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The Manipulation of Synchronous Internet-based Online Social Support in a Laboratory Setting

Ling Xuan Chong^a, Ai Ni Teoh^{a*}

^a*James Cook University Australia, 600 Upper Thomson Road, 574421 Singapore*

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Abstract

The present study aimed to manipulate Internet-based online social support (OS) in a laboratory setting and compare its effect with face-to-face social support (FS). Participants ($N = 161$) were randomly assigned to either alone, FS, or OS condition. Consistent with the hypotheses, alone participants perceived less social support than supported participants and experienced less positive emotions than those who received OS. For all the DVs, FS and OS did not differ from each other. The results ascertained the equivalent benefit of OS to FS. Most importantly, these findings highlighted successful manipulation of synchronous OS in a laboratory setting.

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Excessive and prolonged stress had been reported to threaten the well-being of an individual, such as showing heightened cardiovascular reactivity (Tardy, Thompson, & Allen, 1989) which in turn was constantly associated with negative health outcome (e.g., Krantz & Manuck, 1984), higher anxiety and negative affect, and lower positive affect (Curtis, Groarke, Coughlan, & Gsel, 2004). As stress brings on negative influence on well-being, it is essential to attenuate stress level by selecting an effective coping strategy. One of the effective coping strategies is social support. Social support is found to be able to buffer the negative impact of stress by providing psychological and physical resources that are intended to aid an individual, according to the Stress-Buffering Model (Cohen & Wills, 1985).

As there is a tendency that the number of Internet users increased over the years (Internet World Stats, 2009a; Internet World Stats, 2009b), it is likely that the Internet serves as a medium that provides another form of social support, which we will term Internet-based online social support (OS). However this speculation remains a speculation as limited research was done on OS in a laboratory setting even though a substantial amount of studies was conducted to study traditional face-to-face social support (FS; e.g., Glynn, Christenfeld, & Gerin, 1999). Although several papers had investigated the effect of OS on individuals suffered from chronic disease (e.g., Rotondi et al., 2005), most of these studies focused only on asynchronous type of OS whereby the provision of social support was provided through an electronic bulletin board or forum (Beaudoin & Tao, 2007).

* Ai Ni Teoh. Tel.: +65-6576-6882; fax: +65-6455-2833
E-mail address: aini.teoh@jcu.edu.sg

The present study aims to manipulate synchronous type of OS in a laboratory setting and compare its effect with that of FS and control condition. To manipulation synchronous OS, the usual manipulation method of traditional FS where participant performs stressful task with support provider sits beside to provide social support is inapplicable. Therefore in the present study social support will be manipulated in a different way such that social support will be provided for five minutes between two stressful tasks, rather than during stressful task.

As the effect of OS manipulated is expected to be equivalent to that of FS, it is hypothesized that participants in both the FS and OS conditions would report lower level of negative emotion but higher level of positive emotion, as well as higher level of perceived social support and usefulness of social support as compared to those in alone condition.

2. Method

2.1 Participants and Design

Participants of ethnic Chinese ($N = 161$; 86 females) aged between 18 and 26 were randomly assigned to either alone ($n = 25$ for males; $n = 27$ for females), FS ($n = 25$; $n = 30$), or OS condition ($n = 25$; $n = 29$). Participants assigned to the FS condition were required to bring along a close friend and those assigned to the OS condition were asked to provide contact details of a close friend. This close friend should be willing to participate in this study and is of the same gender and of ethnic Chinese with whom they knew for minimum half a year.

This study adopted a two (gender) by three (social support: alone, FS, and OS) between-subject factorial design with perceived stress, perceived social support, perceived usefulness of social support, and emotional responses as dependent variables (DVs).

2.2 Measures

Perceived stress measure was an one-item scale that measures the level of stressfulness the participants experienced at that moment on a six-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*). This scale was used as manipulation check for stressfulness of tasks.

Perceived social support measure was used to assess level of perceived social support (2 items; quantity and quality of social support; Hughes & Curtis, 2000), and perceived usefulness of social support (2 items) on a six-point Likert scale from 1 (*very slightly / not at all*) to 6 (*extremely*). Perceived usefulness of social support was reported to have high internal consistency of .82 and perceived social support had a Cronbach's alpha of .77 in the present study. Except for the item measuring quantity of perceived social support, the remaining three items were administered only at stage 4.

The Positive and Negative Affect Schedule-Expanded form (PANAS-X; Watson & Clark, 1994) was utilized in this study to measure emotional experiences before and after the two stressful tasks. This study used only 38 out of 60 items, which made up two higher-order scales, which are the 8-item General Negative Affect (GNA) and the 10-item General Positive Affect (GPA) scales, as well as two lower-order scales, including the 15-item Basic Negative Emotion (BNE) and 14-item Basic Positive Emotion (BPE) scales. These items were scored on a five-point scale that ranged from 1 (*very slightly/not at all*) to 5 (*extremely*). The Cronbach's alphas of these scales ranged from .90 to .95 for GPA, from .87 to .92 for GNA, from .93 to .97 for BPE, and from .90 to .96 for BNE at four different stages in the present study.

