SOCIAL USE OF THE INTERNET AND LONELINESS

DISSERTATION

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By

Mu Hu, M.A.

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Dissertation Committee:

Professor Daniel G. McDonald, Advisor

Professor Donald J. Cegala

Professor Artemio Ramirez

Approved by

_______________________________
Advisor
Graduate Program in Communication
ABSTRACT

Previous literature on internet use and psychological well-being mainly adopts correlational analysis, and treats “psychological well-being” as a “package” composed of such constructs as loneliness, depression, anxiety, self-esteem, and so forth. These constructs are not carefully examined in terms of their nature, mechanism, causes, consequences, and furthermore, how they are related to communication. The present study focuses on loneliness and social use of the internet, and reviews the studies relevant to this topic from both social psychology and computer-mediated communication literature, as a response to the call for interdisciplinary research from scholars in these two areas. A pilot study was conducted revealing that recalling and writing stories of loneliness experience was a valid way to arouse mood loneliness. Two hundred and thirty-four subjects participated in the formal study, composed of a survey testing trait loneliness and a 5-condition (face-to-face chatting, instant messenger chatting, watching video, writing assignments, and “do nothing”). Mood loneliness increased after people chatted online. People reported higher level of mood loneliness after chatted online than those conversed face to face. For people with high trait loneliness, the mood loneliness increase in computer-mediated communication condition was significantly higher than that in face-to-face communication condition. People gave more positive evaluation to
face-to-face communication than computer-mediated communication. There was negative relationship between evaluation and posttest mood loneliness in social activity conditions, which are face-to-face and computer-mediated communication. Also in these two groups, evaluation to the communication was positively related to how long the communication lasted. Future communication researchers need to further investigate the psychosocial well-being constructs relevant to their studies. More experimental studies are needed for examination about the influence of Internet use on psychological well-being. Researchers should realize the difference of culture and diffusion of the Internet when trying to apply research models in computer-mediated communication to other countries.
Dedicated to my parents, Hu Dechun and Mu Li
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VITA

2001 ............................................................... B.A., Journalism, Anhui University, China

2002 ............................................................... Media/Operations Executive, China Baseball League

2004 ............................................................... M.A., Communication, The Ohio State University

2002 – 2007 ...................................................... Graduate Teaching and Research Associate, The Ohio State University

FIELDS OF STUDY

Major Field: Communication
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CHAPTER 1

INTRODUCTION

No one can ignore or deny the convenience or significant impact of media in our society. With the development of new media, the perception of the convenience and impact is increasing. However, at the same time, both the general public and academic scholars show concerns about the possible negative effect of media. “Every new technology finds dour critics (as well as ebullient proponents). Communication technologies in particular can be seen as opening the doors to all varieties of social ills” (Katz & Aspden, 1997, p.81).

The concerns are not unique to any specific medium, rather, they are quite ubiquitous over all the media, especially electronic media invented by human beings. For example, the telephone was invented to increase contact with family, friends, and work relations, especially to help overcome physical distance. Nevertheless, telephone users found themselves less likely to visit in person, even if they lived close enough for face-to-face visits. Telephone use increased, while personal visits decreased, and people appeared to replace visits with “wired” contact. Therefore, questions arose about whether the telephone would actually alter the quality of social relationships and isolate people.
Television has a more profound impact on community life, as it works as a relatively individual entertainment tool. People can stay at home enjoying their nighttime without going out to theatre or local community clubs, as they used to do (Bargh & McKenna, 2004; Katz, Rice, & Aspden, 2001). Furthermore, audiences may develop “parasocial interaction” with television characters, the “simulacrum of conversational give and take (Horton & Wohl, 1956, p.215)” between the audience and characters in television programs. Due to television production techniques (e.g., close-up shots and camera zooms), personal traits (e.g., shyness), and external environments, a sense of reliance may be cultivated on this illusive relationship “characteristically one-sided, non-dialectical, controlled by the performer, and not susceptible of mutual development” (p. 215). Thus, the audiences may withdraw from normal social interaction and get “addicted” to the “interaction” with television characters (Levy, 1979; Miyasaki, 1981; Nordlund, 1978).

More recently, the Internet has gained unprecedented popularity in current society. According to a report from Center for the Qualitative Study of Society at Stanford University (Nie, Simpser, Stepanikova, & Lu, 2004), 60 percent of Americans are connected to the Internet. An average Internet user spends 3 hours per day online, which exceeds the average time spent with TV, 1.7 hours. It is more striking to look at the speed of the Internet to reach its present popularity than just focus on its present popularity itself. If we set 50 million users as a milestone, it took radio 38 years to reach this amount, it took television 13 years, while for the Internet, it only takes 4 years. Take the United States for example, the first commercial web browser came out in 1994 when the percentage of Americans connected to the Internet was practically zero. Therefore, it only
took the Internet a decade to reach its popularity today, 60%, from none. As for this point, it surpasses any other media technology in human history. It is the Internet that virtually makes the whole planet into a “global village”.

Just like what happens when a new form of media is invented and brought into people’s daily life, such as telephone and television, there are concerns about the potential negative effects of the Internet from social scientists (Bargh & McKenna, 2004). Researchers argue that, despite its convenience and easy accessibility today, the Internet in essence is a weak medium for information exchange (especially emotional and affective information) and thus decreases the quality of interpersonal relationships and causes negative psychological outcomes.
CHAPTER 2

LITERATURE REVIEW

2.1 Anecdotal reports

The literature concerning the Internet use and psychological well-being started at the early stages of the diffusion of this media technology, with anecdotal reports concerning cases indicating its possible negative effect on people’s psychological well-being. Stoll (1995) proposed “second thoughts on the information highway” in his well-known book *Silicon Snake Oil*. After listing the advantages and convenience the Internet brings to human beings, he reported a few “victims” of the Internet. A teenager at Berkley began to use computer at the age of three, and he could skillfully converse online, while was not able to have a conversation with his parents. Several young computer wizards knew little about their families’ history but could tell every detail of their computers’ disk cache. A lot of high school students who were good at using a word processor didn’t know how to write a thank-you letter. He claimed that anonymity and intractability on the Internet world might make people communicate with fake identity. Turkle (1995) described several MUD’s players’ life and pointed out that the players were actually forming a “virtual reality” on the Internet to meet the need for socialization, to seek comfort and
friendship, and to escape from the difficulties in real life. Turkle proposed that the Internet skewed our experience of the real world as the artificial space seemed so “real” due to technology advancement. Sometimes, the virtual reality was even more compelling than real world and Internet users would expect they could achieve more from the Internet. Little by little, we may sequester ourselves from real life and within cyberspace.

These studies were made in the mid-1990’s. The Internet technology then was still at its infancy and far less advanced than it is today. When the majority of people were fascinated by and tried to open their arms to embrace this new technology, these researchers let the other side of it exposed to the public. Although these studies are anecdotal studies, the researchers insightfully pointed out the possible conflict between real and virtual reality that Internet users might experience. The conflict would become more intense especially when users felt they could acquire online what might be unavailable in real life. They not only raised concern on the negative effect of the Internet from the general public, but also enriched the media research territory by opening a whole new area to be explored. A lot of models, theories, and research questions proposed later derived from these early anecdotal studies.

2.2 National surveys

Rather than reporting a few vivid cases to make the public alert to the negative effect of the Internet, some research agencies conducted large-scale surveys to provide a general picture of how the Internet influences people’s life. For instance, Nie and Erbring’s (2002) survey revealed that Internet use heavily influenced people’s social life as well as other activities. Specifically, the more time people spent online, the more likely it was that they
spent less time with family and friends, talking with family and friends on the phone, attending events outside home. The researchers regarded it as the key finding of the study.

In addition, the Internet competed with traditional media, as the more time people spent online, the less time they spent on TV, radio and newspaper. In a subsequent survey by the same group of researchers 2 years later (Nie, Simpser, Stepanikova, & Lu, 2004), consistent results were acquired on the impact of the Internet use on socializing the traditional media use. For an average Internet user, who spent 3 hours a day online, the time of face-to-face communication with families decreased by 70 minutes, and the time to watch TV decreased by half an hour. The statistics are mostly descriptive data. Research findings just revealed the on-surface phenomenon partly because of their research questions. No further investigation was carried out on psychological consequence of the online relationship, especially in contrast to their corresponding relationship formed off line.

2.3 Quantitative studies

The longitudinal research done by Kraut et al. (1998) is the most influential study in the area of Internet and psychological well-being. Kraut and colleagues sampled 93 families and their 256 members in eight diverse communities in Pittsburgh, Pennsylvania. Each family was provided with a computer connected to Internet. The recruitment excludes families and individuals who already had active Internet usage, so the data represent the families’ first experience of a powerful home computer. The researchers pretested respondents’ social involvement (family communication, local social network, distant social network, and social support), and psychological well-being (loneliness,
stress, depression) before the Internet provision. After 12 to 24 months, follow-up questionnaires were given measuring their Internet use, social involvement and psychological well-being. Internet use was measured with total hours spent each week, World Wide Web use (number of domains visited every week), and email (number of emails user sent and received). Results indicated that greater Internet use caused a small but significant decline in social involvement, and an increase in loneliness and depression.

Kraut et al.’s (1998) study was highlighted in several aspects. First, the researchers distinguished between different types of Internet use, including non-social use (e.g., entertainment) and social use (e.g., email). Secondly, Kraut and colleagues gave explanations to why the Internet use could have negative psychological effect on the basis of these different Internet use. Non-social Internet use was comparable to television watching. Studies show that entertainment-oriented use of the Internet increased the technique and skills in using computer, but this technique improvement was applied by the Internet users to more consumption of time with computer alone, rather than for socializing purpose with family and friends. As for the social use of the Internet, the authors proposed two mechanisms underlying causal relationships. One was time displacement: the time people use the Internet displaced the time they could be socially engaged. The other was the fact that weak ties online displaced strong ties. Strong ties referred to the relationships maintained with physical proximity, frequent contact, and sense of obligation and affection, while weak ties were relationships associated with infrequent contact and narrow focus which were easy to break. The positive or negative
consequences of the social use of the Internet depended on how the Internet shaped the balance of the weak and strong ties people maintain. According to Kraut et al., although people maintain strong ties electronically, many online relationships were new and weak. “By using the Internet, people are substituting poorer quality social relationships for better quality relationships” (p.1029).

Morahan-Martin (1999) found the similar causal relationship. Through an Internet-specific survey concerning Internet use, loneliness, depression, and social anxiety, the author found that loneliness was a byproduct of excessive Internet use because users invested in online relationships at the expense of real-life relationships. Lonely individuals were drawn to some forms of interactive activities online because of the possibilities of connectedness, companionship, and communities they offered.

Some other researchers didn’t find that the Internet use would lead to decrease of psychological well-being, but reported negative relationship between Internet use and psychological well-being (Kubey, Lavin, & Barrows, 2001; Larose, Eastin, & Gregg, 2001; Matanda, Jenvey, & Phillips, 2004; Moody, 2001; Ofosu, 2001; Pawlak, 2002; Subrahmanyam, Kraut, Greenfield, & Gross, 2000; Weiser, 2001; Whitty & Mclaughlin, 2005).

However, if a closer look is taken at these studies in terms of their explanation of the mechanism involved, the conclusion “Internet use will have negative effects on psychological well-being” seems to be too liberal.

As for Kraut et al.’s study, Shapiro (1999) noted that there were two participant populations. One was a population of the families with high school students. The author
pointed out that those students might finish high school and start college life over the two years of the research. They might leave their parents and school friends, which might be the reason for reduced social contact. Therefore older participants may show a greater degree of loneliness than their younger peers. The influence of age as a covariate was found in Kraut et al.’s study, so that evidence is consistent with the proposed alternative explanation.

The second sample population was adult family members on the Board of Directors of local community development organizations. Shapiro regarded these people as those who already had very high level of social connection with community, and the observed lack of social contact was just a reflection of regression to the mean. Therefore the social contacts of the participants in Kraut et al.’s study were likely to decline during the course of the study, regardless of their Internet use. In other words, the reported increases in loneliness and depression may have nothing to do with Internet use. In addition, those participants’ lack of social contacts (such as new college students) might use the Internet to deal with loneliness, so an opposite causal relationship to that posited by the Kraut et al. was proposed, in other words, it is loneliness that leads to Internet use, but not vise versa.

Kraut et al. acknowledged that adolescence growth was an unmeasured variable that may challenge the findings. In addition, their study only includes the first and second year experience of Internet use in terms of social behavior outcomes, which may probably represents the early stage of Internet adoption and use. The results of this study may be just a novelty effect of the Internet, as people in the study were still learning how to merge the Internet into their normal life. It is reasonable to infer that if people gain more
experience and practice on this technology, they will be better in balancing activities online and offline. This viewpoint was supported by Kraut et al.’s “revisit to the Internet paradox” (2002). In a follow-up study based on their research done in 1998, researchers found that there was significant interaction between the Internet use and time. The degree of depression, stress, and loneliness significantly increased over the first period of time but showed no relation with the Internet use during the second period.

In LaRose, Eastin, and Gregg’s (2001) study, social cognitive theory was applied. The researchers found people with different experience in using the Internet differed in stress, depression, and perceived social support. Those with more experience had higher self-efficacy in using the Internet and reported less depression and stress. Through Internet use, they perceived bigger social network and greater social support.

Dittmann’s survey of randomly selected college students (2002) demonstrated an inverse relationship between loneliness and the length of time a student had used the Internet. Newer users were at a higher risk of being lonely than those with a longer history of Internet use.

Neuman, O’Donnell, and Schneider (1996) used special software to track and compare the online behavior and experience of “veteran” and “rookie” users. The findings confirmed the notion that the user experience might make the Internet influence individuals differently. Compared to “veteran users”, “rookies” were “engaged in more aimless surfing, were less successful in finding information, and were more likely to report feeling a souring of affect over the course of their sessions. Their negative reactions reflected not the Internet experience per se but the frustration and sense of
impotence of the inexperienced user without immediate access to social support” (Dimaggio, Hargittai, Neuman, & Robinson, 1996, p.316), which is consistent with the above-mentioned two studies.

