

**COLLEGE STUDENTS' USES AND MOTIVES FOR E-MAIL, INSTANT  
MESSAGING, AND ONLINE CHAT ROOMS**

by

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## TABLE OF CONTENTS

LIST OF TABLES .....	vii
ABSTRACT .....	ix
Chapter	
1 INTRODUCTION .....	1
Technology Justification.....	3
Widespread Use .....	3
Facilitating Person-to-Person Interaction .....	5
Synchronous and Asynchronous Communication .....	6
Building and Exploring.....	7
Uses and Gratifications Perspective.....	9
Assumptions and Paradigm.....	9
Uses and Gratifications and Interpersonal Communication .....	11
Literature Review.....	14
General CMC Research .....	15
Uses and Gratifications Research .....	17
Social and Psychological Antecedents.....	18
Electronic Mail Research.....	20
Uses and Gratifications Research .....	21
Social and Psychological Antecedents.....	22
Instant Messaging .....	22
Online Chat Rooms.....	23
Focus of the Proposed Study.....	25
Research Questions and Hypotheses .....	29

2	METHOD .....	41
	Procedure .....	41
	The Nature of the Sample .....	42
	Class and Major .....	42
	Computer Access and Experience .....	43
	Uses.....	43
	Motives .....	47
	Measures .....	52
	Shyness .....	52
	Loneliness .....	54
	Unwillingness to Communicate.....	57
	Interpersonal Communication Satisfaction.....	60
	Social Networks.....	62
	Involvement in Student Activities .....	62
	Long Distance Relationships .....	63
	Statistical Analysis.....	63
3	RESULTS .....	65
	Uses.....	65
	Motives .....	84
	Psychological Antecedents .....	105
	Social Antecedents.....	112
	Demographic Antecedents .....	113
4	DISCUSSION.....	126
	Summary of Results.....	126
	Uses.....	127
	Motives .....	129
	Psychological Antecedents .....	131
	Social Antecedents.....	136
	Demographic Antecedents .....	138
	Directions for Future Research .....	141
	Limitations .....	144
	Conclusion .....	146

APPENDIX: SURVEY INSTRUMENT .....	147
REFERENCES .....	163

## LIST OF TABLES

1	Descriptive Statistics of CMC Uses.....	45
2	Descriptive Statistics of CMC Motives .....	48
3	Descriptive Statistics of the Shyness Scale.....	53
4	Descriptive Statistics of the Loneliness Scale .....	55
5	Descriptive Statistics of the Unwillingness to Communicate Scale .....	58
6	Descriptive Statistics of the Interpersonal Communication Satisfaction Scale.....	61
7	E-mail Uses Factor Analysis.....	67
8	Instant Messaging Uses Factor Analysis .....	70
9	Task Related Uses.....	74
10	Social Related Uses.....	75
11	Online Uses.....	76
12	Offline Uses .....	77
13	Long Distance Uses .....	78
14	Summary of Means of Uses .....	83
15	E-mail Motives Factor Analysis .....	85
16	E-mail Motives Descriptive Statistics.....	89
17	Instant Messaging Motives Factor Analysis .....	91
18	Instant Messaging Motives Descriptive Statistics .....	95
19	Online Chat Rooms Motives Factor Analysis .....	97
20	Online Chat Rooms Motives Descriptive Statistics.....	100

21	Summary of Means of Motives.....	104
22	Correlations of E-mail and Psychological and Social Antecedents.....	109
23	Correlations of Instant Messaging and Psychological and Social Antecedents.....	110
24	Correlations of Online Chat Rooms and Psychological and Social Antecedents.....	111
25	T-tests of Gender and Uses and Motives .....	117
26	T-tests of Age and Uses and Motives .....	120
27	T-tests of Academic Major and Uses and Motives .....	123

## **ABSTRACT**

The purpose of this study was to explore college students' uses and motives of e-mail, instant messaging, and online chat rooms, as well as to examine the effect of psychological, social, and demographic antecedents on college students' CMC use. This study was grounded in the uses and gratifications perspective, which posits that people use certain communication channels to fulfill needs and motives. The hypotheses predicted that e-mail would be used more for task related and instrumental communication whereas instant messaging and online chat rooms would be used more for social related and ritualized communication. A questionnaire was distributed to 446 college students to measure e-mail, instant messaging, and online chat rooms uses and motives, as well as, shyness, loneliness, unwillingness to communicate, interpersonal communication satisfaction, social networks, involvement in student activities, and several demographic characteristics. Results indicated that e-mail, instant messaging, and online chat rooms share five general uses: task-related, social-related, offline, online, and long distance. Results also indicated that e-mail, instant messaging, and online chat rooms share some motives, but this study found that there were unique motives reported for each of the three forms of CMC: convenience for e-mail, companionship and anonymity for instant messaging, and chat room benefits for online chat rooms. Finally, this study found that psychological, social, and demographic antecedents have an effect on college students' use of e-mail, instant messaging, and online chat rooms. People who are lonely, who are less satisfied with interpersonal communication, and who find

communication to be less rewarding spend more time in online chat rooms. Results showed that the more college students are involved in student activities the more time they spend e-mailing. This study also found that female college students use e-mail more than male students and that younger college students, those 17-20 years of age use instant messaging more than older college students, those 21 years of age and older. The results of this study support uses and gratifications view that people are motivated by different reasons to use certain channels of communication and that social and psychological antecedents affect these choices. The finding that e-mail, instant messaging, and online chat rooms have unique attributes indicate that these various forms of CMC and other Internet activities should be studied individually in future research to better understand what people are using the Internet for and why they are using it.

## Chapter 1

### **INTRODUCTION**

Home computers, with the help of the Internet, are offering people services that are competing with the landline telephone as a main source of communication. Services available through the home computer, such as electronic mail, instant messaging, and online chat rooms, provide users an alternative method of communication. Computer users can connect with friends, family, coworkers, and even meet new people via the Internet and its mediated communication capabilities. Computer-mediated communication (CMC) has been defined in past research as “synchronous, or asynchronous electronic mail and computer conferencing, by which senders encode in text messages that are relayed from senders’ computers to receivers” (Walther, 1992, p. 52). Modes of communication that are termed CMC now include various forms of e-mail and computer conferencing including instant messaging, online chat rooms, listservs, and bulletin boards just to name a few. CMC technologies enable users to communicate in synchronous time, as with instant messaging or chat rooms, or asynchronous time, as with e-mail. They also allow group online conversations, as with chat rooms, or for individual conversations to take place, as with instant messaging and e-mail.