2.3 Tasks

Two stressful tasks, namely computerized Stroop game and speech tasks were used to induce stress. A substantial amount of studies used both tasks as stressful tasks in the same study and the stress level of the two tasks were reportedly high and equivalent (Wang, Delahanty, Dougall, & Baum, 1998).

The computerized Stroop task (Wang et al., 1998) was programmed by the first author with Microsoft ASP.NET (v 2.0). The computer screen displayed four grey buttons on each of which one color name (either BLUE, GREEN, RED, or YELLOW) was printed in black. A color name that was printed in incongruent print color was presented one at a time (e.g., a word BLUE in red color) above the grey buttons. Participants were to click on the grey button that represented the color of the word (e.g., to click on the button with a word RED on it when presented with a

word BLUE printed in red ink). Each question was to be attempted before the next one appeared. A timer that was meant to induce stress started to count down once participant clicked the START button on the front page. A background sound with a voice randomly and repeatedly read the name of colors (e.g., 'red,' 'yellow') was played through headphones during the task (Wang et al., 1998) to further increase stressfulness and to confuse participants.

The next stressful task required the participants to give a three-minute speech in front of a video camera on a given topic "what I hate about myself" (Sher & Levenson, 1982). Before the delivery of speech, participants were given three minutes to prepare. To increase evaluative apprehension and stressfulness of the task, participants were informed that the content and persuasiveness of their speech would be rated by a panel of professional raters.

2.4 Social Support Manipulation

FS was manipulated in this study to produce a traditional face-to-face type of social support. In doing this, friend was instructed to sit next to participant to provide emotional support. Friend was to maintain eye contact, smile and nod at, and give encouraging comments, such as "I am sure you will do fine," "try your best in the next task" (Westmaas & Jamner, 2006).

OS was manipulated by providing participants with synchronous type of emotional social support through the Windows Live Messenger (MSN) chat room. MSN was chosen for its real-time feature and popularity. The experimenter (i.e., the first author) received contact details of participant's friend prior to the experiment. She contacted the friend through email to brief him/her about his/her role as emotional support provider which was similar to that of friend in the FS condition, except that social support is conveyed through MSN chat. The friend was advised not to disclose any details regarding the purpose of this study to participant and was asked to provide social support through MSN either at home or at work place. A MSN account was created for all participants in the OS condition to ensure consistency. The friend was the only user added in the friend list.

Participants assigned to the alone condition attended and completed the experiment alone.

2.5 Procedure

After giving informed consent, participants completed two questionnaires, which were perceived stress measure and PANAS-X (Watson & Clark, 1994; stage 1). Followed by this participants were to perform the first stressful task (i.e., computerized Stroop game; stage 2). A set of questionnaires included perceived stress measure and PANAS-X was to be completed after the task. Next, a five-minute break was given (stage 3). Participants in the alone condition were asked to take a break and refrain from any activities for five minutes. Friend of those in the FS condition entered the experimental room and provided social support, whereas friend of those in the OS condition initiated an online conversation with the participant through the MSN. Five minutes later, MSN conversation was terminated while friend in the FS condition was instructed to leave the room. Participants then filled out another set of questionnaires that consisted of perceived stress measure, social support measure, and PANAS-X. In the last stage (stage 4), participants performed a speech task before completing the last set of questionnaires, which consisted of perceived stress measure, social support measure, and PANAS-X. Lastly, participants were debriefed and thanked.

3. Results

3.1 Assumption Checking and Manipulation Check

With assumptions of normality and homogeneity of variance satisfied with only one outlier observed in BNE scores, which was then replaced by a value that was 3.29 standard deviations away from the mean. Violation of homogeneity of regression assumption was observed on change scores of GNA and BNE, therefore these variables were excluded from the subsequent analyses.

Analyses revealed that no significant difference between the stress levels of two stressful tasks in the alone condition was observed, $t(51) = .44, p = .662$. Therefore, this justified that the counterbalance of the two stressful tasks was unnecessary. Additionally, the manipulation of stress was successful when the difference in stress level reported at stages 2 and 1 ($M = .73, SD = 1.50$) was significantly higher than zero, $t(160) = 6.15, p < .001$, whereas

the discrepancy in stressfulness reported between stage 4 and stage 1 ($M = .47$, $SD = 1.62$) was significantly higher than zero, $t(160) = 3.69$, $p < .001$.

