anxiety groups

To ensure group differences (anxiety level), we conducted a one-way MANOVA for the social anxiety measures (Mini-SPIN, FNE and LSAS). The analysis revealed a significant effect for the anxiety group [$F(3,68) = 469.62, p < .001, \eta^2_p = .96$]. The following univariate ANOVAs revealed significant main effect of anxiety group on the Mini-SPIN [$F(1,71) = 742.5, p < .001, \eta^2_p = .91$], FNE [$F(1,71) = 50.82, p < .01, \eta^2_p = .42$] and LSAS [$F(1,71) = 62.09, p < .001, \eta^2_p = .47$]. Comparing Mini-SPIN against FNE median score (Md = 15), we found adequate sensitivity (75%) and specificity (83%), supporting the use of our screening approach. Table 1 shows descriptive statistics for high anxiety and low anxiety participants, across all social anxiety measures: Mini-SPIN, FNE and LSAS.

#### 3.2. Descriptive statistics

Table 2 shows means and standard deviations for low and high social anxiety groups across both conditions for all subjective vari-

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Means of social anxiety measures for high and low anxiety groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low anxiety M (SD)</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Mini-SPIN</td>
<td>1.00 (0.79)</td>
</tr>
<tr>
<td>FNE</td>
<td>10.87 (5.90)</td>
</tr>
<tr>
<td>LSAS</td>
<td>26.46 (14.25)</td>
</tr>
</tbody>
</table>
ables. For each variable, rows present descriptive statistics separately for the period just prior to the interaction (anticipatory) and for the period during the interaction.

### 3.3. Objective measures

#### 3.3.1. Objective arousal in CMC and FTF conditions compared to baseline measurements

To test our first hypothesis, we conducted two one-way within subjects ANOVAs, comparing between baseline and condition (CMC or FTF) in both objective arousal measures: heart rate (HR) and skin conductance (SC). These analyses revealed that both CMC and FTF produced physiological responses associated with social anxiety, as shown by an increase from baseline to CMC in both HR [$F(1,72) = 27.73, p < .001, \eta^2_p = .28$] and SC [$F(1,72) = 89.31, p < .001, \eta^2_p = .55$]. Similarly, we found an increase from baseline to FTF in HR [$F(1,72) = 36.14, p < .001, \eta^2_p = .33$] and SC [$F(1,72) = 144.30, p < .001, \eta^2_p = .67$]. Means are presented in Figs. 1A and 1B.

#### 3.3.2. Heart rate and skin conductance before and during the tasks

We conducted a 2 (anxiety level) × 2 (condition) mixed model ANOVA, for both measures of objective arousal: heart rate (HR) and skin conductance (SC). Main effects of condition, across an ANOVA, for both measures of objective arousal: heart rate (HR) and skin conductance (SC). These analyses revealed that both CMC and FTF produced physiological responses associated with social anxiety, as shown by an increase from baseline to CMC in both HR [$F(1,71) = 22.83$, $p < .001$, $\eta^2_p = .24$], and SC [$F(1,71) = 15.41$, $p < .001$, $\eta^2_p = .17$] as well as for SC [$F(1,71) = .58$, n.s, $\eta^2_p = .008$].

Anxiety level main effects were also non-significant for both the HR [$F(1,71) = .40$, n.s, $\eta^2_p = .006$] and the SC [$F(1,71) = .97$, n.s, $\eta^2_p = .013$] measures. Finally, The 2 (anxiety level) × 2 (condition) interaction, was not significant for HR [$F(1,71) = 3.46$, n.s, $\eta^2_p = .046$], or SC [$F(1,71) = .26$, n.s, $\eta^2_p = .004$], such that differences between CMC and FTF in objective physiological arousal were not significantly different in those high or low in social anxiety.

### 3.4. Subjective measures

The results concerning the subjective measures were submitted to a series of mixed model ANOVAs with the independent variables Anxiety Level (between subjects) and Condition (within subjects). The respective means as well as the ANOVA results are presented in Table 2.

#### 3.4.1. Subjective anxiety

The ANOVA revealed a significant main effect for anxiety level before and during each task such that socially anxious participants reported higher anxiety than the non-anxious in anticipation and during both interaction tasks. This effects ensures that our anxiety level item (0–100) properly differentiated between the socially anxious and the non-anxious group across conditions.