One population, in particular, has become a wide user of the Internet and its communication capabilities. College students have connected to the Internet more than the general population, according to a survey by The Pew Internet & American Life

Project (Jones, 2002). This survey found that 86% of college students are online, which is considerably higher than the 59% of the general population that is connecting to the Internet. Most college students have grown up with computers in their homes and their schools, and the Internet has almost always been a part of their world. The University of Michigan's Information Technology Central Services reports that around 90% of its incoming first year students already own a PC and are bringing it with them to campus (Brown, 2002). Use of the Internet as a means of communication is not a new concept to today's college students. With high-speed connections available in many dormitories and computer labs on campus, as well as some off-campus housing offering the service, college students are finding it even easier to access the Internet.

The more students use the Internet and its communication technologies, the more it becomes a part of their daily activities. What impact will the daily use of CMC have on college students once they leave the campus and enter the workforce? Will many students become Internet dropouts after college as some researchers have suggested (Kingsley & Anderson, 1998)? Or will they continue to make daily use of the Internet and the technologies it offers? These are questions that researchers would like to be able to answer, but which they cannot answer just yet. First, more research needs to be done looking at why college students are using CMC, what are their purposes and what are they seeking from these forms of communication. Second, more research needs to be done looking at who, in particular, is drawn to each type of CMC. The goal of this study is to look at these two concepts: who, of college students, is using e-mail, instant messaging, and online chat rooms, and why are they using these forms of CMC.

## Technology Justification

Many forms of CMC exist in the virtual world of the Internet. With so many CMC outlets, it can be difficult for researchers to decide which forms to study. It would be difficult to try to look at every single form in just one study. This study will look at three forms of CMC: e-mail, instant messaging, and online chat rooms. These three forms of CMC are not the only ways of communicating online; newsgroups, bulletin boards, and listservs are just a few more of the many ways college students and the general population have to communicate online. But, there are several reasons that lend themselves to why studying these three specific forms of CMC usage in college students is important and appropriate.

### *Widespread Use*

These three specific forms of CMC usage have become a part of many college students' daily activities indicating widespread usage of these technologies. Widespread use of different technologies can have implications for the future depending on how and why the technologies are used by certain groups of people. College students' usage of CMC technologies needs to be explored to lead researchers to ask questions about the impact of these technologies on students' lives and face-to-face interaction with other people. In choosing how to do this research, examining the widely used technologies will be more beneficial in that more information can be learned about a larger part of the population.

E-mail is a mediated communication technology that enables users to send messages in the form of electronic letters to other users in asynchronous time. The Pew

Internet & American Life Project indicated that e-mail is the most frequently used Internet communication tool among college students (Jones, 2002). Among the respondents, 62% of students surveyed reported using e-mail as their primary Internet medium; the study also found that 72% of college students check their e-mail at least once a day, which points to e-mail usage becoming part of their daily routines (Jones, 2002). Some researchers have pointed to e-mail as the main reason people are getting online (Baym, 2002). E-mail is among the top five activities on the Internet, along with another form of CMC—instant messaging (Cole, 2001).

Instant messaging is a form of mediated communication technology in which users are able to communicate with other users in real time. Users send a message to another user, which appears on the receiver's computer screen. The receiver then responds by sending a message back. A synchronous conversation is then able to occur. Many different instant messaging programs are available, including two of the most popular: America Online's Instant Messenger (AIM) and ICQ ("I seek you"). The popularity of instant messaging has taken hold in the college student population; they are twice as likely as the average Internet user to use it (Jones, 2002). The Pew Internet & American Life Project found that 29% of students surveyed reported that instant messaging is their primary Internet tool and that on any day 26% of college students use instant messaging (Jones, 2002). Leung (2001) found that for many Chinese college students, use of ICQ was a daily activity, with 32% of respondents indicating that they chat on ICQ daily. In another study conducted by the Pew Internet & American Life Project, researchers found that instant messaging was primarily a young person's activity

(Rainie, 2000). They found that 59% of those people 18-24 years old, who were surveyed, have engaged in instant messaging (Rainie, 2000).

Online chat rooms appear to be an activity in which many young adult Internet users take part as well. Online chat rooms are a form of mediated communication technology in which users, like instant messaging, are able to communicate with others in real time but also add the possibility of conversation with many people rather than just a single person. Users enter a chat room, which may be for people with a specific interest, such as knitting, or for people of a certain age, such as those 50 years or older. Once in the chat room users are able to carry on a conversation. Fifty-three percent of Internet users ages 18-24 have participated in online chat rooms at some point and 8% of this population engage in the activity daily (Rainie, 2000). Rumbough (2001) found that 37% of the college students he surveyed have joined a chat room to interact with other people at some point with 5.8% of those doing so daily. While the numbers of college students using online chat rooms as a daily activity is not as high as those using e-mail and instant messaging daily, large percentages of college students have participated in chat rooms and the gratifications they seek from this particular form of CMC is worth studying.

#### *Facilitating Person-to-Person Interaction*

Another important reason for focusing on e-mail, instant messaging, and online chat rooms has to do with the technologies themselves. E-mail, instant messaging, and online chat rooms are conceptually similar technologies in that they allow for interpersonal communication to occur through a mediated channel. Each of the channels allows people the ability to communicate with others and convey information without

actually having face-to-face interactions, but they are able to convey the same sort of information that they may have done in a face-to-face setting. Other forms of CMC, such as bulletin boards and newsgroups, are technologies that are geared more towards person-to-group interaction; whereas, e-mail, instant messaging, and online chat rooms allow more person-to-person communication.

Studying technologies that are more person-to-person in nature brings the study of CMC into the realm of interpersonal communication, which has just recently begun to explore the effect of CMC on relationship development and maintenance. Most of the earlier work done with CMC has been in an organizational setting, focusing on the effect of CMC on relationships within organizations (Stafford, Kline, & Dimmick, 1999) rather than on how it affects the everyday, personal relationships of users and what reasons they are using it.