“Time displacement” effect sounds pretty reasonable. “If television, a unidirectional mass medium, displaced so many activities, then it stands to reason that the Internet, which permits interactive as well as one way communication, might substitute for even more” (Dimaggio, Hargittai, Neuman, & Robinson, 1996, p.315). The above-mentioned Nie and colleagues’ surveys (2002, 2004) confirmed this effect. However, more surveys seemed to refute it. There were no significant differences of the membership rates of religious and community organizations between the Internet users and non-users. In addition, the Internet proved to facilitate existing communication with family members, acquaintances in online communities. Face-to-face and telephone communication were not influenced by the Internet. The Internet was a solid medium to create and develop friendship (Katz & Aspden, 1997). Most of the Internet users reported that they communicated more often with their families and friends than they did before using the Internet. They even used the Internet to contact certain family members that they had not contacted much before. Internet use was found positively associated with social activity, indicating that Internet users were more sociable than nonusers (Howard, Rainie, & Jones, 2001). Robinson and colleagues (1997, 2000) reported the surveys conducted by Pew center in 1995 and 1998, revealing that Internet use was unrelated or positively associated with social interaction. In a more recent Pew’s survey (2002), Internet users were found to have a larger social network than non-Internet users.
Kraut et al.’s (1998) argument related to strong and weak ties is problematic. They “diagnosed” strong ties and weak ties by listing a variety of their “symptoms” respectively, but did not reasonably explain why face to face communication indicates a strong tie, while online communication indicates a weak tie. Although they stated that “generally, strong ties are supported by physical proximity” (p.1019), they left the question “whether and how people form relationship based on common interest rather than convenience” arising at the beginning of their study unresolved. Physical proximity is not necessarily the sole decisive factor on whether social ties are strong or weak, rather “the strength of a tie is a combination of amount of time, emotional intensity, intimacy, reciprocal services” (Kavanaugh, Reese, Carroll, & Rosson, 2005). In addition, this dichotomy of strong and weak ties is based on the assumption that face-to-face interaction occurs between existing social relationships while the online communication happens between new relationships, so the researchers were comparing two types of relationships at different developmental stages. Even this assumption itself is challenged by recent statistics: only 20 % of the Internet users communicate with someone they never met in person. In other words, the rest 80% communicate with the existing relationships (Nie, Simpser, Stepanikova, & Lu, 2004). Actually, Kraut et al. (1998) acknowledged that “people often use the Internet to keep up with those whom they have pre-existing relationships” (p. 1019), but they skipped this point without explanation and went on to propose “but they also develop new relationships online. Most of these new relationships are weak” (p. 1019).
Kraut et al.’s explanation on why the social use can have negative effect on people’s psychological well-being is that people replace the face to face strong ties (such as family) with weak ties online (1998). This “surrogate” effect is open to question, too. First, as discussed above, most of our social use of the Internet is with preexisting relationships. In other words, the people with whom Internet users interact online and offline overlap greatly. Second, Kraut and colleagues seem to underestimate people’s capability of self-control in coordinating online and offline activities and relationships.

The question is how many and which kind of Internet users, under what sort of circumstances, will use new online relationships as a substitute to preexisting social ties, especially strong ties. So far, there aren’t many studies in computer-mediated communication exploring this question, but the previous research in other similar electronic media may shed light on it. When studying the relationship between social interaction and parasocial interaction (audiences’ illusory interaction with television characters), Tsao (1996) proposed two paradigms of media use: the deficiency paradigm and the global-use paradigm. The deficiency paradigm assumes that parasocial interaction acts as a surrogate for face-to-face interpersonal relationships, while the global-use paradigm assumes that parasocial interaction is a more universal experience in which all individuals may readily engage, regardless of whether they’re satisfied with their actual social relationships. For a small proportion of psychologically unhealthy people, their involvement with television characters is more like a pathological act, as it is exclusive to social interaction. In contrast, for the majority of ordinary people, mediated and face-to-face channels are not mutually exclusive, but are complementary to each other in
satisfying their interaction needs (Rafaeli, 1990; Rubin & Rubin, 1985). Based on the same logic, social use of the Internet and face-to-face interaction may also be complementary but not exclusive for most people. However, empirical studies on this topic are yet to be developed.

Kraut et al.’s dichotomy of “strong” and “weak” ties proposed that online communication was inferior to face-to-face interaction in terms of the efficiency to convey messages, especially affective and emotional messages. This dichotomy reflects “cues filtered out” model (Sproull & Kiesler, 1985), which is based on the assumption that the efficiency of communication is decided by the number of communication cue systems a media technology can convey. Researchers pointed out that the Internet lacks nonverbal and social context cues, which is critical to communicators’ perceived presence, warmth and friendliness to each other, and therefore concluded that the social use of the Internet is primarily impersonal and more suitable for delivering task-oriented information (Walter, Anderson, & Park, 1994; Walther, 1996). Most early research on computer-mediated communication took this engineering approach (Bikson, Gutek, & Mankin, 1981).

Extensive critique has been made of the “cues filtered out” model. For example, Walther (1992) proposed that time was critical for the quality of online communication. In early studies, especially the lab experimental studies, time was restricted for online interaction. So it was the time limitation, but not the capacity of the Internet, that explained the findings in “cues filtered out” approach. In other words, given enough time, the communicators online could reach the quality of the interaction in face-to-face setting.
In Reid and colleagues’ (1996) experiment on small group tasks, teams using networked computers spent more time completing their tasks, but produced reports of quality equal to teams interacting face to face. In another group decision-making experiment, computer-mediated communication groups reported greater communicating ideas than face-to-face communication groups and took longer to reach a decision. In addition, time limit was found to influence task environment characteristics. When online group members were exposed to relatively complicated tasks, time scarcity made people less effectively process the information relevant to the task. Online communication groups used almost half an hour more than face-to-face communication groups to reach a decision, while the latter condition produced over five times as many utterance units as the former condition. Therefore, communication rate may be a valid comparable factor of the social interaction in the two conditions (Reid, Morley, & Evans, 1997; Rice & Love, 1987).

The role of time was also reported in online impression formation studies. It may take longer to interpret impressions from verbal/text cues alone through the Internet, than communication system involving multiple channels. Therefore, the longer time, along with lack of non-verbal cues, may slow down impression formation. Through a longitudinal experiment in which research participants used an asynchronous computer conferencing system to work on group tasks, Walther (1993) found that impression development was possible in computer-mediated communication. There were changes in impression development when communicators interacted over longer periods of time.
Although an impression was more developed in initial stages of communication in face-to-face condition than in computer-mediated condition, at experiment’s end, the groups in the latter condition were approaching the level of impression development of the groups in the former condition. In another study by Walther and Burgoon (1992), the researchers attributed the initial difference between these two conditions to the difference between the two communication channels in terms of immediacy, composure, receptivity and social orientation. Through meta-analysis of the influence of time on online social interaction, Walther, Anderson and Park (1994) reported that there was greater socially-oriented information in the “no time restricted” than in the “time restricted” computer-mediated communication condition.

Longitudinal studies can follow the interactions of subjects in both face-to-face and computer-mediated groups. The effect of time then outweighs that of media in predicting people’s assessment of relational communication. Thus, time is “an indispensable factor in describing CMC group behavior where it [time] was allowed” (Walther & Burgoon, 1992, p.77).

Walther and Parks (2002) reported numerous studies suggesting “time limits may affect CMC interactions and FtF groups in qualitatively different ways” (p.532), in that when people communicate online, they are more sensitive to time pressure. The researchers’ explanations are pretty simple as to why online communication takes longer than face-to-face communication. Both task information and relational information is conducted through a relatively limited bandwidth, and typing and reading are slower than speaking and listening. Walther (1992) proposed that time could be a better explanation
for less personalized communication through the Internet, rather than the “invariant social presence or social context cues effect” (p.62), the assumption of the engineering method.

Through the review of studies taking the “cues-filtered-out” approach, Walther (1992) pointed out that although this approach emphasizes the lack of non-verbal cues in computer-mediated communication in comparison to face-to-face communication, the nonverbal visual behavior is not examined in face-to-face conditions, either. Even for verbal data only, these audio-recorded data are not examined for their role in interpreting face-to-face comments. Therefore, the conclusion that the computer-mediated communication is inferior to face-to-face communication may be just due to the incomplete measure of both verbal and nonverbal cues in a number of studies.

Some other researchers reject the main viewpoint of “cues-filtered-out” model that computer-mediated communication lacks contextual cues and thus constrains the efficiency of information change. Instead, communicators are willing to and able to reduce uncertainty and reach intimacy in online communication. This model is labeled as “cues-filtered-in” model (Bargh & Mckenna, 2004). Social Information Processing (SIP) theory is one of the representative theories in this model (Walther, 1992; Walther & Burgoon, 1992). This theory is based on the assumption that Internet users are not passively accepting the fact of inadequate non-verbal and social context cues, rather they are actively trying to make online communication as smoothly as face to face contact. When the accessibility of nonverbal cues is limited, Internet users will figure out how to transfer those “cues” into what is available through online communication, such as in the wide usage of facial expression icons in online chat rooms.
Furthermore, there are cases that Internet users perceive online relationships more intimate than those formed in face-to-face communication settings. Previous models cannot explain this phenomenon. Therefore, Walther (1996) theorized these cases as “hyperpersonal communication”. Due to relatively anonymous nature of computer-mediated communication, senders have greater control over self-presentation and message construction than in face-to-face context. Receivers make use of the minimal contextual cues in computer-mediated communication and may create inflated “overattribution” of partners. They may not perceive individual differences of their partners as salient, but form stereotypically positive and idealized images of their partners, because they overestimate the group identity of the partners or they eagerly look forward to new social relations and expect future interaction. Channels, especially asynchronous channels (e.g., email), provide more sources and chances for users to perform the above-mentioned self-presentation. Receivers who receive hyperpositive message may in turn provide more positive feedback to senders (Bargh & McKenna, 2004).

The tradition of studying computer-mediated communication effect, although challenged by some researchers regarding it as unjustified (Culnan & Markus, 1987), is to compare computer-mediated communication groups to face-to-face communication groups. Face-to-face communication is treated as “the standard against which all other communications are compared”, and it contains “the prototypical dimensions and expectations to which communicators are accustomed” (Walther, 1992, p.69).

At the very early age of computer-mediated communication research, researchers suggested that a “cues-filtered-out” approach, based on the technical capability of media
was a “common” and “convenient” way to analyze technologies. With the development of Internet technology, the limitations and weakness of this engineering model gradually became apparent. This approach just reflects the technical structure and characteristics of media, but not the functions and/or purposes of usage of these media. Researchers now throw doubt on its basic assumption that “the channel effects of Internet communication are the same for all users and across all contexts —— in other words, it predicts a main effect of communication channel” (Bargh & Mckenna, 2004, p.578). In real life, however, technological functions do not exist in isolation”. Rather, “each technical component may be part of a larger context or may trigger certain social psychological processes” (Kiesler, Siegel, & McGuire, 1984, p.1123).

The debate on “cues-filtered-out” approach and propositions of other theories provide solid theoretical foundations for the subsequent development of computer-mediated communication research. These researchers discovered the key characteristics of the new form of communication then and predicted its impact on individuals and society. However, many of these studies were made in early 1990’s and even two decades ago. Internet today is much more advanced than what it used to be, as it is the most fast-growing new media technology so far. Therefore, today’s researchers should be careful when trying to cite these studies, especially to use the findings of these studies to support their own points or as assumptions on which hypotheses and research questions are built. For example, more than 20 years ago, Kiesler, Siegel and McGuire (1984) proposed that Internet culture was yet to be developed. Because only computer professionals had access to some computer networks, for general public, communicating
through computers was probably just an idea, let alone a certain subculture involving rules or etiquette. Nowadays, in contrast, the Internet is a virtual and real world. Numerous “online communities” are established based on people’s careers, interests, and hobbies. The public computer-mediated communication gives birth to Internet culture, and Internet culture, in turn, shapes people’s communication online. The most obvious example is Internet language. People create and use new words, new grammars and new symbols. This subculture is so powerful that it has influenced the language systems used in daily face-to-face contexts developed thousands of years ago.

In studies reporting Internet use associated with negative psychological well-being, the extent of Internet usage was generally found to be unrelated to negative psychological well-being. For example, Gross and colleagues (2002, 2004) found that the time spent online was not related to depression, loneliness, anxiety or perceived friendship. However, the perceived closeness of online communication partners, especially instant messenger communication partners, was found to be associated with daily social anxiety and loneliness at school.

In contrast to those researchers examining the Internet use from a quantitative perspective (e.g., time, frequency, etc.), Kubey, Lavin and Barrows (2001) and Ofosu (2001) took a more qualitative approach by pointing out that the extent of dependency on the Internet was related to the psychological well-being. Through similar methods by identifying and comparing Internet dependent users and non-Internet dependent users, researchers found Internet dependents demonstrated more shyness, more social loneliness, and more dissociation than did non-Internet dependents.
Weiser (2001) examined the social and psychological effects of Internet use on users’ motives for using the communication technology. Results showed that people used the Internet mainly for Socio-Affective Regulation (SAR) purpose and Goods-and-Information Acquisition (GIA) purpose. The former purpose was a social or affiliating orientation toward Internet use, while the latter one reflected a utilitarian or practical orientation. Furthermore, Internet use driven by SAR negatively influenced psychological well-being (e.g., loneliness, depression, and perceived satisfaction with life) through reducing social involvement. However, Internet use motivated principally by GIA show positive effect on psychological well-being through increasing social integration.

Since most of the studies reporting relationship between Internet use and negative psychological well-being adopted correlational method, the results can either suggest that Internet use leads to negative psychological well-being, or those who suffer from negative psychological well-being are more likely to turn to the Internet (Weiser, 2001).

Furthermore, as mentioned above, the Internet is different from the traditional media due to its multi-function feature. It is hard to label the Internet with the traditional “mass” or “interpersonal” category. We read news stories, watch online videos, and chat with friends, and the Internet functions as newspaper, television and telephone respectively. Kraut et al. (1998) divided the Internet use into communication, information seeking, entertainment, and commerce. However, although they realized different sorts of the Internet use, they did not include this point in their data analysis, and thus did not find which kind of Internet use contributed most to users’ loneliness. In addition, the time Internet users spent on communication, information, entertainment, and shopping are not
equal. Nie, Simpser, Stepanikova, and Lu (2004) reported that 57% of the time on Internet is for communication, such as email, instant message, or chat room, indicating that the Internet is basically a means of communication. The remaining 43% of the time online that is not on communication is spent on playing games (20.3%), web surfing (15%), and shopping (10%). The different types of Internet use may influence users differently, so it is problematic to treat the Internet as “a single identity that influences its users through sheer exposure” (Baym, Zhang, & Lin, 2004). This may explain why studies exploring Internet use and loneliness have yielded such different results.