A significant main effects for condition were found for subjective anxiety in anticipation of and during the task. The ANOVA also revealed a significant main effect for condition in anticipation for the task, whereby all participants, across anxiety groups, reported higher anxiety in anticipation of the FTF task [$M = 34.34$, $SD = 25.13$] than for the CMC task [$M = 22.02$, $SD = 24.74$]. For anxiety during the task, the ANOVA revealed a significant main effect for condition, such that all participants reported higher anxiety levels during the FTF task [$M = 23.94$, $SD = 23.22$] than during the CMC task [$M = 15.33$, $SD = 21.06$]. No significant interaction effects were found for subjective anxiety in anticipation for the task or during the task.

#### 3.4.2. Subjective physiological arousal

The ANOVA revealed a significant main effect for condition whereby all participants reported higher physiological arousal in anticipation for the FTF task [$M = 1.87$, $SD = .91$] than for the CMC task [$M = 1.63$, $SD = .71$]. For subjective arousal during the task, the ANOVA revealed a significant main effect for condition, such that all participants reported higher levels of arousal during the FTF task [$M = 1.87$, $SD = .91$] than during the CMC task [$M = 1.39$, $SD = .54$]. Significant main effects for anxiety level were found across conditions both before and during the tasks. No significant interaction effects were found for subjective arousal in anticipation for the task, or during the task.

### Table 2

Mean subjective variable values according to condition and ANOVA results.

<table>
<thead>
<tr>
<th></th>
<th>Low anxiety M (SD)</th>
<th>High anxiety M (SD)</th>
<th>CMC</th>
<th>FTF</th>
<th>ANOVA results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety (0–100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipatory</td>
<td>13.10 (18.04)</td>
<td>32.25 (27.55)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During</td>
<td>7.63 (10.93)</td>
<td>24.44 (26.16)</td>
<td>25.69 (21.35)</td>
<td>44.26 (25.76)</td>
<td></td>
</tr>
<tr>
<td>Arousal (1–7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipatory</td>
<td>1.45 (0.52)</td>
<td>1.80 (0.85)</td>
<td>1.74 (0.91)</td>
<td>2.03 (0.90)</td>
<td></td>
</tr>
<tr>
<td>During</td>
<td>1.29 (0.49)</td>
<td>1.52 (0.58)</td>
<td>1.41 (0.49)</td>
<td>1.87 (0.81)</td>
<td></td>
</tr>
<tr>
<td>Perceived control (1–7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipatory</td>
<td>5.74 (1.00)</td>
<td>5.24 (1.12)</td>
<td>5.39 (1.00)</td>
<td>4.58 (1.21)</td>
<td></td>
</tr>
<tr>
<td>During</td>
<td>6.09 (0.96)</td>
<td>5.48 (1.05)</td>
<td>6.00 (1.01)</td>
<td>5.37 (0.79)</td>
<td></td>
</tr>
<tr>
<td>Perception of success (0–100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipatory</td>
<td>86.85 (10.42)</td>
<td>72.13 (17.94)</td>
<td>83.40 (11.25)</td>
<td>72.04 (15.75)</td>
<td></td>
</tr>
<tr>
<td>During</td>
<td>88.46 (17.97)</td>
<td>82.41 (13.83)</td>
<td>90.46 (10.04)</td>
<td>76.97 (17.38)</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$.
** $p < .01$.
*** $p < .001$. 

3.4.4. Perceived success

The ANOVA yielded a significant interaction indicating that high anxiety participants perceived themselves as more successful during the CMC task than the FTF task. No such differences were found in the low anxiety group. This interaction is depicted in Fig. 2.

Significant main effects for anxiety level were found across conditions both before and during the tasks, such that socially anxious participants \([M = 72.09, SD = 16.86]\) felt less successful than the non-anxious participants \([M = 85.12, SD = 10.38]\) before and during the two tasks. The main effect for condition was found to be non-significant before and during each task.

4. Discussion

Although survey findings point to differences in patterns of use and experience of using CMC among the socially anxious (High & Caplan, 2009; McKenna, Green, & Gleason, 2002; Tian, 2013), little is known about their actual experience during CMC. To our knowledge this is the first study to compare physiological arousal during CMC vs. FTF interactions in individuals with high levels of social anxiety.