#### *Synchronous and Asynchronous Communication*

Exploring college students' uses of e-mail, instant messaging, and online chat rooms allows the study of the asynchronous and synchronous communication dichotomy. These three forms of CMC differ in regards to this particular characteristic. E-mail is a form of CMC that is asynchronous in nature; users are able to send an e-mail without the recipient being available at the time the e-mail is sent. E-mail's asynchronous nature has been labeled as a critical feature because it expands a person's potential for interpersonal interaction (Baym, 2002). The ability of e-mail to allow for asynchronous communication is an advantage it holds over devices such as the telephone (Dimmick, Kline, & Stafford, 2000), and may be an advantage that it holds over other types of CMC.

In contrast to e-mail's asynchronous feature, instant messaging and online chat rooms are usually synchronous in nature; users are able to "chat" with another user in real time. One aspect of instant messaging and online chat rooms' synchronous feature makes it unique from the telephone's synchronous nature. While the CMC interaction occurs in real time, a user can be typing an e-mail, searching the web, and downloading music while "chatting" with two or three people and never miss a beat of each and every conversation since unlike the telephone a user reads the other person's responses rather than having to listen to them. Synchronous and asynchronous communication have benefits that make them more desirable for certain people and for certain occasions. Future research in the area of CMC will help to discover these people and occasions.

### *Building and Exploring*

Much of the research that has been conducted so far on people's use of CMC technologies has looked at e-mail (Dimmick et al., 2000; Golden, Beauclair, & Sussman, 1992; Hill & Monk, 2000; Romm & Pliskin, 1999; Stafford et al., 1999) or CMC/Internet usage as a whole (Dainton & Aylor, 2002; Flaherty, Pearce, & Rubin, 1998; McKenna, Green, & Gleason, 2002; Papacharissi & Rubin, 2000). There is not as much information available about the specific use of instant messaging (Hard af Segerstad & Ljungstrand, 2002; Lenhart, Rainie, & Lewis, 2001; Leung, 2001) and online chat rooms (Markey & Wells, 2002; Peris, Gimeno, Pinazo, Ortet, Carrero, Sanchiz, & Ibanez, 2002; Whitty, 2002). More and more studies are being done on these two forms of CMC, but even more research is still needed. Now, there are many different Internet activities that a person can engage in, such as interpersonal communication, online games, online

shopping, information searching, streaming audio and video as well as many more. Because of this diversity it is now more useful to study the specific activities of the Internet separately. There are differences between the activities and there are differences between the people who engage in these activities. For example, the people who get online to play games are not necessarily the same people who get online to shop. To better understand the impact of the Internet on people's lives, it is necessary to have an understanding of all the different activities that people engage in online and the best way to do this is to look at each separate activity.

This study attempts to explore three specific interpersonal communication activities that people engage in while on the Internet: e-mailing, instant messaging, and participating in online chat rooms. Previous research on e-mail usage will be helpful in discovering why and how college students use e-mail. More information regarding why and how students use instant messaging and online chat rooms will be discovered from this study and be able to be used by future researchers. The limited amount of research that has looked at separate forms of CMC indicates that there are differences in relation to motives for using various forms of CMC. Seeking conversation and initiating relationships with others are two motives reported for online chat room use (Peris et al., 2002). These motives differ from the motives found for e-mail, which include sustaining relationships and convenience (Stafford et al., 1999), and for instant messaging, which include keeping up with fashion trends (Leung, 2001). The difference in motives indicates that these three forms of CMC are unique and deserve to be studied separately.

## Uses and Gratifications Perspective

The uses and gratifications perspective offers a functional approach to studying various forms of technology. It allows researchers to ask the question “why?” without adding a value judgment to the answer (Katz, Blumler, & Gurevitch, 1974). This perspective gives researchers the opportunity to conduct pure exploratory research. Uses and gratifications suspends value judgments about specific content, so researchers would not assume that soap opera viewing is dysfunctional, for example, instead researchers ask soap opera viewers why they watch, and then identify the functions that these television programs do perform in their viewers’ lives. The study of computer-mediated communication is well suited to the uses and gratifications perspective. Uses and gratifications has been suggested as a useful perspective to study new technology (Rubin & Bantz, 1987). Interpersonal communication via the Internet is still rather new that it could benefit from a more exploratory perspective. The Internet is a technology that is seen as both functional and dysfunctional; it has been criticized by some as having a negative impact on society and hailed by others for its positive outcomes (Bargh, 2002). Because the Internet and the services that it provides are still evolving, these value judgments are ones which should be set aside until more information can be found out about people’s usage of the technology and services.

### *Assumptions and Paradigm*

Uses and gratifications is built on five assumptions (Katz et al., 1974): (a) the audience is viewed as active, (b) the choice to use a particular media to fulfill a certain gratification lies within the user, (c) media compete with other media to satisfy users,

(d) the audience is capable of self-report, and (e) value judgments should be suspended while conducting research.

Several of these assumptions show how uses and gratifications can illuminate understanding of CMC. The CMC audience is certainly active, for example, choosing to use e-mail or instant messaging. The choice to use a particular CMC to fulfill a certain gratification lies within the user. And CMC also competes with the telephone and face-to-face interactions to fulfill social and relationship needs.

A key point to the uses and gratifications perspective is that social and psychological antecedents affect people's use of different communication channels (Katz et al., 1974; Rosengren, 1974). These social and psychological factors should not be neglected in research. Rosengren (1974) explained that people have needs, which are influenced by individual and societal characteristics; these needs produce motives, which lead to behaviors to gratify the needs.

Rosengren's paradigm has led to some criticism that uses and gratifications' terms lack precision (Swanson, 1979). So, it is important to define terms. The term *uses* is defined as a person's selection of certain communication channels, usually measured as preferences or amount of time spent with the selected channel. A use is a specific activity that an individual performs using a communication channel. People use various channels to fulfill communication *motives* and *needs*. Motives and needs are difficult to separate since the latter is manifested in the former (Rubin, Perse, & Barbato, 1988). For clarity, a need is referred to as some sort of basic drive or problem and it produces a motive to try to solve the problem. For example, if a person has a need for interaction

with others, this need will produce the motive to seek out some sort of communication channel that will allow him or her to interact with other people. A motive is a reason that prompts a certain use. Another term that can be used to describe a motive is *gratification sought*. According to uses and gratifications, the gratifications sought can be indirectly affected by the influence of certain social and psychological characteristics (Rosengren, 1974). In terms of CMC usage these social and psychological characteristics may consist of factors of college students' lives, including social networks, social skills, and involvement in student activities.