Matanda, Jenvey and Phillips (2004) conducted a survey on the Internet use, anxiety and loneliness. Researchers found that it was easier to use specific types of Internet use, but not overall Internet use, to predict its relationship to psychological well-being. The lonely used the Internet more for entertainment-oriented Internet use, while those with lower anxiety used the Internet for information search. Whitty and Mclaughlin (2005) found similar results.

A more comprehensive review of the literature reveals that only a small section of research report that Internet use leads to negative psychological well-being. In contrast, more studies showed no such causality (Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2003; Franzen, 2000; Goulet, 2002; Gross, 2004; Leung, 2002), or even found the Internet use could alleviate negative psychological well-being (Shaw & Gant, 2002; White, et al., 1999; White, et al., 2002), and Internet use was related to better psychological well-being (Cheng, Wigand, & Nilan, 2000; Clark, 2002; Epstein, Rosenberg, Grant, & Hemenway, 2002, Fogel, 2002; Kim, 2003; Sa'adiah, 2002; Wright, 2000).
The mixed findings may be partly explained by the variety of research methods adopted in these studies. In Kraut et al.’s (1998) study, samples are 256 members from 93 families, so these members ranged greatly from age, occupation and other demographics. Matanda, Jenvey and Phillips (2004) enrolled adults as subjects. Franzen (2000), Goulet (2002), Kubey, Lavin and Barrows (2001), Leung (2002), Ofosu (2001), Shaw and Gant (2002), Weiser (2001), and Whitty and Mclaughlin (2005) used college students. In Clark’s (2002), White et al.’s (1999, 2002) and Wright’s studies (2000), research participants were elderly people, while Epstein and colleagues (2002), Fogel and colleagues (2002, 2003), Kordy and colleagues (2006), and Sa’adiah (2002) used the patients who had same diseases. Gross, Juvonen and Gable (2002) and Gross (2004) drew their conclusion based on the findings from adolescents. In addition, studies included field experiments (Kordy, et al., 2006; Kraut et al., 1998; White et al., 1999, 2002), surveys (Clark, 2002; Epstein, Rosenberg, Grant, & Hemenway, 2002; Goulet, 2002; Kim, 2003; Kubey, Lavin, & Barrows, 2001; Leung, 2002; Matanda, Jenvey, & Phillips, 2004, Ofosu, 2001; Whitty & Mclaughlin, 2005), diary (Gross, 2004; Gross, Juvonen, & Gable, 2002), experiments (Shaw & Gant, 2002), and interviews (Sa’adiah, 2002). The conclusions of the studies are based on the differences in psychological well-being either between people with different levels of Internet use (e.g., users vs. non users, heavy users vs. light users) or at different stages of Internet use (e.g., before vs. after Internet adoption). Internet use was operationalized as hours spent online (Kraut et al., 1998; Goulet, 2002), use of online chatroom (Shaw & Gant, 2002; Kordy et al., 2006), ICQ (Leung, 2002), and general Internet access (White et al., 1999, 2002).
In addition, these findings may further suggest that it is problematic to assume that the usage of the Internet will have negative effect on the psychological well-being of the general public. As indicated by above-mentioned Tsao’s (1998) two paradigms of parasocial interaction in television research, for the great majority of the Internet users, Internet use is complementary to normal social life, while a marginal segment of the public represents the extreme development of over-reliance on the Internet. Based on a survey of college undergraduate students, Dittman (2002) reported that Internet use did not influence loneliness levels overall. However, loneliness was found to be more prevalent among the few who spent more than 40 hours per week on the Internet and preferred the Internet over face-to-face interaction or talking on the phone. Internet use did not contribute to loneliness among those using the Internet less than 40 hours per week. In other words, for most, use of the Internet was both highly enjoyable and useful. The key point is the need to identify who constitute the “marginal segment” and empirically examine whether their Internet use will have negative influence on them. A group of researchers focusing on “Internet addiction” and “pathological Internet use” may shed light on these questions.

Rheingold (2000) reported that “Internet addiction” had been a serious concern for psychologists, sociologists and even psychiatrists on the harmful impact of the Internet. Researchers used “Internet Addition Disorder” in 1995 to label the mental disorder due to obsessive use of the Internet. Some experts regarded it as a “notion of a widespread outbreak of a new mental disorder” (p.357), and made efforts in adding it in to the Diagnostic and Statistical Manual of Mental Disorders. The author summarized a variety
of research projects and their findings, and then concluded that there are some people who spend inordinate amounts of time on the Internet so that it becomes detrimental to their mind and social life.

Caplan (2002, 2003, 2005) and other researchers pointed out that not only excessive time spent online, but also perceived online benefits, perceived social control on the Internet, withdrawal from social life, and some other factors constitute criteria to “diagnose” the Internet addiction. Based on these criteria, a series of scales, including Pathological Internet Use Scale (PIUS) and Generalized Problematic Internet Use Scale (GPIUS), were developed to identify those who use the Internet compulsively and lacked self control. They found that those who were identified as “addictive users”, in contrast to those who were not, showed higher level of loneliness, anxiety, depression, stress and lower social support and perceived self-esteem. The difference of psychological well-being was consistently found between addictive Internet users and non-addictive Internet users (Davis, 2001; Mcglinchey, 2003; Morahan-Martin & Schumacher, 2000; Nalwa & Anand, 2003; Nichols, 2004; Niemz, Griffiths, & Banyard, 2005; Pawlak, 2005; Young & Rogers, 1998).

When explaining the mechanism of Internet addiction and negative psychological well-being, Caplan (2002) pointed out that those who already suffer from psychological problems show more preference for Internet use as an alternative to face-to-face communication, as the challenges and difficulties they encounter in a face-to-face context, such as perceived lack of social competence, are greatly reduced in online context. They regard cyberspace as a less threatening and more efficacious place for information change
and self-disclosure. Therefore, they are more vulnerable to excessive and compulsive Internet use, more likely to develop Internet addiction and worsen their problems. This model well resolves the “cause and effect” issue between Internet use and psychological well-being by suggesting that they can be both cause and effect.

The concept of “psychological well-being” varies study by study, which mainly include loneliness, depression, anxiety, shyness, self-consciousness, self-esteem, and perceived social support. Most of the research treats it as an ambiguous congregation composed of the above-mentioned psychosocial constructs. Very few studies have reviewed the literature of these constructs carefully in terms of their nature, mechanism, causes, consequences, and furthermore, how they are related to communication. Lack of necessary exploration of these concepts restricts the further development of computer-mediated communication research. This may be due to the borders of different research disciplines. However, “studies of behavioral and social processes in computer-mediated communication (indeed of all computing) will be carried out best as an interdisciplinary effort” (Kiesler, Siegel, & McGuire, 1984, p.1132).

Rather than investigating the general psychological well-being consisting of a number of psychosocial constructs, the present study focuses on loneliness, a widely studied concept in social psychology area. Social psychologists and psychiatrists called for media scholars’ contribution decades ago to further the understanding of loneliness. Peplau and Goldston (1984) proposed eight recommendations for loneliness research in a National Institute of Mental Health workshop. One of them was “studies of loneliness and the popular media” (p.107).
Loneliness is always a concern for psychologists and sociologists. There has been a widespread assumption stating that the more social interaction a person participates in, the less lonely he will be. In other words, a person’s loneliness is decided by how much a person socializes with others. Lemon, Bengtson and Peterson (1972) stated that all the social interaction variables were negatively related to loneliness. However, researchers later found that it was not necessarily the case, and there were studies even reporting some cases of positive relationship between the frequencies of a person’s social activities and his feeling of loneliness (Jones, 1981).

Peplau and Perlman (1979) defined loneliness as a subjective experience in which the individual’s relationships were fewer or less satisfying than desired. Young (1982) stated that loneliness was the absence or perceived absence of satisfying social relationships. Williams (1983) said loneliness was not the same as aloneness or isolation but represented feelings of dissatisfaction with current interpersonal relationships. Wheeler, Reis and Nezlek (1983) pointed out loneliness was strongly predicted by how meaningful one’s interactions were, rather than just the amount of those interactions. Researchers began to realize that loneliness was decided by two factors: the social interaction a person both desires and acquires. When a person’s social interaction is inadequate, or more specifically, assumed by himself to be inadequate, so much so that it cannot meet his psychological need, feelings of loneliness will occur.

Research in loneliness demonstrates numerous typologies, depending on the perspectives of each study. “Underlying these diverse typologies are three major
dimensions concerning how the person evaluates his or her social situation, the type of social deficit experienced, and the time perspective associated with loneliness” (de Jong-Gierveld & Raadschelders, 1982, p. 105).

The first dimension is reflected in discussion of positive and negative functions of loneliness. Despite the present and popular recognition that loneliness is an unpleasant and depressive experience, early German philosophers emphasized the positive side of the “Einsamkeit” (loneliness) experience. It can help human beings have self-reflection and realize the strength of spirit (de Jong-Gierveld & Raadschelders, 1982). Moustakas (1961) pointed out that loneliness was part of human nature and universal among individuals, “involving periods of self-confrontation and providing an avenue for self-growth” (Peplau & Goldston, 1984, p. 16).

The second dimension can be seen from Weiss’s (1973) distinction between social and emotional loneliness based on social provision theory. According to this theory, different social relations have different meanings to an individual. Certain social relationships meet particular needs and they are not replaceable in terms of specific function (Saklofske & Yackulic, 1989).

Weiss (1974) proposed six basic “provisions” offered by social relationships, including social integration, attachment, reliable alliance, reassurance of worth, guidance, and opportunity for nurturance. As mentioned above, although it is possible that one social relation offers more than one provision, an individual’s social “relationships tend to become specialized in their provision” (Cutrona, 1982, p.299). In addition, the importance of these provisions at a person’s different life stage is different. For example, the most
critical social provision for new college students is social integration. In contrast to their younger peers, higher class students more frequently suffer from inadequate attachment to a romantic partner (Peplau & Goldston, 1984). Similarly, Bowlby (1969) proposed that an attachment figure becomes unique to an individual to foster feeling of security and deal with emotional loneliness, and this function could not be easily taken over by other social contacts. Weiss further elaborated this theory by proposing two types of loneliness: emotional and social loneliness. Emotional loneliness results from the deficit of a psychological attachment to intimate others, such parents, spouses, and children. An example of emotional loneliness would be a teenager just leaving his parents and going to college, a woman who recently lost her husband, or an elderly person whose children live far away. Its’ typical symptoms are anxiety and apprehension as the attachment with intimate others mainly provides a sense of security. In contrast, social loneliness is caused by deficit of the perceived belongingness to a general social network/community. A kid feeling excluded by other children in the neighborhood, a housewife just moving into a new place with her husband, or an elderly person who cannot participate in community activities due to physical disabilities would likely experience this type of loneliness. It usually takes the forms of boredom and feelings of exclusion as peer engagement generally offers a sense of social integration. Subsequent empirical studies exploring the distinction between social and emotional loneliness supported Weiss’s proposition (Clinton & Anderson, 1999; Cutrona, 1982; Davis, Morris, & Kraus, 1998; Di’Tommaso & Spinner, 1993; Green, Richardson, Lago, & Schatten-Jones, 2001; Hsu, Hailey, & Range, 1987; Rubinstein & Shaver, 1982; Saklofske & Yackulic, 1989; Stroebe, Stroebe,
Abakoumkin, & Schut, 1996; Van Baarsen et al., 2001). Due to his theoretical contribution, Weiss is regarded as the pioneer of modern loneliness research and is cited in most of the loneliness studies (Clinton & Anderson, 1999; Perlman, 1989).

The studies on the chronicity of loneliness reflect a third dimension, namely, time. It is a focus of the present study’s discussion of loneliness. Peplau and Goldston (1984) pointed out that “the duration of loneliness over time is an important dimension” (p. 17), while “it has generally been overlooked” (Young, 1982, p.381).

The duration of loneliness caught researchers’ attention at the very beginning of loneliness research. Zilboorg (1938) proposed the dual characteristics of loneliness as sometimes being normal and transient state of mind due to specific situation while sometimes being a long term and stable experience. This study is regarded as “what is probably the first psychological analysis of loneliness” (Perman & Peplau, 1982, p.124).

Beck and Young (1979) systematically distinguished chronic loneliness, situational loneliness, and transient loneliness in their study on newly enrolled college students. Chronic loneliness happens when a person fails to establish satisfactory personal relationships with others for two or more consecutive years. It “involves long-term cognitive and behavioral deficits in relating to other people” (Young, 1982, p.383). Situational loneliness is due to certain life events, such as leaving home for college. In contrast to the two above-mentioned types of loneliness, “transient loneliness is probably the most common of the three diagnostic categories and refers to the everyday, garden variety of loneliness, the periodic passing mood that usually disappears as soon as someone comes to talk with us” (Beck & Young, 1979, p.89).
The influence of the chronicity dimension of loneliness has resulted in two lines of research on factors related to loneliness. One line of research considers internal factors, that is, personality characteristics. Researchers following this line treat loneliness as a personal trait. The other line of research focuses the external factors, that is, situational events. Scholars following this line are more likely to treat loneliness as a state (Peplau, Miceli, & Morasch, 1982; Weiss, 1982). In answering the question why people are differently susceptible to loneliness feelings, Suedfeld (1982) and Russell (1982) called for more attention to the state-trait distinction. Similarly, Peplau and Perlman (1982) identified two classes of causes of loneliness. These two distinct classes respectively refer to “factors that predispose individuals to become lonely or to persist in remaining lonely over time” and external “events or changes that precipitate the onset of loneliness” (p.8). “Available evidence suggests that people conceptualize the causes of loneliness on the basis of whether they reflect something about the self versus the setting, and whether they are relatively permanent or changeable” (Peplau, Miceli, & Morasch, 1982, p.141).