There were statistically significant main effects for social support conditions on quantity of perceived social support at stage 3, $F(2, 158) = 30.07$, $p < .001$, and stage 4, $F(2, 158) = 20.94$, $p < .001$. Participants received FS ($M = 3.91$, $SD = 1.38$) and OS ($M = 4.13$, $SD = 1.33$) perceived higher level of social support at stage 3 than did those in the alone condition ($M = 2.33$, $SD = 1.23$). Likewise higher perceived level of social support was induced in the FS ($M = 2.96$, $SD = 1.26$) and OS ($M = 3.33$, $SD = 1.26$) conditions than did the alone condition ($M = 1.85$, $SD = 1.16$) at stage 4. This indicated that the manipulation of FS and OS was successful.

3.2 Hypothesis Testing

One-way ANCOVAs with social support as independent variable (IV), baseline readings at stage 2 as covariate and change scores in GPA and BPE (difference between readings at stages 4 and 2) as dependent variable (DV) respectively were performed to test the hypotheses related to emotional changes. In addition, one-way ANOVAs were conducted with the same IV and perceived level of social support (average scores of quantity and quality of social support) and perceived usefulness of social support (average scores of the two items) at stage 4 as DV respectively to test for the remaining hypotheses. Analyses revealed significant main effects for social support on perceived usefulness of social support, $F(2, 158) = 20.11$, $p < .001$, $\eta^2 = .203$ perceived social support, $F(2, 158) = 21.97$, $p < .001$, $\eta^2 = .218$, and BPE, $F(2, 157) = 4.10$, $p < .05$, $\eta^2 = .050$. Participants in both FS ($M = 3.38$, $SD = 1.62$ for usefulness of social support; $M = 3.25$, $SD = 1.25$ for perceived social support) and OS condition ($M = 3.68$, $SD = 1.37$; $M = 3.41$, $SD = 1.13$) reported higher usefulness and perceived social support than those in the alone condition ($M = 2.09$, $SD = 1.05$; $M = 2.03$, $SD = 1.12$). Only participants in the OS condition ($M = .04$, $SD = .66$) showed higher level of BPE than those in the alone condition ($M = .39$, $SD = .52$) after the second stressful task. The response in BPE of participants received FS ($M = .14$, $SD = .70$) was not significantly different from the other two conditions. However, contrary to the hypothesis, no significant result was observed on GPA, $F(2, 157) = 1.51$, $p = .225$.

4. Discussion

The purposes of this study were to manipulate synchronous OS in a laboratory setting and subsequently compare the effects of OS and FS. The social support manipulation method designed in this study was successful. Not only did participants in the support conditions perceived more social support after the five-minute social support session, the social support effect persisted till the next stressful task period. In addition, consistent with the expectation, the synchronous OS manipulated in this study was as effective as the traditional FS. Perceived level of social support and usefulness of social support were reportedly higher among supported participants than alone participants. In addition, relative to alone participants, responses in basic positive emotions were shown to be higher among participants who received social support from MSN chat.

The alone condition, where participants attended and performed the experiment alone, served as a control condition in the present study. By comparing this condition with provision of OS, as support provider was absent in both conditions, the difference observed between these in terms of emotional responses and social support perceived can be attributed to provision of social support through the Internet from the OS. Similarly, the difference between the alone and FS conditions can be attributed to presence of support provider and provision of social support in the FS condition. The manipulations of FS and OS differed in a way that support provider was absent in the OS condition. Since the FS and OS conditions did not differ in terms of all the DVs, this signifies that physical presence of a support provider is not crucial for social support to take effect.

According to the Stress-Buffering Model (Cohen & Wills, 1985), social support helps stressed individuals by interfering with the process that take place between stressful events and psychological symptoms. Specifically, social support either modifies or prevents stress appraisal response. Since effective social support was reported to alleviate perceived stress, it could be deduced that social support is associated with high level of positive affect. In addition, in a study by Curtis et al. (2004) perceived level of stress was negatively associated with positive affect in a women sample. Putting all the pieces together, the result observed in this study supported the Stress-Buffering Model and is also in line with the study by Curtis and colleagues where OS was effective in reducing the negative impact of stress and hence higher level of BPE was reported as compared to those in the alone condition.

Some limitations were identified in the present study. When the DVs measured in the present study were through self-report method the responses might be affected by intra and interpersonal bias. It is recommended that other methods such as physiological measures be included in future studies as well. Only emotional support was used in this study which has limited the generalizability of the findings. As this is an exploratory study that examines the stress-buffering effects of FS and synchronous OS, more investigations are required to contribute to knowledge in the field. For instance, the moderating effects of personality traits and gender as well as the effect of different forms of social support on other DV measures should be explored.

In conclusion, in comparison with the control condition where no social support was provided both FS and OS were observed to have a positive effect on perceived social support and usefulness of social support. The result that FS and OS did not differ from each other also ascertained that OS has an equivalent benefit to FS. In addition, OS alleviated stress level which is indicated by higher level of positive affect reported. Most importantly, these findings highlighted the successful manipulation of synchronous Internet-based social support in a laboratory setting.

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