#### *Uses and Gratifications and Interpersonal Communication*

Originally, uses and gratifications was introduced as a mass communication perspective, which sought to examine the role played by the media in people's lives. Scholars, however, have found the perspective applies to interpersonal communication research. To understand the usefulness of uses and gratifications in studying computer-mediated communication, it is important to understand how it has been applied to more traditional forms of interpersonal communication.

The five assumptions of uses and gratifications are consistent with views about interpersonal communication (Rubin & Rubin, 1985). The first assumption, which states that mass media use is goal-directed, is also true of interpersonal communication. People seek out others with whom to interact and socialize. Second, the assumption that users seek out media to gratify certain needs, coincides with many interpersonal approaches to needs such as Schutz's (1958) approach which states that people have three basic needs: inclusion, affection, and control. The third assumption states that various forms of media

compete with each other to satisfy the user's needs. This is the case with interpersonal communication as well; people choose from among their friends and family to initiate and conduct interactions with and are able to structure the interactions in a certain way. The uses and gratifications perspective assumes that the audience is able to self-report their motives for using certain media; self-report is a popular method used in interpersonal communication research also. The last assumption, which states that judgments should be withheld from research until audience motives can be explored independently, is also true of findings in interpersonal research.

Interpersonal communication research has spent a great deal of time answering the question of how communication takes place and how relationships develop, but researchers have not always been asking why communication takes place and why relationships develop (Rubin et al., 1988; Rubin & Rubin, 1985). The uses and gratifications perspective allows researchers to ask both how and why. Certain aspects of the uses and gratifications perspective that directly relate to the question of why are clearly applicable to interpersonal communication research.

An important aspect of uses and gratifications research is the importance of needs and need fulfillment. Uses and gratifications helps to understand how certain communication channels fulfill human needs and motives. Through an understanding of people's motives, information about media use in general has been discovered; thus, an understanding of people's motives for interpersonal interaction would also provide information about interpersonal communication choices and outcomes (Rubin et al., 1988). Based on the understanding of uses and gratifications research, Rubin, Perse, and

Barbato (1985) were able to not only develop an instrument to measure interpersonal communication motives, but they were able to generate information about how the uses of communication were related to a number of other factors such as demographic characteristics and communication outcomes.

Another aspect of uses and gratifications that lends itself to interpersonal research is the concept of functional alternatives. A functional alternative is another way or channel a person has for fulfilling a particular need. For example, in mass communication research, television news may be seen as a functional alternative to the newspaper as a way of gathering information about current events. In interpersonal communication, a person may have a number of different friends from whom to choose to fulfill a need for belongingness and each of these friends represents a different functional alternative. Interpersonal communication may also serve as a functional alternative to mass communication channels and vice versa (Rubin & Rubin, 1985). In more recent research, the Internet is being studied to see if it is a functional alternative to face-to-face communication (Flaherty et al., 1998; Papacharissi & Rubin, 2000).

A third aspect of uses and gratifications theory that has also been applied to recent Internet research (Papacharissi & Rubin, 2000) and is applicable to the study of interpersonal communication is the idea of ritualized versus instrumental use of communication channels. Ritualized use is a habitual use of communication channels; instrumental use is a selective use of communication channels. The patterns of ritualized and instrumental communication that are seen in interpersonal research are similar to those found in mass communication research (Rubin & Rubin, 1985). People engage in

communication with friends many times just because it is a habit and a way of passing time, which marks ritualized communication. At other times, people interact with others to find out information such as how much a pair of shoes costs at a department store; this is more instrumental communication.

Uses and gratifications is a general perspective to study both mass and interpersonal communication. The assumptions and various aspects of the approach lend themselves to extend the perspective's use beyond its initial applications. Researchers have started to expand uses and gratifications first to explore the realm of interpersonal communication (Rubin et al., 1988) and even further to explore the Internet (Papacharissi & Rubin, 2000). Now researchers are expanding even more and studying computer-mediated communication, one specific area of the Internet, from a uses and gratifications perspective.

#### Literature Review

Research on the Internet and, more specifically, on computer-mediated communication, has started to grow, but it is still in its beginning stages. One reason for this is that it is an area of study that sometimes blurs the line that exists in communication research between what is considered mass communication and what is considered interpersonal communication. Some researchers argue that CMC may actually present a new communication system, called hyperpersonal, which may need its own theories to explain the usage of these new communication technologies (Caplan, 2001; Walther, 1996).

What is interesting and possibly somewhat difficult about CMC research is that it is an area of research that can be and has been examined from a number of different perspectives or theories. All of these perspectives and theories, including Media Richness Theory (Daft & Lengel, 1984), Social Presence Model (Short, Williams, & Christie, 1976), and Social Penetration Theory (Altman & Taylor, 1973), can add something to the body of research about the subject. Regardless of whether a study was grounded in a mass communication perspective or an interpersonal theory, the findings provide researchers with the information they need to further the area of computer-mediated communication. While this thesis is mostly driven by the uses and gratifications perspective, it will be helpful to look at other types of research that have examined the uses of computer-mediated communication.

#### *General CMC Research*

Prior research has studied the Internet and CMC technologies as single technologies, which perform numerous functions. Researchers generally looked at the Internet as a whole and did not differentiate various forms of CMC or other non-CMC activities of the Internet. This might have made some sense in the 1980s and early 1990s when e-mail was virtually the only widespread CMC use of the Internet. There were, however, other communication activities then, such as bulletin boards, listservs, and MUDs and MOOs. Researchers looked at topics such as CMC compared to face-to-face communication (Flaherty et al., 1998; McKenna et al., 2002), relationship development on the Internet (McKenna et al., 2002; Parks & Floyd, 1996; Rumbough, 2001), CMC use in organizational settings (Wellman, Salaff, Dimitrova, Garton, Gulia, &

Haythornthwaite, 1996), deceptive behaviors in CMC (Rumbough, 2001), and CMC use in the area of healthcare (Scheerhorn, Warisse, & McNeilis, 1995).