Numerous studies reveal the personal characteristics that are associated with loneliness. Loneliness is increased by personality characteristics that may be detrimental to the initiation, development and maintenance of good quality interpersonal relationships, or makes an individual adopt inappropriate strategies to overcome social relation deficit (Peplau & Perlman, 1979). These characteristics include introversion, shyness, low self-esteem (Cutrona, 1982; Horowitz & French, 1979; Jones, Freeman, & Goswick, 1981), fear of intimacy (Weiss, 1982), lack of social skills (Jones, Hobbs, & Hockenbury, 1982; Page, Frey, Talbert, & Falk, 1992; Spitzberg & Canary, 1985; Zakahi & Puran,
negative evaluation of interpersonal relationships (Jones, Sansone, & Helm, 1983), depression, anxiety (Hanson, Jones, Carpenter, & Remondet, 1986), impatience (Rubenstein & Shaver, 1982), feelings of emptiness, awkwardness and boredom (Russell, Peplau, & Ferguson, 1978), aggressiveness (Zilboorg, 1938), rejection by other peers (Cassidy & Asher, 1992), apathy and aimlessness (Brennan, 1982), and low affiliative tendency (Cutrona, 1982).

Researcher examining the situational factors associated with loneliness focus on changes in the person’s “actual social relations” (Peplau & Perlman, 1982, p.8), especially important life events. The studied life events in loneliness literature include divorce, loss of a spouse, hospitalized individuals, recent move into a neighborhood (Weiss, 1973, 1982), newly enrolled college students (Beck & Young, 1978; Cutrona, 1982; Shaver, Furman, & Buhrmester, 1985). Besides these life events, some sociologists proposed that an individual’s economic and political realities, working environment, and culture were also external factors that might contribute to loneliness. Fischer (1983) reported that economic conditions determined nature of social relationships and offered opportunity of providing aids to others, and education helped people develop skills to build social networks. It is reported that physical proximity facilitates liking, and a physically isolated working place may make a person feel lonely (Peplau & Perlman, 1982). Cross cultural comparison studies on Canadian, German, and American societies (Hofstätter, 1957; Underhill, 1961) and anthropology research on African societies (Fortune, 1963) and French Polynesia societies (Levy, 1973) revealed that culture played an important role in shaping people’s perception of loneliness experience and their coping strategies. The
perception and strategies can be dramatically dissimilar especially when two cultures are fairly different in the dimension of individualism and collectivism (Slater, 1976). These studies reflect great potential for research to examine computer-mediated communication and other factors in human society.

In a survey study exploring causes of loneliness for college freshmen, Berke and Peplau (1976) found 13 common reasons for loneliness in free response data, including both personal and situational factors. However, students’ cognition on these reasons was different over time. Cutrona (1982) identified two distinct groups of students at the end of the first academic year in his study on new college students. One group overcame their loneliness during that year by establishing new social networks and attributed their loneliness early in that year to situational factors. The other group, in contrast, remained lonely all through the year, and blamed their loneliness on their own personal traits. These personal traits might even cultivate an attitude at the beginning of their college life that prevented them from actively developing new social relationships. “They may have assumed too quickly that they were incapable of making and maintaining friendships” (p.297). Peplau, Miceli and Morasch (1982) and Shaver, Furman and Buhrmester (1985) reported similar research findings. According to Peplau and Perlman’s (1979) attribution theory of loneliness, since these two groups of people ascribed their common feeling to different factors, situationally lonely people were more optimistic about the change in their loneliness feelings, while chronically lonely people were more pessimistic and apathetic. Chronically lonely people and situationally lonely people are different not only in duration and recognition of their loneliness, but also in affective, cognitive, and
behavioral features. For example, Gerson and Perlman (1979) used the trait (loneliness feeling through lifetime) and state (loneliness feeling in the past two weeks) versions of the UCLA loneliness scale to identify the trait-lonely, the state-lonely and the non-lonely people. State-lonely individuals were found to be more motivationally aroused and more successful in initiating communication. Hojat (1982) compared chronic loners and transitory loners based on Eysenck’s “big five” personal traits. Chronic loners reported higher levels of global loneliness, anxiety, depression, neuroticism, and external locus of control but lower levels of self-esteem and extroversion than transitory loners. However, one limitation of the Hojat’s study was that all the research participants were female, while quite a few studies reported gender difference in terms of perception of loneliness (Brennan, 1982; Fischer & Phillips, 1982; Rubin, 1980). Rubenstein and Shaver ((1982) discovered that chronically lonely people tended to rely on passive strategies to cope with loneliness (e.g., sleeping, watching television), while situationally lonely persons were characterized of active strategies (e.g., contacting friends, establishing new relationships). Psychiatrists also emphasized the distinction of trait and state loneliness while devising interventions to help their lonely patients. “Chronically lonely individuals, for example, may benefit most from desensitization of social anxiety or from social skills training. Situationally lonely individuals, in contrast, may benefit most from reassurance and assistance in identifying social contexts in which new relationships can be explored” (Rook & Peplau, 1982, p.382).

Although trait loneliness and state loneliness are found to be distinct from each other in many aspects, some other researchers pointed out that people should not ignore their
internal connections. Weiss (1982) proposed that scholars should study the interplay between personal characteristics and situation as “joint determinants of loneliness” (p. 75). Some people are always lonely no matter what situations they are in, while some others experience loneliness quickly and intensely only when they are among strangers. The author further pointed out that an aim of loneliness research should be “which people will experience loneliness under what kinds of conditions” (p.75). This viewpoint represents interactionist approach to study loneliness treating loneliness as the product of the interactive effect of personality and situational factors (Perlman and Peplau, 1982). Similarly, while discussing the distinction between trait and state loneliness, Russell (1982) emphasized that “undoubtedly” loneliness could have both characteristics. In addition, although Beck and Young (1982) first formally highlighted the chronicity dimension of loneliness, the researchers suggested the possible influence of situational factors on the formation of the loneliness trait. A new student may suffer from situational loneliness due to transition to college. However, if the student fails to adjust to the new environment for years and his loneliness experience persists for a substantial duration of time, he may become a chronically lonely person, with his personality changed somewhat by this experience. In other words, different types of loneliness may overlap each other due to the effects associated with chronicity. There is a continuum underlying chronic loneliness, situational loneliness and transient loneliness reflecting human beings’ “feeling more or less lonely for a greater or smaller proportion of time, with a higher or lower relationship to the actual observable environment, rather than clear-cut distinct categories” (Suedfeld, 1982, p.56).
The discussion above indicates that researchers have been making great efforts in exploring the distinction and connection between trait and state loneliness. However, attention is not equally paid to these two constructs. There is a tendency to overestimate the importance of personal factors in causing loneliness (Peplau & Perlman, 1982; Peplau, Russell, & Heim, 1979). Similarly, after a review of the studies on the causes of loneliness, Weiss (1982) concluded that although most of the researchers held a multifactor theory, “people seem to underestimate the relative importance of situational causes and to overestimate the relative importance of their characters or actions” (p.78). The researcher pointed out that state loneliness should receive more interest, as abundant evidence had been found supporting external factors influencing loneliness, while “the existence of characterological determinants is as yet more nearly a plausible conjecture than a demonstrated fact” (Weiss, 1973, p.74). Furthermore, it is much easier to modify external factors, especially for experimental studies, than to “enter into the complexities of character change”.

Literature on trait and state loneliness produces fruitful results over decades, but these results also suggest that there is much left in this area to be explored. For instance, Peplau, Miceli and Morasch (1982) questioned the use of self-report data to identify chronic and temporary lonely individuals and seek causes of loneliness. The researchers argued that people could be preoccupied by the unpleasant feelings resulting from loneliness (e.g., depression, stress), and “genuinely puzzled or confused about the reasons” leading to loneliness, thus their “attributions for loneliness are not necessarily precise” (p.141). As mentioned above, Gerson and Perlman (1979) devised trait and state
loneliness scales by adding “in the whole life” and “in the past two weeks” respectively into revised UCLA loneliness. The members having scores in the top third of the distribution of state loneliness scale while in the lower third of trait loneliness scale were labeled as “situationally lonely” group, and those with scores in the top third of both scales were regarded as “chronically lonely” group. This method for identifying the two lonely groups, especially the chronically lonely group, reflects researchers’ common recognition that chronically lonely people are more vulnerable to the influence of external environment due to certain personality characteristics. However, chronically lonely people are also characterized by apathy, disinterest and indifference to social relationships, maybe because of exposure to lonely situations for too long.

Contrary to the notion that chronically lonely individuals are more sensitive, this population may be more insensitive to situations that will make other people feel lonely. Weiss (1982) indicated this possibility over two decades ago. “We tend to think of loneliness as an acute episode of restlessness and tension associated with yearnings for companionship or intimacy. But it may be that loneliness undergoes modification if it becomes chronic: it may be that it gradually transmutes itself into hopeless apathy, or it may be that individuals who are chronically lonely learn to avoid attending to their discomfort” (p.76). Therefore, one who regards himself as a chronically lonely person may not necessarily report high state loneliness. If this is true, it will challenge Gerson and Perlman’s (1979) method of identifying different types of lonely people.
2.5 *Traditional media and loneliness*

Mass communication and media researchers responded social psychologists’ call with series of studies on relationships between loneliness and media. These studies all assumed that an alternative way of satisfying the need for social contact is to use mediated fare for interaction. Lonely people will prefer whatever channel, face to face or mediated interaction (Canary & Spitzberg, 1993), which can better meet their social need (Bargh & Mckenna, 2004). This assumption is based on media researchers’ review of the self-report data in loneliness literature on strategies to cope with loneliness. Watching television, listening to radio, reading magazines, and going to a movie are commonly what people report to do when they feel lonely (Rokach, 1990; Rook & Peplau, 1982; Schultz & Moore, 1984).

Katz, Gurevitch, and Hass (1973) studied the relationship between Israeli people’s needs and usage of different media, based on uses and gratifications theory. Among the five clusters consisting of 35 types of needs, retaining contact and overcoming loneliness is ranked at the top of the needs hierarchy. Through the analysis of people’s report on the perceived usefulness of five different media, the researchers found that newspaper best satisfied people’s need to overcome loneliness and books best helped people escape from reality, while television was the most helpful medium to use to kill time. The researchers also revealed that education played an important role in people’s evaluation of different media’s helpfulness. People with higher education level reported that print media were more important in their life while the less educated thought electronic media were more useful in satisfying their social needs.
As Katz and colleagues mentioned (1973), uses and gratification theory is basically a functional approach to analyzing mass communication. Austin (1985) also followed this approach and proposed that companionship is one of the most important functions that mass media serve for human beings. The researcher tried to find out how the mass media consumption of college students was related to loneliness. Results showed that frequency of movie, magazine, book or television use was not related to loneliness, while reading newspaper and listening to radio were negatively related to loneliness.

Elderly people are characterized by desolation, isolation and loneliness, and it was reported that this population spends a considerable amount of time with mass media (Perloff & Krevans, 1987). Monk (1988) reported and critically analyzed the experimental application of such media technology as two-way cable television and closed-circuit television in the field of aging. Although these technologies were too costly for the elderly population then, it was predicted that they would be most frequently used in helping the elderly living alone returning to community. With the increasing concern about the elderly population and increasing prevalence of mass media, a body of literature has accumulated that deals with older people’s media use habits. Among these media, television receive most research interest as numerous studies have reported that the elderly people typically spend more time in watching television than they do with other media (Harris & Associates, 1975; Rubin, 1982).

Perloff and Krevans (1987) proposed that the elderly individuals’ television viewing habits were determined by both social structural factors, such as living environment, and personal and psychological factors, such as loneliness. The researchers examined the
relationships among psychosocial factors, television use and social contact. Results suggested that emotional loneliness (lack of intimacy) is the best predictor for elderly people’s television preferences, uses and gratifications. Emotionally lonely people watched more television, and more likely for companionship purpose. However, contrary to many researchers’ expectations, emotionally lonely people did not show preference to parasocial interaction programs such as soap operas.

Chory-Asaad and Yanen (2005) pointed out that it was problematic to just focus on the sheer exposure to television (e.g., frequency, time), rather, researchers should pay attention to the relationships between audiences and television characters. Such relationships revealed by previous literature included parasocial interaction, wishful identification, identification, and interest in favorite characters. In their surveys to older adults, loneliness was a significant predictor of wishful identification, suggesting that lonely people showed a stronger desire to be like their favorite television characters than did non-lonely people.

Some other researchers focused on people’s mass media use and its relation to social contact. Davis and Kraus (1989) conducted a survey of college students and adolescents examining the “compensation hypothesis” and the “buffering hypothesis”. These two hypotheses reflected people’s strategies for coping with loneliness and the effectiveness of these strategies. The former hypothesis predicts that people with greater loneliness will be more likely to use mass media to “compensate” for the perceived social deficit, while the latter hypothesis holds that the sense of loneliness can be somewhat “buffered” by heavy use of mass media. Compensation hypothesis was not supported as no relationship
was found between loneliness and people’s use of movie, newspaper, television or music. With regard to buffering hypothesis, although watching a movie was found to be an effective way to alleviate loneliness, it was probably the social nature of movie watching behavior that led to the result. This social nature also distinguished watching movies from other “solitary” activities as watching television alone, listening to music and/or reading.

Perse and Rubin (1990) examined the television use behavior of people with chronic loneliness. In contrast to non-lonely people, chronically lonely individuals watched television news for pass time purpose and reported less perceived reality of television news. They were less likely to watch soap operas for excitement and companionship. Consistent with previous literature, chronic lonely people were found less involved in interpersonal communication activities with family and friends, but spending more time watching television. People experiencing different levels of loneliness not only have different motives for media use, but also feel different gratifications from media. Canary and Spitzburg (1993) reported that media did not meet chronically lonely people’s expectation for companionship, while those who experienced situational loneliness felt more satisfied with media as a functional alternative for social interaction. In comparison with Perse and Rubin’s (1990) finding, Canary and Spitzburg (1993) found that situational lonely individuals had stronger motive to watch soap operas and perceived them more fun and engaging.