Consistent with our first hypothesis, objective measures showed increased physiological arousal in CMC as well as in FTF relative to a baseline condition. This suggests that despite the comforting characteristics of CMC, such as absence of nonverbal features and relative anonymity (High & Caplan, 2009), online social interaction does elicit arousal of sufficient intensity to be detected in objective measures. Interestingly, no differences were found in objective indices of arousal between CMC and FTF conditions. On the other hand, subjective report of arousal and anxiety was higher in FTF than in CMC. Previous studies of social anxiety in FTF situations, have also reported discrepancies between subjective and objective measures of physiological arousal in social anxiety (Edelmann & Baker, 2002; Mauss et al., 2004). Current findings indicate that this discrepancy between subjective and objective occurs in CMC as well.

We also found that subjects felt more in control and perceived themselves as more successful during CMC. In sum, though CMC elicits similar physiological response of anxiety as FTF, it is perceived as less threatening, more controllable and as a facilitator of greater sense of success.

Interestingly, we also found no differences in objective physiological arousal (heart rate and skin conductance) between high and low socially anxious individuals. This lack of difference may be due to limitations of our experimental manipulation. Although the “getting acquainted task” has been widely used to study social anxiety (Alden & Wallace, 1995; Mellings & Alden, 2000; Turner, Beidel, & Larkin, 1986) and did lead to increases arousal in the current study, a more stressful social task, such as an impromptu speech, might be needed to detect differences in response across groups. At the same time, findings have been inconsistent regarding distinct pattern of physiological arousal among those high in social anxiety (e.g., Mauss et al., 2004). Considering discrepancy between subjective and objective measures of arousal and in consistent findings regarding distinct patterns of arousal in high social anxiety, perceived physiological differences in those with high social anxiety seem to be primarily due to differences in cognitive appraisal of similar physiological responses (Mauss et al., 2004).

Our third hypothesis, of an interaction between anxiety group and (CMC vs. FTF) conditions, was partially supported. A significant interaction was found only for perception of success such that socially anxious individuals perceived themselves as more successful at CMC than at FTF; while no similar difference was found in the non-anxious group. Perception of success has been found to be associated with experience of self-efficacy and lower anxiety in...
social anxiety (Kashdan & Roberts, 2004). As such, this may account, at least in part, for the apparent appeal of CMC for those who are high in social anxiety. In a previous study of socially anxious participants, a brief CMC introduction led to decreased anxiety and decreased desire to avoid a subsequent FTF interaction (Markovitzky et al., 2012). It is possible that greater perception of success in CMC might help account for this positive effect. Further study is needed to better understand the role of perceived success and to determine whether this mediates beneficial effects of CMC for the socially anxious.

For other subjective as well as both objective measures of arousal no interactions between group and condition were found. Socially anxious participants reported higher levels of anxiety than the low anxiety group across conditions, but differences were not greater in FTF than CMC. Just as those high in social anxiety reported somewhat less anxiety and arousal in CMC compared to FTF, those low in social anxiety reported a comparably lower level of arousal and anxiety in CMC. Despite the lack of an interaction, these parallel differences could also help explain the relative appeal of CMC for those with high social anxiety. For the highly anxious FTF is more likely to elicit moderate, uncomfortable levels of anxiety compared to CMC. For those generally lower in social anxiety, both CMC and FTF are unlikely to generate moderate, uncomfortable levels of social anxiety.

Some limitations of this study should be considered. First, as mentioned above, the experimental manipulation involved an interactive task of making the acquaintance of a stranger, which may not have been sufficiently stressful to elicit differential patterns across groups or in physiological differences across conditions. In addition, we used an analogue sample of students with high social anxiety rather than a true clinical sample. Although many (e.g., Stopa & Clark, 2001) have argued that analogue samples are informative and parallel clinical groups, and mean LSAS score in our high anxiety group approaches clinical levels, it is possible that more consistent group differences would be found had we used a true clinical sample with more severe social anxiety. Finally, this study examined the specific CMC context of active communication in text chat. It is not known whether findings are generalizable to other interactions via the internet, with somewhat different characteristics, such as interaction on social networks or communication with audio or video components.

4.1. Conclusions

In this experimental study of social anxiety in CMC using physiological measures we found that CMC does lead to significant physiological arousal and that magnitude of increase was similar to that in FTF. However, subjective anxiety and arousal increased significantly less in CMC. This suggests that preference of CMC for the socially anxious is more closely related to appraisal than to actual differences in physiological response. Consistent with this possibility, only social anxious participants judged their interaction to be more successful in CMC than in FTF. Although surveys of CMC use and social anxiety are informative, further experimental study is needed to improve our understanding of the experience of interactions in CMC for the socially anxious and to better understand specific effects, such as perception of success, that might influence consequences of this use.

References