Past research has shown that meaningful relationships are able to form on the Internet (McKenna et al., 2002). Parks and Floyd (1996) found that two-thirds of respondents reported forming a personal relationship with someone they had met on the Internet indicating that relationship development online is commonplace. This finding contradicts some of the earlier research findings that suggested that relationships formed online were impersonal because of a lack of nonverbal cues (Walther, 1996). The absence of cues such as physical appearance has been shown to positively affect first impressions formed online. McKenna and her colleagues (2002) found that people who met online liked one another better than they would have initially had they met face-to-face. Research found that many people used the Internet technologies as a means of initiating and establishing face-to-face relationships (Rumbough, 2001). Those who meet online many times contact each other using other forms of communication such as the telephone and face-to-face encounters (Parks & Floyd, 1996). One negative aspect of online relationship formation that has been researched is the use of deception in online behavior. Many times people pretend to be someone else or lie about aspects of their life such as age, weight, gender and geographical location (Rumbough, 2001).

Research has not only considered certain aspects of online communication or types of online behavior, but it has also looked at various settings in which CMC and the Internet are used. The Internet and its CMC capabilities have been shown to be a way for members of illness-related communities to share information and social support

(Scheerhorn et al., 1995). Bresnahan and Murray-Johnson (2002) found that women dealing with menopause and midlife transition experienced social support via CMC. A more traditional area of Internet and CMC research has been in the realm of organizational use of the technology. Much of the research looking at organizations' uses of CMC and the Internet has focused on aspects of group interactions such as decision-making, participation, agreement formation, leadership styles, and brainstorming (Wellman et al., 1996). In a meta-analysis of literature regarding the use of CMC in group decision making, researchers concluded that CMC, as compared to face-to-face communication, carries with it decreased group effectiveness, increased time needed to complete tasks, and lower satisfaction among members (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002).

*Uses and gratifications research.*

Researchers have also examined CMC and the Internet from a uses and gratifications perspective. Much has been found about people's use of CMC and Internet technologies in general. In a recent study, Rumbough (2001) found that 37% of respondents had used the Internet to meet someone new. McKenna and her colleagues (2002) also found that people are using the Internet to form new relationships with people online in addition to maintaining relationships with their family and friends. People are using the Internet as a way of maintaining relationships with friends and family whom they know offline (McKenna et al., 2002). In particular, mediated communication seems to play a role in the maintenance of one type of relationship: long-distance relationships (Dainton & Aylor, 2002). Although the telephone has been found

to be a popular means of long distance communication, computer-mediated communication has become a way for many people to maintain relationships across a distance. One explanation that Dainton and Aylor (2002) propose for people's choice to use CMC in long-distance relationships is the relative inexpensiveness and convenience of the medium.

Papacharissi and Rubin (2000) also found that interpersonal utility and convenience were two motives for people's computer use along with information seeking, entertainment, and pass time. Flanagin and Metzger (2001) found ten motive clusters for people's Internet use including information, learning, playing, leisure, persuasion, social bonding, relationship maintenance, problem solving, status, and insight. These researchers found that mediated interpersonal technologies, including both CMC and the telephone, were used mainly for social bonding, relationship maintenance, problem solving, and persuasion (Flanagin & Metzger, 2001).

*Social and psychological antecedents.*

Uses and gratifications research often looks at social and psychological antecedents that affect people's motives (Rosengren, 1974). Prior research has tended to associate those who are less socially skilled and lonelier as more likely to be users of the computer-mediated technologies because of the anonymous nature of the Internet. McKenna and her colleagues (2002) found that the Internet is a helpful way for people who are shy, lack social skills, or have social anxiety to form relationships. Specifically, they found that those who are socially anxious and lonely feel that they can better express themselves on the Internet than with the people they know offline. Caplan (2002) also

found that people who have higher levels of depression, shyness, and loneliness and lower self-esteem have a higher preference for online conversation.

Other research has found a difference in Internet usage between those adolescents who are more socially isolated and who have problems forming intimate friendships and those who do not. Adolescents who have difficulty in forming intimate friendships were more likely to be Internet users (Mesch, 2001). Other researchers have even found that the Internet has a greater importance for people who are less satisfied with their social interactions and that they use the Internet as a functional alternative to face-to-face communication (Papacharissi & Rubin, 2000). Papacharissi and Rubin (2000) found that people who found interpersonal communication to be less rewarding and were anxious about communicating in face-to-face situations used the Internet for interpersonal utility.

Involvement in offline social networks is a social characteristic that has been studied in relation to the Internet and CMC usage. Matei and Ball-Rokeach (2001) found that belonging to offline community groups increases the likelihood of a person forming relationships online. McKenna and her colleagues (2002) also found that those who were “friend-rich” offline became even richer when they got online, but also that those who were “friend-poor” increased their social circle when they got online. One particular type of offline relationship already mentioned that seems to use mediated communication, including CMC, is long-distance relationships. Many college students have used the Internet and its CMC capabilities to stay in touch with friends from high school, who attend other universities, which indicate that today’s college students have broader social

networks than ever before (Jones, 2002). Involvement in large networks may be one aspect of people's social networks that prompt their use of CMC.

Another factor that seems to be an antecedent to Internet usage is demographic characteristics such as age and gender. Whitty (2002) argues that demographic characteristics need to be examined when dealing with online activity. Weiser (2000) found that males use the Internet for entertainment and leisure, whereas women use the Internet for interpersonal communication and educational assistance. A demographic characteristic unique to the college student population is the difference in academic majors. Anderson (2001) found that students in the hard science majors (chemistry, computer science, engineering, math, and physics) might be more likely to become Internet dependent.

#### *Electronic Mail Research*

Much of the research regarding people's use of e-mail has looked at its presence in organizational settings. Golden and her colleagues (1992) concluded that due to e-mail's lack of nonverbal cues, members of organizations are more likely to use it to send task-related messages. Other research regarding organization use of e-mail suggests that the use of e-mail by key leaders within an organization, who may apply direct or indirect pressure, assist in the diffusion process of e-mail usage within the organization (Golden et al., 1992; Romm & Pliskin, 1999).