2.6 Internet use

From the technology perspective, the Internet has a lot of advantages over face to face communication in dealing with loneliness, because of the characteristics of this new
technology. First, it overcomes the limitation of physical distance. The Internet expands human beings’ social network to the whole world. Then, access time is not an issue online as the Internet never sleeps (Rheingold, 2000). You can easily find people to interact with online 24 hours a day and seven days a week, but it is not that convenient for face-to-face interaction. Next, online communication can be anonymous in a lot of cases, and communicators can interact without getting their true identities revealed. Taking online friendship for example, gender, race, appearance, social status and other factors that may prevent the information exchange and relation development in face-to-face context disappear. Internet users can enjoy unprecedented freedom and equality (Bargh & McKenna, 2004; Walther, 2002). In addition, software supported by the Internet develops greatly due to fast growing information technology industry. “There are a variety of electronic venues available on the Internet where one can communicate with others who share one's core interests and values - chat rooms, message boards, newsgroups, and of course electronic mail - and so satisfy these basic social needs” (McKenna & Bargh, 1999, p.250). Furthermore, information delivered through the Internet has the adaptability of written text. “Messages can be sent to groups of any size and can be programmed for such special functions as automatic copying to a prespecified distribution list” (Kiesler, Siegel, & McGuire, 1984, p.1125).

From the user perspective, most studies reporting therapeutic effects of the Internet use elaborate the above-mentioned “supplementary relationships” via the Internet. Fogel and colleagues (2002, 2003) interviewed 188 breast cancer patients and found that 52 percent of them used the Internet resources and spent about 0.8 hour per week for medical
information related to breast health issues. Their research findings showed that Internet use for breast health issues was associated with greater social support and less loneliness than nonusers. Sa’adiah (2002) analyzed the content of the narrative from a psychiatric patient. The patient stated that virtual friends helped him cope with thoughts and feelings, and enabled him to be part of a community. The Internet was regarded as a means for communication and for meaningful activity. It may work as a therapy for people suffering from loneliness. Kordy, Golkaramnay, Wolf, Haug, and Bauer (2006) developed an online chat group for patients who were under treatment in a German psychotherapeutic hospital. Those who joined the chat group and those who didn’t were compared using data from the 6 months follow-up assessment. Most of the chat group participants regarded it as an expedient to their recovery. The chat participants also showed better health status.

White et al. (1999, 2002) provided the Internet and electronic mail access to older adults in a retirement community and explored the extent to which this influenced psychosocial well-being. Nineteen elderly adults used email and Internet browsing for five months after brief training. Data related to how much computer time was spent, what applications were used, and types of problems they encountered were recorded. Several factors related to psychological well-being, such as loneliness, depression and social support were measured at three different times within five months. In contrast to eight members in a comparison group, loneliness was observed to decrease among participants. In a pilot study trying to obtain descriptive qualitative data of seniors’ Internet use experiences, Clark (2002) used a web page questionnaire and chat room interviews with online participants aged 65 years and older living alone. They found that seven out of the
ten research participants used the Internet to alleviate and reduce loneliness. Through online questionnaires completed by older adults, Wright (2000) found that 86% of them communicated daily over the Internet, and greater involvement with the online community was predictive of lower perceived life stress.

From a theoretical perspective, these findings again challenge the engineering model ("cues filtered out" approach), which proposes that characteristics of media decide their effect on people. Rather, specific goals and needs of the Internet users may also contribute to the psychological outcomes, in addition to media. More and more people are turning to the Internet for social and psychological needs. “The Internet is, perhaps more than anything else, a means of communication – about 57% of the time on Internet is spent on email, instant messaging, or at chat rooms” (Nie, Simpser, Stepanikova, & Lu, 2004, p.3).

In summary, the concern about the negative effect on users’ psychological well-being is not unique to the Internet, but derives from the early media, especially electronic media. Anecdotal reports aroused people’s caution to this new technology. As far as the empirical study results are concerned, “time displacement” effects are yet to be confirmed due to the conflicting survey results. The Internet is different from traditional media as it combines functions of multiple media, so it is problematic to use the general term “Internet use,” as if it were “television exposure”. The distinction between “strong ties” and “weak ties,” as based on communication channels, is questionable, as most of the online communication is conducted with preexisting relationships. For new relationships being developed online, such factors as time and people’s activeness and creativity can be make online communication as “interpersonal” as face-to-face communication. Under
certain contexts, due to both technology and personal characteristics, people can even form more intimate relationships online than offline. Different methods, samples, operationalizations of variables, and components of “psychological well-being” make it too liberal to conclude that “Internet use has a negative effect on people’s psychological well-being”. Pathological Internet use and the deficiency paradigm only apply to those few diagnosed as “Internet addicted”. For the general public today, the Internet merges into people’s daily communication systems and works as a useful channel to maintain connections with an expanded social network. The Internet may provide great opportunities to keep in touch with people’s preexisting relationships and develop “supplementary relationships” to alleviate loneliness and fill the social contact deficit, especially for those experienced Internet users. Therefore, researchers propose that since people communicate through the Internet, especially when the communication is on a shared topic or due to common interest, this interaction behavior is just like social interaction in “real” social settings, such as workplaces, community organizations, and bars. However, considerable discussion centers on the “quality” of computer mediated communication. In other words, will computer mediated communication be rewarding enough to satisfy people’s social needs? What are the consequences of those social relations formed online? Through online communication, do people really feel they add additional relations to their social network, especially when the network is less than satisfying?
2.7 *Research question and hypotheses*

The previous loneliness literature suggests the joint influence of internal and external factors on loneliness. Two research lines have formed, treating loneliness as both a trait and a state. State loneliness is less studied - maybe because it is both common and elusive, while trait loneliness catches more attention not only from the public but also from academic and professional experts, probably due to the curiosity and interest in the internal world of “the lonely people” and people’s altruistic nature of seeking ways to help those people. Therefore, the present study focuses on the Internet use’s influence on loneliness mood, following Weiss’s (1982) proposition that the concept of loneliness “should mean that the person is experiencing a very special emotional state” (p.72). The first research question is:

RQ1: Will social Internet use alleviate people’s loneliness mood?

People should use different strategies to cope with loneliness. “Since most lonely people cope without the benefit of professional guidance, research identifying the most effective self-help strategies would be especially useful” (Peplau & Perlman, 1982, p.13). Based on the interviews to adult Americans, Rubenstein and Shaver (1982) did a factor analysis on the 24 responses to the question “when you feel lonely, what do you usually do about it?” Four factors were identified, including sad passivity (e.g., cry, sleep, and sit and think), active solitude (e.g., study or work, write, and listen to music), spending money (e.g., go shopping), and social contact (e.g., call a friend, and visit someone). Paloutzian and Ellison (1982) used a college sample to investigate behavioral correlates of loneliness and came up with similar results. The only difference was that these two
researchers found that “religiously oriented responses”, such as praying and reading the Bible, was also reported as a way to deal with loneliness. Despite the variety of these solutions to loneliness, their roles are different. In Rubenstein and Shaver’s (1982) study, sad passivity was found to be most highly correlated with loneliness. In other words, people who are severely lonely often try to get rid of loneliness feelings by engaging in such activities as overeating, sleeping, drinking, or crying. Another notice worthy finding is that sad passivity was negatively related with age, indicating these strategies are especially prevalent among young people. Active solitude, “a creative and rewarding use of time spent alone” (p.217), was less correlated with loneliness than sad passivity, but more than shopping. The probability of using shopping to deal with loneliness was partly decided by people’s income level. Social contact was the only type of strategy found to be negatively related with loneliness, suggesting that the less lonely people feel, the more likely they try to contact others to deal with loneliness. The college students in Paloutzian and Ellison’s (1982) research reported that when they felt lonely, the most common responses were listening to music, thinking alone, talking to a close friend, and reading.

The focus of the literature on coping strategies to loneliness is its effectiveness. Paloutzian and Ellison (1982) found that the majority of college students rated talking to or staying with a close friend effective, around half of the students thought thinking alone and listening to music to be effective, and fewer students regarded reading and eating as effective ways.

Researchers further explored why different people rate the effectiveness of those coping strategies differently, or more specifically, who rate what solution to be more
effective than the others. Numerous studies reveal that perceived effectiveness of different strategies to deal with loneliness feeling may be dependent upon trait loneliness. In Cutrona’s (1982) well-known UCLA new student study, college freshmen who were low in trait loneliness reported that developing new friendships through social interaction was the most effective way to overcome loneliness. As mentioned above, people suffering from chronic loneliness like passive strategies to cope with loneliness, while for those who just experience loneliness now and then tend to rely on active strategies (Rubenstein & Shaver, 1982). In addition, situationally lonely individuals reported that social activities were more engaging, while chronically lonely persons showed more positive attitudes toward solitude activity (Rook & Peplau, 1982). One explanation is that those with high trait loneliness are more likely to attribute their loneliness experience to internal and stable personality defects, such as communication skill deficit and shyness, and therefore, they are less likely to cope with this experience by trying to change the external social relation situation (Horowitz, French, & Anderson, 1982; Paloutzian & Ellison, 1979; Rubenstein & Shaver, 1982). In contrast, those with low trait loneliness are more likely to overcome loneliness feeling by developing new relations, and are “less likely to attribute their loneliness exclusively to themselves” (Rook & Peplau, 1982, p.372). Jones (1982) concluded that “the more favorable the view of one’s social functioning, the more likely loneliness results in approaches to other people, a strategy that might be expected to reduce the feelings of loneliness, as opposed to activities that do not directly address such feelings” (p.244). Therefore, in the current study, it is hypothesized that:
H1: For individuals with high levels of trait loneliness, non-social activities will more effectively reduce loneliness mood than social activities.

H2: For individuals with low levels of trait loneliness, social activities will more effectively reduce loneliness mood than non-social activities.

The effectiveness of social activities and non-social activities may be different depending upon people’s trait loneliness. Due to characteristics of loneliness and the Internet technology, fact-to-face communication and computer-mediated communication, both as social activities, may be different in term of effectiveness in dealing with loneliness, too. As mentioned above, people with high trait loneliness are found to be shy, low in communication skills and self-esteem, and worried about rejection from others in face-to-face context. While online communication is characterized by anonymity, easy availability of communication partners, and multiple venues. People may regard the Internet as less threatening and more useful media to meet social need, as those concerns related to trait loneliness in face-to-face context are less apparent in computer-mediated communication:

H3: For individuals with high level of trait loneliness, computer-mediated social interaction will more effectively reduce loneliness mood than face-to-face social interactions.

H4: For individuals with low level of trait loneliness, face-to-face social interaction will more effectively reduce loneliness mood than computer-mediated interactions.

Lonely people tend to show negative attitude toward their interpersonal relationships based on their past experience and have more pessimistic expectations on their future
social interaction (Jones, Sansone, & Helm, 1983). Lonely people not only give negative ratings to their relationship with others but also expect negative ratings of themselves by other people (Spitzberg & Canary, 1985) and have stronger feeling of being rejected by others (Cassidy & Asher, 1992). Lonely individuals tend not to like other people, either collectively or individually. They are not interested in people around them, and have less desire for continued interaction (Jones, 1982). Thus, in present study, it is hypothesized that:

H5: People with high trait loneliness give more negative evaluation of social interaction than those with low trait loneliness.
CHAPTER 3

PILOT STUDY

Before the formal experiment was conducted, a pilot study was made to test and compare the validity of different procedures to arouse mood loneliness, and choose an appropriate one to be used in the experiment.

3.1 Mood induction procedure

Experimental approaches to induce emotional states have aroused researchers’ interests since late 1970’s. It is regarded as “the most rigorous method of varying mood states” (Gerrards-Hesse, Spies, & Hesse, 1994, p.56), in contrast to such quasi-experimental procedures as pre-experimental emotional state classification, non-clinical people and clinical patients’ comparison and natural field observation. Although different researchers use different terms to label these approaches in their individual studies, they are generally called Mood Induction Procedures (MIPs). There are five types of MIPs used by psychologists: free mental generation of emotional states, guided mental generation of emotional states, presentation of emotion-inducing material, presentation of need-related emotional situation, and generation of emotionally related physiological states (Gerrards-Hesse, Spies, & Hesse, 1994).
In free mental generation of emotional states method, experimenters ask the subjects to imagine certain situations or events of elation or sadness at their own choice in order to evoke relevant mood. Experimenters do not present stimuli intended to lead to the mood.

In guided mental generation of emotional states approach, emotion-inducing material with instructions is presented by experimenters to make the audiences feel certain moods. Typically, researchers use self-referent statements, music, film, story or combination of them plus instructions to let participants imagine or get engaged into the feelings reacting to the stimuli. Williams (1980) showed his subjects a 10-minute taped story about a person’s friend becoming ill and eventually being diagnosed as having incurable lymphoma. Then the participants were asked to imagine themselves involved in such a situation. After that, some of the subjects’ mood variables were measured and it was found that their own feelings of helplessness and loneliness increased. Similarly, Baumgardner and Arkin (1988) assigned subjects to different conditions observing a movie pretested to be positive and mood-uplifting, negative and mood-depressing, or neutral. The positive-mood movie consisted of excerpts from the 1984 Olympics depicting American athletes at winning moments. The negative-mood movie was about a man who lost his wife and subsequently lived a forlorn life as a hermit. The neutral-mood movie was a documentary about the state of Oregon. In each of the conditions, subjects were instructed to assume the perspective of a main character in the movie and try to experience his or her feelings. Participants in different conditions showed significantly different mood of elation or depression.
Researchers also found that people with different personalities are vulnerable to different external stimuli that lead to the same mood. Sociotropic individuals, who highly value social relationships, care more about the disapproval of others and believe that poor social relationships are the causes of their depression. Autonomous and achievement-oriented individuals care more about possibility of personal failure and control of environment, and accordingly, their depression comes from those aspects. Based on these previous research findings, Robins (1988) proposed that one way to induce a depression mood was the use of taped depressing stories that incorporate specific vulnerability-related events. In his experiment, participants were asked to listen to either achievement-failure event tapes or social-rejection tapes, and close eyes to imagine the events described in the tapes were happening on them, and how they felt if those things really happened to them. Both the social rejection and achievement failure tapes were successful as mood induction procedures.

Among guided mental generation of emotional states approaches, the most widely used method is the Velten MIP. Velten first used this method in 1968 in an exploratory study of mood induction. The material used was basically self-referent statements involving both “positive mood” and “negative mood”. The former type of statement included happiness, cheer, liveliness, efficiency, optimism, and expansiveness. One example in this category was “This is great — I really do feel good — I am elated about things.” The latter type of statement included indecision, tiredness, slowness, unhappiness, inefficiency, and pessimism. One sample statement in this category was “I have too many bad things in my life.” The subjects were asked to read the statements
silently and then loudly and try to feel the mood suggested by the statements. According

to Kenealy’s review (1986), the stimuli used in later studies with Velten MIP included
self-referent statements, but also hypnotic suggestion, autobiographical recollection,
taped stories, and exposure to confederates. However, many of the studies using this
approach have not demonstrated that the procedure successfully induced significantly
different mood states in subjects. As for those studies reporting expected findings, some
researchers argued that they were due to the perceived demand characteristics of the
experimental situation but not the experiment variables.

In presentation of the emotion-inducing material approach, only emotional stimuli
are presented while no explicit instructions are provided. Researchers adopt this approach
based on the assumption that the material can automatically elicit certain mood. Marston,
Hart, Hileman and Faunce (1984) devised a laboratory experiment in which sadness was
elicited. The experimenters showed a 55-minute edited videotape including a lot of
emotionally intense content to the research participants, and then asked them to
experience whatever emotions they might have as fully as they could. Finally, participants
finished the post film rating of the Feeling Assessment form. Results showed that
happiness decreased, while sadness increased after viewing.

With regard to need-related emotional situation method, researchers assume that
people’s mood is influenced by whether their needs are met or not. Such needs include
success/achievement and social interaction. Therefore, during experiment process,
subjects are exposed to environment activating certain needs. For example, Weiner,
Russell and Lerman (1979) investigated how emotional reactions in achievement-related
context are influenced by causal attributions. The researchers asked the subjects to think of a time when they did well on a test in a very important school subject, then try to recall a time when they had been in such a situation. If they could recall this type of personal experience, they wrote a brief description about it, including details.

In generation of emotionally related physiological states, researchers believe that mood states changes by variation of physiological states combined with variation of environmental stimuli. They use certain drugs to produce physiological state change, in order for mood change.

Among those studies using different MIPs to induce negative mood, some of them focus on loneliness. In Rotenberg and Flood’s (1998) study examining the influence of mood loneliness on eating behavior, research participants were asked to read two statements, “I lack companionship” and “I am not close to anyone.” Then the participants thought about the times that they felt that way for two minutes for each item, and recalled out loud, and then continue to think about the experience making them feel most lonely for one minute. The researchers used a combination of methods to increase the effectiveness of mood induction: the free mental generation of emotional states and the Velten. Loneliness, along with sadness, significantly increased after the treatment. In this study all the participants were female. However, the MIP was reported to influence male and female differently, especially when negative mood is to be induced (Robins, 1988).

There are three ways of assessing the effectiveness of different mood induction procedures: self-report, physiological state record, and observation of overt behavior (Gerrards-Hesse, Spies, & Hesse, 1994). The most common way is self-report, typically
with self-constructed rating scales (Baumgardner & Arkin, 1988; Marston, Hart, Hileman, & Faunce, 1984; Weiner, Russell, & Lerman, 1979) or standardized mood questionnaires (Robins, 1988; Rotenberg, & Flood, 1999; Williams, 1980).

Despite the different mood induction procedures, they share something in common in terms of their underlying mechanism (Gerrards-Hesse, Spies, & Hesse, 1994). Researchers have been trying to use stimuli/instructions to make participants temporarily “get engaged in” either their own past experience or a hypothetical situation of others (which is basically an identification process) to enhance the salience of the event, and evoke the intended mood (Weiner, Russell, & Lerman, 1979). Gerrards-Hesse and colleagues (1994) reviewed more than 200 studies using the MIP and concluded that for inducing negative mood, such as depression, sadness and loneliness, the best procedures included free imagination MIP, the film/story MIP and Velten MIP. Since Brennan (1982) and Peplau and Perlman (1979) found that decreasing the salience of perceived social relationship deficiency could alleviate loneliness, it is a viable direction for the present study to induce loneliness mood through increasing the salience of dissatisfied social relation experience. The present study devised one free imagination MIP and one Velten MIP and intended to choose one in the formal experiment.

3.2 Sample

One hundred and twenty one undergraduate students taking a large introductory course in a public Midwestern university were enrolled in the study. The sample ranged in age from 18 to 31 years, with average age of 20.02 ($SD = 1.80$). Forty two percent of the participants were male ($n = 50$), and 58% of them were female ($n = 71$). Among all the
participants, 69% were Caucasian (n = 84), 17% were African American (n = 20), 3% were Asian American (n = 4), 5% were Hispanic (n = 6), and 6% were from other races than the four race types mentioned above (n = 7).

3.3 Procedure

The study was composed of two parts. Part one was a questionnaire to measure trait loneliness. Participants finished part one and then signed up for part two. Since certain words and phrases in the questionnaires used in part one and two were similar, for any individual participant, the time between part one and part two was at least one week so as to minimize sensitization effect. Part two of the study was conducted in a computer lab with 24 computers connected to the Internet. In order to minimize the distraction from each other, a maximum of 12 participants were allowed into the lab in a session and there was at least one seat between two adjacent participants. Participants were randomly assigned into one of the three conditions. Conditions one and two were experimental groups, representing Velten MIP and free imagination MIP respectively, while condition three was a control group. Gerrards-Hesse and colleagues (1994) pointed out that many MIP studies did not include a control group, and argued that in those cases, one could not judge whether the mood induction was effective, even when data in different treatments were significantly different.

In condition one, participants were asked to read a story about one person’s lonely experience as he begins life as a college student. The story was written as:

“I said good-bye to my parents and high school friends, left my hometown and moved to (city name). I hardly knew anyone here. I struggled to find someone to hang
out with on weekend nights. I felt lonely because there was no one here to talk to – to ask what to do or just pass the time with. Even worse, I felt that some people here were not as friendly as my old friends.”

After reading the story, participants were asked to think for a minute about their own experience coming to college. If there were times that they felt something similar in some ways to what was described in the story, they needed to write it down on a blank sheet provided.

In condition two, participants were asked to read a statement about loneliness experience. The statement was written as:

“Everyone at one time or another experiences the feeling of loneliness. Sometimes people feel lonely because they have become separated from friends or family, or because of other things that just make it difficult to connect to other people.”

After reading the statement, participants were asked to think for a minute about their own experiences of being lonely and then to write a short story about the feelings they experienced at that time.

In condition three, participants were asked to read a story about one college freshman’s experience as he first visited a campus bookstore. The story was written as:

‘I was excited. Here I was in the bookstore at (a university), getting ready to take college level classes for the first time. My head was filled with questions like “Which books should I buy?” “What kinds of supplies will I need for classes?” “Will I be able to find my classes in time for class?” As I looked around the store, people were friendly and seemed to know I was new.’
After reading the story, participants were asked to think for a minute about their own experiences of first visit to a campus bookstore and then to write a short story about it.

Upon finishing writing, participants used the computers in front of them and filled out an online questionnaire. The questionnaire was designed to test their mood loneliness. The participants were asked to choose the responses that came closest to how they felt at that moment.

One hundred and fourteen participants finished both parts of the study, and there were 38 participants in each of the three conditions in part two.

3.4 Measures

There were two measures used in this study to measure trait loneliness and mood loneliness respectively. Trait loneliness was measured with the revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980), with Cronbach alpha of .92 (M = 1.98, SD = .55). It has 20 items, such as “I feel in tune with the people around me”, “I lack companionship”, and “there are people I feel close to”. Response categories ranged from “strongly disagree” (1) to “strongly agree” (5). This scale is the most widely used scale in social psychology and mass communication studies to measure global, trait loneliness (Bell, 1987; Canary, 1986; Cutrona, 1982; Hojat, 1983; Russell, 1982; Russell, Peplau, & Ferguson, 1978; Spitzberg & Hurl, 1987). The scale is highlighted in two aspects. First, the scale is “neither time- or context-specific, suggesting a chronic loneliness condition” (Perse & Rubin, 1993, p. 41). Shaver and Brennan (1990) reported a series of studies obtaining test-retest reliability of this scale suggesting that it is primarily a trait measure. Second, the word “loneliness” does not appear in any of the items (Shaver & Brennan,
1990), which can reduce response bias (Russell, 1982), as loneliness is commonly recognized as socially undesirable characteristic (Gordon, 1976). Mood loneliness was measured with the social loneliness subscale of Social and Emotional Loneliness Scale for Adults (Di’Tommaso & Spinner, 1993), with Cronbach alpha of .86 (M = 1.80, SD = .50). It has 11 items, such as “I have friends that I can turn to for information”, “I don’t have a friend(s) who shares my views”, and “I like the people I hang out with”. In order to test the short-term, transient and situationally induced mood loneliness, in contrast to long-term, stable and dispositional trait loneliness, subjects were asked to “describe how you feel NOW by circling the response that comes closest to how you feel about each of the items.” Response categories ranged from “strongly disagree” (1) to “strongly agree” (5).

3.5 Results

ANCOVA was adopted for data analysis, with mood loneliness as the dependent variable, and trait loneliness as the covariate. In order to test which procedure could arouse loneliness mood, the participants in the two experimental conditions were compared to those in control group respectively. The mean and standard deviation of mood loneliness in the three conditions were listed in table 1. The data indicated that the procedure of asking people to recall and write down their lonely experience (condition two) was an effective way to arouse loneliness mood. Participants in condition two reported significantly higher level of mood loneliness than those in control group, after adjusting for trait loneliness, F (1,73) = 5.23, p < .05. In contrast, the procedure of asking people to read a college student’s lonely experience at the beginning of his college life
and write down their own similar story (condition one) did not effectively arouse loneliness mood. There was no significant difference of mood loneliness between the participants in condition one and the control group, after adjusting for trait loneliness, $F(1, 73) = 1.77, p = .19$. A review of the stories written by participants in this condition revealed that only 26% of them responded that they had similar experience. In other words, the majority of the participants did not identify with the college student’s lonely experience story in condition one. It may explain why the procedure in this condition was not a very useful one to arouse loneliness mood. The conclusion of this pilot study is that recalling and story writing about loneliness experience is a superior method for inducing loneliness.
CHAPTER 4

METHOD

4.1 Study design

More than two decades ago when computer-mediated communication research was still at its infancy, Kiesler, Siegel and McGuire (1984) pointed out that experimental research suggesting new ways to use computers in mental health was one avenue of developing social psychological studies of computer-mediated communication. In subsequent studies, however, those examining Internet use and loneliness have predominantly adopted the survey method. This method may reveal the relationship between the two constructs, but is not suitable to draw causality conclusions. In the loneliness literature in social psychology, “available data about typical coping strategies for loneliness are based exclusively on self-reports” (Rook & Peplau, 1982, p.369). Rook and Peplau (1982) argued, “available information about self-help strategies does not provide a clear set of guidelines for effective coping with loneliness…self-report data may provide only a partial picture of what lonely people actually do” (p.372). As mentioned above, people, especially those with high trait loneliness, may have a distorted view of their actual social relationship, and therefore, people’s perceived usefulness of
different strategies to cope with loneliness experience may be distorted, too. “In some cases people may be unaware of the patterning of their own responses to loneliness” (p. 372). The limitations of research methods in both Internet communication and social psychology areas call for more experimental designs, which can demonstrate causal relationship and reflect the actual effectiveness of different approaches to deal with loneliness.

The current study consists of two parts. The first part was a survey testing subjects’ trait loneliness. In order to test the research questions and hypotheses raised in present study, in part two, an experiment with five conditions was designed representing different types of approaches to cope with loneliness. Before the participants were assigned to one of the five conditions, all of them underwent an identical experimental procedure practiced and proved to be valid to arouse loneliness mood in pilot study. Condition one was face-to-face communication, condition two was computer-mediated communication, condition three was watching videos, condition four was doing school assignments, and condition five was doing nothing. Activities in condition one and two are social activities, while those in condition three and four are non-social activities. The “do nothing” condition is the control group. The design of these five conditions is based on people’s responses to previous researchers’ unstructured questionnaires on what people usually do about it when they feel lonely (French, 1981; Paloutzian & Ellison, 1982; Rubenstein & Shaver, 1982; Shaver, Furman, & Buhrmester, 1985). These studies yielded very similar results despite their sample difference. The open-ended questions “can provide more information than closed questions about the particular perspectives of individual
respondents, and thereby, allow people to respond with what is on their mind” (Frey, Botan & Kreps, 2000, p. 100). They make respondents avoid answering questions in any preconceived way and these answers reflect what people actually do to deal with loneliness. “Real activities” that people are involved in to deal with loneliness were selected as activities in different conditions of the current study in order to minimize artificiality, which is an issue often evoking criticism of experimental study designs. Participants completed two versions of online questionnaires to measure mood loneliness, as pretest and posttest of mood loneliness respectively, before and after their activities in one of the five conditions.

4.2 Sample

Participants were recruited from multiple communication courses at a large Midwestern university and were awarded extra class credits for their participation. A total of 234 participants completed the both parts of the study. The sample ranged in age from 18 to 37, with average age of 21.50 (SD = 1.80). Sixty four percent of the participants were female (N = 151) and 36% were male (N = 83). Eighty percent of them were Caucasian (N = 188), 8% were African American (N = 18), 5% were Asian (N = 12), 3% were Hispanic (N = 6), and 4% were from other races than the four race types mentioned above (N = 10).

4.3 Procedure

In February of 2007, paper-and-pencil questionnaires to measure trait loneliness, as part one of the study, were distributed and filled out by research participants in class. They were told that participation of the study was totally on voluntary basis, and they
could withdraw from the study at anytime they wanted. After the questionnaires were collected in class, they were asked to sign up for the experiment, which is part two of the study.

In order to minimize the sensitization effect, there was at least one week between the time when a participant completed part one and part two of the study. On a certain day that the participant chose, he came to the lab where the experiment as part two of the study was conducted.

The lab was composed of three sections, designed based on the activities in different conditions of the study. The first section of the lab consisted of eight separate booths with a computer, a desk and a chair in each of them, so each session of the experiment could hold up to eight people simultaneously. As these booths isolated the subjects from each other physically, when a participant sat in front of the computer, he could not see other participants. All computers were connected to the Internet and installed with Internet Explorer, MSN Instant Messenger and Window Media Player software. In addition, each computer had one headset. This section is for all the participants to complete online questionnaires and those in computer-mediated communication condition and video-watching condition to fulfill online chatting task and watching video task.

The second section of the lab was designed to be similar to an ordinary living room. It had one sofa, one loveseat, one coffee table, and one television stand with a big screen television on it. This section is for those participants in face-to-face communication condition to complete the task of chatting.
The third section of the lab was a single room. There were a couple of chairs and a desk in it. This section is for those participants in “do nothing” condition.