Another area of research regarding e-mail has been the comparison of the CMC technology with other forms of communication. The use of e-mail has been compared to other forms of mediated communication such as voice mail. Marold and Larsen (1999)

found that e-mail was preferred to voice mail by a sample of staff, faculty, and administration at an academic institution. E-mail has also been compared to a more traditional mode of communication: printed text, such as letters and printed documents. Hill and Monk (2000) found that e-mail was no less persuasive than a printed document received through the mail. They also found that the mode of communication (e-mail or print communication) did not affect the way messages and the senders of these messages are rated by respondents.

*Uses and gratifications research.*

Researchers have started to look specifically at e-mail from a uses and gratifications perspective as well. What many researchers have found is that people are using e-mail as an effective way to sustain relationships (Stafford et al., 1999). In a recent study, Dimmick and his colleagues (2000) compared gratifications of e-mail and telephone usage. They found that e-mail's ability to allow for asynchronous communication was an advantage it held over the telephone. E-mail allowed people to communicate with friends and family who lived far away, or in different time zones, and with those who they did not have time to connect with in person. These researchers found that a gratification that e-mail fulfilled is the ability to communicate and maintain relationships with people even when face-to-face and telephone communication is not possible because of distance or schedules. The gratification opportunities that e-mail presents are part of the reason that people are motivated to use it as a means of sustaining relationships. Some of these gratification opportunities include that it is faster than postal mail, but cheaper than the telephone (Stafford et al., 1999). E-mail is also a convenient

way to voice opinions, share information and ideas with friends and family who lived in different time zones and different places and those with different schedules (Stafford et al., 1999). Information seeking and entertainment have been found to be motives for the use of e-mail also (Papacharissi & Rubin, 2000).

*Social and psychological antecedents.*

Stafford and her colleagues (1999) found that demographic characteristics such as age, income level, and education signify home e-mail users from nonusers. Home e-mail users are younger and have a higher level of income and education than nonusers. Gender also seems to be a factor in use of e-mail. Females tend to communicate via e-mail more than males (Weiser, 2000). E-mail also tends to be a technology more likely to be used by a younger population (Weiser, 2000).

*Instant Messaging*

Research regarding instant messaging is not nearly as abundant as the research available on general CMC/Internet usage and e-mail usage. The research that has been conducted seems to indicate that instant messaging appears to be a technology that is widely used by a younger population. Teenagers, in particular, use it to ask each other out, to break up with each other, and to make plans with friends (Lenhart, Rainie, & Lewis, 2001). Hard af Segerstad and Ljungstrand (2002) found that college students use WebWho, a web-based instant messaging program, to collaborate on assignments and to coordinate social activities. This finding suggests that instant messaging is used for both task and social activities and has instrumental and ritual uses. Leung (2001) found that students' motives for ICQ differed depending on whether they were heavy or light users.

Heavy use of ICQ was motivated by affection and sociability; light ICQ use on the other hand was motivated by keeping up with fashion trends. Leung (2001) found that males used ICQ to fill time between classes; females on the other hand used ICQ to show or seek affection and to socialize with friends. One aspect of instant messaging that is an advantage it holds over the telephone is its ability to enable users to multi-task. Instant messaging allows users to have multiple synchronous conversations at once (Lenhart et al., 2001).

### *Online Chat Rooms*

Research regarding online chat rooms is another area that has not been researched as heavily as general CMC or e-mail usage. It has been explored however, more than instant messaging. One particular area of interest has focused on users' perceptions of those with whom they are communicating. Markey and Wells (2002) found that in group interactions in chat rooms people saw little difference among the personalities of the various people with whom they were interacting. One reason given by the researchers for this finding is the chaotic nature of group chat rooms. People's communication behavior has also been an area of interest regarding chat rooms, particularly that of deceptive behavior. Whitty (2002) found that people who spend more time in chat rooms are more likely to be open about themselves. He also found some gender differences in regard to deceptiveness. Men are more likely to lie than women, and specifically they are more likely to lie about their socioeconomic status.

Another area of interest with chat rooms is linguistics, examining aspects of the statements used in chat rooms. Research has found that aspects of people's statements

have an effect on the reciprocal communication in a chat room. The length of statements by users in a chat room is positively related to reciprocal communication in a chat room (Rollman, Krug, & Parente, 2000). The type of statements used in chat rooms also has an effect on reciprocal communication. Provocative statements, those that are offending or derogatory to a specific person in a chat room or to the entire group in a chat room, elicit a higher amount of reciprocal communication than other types of statements (Rollman & Parente, 2001). When Stone and Pennebaker (2002) examined the content of conversations in chat rooms following the death of Princess Diana, they found that conversation patterns followed similar ones that occur in face-to-face interaction regarding collective grief.

Some limited research has looked at people's motives for using online chat rooms. Motivations for online chat rooms include seeking conversation and initiating relationships with others (Peris et al., 2002). Whitty (2002) found that 63% of respondents found some emotional support from the use of chat rooms. Stone and Pennebaker (2002) examined the use of chat rooms for coping following the death of Princess Diana and found that some people use online chat rooms as a way of coping with trauma.

Researchers have examined characteristics about the people who use online chat rooms. Peris et al. (2002) found, contrary to the belief of many, shyness and emotional instability were not characteristics of chat users as a whole. Peris et al. (2002) found that people who engage in and fulfill social needs through online chat are just as able to fulfill these needs through face-to-face interactions as well. In fact, Peris et al. (2002)

concluded that online relationships are healthy and complement face-to-face relationships. A finding that may contradict that of Peris et al. (2002) is that of Markey and Wells (2002). They found that individuals who were introverts became moderate extraverts in chat rooms, which may indicate that the anonymous nature provided by chat rooms allow individuals to be less shy and more outgoing. Rumbough (2001) also found a difference between men and women's CMC use in that women are more likely than men to disclose personal information about themselves in chat rooms. Age is another demographic characteristic that has been explored. People aged 21-55 found more emotional support from chat rooms than did those aged 17-20 (Whitty, 2002).