In pilot study, recalling and writing personal loneliness experience was found to be a useful mood induction procedure of loneliness. Therefore, when the participants were seated in the lab, all of them were asked to repeat this procedure. The first page of instruction sheets included the following statement (the stimuli used in condition two of pilot study):

“Everyone at one time or another experiences the feeling of loneliness. Sometimes people feel lonely because they have become separated from friends or family, or because of other things that just make it difficult to connect to other people.

Think about it for a while about your own experiences and your own life. Were there times when you felt lonely and needed other people to talk to or just be with for a while?

Please now carefully think about it for at least three minutes, in silence.

Write a short story about the feelings you experienced at that time, on the blank sheet provided.”

When the participants thought they were ready for writing their stories, they could write them down on blank paper provided. Loneliness feeling can change according to perceived salience of social deficit (Peplau & Perlman, 1982; Young, 1982). Therefore, this procedure was used to arouse people’s current loneliness mood by making their past lonely experience more salient through recollection and writing.

When they finished writing their lonely experience stories, they used the computers to get connected to the Internet and finish an online questionnaire as the pretest of mood
loneliness. The participants were asked to choose the options that come closest to how they felt at that moment. Upon completing the online questionnaires, participants were randomly assigned into one of the five conditions.

In condition one, each participant had a semi-structured group chatting in a three- or four-person group. Two topics were given, “What do you do to have fun at weekends? Do you know any good bars in Columbus? Why are they good?” and “What classes are you taking this quarter? What do you think of them so far?” Participants were told that they could talk about these topics, but they could also talk anything else that they were interested in, as these topics were just intended to facilitate chatting and avoid the embarrassing situation of “looking for a topic”. The topics are chosen from those used in Shaw and Gant’s (2002) experiment on the Internet’s influence on depression, loneliness, self-esteem and social support. There were 49 participants in this condition.

In condition two, every subject logged into MSN Instant Messenger with an assigned username and a password, and had an online chatting in a three- or four-person group. The topics of online chatting were the same as those in the face-to-face chatting condition. Each group member typed his comments on these topics into a chat window, in which messages from all group members appeared. The subjects were told that they were chatting with some others either in the lab or not in the lab. There were in total 49 participants in this condition.

In condition three, subjects, with headsets, watched a 10-minute video clip individually played on computers. The video clip is a BBC America Friday night comedy called “Feel the Force”. The video clip was chosen against other popular American
comedies, such as Friends, Cosby Show, and Everybody loves Raymond, in order to keep the subjects at the same level of familiarity with the show. This goal was obtained by the fact that none of the subjects reported that they had ever watched this comedy. There were 47 participants in this condition.

In condition four, subjects were asked to individually write a small research essay on mass media’s (newspaper, radio, television, and the Internet) influence on American society by utilizing what they learned from their communication classes. They could either choose one the media or treat media as a whole to develop their discussion. There were 40 participants in this condition.

In condition five, each subject was invited into the single room, which was the third section of the lab. Researchers told the subject that another researcher was on his way to bring him necessary material for the rest of the experiment, and asked the subject to wait for a few minutes. The subject was not allowed to bring any personal belongings, such as cell phone, ipod, and schoolwork, into the room. He was not allowed to get out of the room, either, unless instructed by the researcher to do so. Each time, there was only one subject in the room, so there was no way for him to talk to somebody else. After 10 minutes, the researcher returned to the room and told the subject that the other researcher was not coming, and he could leave the room and go back to section one of the lab to complete rest of the study. There were 48 participants in this condition.

When the subjects in these five conditions completed their respective tasks, they went back to section one of the lab and used the computers to answer the online questionnaire of mood loneliness another time. Those in face-to-face communication and
online communication conditions also made evaluation of the group chatting they just had in addition to mood loneliness scale. From the beginning to the end of the experiment, participants were asked not to talk to each other unless instructed by experimenters.

4.4 Measures

Trait loneliness and mood loneliness scales used in current study were identical to those used in pilot study. Trait loneliness was measured by the revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980), and mood loneliness was measured by subscale of Social and Emotional Loneliness Scale for Adults (Di’Tommaso & Spinner, 1993). Due to sensitization effect concerns, the order of items in the mood loneliness scale was different in pretest and posttest of the experiment. Cronbach alpha of .93 was achieved for trait loneliness scale (M = 1.98, SD = .56), while mood loneliness scale was also found to be reliable, with Cronbach alpha of .90 in both pretest (M = 1.93, SD = .58) and post test (M = 1.94, SD = .56). In addition, the six selected items from Basic Social Skill Assessment (Riggio, 1986) and 13 selected items from the Self-Esteem Inventory (Coopersmith, 1967) were mixed with mood loneliness scale for the same purpose. All these scales have been widely used over decades by researchers in social psychology and communication. Social interaction evaluation for subjects in condition one and condition two were measured by a 7-point semantic differential scale consisting of seven items (1 = “not at all”, and 7 = “very much”). These items were created by researchers of current study. The items include “enjoyable”, “boring”, “fun”, “exciting”, “interesting”, “engaging”, and “frustrating”. Among them, responses to “boring” and “frustrating” were inversely coded, and the score of this scale was obtained by averaging the items.
Therefore, the higher a participant’s score, the more positive evaluation he gave to the group chatting, either in the face-to-face or online condition. This evaluation scale’s Cronbach alpha was .91 (M = 4.40, SD = 1.85).

4.5 Results

4.5.1 Preliminary results

Mean comparison of pretest and posttest mood loneliness was conducted to examine mood loneliness change by conditions. The result is reported in table 2 in appendix. As is shown in table 2, none of the mean comparisons of pretest and posttest yielded significant results except computer-mediated communication condition, t (48) = -2.1, p < .05. However, the positive value (.06) indicates an increase of mood loneliness after participants chatted online with each other.

In order to test the difference in mood loneliness after treatments in different conditions, pairwise comparisons of posttest mood loneliness by conditions with trait loneliness controlled were made (table 3). Table 3 shows that posttest mood loneliness in face-to-face communication and computer-mediated communication conditions was marginally significantly different, F (1, 90) = 2.92, p = .09. In addition, table 2 shows that mood loneliness in computer-mediated communication condition was higher than that in face-to-face communication condition. The results in table 2 and table 3 show that those communicated online reported higher levels of mood loneliness than those who communicated face to face.
4.5.2 Research question and hypothesis testing

To test the first research question on whether social use of the Internet will alleviate people’s loneliness mood, analysis of covariance (ANCOVA) was made to compare the mood loneliness change (the difference between pretest and posttest mood loneliness) in condition one (computer-mediated communication group) and condition five (control group), controlling for trait loneliness. The result of analysis showed that there was no significant difference of mood loneliness change between these two groups, $F(2, 88) = 2.32, p = .13$, suggesting that social use of the Internet can not reduce people’s mood loneliness.

It is hypothesized in the current study that the effectiveness of social versus non-social activities to alleviate mood loneliness is dependent upon individuals’ levels of trait loneliness. More specifically, people with high level of trait loneliness, non-social activities will be more effective. While those with low trait loneliness, social activities will be more effective. Social activities refer to face-to-face communication and computer-mediated communication in condition one and condition two, and non-social activities refer to video watching and writing assignment in condition three and four. Subjects were divided into low and high trait loneliness groups by top 1/3 (2.13) and bottom 1/3 (1.60). One-way ANOVA was used to test the difference in the mood loneliness change for people with high trait loneliness and low trait loneliness, respectively, by type of activities (social activities vs. non-social activities). For subjects with high trait loneliness (whose trait loneliness score was no less than 2.13), there was no significant difference in mood loneliness change between social activities and
non-social activities conditions, $F(1, 57) = .00$, $p = .99$. For subjects with low trait loneliness (whose trait loneliness score was no more than 1.60), there was no significant difference of mood loneliness change between social activities and non-social activities conditions, either, $F(1, 51) = .33$, $p = .57$. These results show that for people with either high or low trait loneliness, there is no difference of the effectiveness between social and non-social activities. In other words, the effectiveness of social and non-social activities to alleviate mood loneliness is not dependent upon people’s levels of trait loneliness. The results are reflected in figure 1 in appendix.

The third and fourth hypotheses predict that the effectiveness of face-to-face communication and computer-mediated communication to alleviate mood loneliness depends on people’s trait loneliness. More specifically, for people with a high level of trait loneliness, computer-mediated communication will be more effective. While for those with low trait loneliness, face-to-face communication will be more effective. Similarly, subjects were divided into low and high trait loneliness groups by top 1/3 (2.13) and bottom 1/3 (1.60). One-way ANOVA was performed to examine the difference in mood loneliness change of people with high trait loneliness and low trait loneliness, respectively, by type of social interaction (face-to-face communication vs. computer-mediated communication). For subjects with high trait loneliness (whose trait loneliness score was no less than 2.13), there was a significant difference of mood loneliness change between face-to-face communication and computer-mediated communication conditions, $F(1, 25) = 4.25$, $p = .05$. In this situation, the mean in mood loneliness change of those involved in face-to-face communication was -.04 (SD = .20),
while the mean in mood loneliness change of those involved in online communication was .12 (SD = .20). As mentioned above, the mood loneliness change was calculated by posttest mood loneliness minus pretest mood loneliness, so positive value suggests increase of mood loneliness, while negative value indicates decrease of mood loneliness. This result is contradictory to what is predicted in present study, because for people with high level of trait loneliness, computer-mediated communication contributed to the increase of mood loneliness and then turned out to be a less effective way to alleviate loneliness than face-to-face communication. For subjects with low trait loneliness (whose trait loneliness score was no more than 1.60), there was no significant difference of mood loneliness change between face-to-face communication and computer-mediated communication conditions, F (1, 28) = .02, p = .90. The results indicate that for those with low level of trait loneliness, face-to-face and computer-mediated communication is not different in terms of their effectiveness to alleviate mood loneliness. The results are shown in figure 2 in appendix. In addition, figure 3 shows the mood loneliness change of people with high trait loneliness using face-to-face communication and computer-mediated communication, and figure 4 shows the mood loneliness change of those with low trait loneliness using these channels.

The fifth hypothesis predicts that people with high trait loneliness give more negative evaluation to social interaction than those with low trait loneliness. Correlation analysis was made to those subjects in face-to-face and computer-mediated communication conditions combined. No significant result was achieved, r = .02, p = .88, suggesting that there is no relationship between trait loneliness and evaluation of social
interaction. The same data analysis was performed to the subjects in these two conditions respectively, and still no significant result is obtained. In face-to-face communication condition, there was no significant relationship between trait loneliness and evaluation, \( r = .04, p = .80 \). In computer-mediated communication condition, there was no significant relationship, either (\( r = -.02, p = .91 \)).

4.5.3 Exploratory analysis

Data analysis in current study went beyond the research questions and hypotheses raised. Further exploratory tests provide more information than what the present study originally tried to reveal.

To test the research question of whether computer-mediated communication can alleviate mood loneliness, the mood loneliness changes between computer-mediated communication condition and “do nothing” condition was compared, with trait loneliness controlled. Besides that, mood loneliness change in computer-mediated communication condition was compared to that in all other conditions one by one (table 4). Results show that there was significant difference of mood loneliness change between face-to-face communication condition and computer-mediated communication, \( F (1, 90) = 4.96, p < .05 \). Preliminary analysis shows that there was significant increase of mood loneliness during treatment in computer-mediated communication condition, while there was no significant change of mood loneliness in face-to-face communication condition. Two sets of results combined suggests that when people feel lonely, those using computer-mediated communication will experience more increase of mood loneliness than those turning to face-to-face communication. Furthermore, if trait loneliness is not controlled, there was
no significant difference of mood loneliness change between face-to-face communication condition and computer-mediated communication, indicating that trait loneliness was a suppressor variable.

The last hypothesis, predicting that there is a negative relationship between trait loneliness and evaluation of social interaction, was not supported. However, the mean of evaluation of face-to-face communication was 5.20 (SD = .94), while the mean of evaluation of computer-mediated communication was 4.39 (SD = 1.20). The evaluation of face-to-face communication was significantly higher than that of computer-mediated communication, F (1, 96) = 13.91, p < .01, suggesting that people showed more positive attitude toward face-to-face communication than toward computer-mediated communication.

In addition, if face-to-face and computer-mediated communication conditions were combined together, there was negative relationship between evaluation and posttest mood loneliness, r = -.21, p < .05, suggesting that the more positive the evaluation, the lower the mood loneliness after social interactions. This finding proves the definition of loneliness, stating that loneliness results from dissatisfaction with social interaction. It also supports modern loneliness literature repeatedly reporting that such a qualitative construct as perceived quality of social interaction, but not such quantitative constructs as number of friends or frequency of social contacts, predicts loneliness. However, no significant relationship was found between evaluation and posttest mood loneliness respectively in face-to-face communication condition, r = -.16, p = .28, and computer-mediated communication condition, r = -.22, p = .13.
As mentioned above, researchers who argue against the “cues-filtered-out” approach point out that time is important to the analysis of social Internet use effects. The role of time makes the early studies’ one-shot and equal-time investigation approach questionable (Walther, 1992). Time restriction was found to hinder effective online communication. Time is originally designed for experimental control purpose, but may create an unequal issue. As computer-mediated communication is slower than face-to-face communication, “imposing equal time limits on CMC and FtF conditions may have an unequal effect: it may cut off slower CMC before sufficient messages are exchanged for interpersonal effects to accrue” (Walther, Anderson, & Park, 1994, p.465). Therefore, in order to avoid such influence, no time limit was given to face-to-face communication and computer-mediated communication groups. In other words, it’s up to the communicators when to end the chat.

Consistent with previous literature’s findings, in the present study it took computer-mediated communicators much more time to complete the discussion in contrast to face-to-face communication, although the topics were identical. The average time in computer-mediated communication groups was 1338.47 seconds (22 minutes and 18.47 seconds, SD = 301.26 seconds), while the average time in face-to-face communication groups was 886.04 seconds (14 minutes and 46.04 seconds, SD = 275.34 seconds).