#### Focus of the Proposed Study

A goal of this proposed study is to build on the literature of general CMC and e-mail uses and gratifications, but also to expand the literature on uses and gratifications of instant messaging and online chat rooms. I would like to answer the following questions: What are the uses college students report for e-mail, instant messaging, and online chat rooms? What motives drive college students' use of e-mail, instant messaging, and online chat rooms? Are there differences between e-mail, instant messaging, and online chat rooms regarding uses and motives? Are there social, psychological, and demographic antecedents that affect CMC use? Three constructs are contained in the previous questions, which will be explored in this study: uses of CMC, motives for use of CMC, and social, psychological, and demographic antecedents that affect motives.

Uses of CMC refer to the reasons that college students give for using a particular form of CMC and with whom they are communicating via CMC. For example, a use

would be if a college student reports using e-mail to contact classmates. Knowing the reasons that college students report using CMC technologies can add valuable information to this area of research. Research has found that CMC users communicate with friends and family, and in particular, those who live far away (Dainton & Aylor, 2002; McKenna et al., 2002). Other research has found that people are using CMC and the Internet as a means of meeting new people (Rumbough, 2001). This study attempts to explore the specific uses of e-mail, instant messaging, and online chat rooms by college students and discover any differences in the uses between these three forms of CMC. Researchers have also been concerned with discovering people's motives for using CMC.

A motive refers to the gratifications a person seeks from a particular media, or in this case a particular form of CMC. Several motives have been found by researchers for CMC and Internet use. Interpersonal utility, convenience, information seeking, entertainment, and to pass time are motives for Internet usage found by Papacharissi and Rubin (2000). Other researchers have found that motives for interpersonal mediated communication have included persuasion, social bonding, relationship maintenance, and problem solving (Flanagin & Metzger, 2001). Researchers have looked at motives of specific forms of CMC. Peris et al. (2002) found that seeking conversation and initiating relationships were two motives for chat room use. More research needs to be done examining the specific motives for e-mail, instant messaging, and online chat room use, which is what this study proposes to do.

The uses and motives that have been identified for CMC thus far by researchers seem to fall along two continuums. They appear to be either task or social related or instrumental or ritualized. These two factors have been found in past uses and gratifications research. Rubin (1984) found that people's motives for television viewing were either intentional or habitual indicating the instrumental or ritualized elements, respectively, of media use. Past research in television viewing has also indicated that motives for such activity include seeking information, which coincides with the idea of a task-related motive, and using television to seek interpersonal connection with others, which coincides with the idea of a social-related motive (Rubin & Bantz, 1987). In more recent research regarding CMC use, Papacharissi and Rubin (2000) concluded that there are instrumental and ritualized elements to people's motives for Internet usage. People who use the Internet to find information may be more instrumental in their usage than those who use it to pass time or for entertainment, these motives may be more ritualized in nature. Examining how people's motives and uses fall along these continuums may provide information indicating that a particular form of CMC may be more instrumental in use or more ritual in use; this study will attempt to look at this aspect of CMC use.

This study will also examine antecedents for CMC use. Social, psychological, and demographic antecedents refer to variables about people or their social situation that can have an effect on media use. A number of psychological antecedents regarding social skills have been studied by researchers looking at CMC. A great deal of research has found that people who are shy, lonely, anxious about communicating, and less satisfied with their social relationships are more likely to use the Internet or CMC

(Caplan, 2002; Markey & Wells, 2002; McKenna et al., 2002; Papacharissi & Rubin, 2000). Peris et al. (2002) found contradicting evidence for these past claims; they found that shyness and emotional instability were not characteristics of Internet chat users. The contradicting findings regarding psychological and social antecedents to CMC use require more research to be conducted in the area.

Another social characteristic of college students that might relate to their CMC usage is their level of involvement in student activities. This has not been studied previously by researchers, however, it is a unique aspect of college life as students are many times involved in a number of different campus activities, including Greek organizations, service organizations, student government organizations, just to name a few of the many possible activities. Given that CMC use has taken hold in the college student population with almost half using it to contact classmates and 42% using it primarily to communicate socially (Jones, 2002), it holds that students will use CMC to communicate with fellow members of student organizations. These organizations are many times more task-related than social-related, which may indicate a different type of CMC use.

CMC use has also been shown to be affected by demographic antecedents. One such antecedent that has been previously studied is gender; males and females have been found to use the Internet and CMC differently from each other. Females tend to use the Internet for interpersonal communication and communicate via e-mail more often than males; whereas males use the Internet more for leisure (Weiser, 2000). Age has also been explored by researchers indicating that many of the CMC technologies are used

more often by a younger audience (Weiser, 2000). Age differences in chat room use has also been looked at and results suggest that people aged 21-55 find more support from online chat rooms than their 17-20 counterparts (Whitty, 2002). While most college students are within a relatively small age difference from one another, the previous finding suggests that there may be a difference between first and second year college students and those who are in their third or fourth year. So, age and year in school may indicate differences in CMC usage. Anderson's (2001) finding that Internet use differs across academic major also points to a demographic antecedent unique to the college student population that should be explored.

#### Research Questions and Hypotheses

The first goal of this study is to explore the uses, or reasons, college students report for using e-mail, instant messaging, and online chat rooms. Other studies have failed to separate CMC into specific forms to examine the differences between the various forms of CMC. The following research questions are posed to attempt to reach this goal:

RQ1a: What are college students' uses for e-mail?

RQ1b: What are college students' uses for instant messaging?

RQ1c: What are college students' uses for online chat rooms?

RQ1d: Do the uses of e-mail, instant messaging, and online chat rooms differ from one another?

Research findings indicate that people use e-mail as a way of communicating with others who live far away such as friends and family (Dimmick, Kline, & Stafford, 2000;

Stafford, Kline, & Dimmick, 1999). Research on instant messaging has shown that people use it to communicate with people they also interact with in face-to-face settings on a regular basis such as friends and classmates for reasons such as collaborating on assignments and planning social activities (Hard af Segerstad & Ljungstrand, 2002; Lenhart et al., 2001). Research on online chat rooms has found that a use of this type of CMC is to meet new people (Peris et al., 2002). Also research in the area of organizations suggests that e-mail is used to send task-related messages (Golden et al., 1992). Instant messaging, however, is used for both task and social activities (Hard af Segerstad & Ljungstrand, 2002). Online chat rooms have also been found to be used for social activities (Pennebaker, 2002; Peris et al, 2002; Whitty, 2002). These findings prompt the following hypotheses:

H1a: College students will use e-mail more than instant messaging to communicate with members of their social networks who do not live in the same geographic area.