In the face-to-face communication condition, time was positively related to evaluation of interaction, r = .32, p < .05. In computer-mediated communication condition, a similar positive relationship was also found, r = .34, p < .05. These findings suggest that
the better people feel about the interaction, the longer the interaction lasts. The worse people feel, the sooner the interaction ends. As for the computer-mediated communication specifically, the result can also be interpreted in an opposite direction. The longer the computer-mediated communication lasts, the more positive assessment people give. It is consistent with what is reported in Walther, Anderson, and Park’s (1994) meta-analysis that in “no time restricted” situations, more positive socially-oriented messages were exchanged than in conditions with time restriction.
CHAPTER 5

DISCUSSION

5.1 Summary

The study examines whether computer-mediated communication can help reduce loneliness mood, the influence of trait loneliness as personality characteristics on the effectiveness of social and non-social strategies, and the relationship between evaluation of social interaction and trait loneliness.

With trait loneliness controlled, mood loneliness increases overtime between pretest and posttest in the computer-mediated communication group. In contrast to the control group, in which people “did nothing,” no difference was observed in terms of mood loneliness change. No matter whether people have high trait loneliness or low trait loneliness, there is no difference of the effectiveness between social and non-social activities. However, when face-to-face communication and computer-mediated communication are compared to each other, results are different. For those with high trait loneliness, computer-mediated communication makes mood loneliness increase and thus is a less effective way to cope with loneliness. While when people’s trait loneliness level is low, there is not much difference between face-to-face and computer-mediated
communication. In addition, there is no relationship between people’s trait loneliness and their evaluation of social interaction. Exploratory analysis shows that people have more positive evaluation to face-to-face communication than to computer-mediated communication, even through the topics of communication in these two channels are the same. Consistent with the widely accepted definition of loneliness as dissatisfaction of the perceived quality of social interaction, in current study, people with more positive evaluation of social interaction were found to be less lonely after interaction. Computer-mediated communication takes more time than face-to-face communication. The more positive evaluation people give to the social interaction, either face-to-face or computer-mediated communication, the longer the communication lasts.

In the present study, “psychological well-being” is not treated as a vague, random, or unjustified “package” composed of a number of constructs in social psychology and psychiatry (e.g., loneliness, depression, anxiety, etc.), which is a routine in current media technology research. Rather, this study focuses on one specific construct, and critically reviews the literature on loneliness from the perspective of communication. Hopefully, this study can be a useful response to social psychologists’ call for media researchers’ contribution to loneliness research, and meanwhile provide some enlightenment and arouse some inspiration for further studies on media and psychological well-being in communication research.

Previous literature examining loneliness and Internet use mainly adopts correlation analysis. As mentioned above, one weakness of this method is the difficulty to draw any conclusion of causality. It is more problematic when some studies use this method and
treat loneliness as a dependent variable, trying to conclude how much Internet use “causes” how much loneliness change. As discussed earlier, the Internet is a multi-functional medium, so the simple time or frequency measurement of general Internet use may conceal its nature. In addition, due to the routine borders of disciplines and subdisciplines of communication research, most studies on this topic just focus on Internet use and explore its relationship with loneliness as a whole, while ignore the contribution of other media use, other communication behavior, and other non-communication behavior to loneliness. Therefore, it is open to question whether one can attribute a person’s loneliness level simply to his or her Internet use. Furthermore, what makes the research in this area more challenging is that different activities may interact with each other. “We need to know more about the combination of different coping responses. For example, watching television may be ineffective as a sole solution to loneliness, but individuals who are actively engaged in the sometimes risky business of meeting new people may find that a distracting evening of TV renews their energies” (Rook & Peplau, 1982, p.372). Story writing, proving to be a valid mood induction procedure, was adopted to arouse mood loneliness, and then mood loneliness changes were tested in different activities, representing different approaches to cope with loneliness experience. Although the dependent variable in the current study is mood loneliness, trait loneliness is not ignored, but treated as a covariate, based on the review of previous social psychology literature revealing the connection and interplay of personality characteristics and mood state. Therefore, the interpretation of research results is convincing suggesting causality relationship.
In the experimental design of current study, “do nothing” is treated as a control group. The conclusion that computer-mediated communication does not effectively reduce mood loneliness is based on the comparison of mood loneliness change between online communication condition and “do nothing” condition. However, the self-reports of cognitive strategies to alleviate loneliness challenge this approach (Paloutzian & Ellison, 1982; Rubenstein & Shaver, 1982). Besides those observable behavioral activities, either social or not, people sometimes deal with loneliness by just thinking. For example, when people feel lonely, they may remind themselves that their social relationships with others are actually good, they may think about the positive sides (e.g., schoolwork, athletics) of their life, or they may question themselves whether the goals for good social relationships are too high (for review, see Rook & Peplau, 1982). These strategies respectively include such mechanisms as self-comfort, distraction, and lowering the social relationship standard. Brennan (1982) and Peplau and Perlman (1982) summarized three approaches to deal with loneliness. Besides the behavioral strategy of actively changing the actual social relationships, the other two are cognitive ones. One is reexamining and changing the social relationship desire, the other is deceasing the salience of social relationship deficit. These cognitive strategies are reported to be effective, for both long-term and short-term purposes (such as current study dealing with transient mood loneliness). In present study’s experiment, people’s behavioral activities can be manipulated, but their mental activities can not. Therefore, in the “do nothing” condition, although experimenters managed to prevent them from taking on any activities, the possibility of self-motivated cognitive strategies to deal with loneliness could not be ruled out. Is “do
nothing” a control condition, or another experimental condition? This may influence the interpretation of the result of the first research question, too. Does that suggest the low effectiveness of social Internet use to deal with loneliness, or just the little difference of effectiveness between social Internet use, as a form of behavioral strategy, and thinking, as a cognitive strategy? In addition to above discussion on self-help strategies, actually, cognitive treatment is regarded as an important therapy by psychiatrists for their patients suffering from loneliness. Based on Beck’s cognitive theory underscoring cognition’s influence on people’s emotion and behavior, Young (1982) developed a widely acknowledged cognitive-behavioral therapy to loneliness. The therapy includes correcting people’s view on social relationship deficiency, elevating their self-esteem, and helping them avoid attributing loneliness to their own personality traits.

5.2 Limitations

There are a few limitations of present study. First, computer-mediated communication is operationalized as chat through instant messenger. People keep in touch with each other through a variety of communication software supported by Internet technology. Some of them are different in terms of synchronicity, such as email and instant messenger. Electronic bulletin board provides a virtual online public forum. Blog, MySpace or Facebook is a relatively more private place to build, maintain and develop a person’s own social network. Sometimes, communication function is combined with other functions of the Internet, such as multi-player online games. The games not only offer entertainment, but also give players opportunities to interact with each other, and sometimes the content of the interaction goes beyond the game itself (Baym, Zhang, &
Lin, 2004). Although all of them are used by people for communication purpose, the way people communicate through them may be different due to the distinction of technology of the software. Take synchronicity for example, synchronous communication is more cognitively demanding, while “asynchronous communication may offer the communicator less stressful conversational demands, allowing increased opportunity and flexibility” (Walther, 1993, p.394). In asynchronous online communication, people have more time to deliberate, construct and edit messages to be sent. It is easier for people to build a more positive image through “selective self-presentation”. Therefore, it is reasonable to expect that asynchronous online communication may include more positive socially-oriented information than synchronous online communication, and thus is more effective to alleviate loneliness.

Second, the face-to-face and computer-mediated communication in the current study is conducted among strangers. None of the participants in these two conditions reported that they knew each other personally, mainly maybe because they came from quite a few different classes. Although interacting with strangers was rated among the top choices of ways to deal with loneliness for college students, talking or spending time with friends was reported as most effective (Paloutzian & Ellison, 1982). As mentioned earlier, new media technology researchers show that the majority of Internet users do not communicate with someone they’ve never met in person (Nie, Simpser, Stepanikova, & Lu, 2004). In other words, for most people, Internet is more like a supplementary medium to reach preexisting social relations, in addition to traditional channels (e.g., face-to-face interaction and telephone), rather than a tool to initiate new social relationships. Therefore,
chatting through instant messenger with a group of strangers, which is a computer-mediated communication condition in current experiment, may not be what the subjects usually do with the Internet to deal with loneliness. The uncertainty and unfamiliarity might exert extra cognitive burden to subjects when they were chatting online, which required more time and efforts in overcoming it. This may also help explain why the research question on the effectiveness of computer-mediated communication does not yield significant results.

Third, since the current study focuses on mood loneliness, the findings about the usefulness of different activities just reveal short-term effects. In addition, reported strategies to loneliness by Paloutzian and Ellison (1982) and Rubenstein and Shaver (1982), from which the conditions of the experimental portions of the current study derive, were aroused by questions whose wording emphasized immediate responses. Social psychologists called for the distinction between short-term and long-term coping responses to loneliness, representing temporary distracting tactics and those to improve social relationships. Human beings are social animals and social needs are part of their nature. In his basic need hierarchy theory, Maslow says, “if both the physiological and the safety needs are fairly well gratified, there will emerge the belonging needs and love needs”, and if these needs are unsatisfied, “a person will feel hunger for relations with people in general—for a place in the group or family—and will strive with great intensity to achieve this goal” (1987, p.20). Therefore, in the long run, improving one’s social relationship may be the most effective way to overcome loneliness, as opposed to the other two basic approaches mentioned earlier, which are reported to be effective, but may
just be useful temporarily. “Whereas reading a mystery novel may effectively blot out the pain of loneliness for an evening, it is not likely to improve a deficient social network” (Rook & Peplau, 1982, p.371). For communication researchers, “a complete analysis of naturally occurring responses to loneliness ought to consider not only immediate responses to feelings of loneliness, but also longer-range strategies people use to improve their social life” (p. 369).

Fourth, the present study used college students as a sample, like many other communication studies for convenience purpose. Social psychologists show this concern by asking for more knowledge on where and how people conduct social activities to deal with loneliness. Rook and Peplau (1982) pointed out that campus libraries or cafeterias could probably be social gathering places for college students, but where and how those working in isolated environments, middle-aged singles and the elderly meet other people. As for people’s connection with the Internet, college students are technology savvy and enthusiastic about trying new media technology, and therefore, they may be more likely to use the Internet than other populations when they feel lonely. College student sample is also an issue for communication researchers. Journal of Broadcasting and Electronic Media listed a guideline of manuscript submission, “The use of data collected from students should be carefully justified on theoretical or methodological grounds. In many instances, it is inappropriate or of limited value to make inferences or test hypotheses using data collected from students” (1995, p.146). Potter (1996) pointed out that researchers should be cautious when trying to make inferences from research findings using college student sample to general population, while when only hypotheses are
tested among variables without further inferences, college students are usually appropriate. The sample issue, as well as other limitations of this study mentioned above, should provide readers with some notes to the interpretation of its results.
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APPENDIX

TABLES AND FIGURES
### Table 1: Mean and standard deviation of mood loneliness by conditions in pilot study

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td>Condition 1</td>
<td>1.83</td>
<td>.52</td>
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<tr>
<td>Condition 2</td>
<td>1.86</td>
<td>.52</td>
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<tr>
<td>Condition 3 (control group)</td>
<td>1.74</td>
<td>.47</td>
</tr>
</tbody>
</table>

Table 1: Mean and standard deviation of mood loneliness by conditions in pilot study
Table 2: Mood loneliness change by conditions in experiment

* Mood loneliness change is obtained through posttest mood loneliness minus pretest mood loneliness, so negative value of mood loneliness change suggests decrease, while positive value indicates increase.
<table>
<thead>
<tr>
<th>Condition 1 vs. Condition 2</th>
<th>$F(1, 90) = 2.92, p = .09$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition 1 vs. Condition 3</td>
<td>$F(1, 92) = .68, p = .41$</td>
</tr>
<tr>
<td>Condition 1 vs. Condition 4</td>
<td>$F(1, 85) = 1.12, p = .29$</td>
</tr>
<tr>
<td>Condition 1 vs. Condition 5</td>
<td>$F(1, 93) = .78, p = .38$</td>
</tr>
<tr>
<td>Condition 2 vs. Condition 3</td>
<td>$F(1, 87) = .75, p = .39$</td>
</tr>
<tr>
<td>Condition 2 vs. Condition 4</td>
<td>$F(1, 80) = .11, p = .74$</td>
</tr>
<tr>
<td>Condition 2 vs. Condition 5</td>
<td>$F(1, 88) = .44, p = .51$</td>
</tr>
<tr>
<td>Condition 3 vs. Condition 4</td>
<td>$F(1, 82) = .12, p = .73$</td>
</tr>
<tr>
<td>Condition 3 vs. Condition 5</td>
<td>$F(1, 90) = .01, p = .90$</td>
</tr>
<tr>
<td>Condition 4 vs. Condition 5</td>
<td>$F(1, 83) = .06, p = .80$</td>
</tr>
</tbody>
</table>

Table 3: Pairwise comparisons of posttest mood loneliness in all conditions after trait loneliness is controlled
**Result of ANCOVA**

<table>
<thead>
<tr>
<th>Condition 2 vs. Condition 1</th>
<th>F (1, 90) = 4.96, p &lt; .05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition 2 vs. Condition 3</td>
<td>F (1, 87) = 1.61, p = .21</td>
</tr>
<tr>
<td>Condition 2 vs. Condition 4</td>
<td>F (1, 80) = 1.23, p = .27</td>
</tr>
<tr>
<td>Condition 2 vs. Condition 5</td>
<td>F (2, 88) = 2.32, p = .13</td>
</tr>
</tbody>
</table>

Table 4: Comparisons of mood loneliness change in computer-mediated communication condition with that in all other conditions after trait loneliness is controlled
Figure 1: Mood loneliness change of people with high and low trait loneliness involved in social and non-social activities

* Positive value of mood loneliness change suggests that the mean of mood loneliness in posttest is higher than that in pretest, while negative value of mood loneliness change suggests that the mean of mood loneliness in posttest is lower than that in pretest
Figure 2: Mood loneliness change of people with high and low trait loneliness involved in face-to-face communication and computer-mediated communication

* Positive value of mood loneliness change suggests that the mean of mood loneliness in posttest is higher than that in pretest, while negative value of mood loneliness change suggests that the mean of mood loneliness in posttest is lower than that in pretest
Figure 3: Mood loneliness change of people with high trait loneliness in face-to-face communication and computer-mediated communication conditions
Figure 4: Mood loneliness change of people with low trait loneliness in face-to-face communication and computer-mediated communication conditions