H1b: College students will use e-mail more than online chat rooms to communicate with members of their social networks who do not live in the same geographic area.

H2a: College students will use e-mail more than online chat rooms to communicate with people they know offline.

H2b: College students will use instant messaging more than online chat rooms to communicate with people they know offline.

H2c: College students will use online chat rooms more than e-mail to communicate with people they do not know offline.

H2d: College students will use online chat rooms more than instant messaging to communicate with people they do not know offline.

H3a: College students will use e-mail more than online chat rooms for task-related communication.

H3b: College students will use instant messaging more than online chat rooms for task-related communication.

H4a: College students will use online chat rooms more than e-mail for social-related communication.

H4b: College students will use instant messaging more than e-mail for social-related communication.

The second goal of this study is to examine the motives, or gratifications sought, of college students for e-mail, instant messaging, and online chat rooms. Previous research has identified motives for CMC in general and for certain types of CMC, but they have not attempted to compare the motives for different forms of CMC to identify differences between the forms, possibly along the continuums of task-social and instrumental-ritualized previously mentioned. The following research questions are posed to attempt to reach this goal:

RQ2a: What are college students' motives for e-mail use?

RQ2b: What are college students' motives for instant messaging use?

RQ2c: What are college students' motives for online chat room use?

RQ2d: Do the motives of e-mail, instant messaging, and online chat rooms differ from one another?

Research has found that the speed and inexpensiveness of e-mail has been a motive for people's use of this form of CMC (Stafford et al., 1999). Maintaining relationships has also been reported as a motive of both e-mail and instant messaging use (Dimmick et al., 2000; Leung, 2001; Stafford et al., 1999). These motives, however, have not been reported in the literature regarding online chat rooms. Research has shown that a motive for people's use of online chat rooms is emotional support (Pennebaker, 2002; Whitty, 2002). These findings prompt the following hypotheses:

H5: College students will report convenience as a motive for using e-mail more than for using online chat rooms.

H6a: College students will report maintaining relationships as a motive for using e-mail more than online chat rooms.

H6b: College students will report maintaining relationships as a motive for using instant messaging more than online chat rooms.

H7: College students will report emotional support as a motive for using online chat rooms more than for using e-mail.

Past research has found support for the idea of people having both instrumental and ritualized uses for the Internet (Papacharissi & Rubin, 2000). Based on this finding, it seems likely that people would have instrumental and ritualized uses for technologies available through the Internet such as e-mail, instant messaging, and online chat rooms.

The next hypotheses concern instrumental and ritual uses of CMC. Because I expect college students to report instrumental uses for e-mail more than for online chat rooms:

H8a: College students will report information seeking as a motive for e-mail more than for online chat rooms.

H8b: College students will report interpersonal utility as a motive for e-mail more than for online chat rooms.

Because I expect college students to report ritualized uses for instant messaging more than for e-mail:

H8c: College students will report convenience as a motive for instant messaging more than e-mail.

H8d: College students will report passing time as a motive for instant messaging more than e-mail.

H8e: College students will report entertainment as a motive for instant messaging more than e-mail.

Because I expect college students to report ritualized uses for online chat rooms more than for e-mail:

H8f: College students will report passing time as a motive for online chat rooms more than e-mail.

H8g: College students will report entertainment as a motive for online chat rooms more than e-mail.

The third goal of this study is to identify social, psychological, and demographic antecedents of e-mail, instant messaging, and online chat room use. Previous research

has identified antecedents, but some of the findings have been contradictory, and previous findings have not often identified the difference in motives and uses of CMC in terms of these antecedents. Four specific areas of antecedents will be examined in this study.

The first of these antecedents is level of social adeptness of CMC users. This concept will be explored by looking at four psychological conditions that affect social skills that have been commonly found in past research on Internet and CMC use: shyness, loneliness, unwillingness to communicate, and interpersonal communication satisfaction. Shyness can be defined as “discomfort and inhibition in the presence of others” (Leary, 1991, p. 182). Loneliness can be defined as the emotional response to the discrepancy between desired and actual social contact (Shaver & Brennan, 1991). Unwillingness to communicate can be defined as the continuous tendency to avoid oral communication (Rubin, 1994). It consists of two dimensions: Approach-Avoidance, which is the likeliness of a person engaging in communication with others, and Reward, which is how rewarding people find communication with others (Rubin, 1994). Interpersonal communication satisfaction can be defined as “the positive reinforcement provided by a communication event that fulfills positive expectations” (Graham, 1994, p. 217). Because of the contradicting findings in this area of research, the following research questions are proposed:

RQ3a: Is shyness related to college students’ uses and motives for e-mail, instant messaging, and online chat rooms?

RQ3b: Is loneliness related to college students' uses and motives for e-mail, instant messaging, and online chat rooms?

RQ3c: Is finding communication rewarding related to college students' uses and motives for e-mail, instant messaging, and online chat rooms?

RQ3d: Is communication avoidance related to college students' uses and motives for e-mail, instant messaging, and online chat rooms?

RQ3e: Is interpersonal communication satisfaction related to college students' uses and motives for e-mail, instant messaging, and online chat rooms?

People who experience shyness, loneliness, less satisfaction with interpersonal communication, and anxiousness about oral communication are more likely to use the Internet and CMC (Caplan, 2002; Markey & Wells, 2002; McKenna et al., 2002; Papacharissi & Rubin, 2000). These findings prompt the following hypotheses:

H9a: Shyness will be positively related to amount of time spent in online chat rooms.

H9b: Shyness will be negatively related to amount of time spent instant messaging.

H9c: Shyness will be negatively related to amount of time spent e-mailing.

H10a: Loneliness will be positively related to amount of time spent in online chat rooms.

H10b: Loneliness will be negatively related to amount of time spent instant messaging.

H10c: Loneliness will be negatively related to amount of time spent e-mailing.

H11a: Communication avoidance will be positively related to amount of time spent in online chat rooms.

H11b: Finding communication rewarding will be negatively related to amount of time spent in online chat rooms.

H11c: Communication avoidance will be positively related to amount of time spent instant messaging.

H11d: Finding communication rewarding will be negatively related to amount of time spent instant messaging.

H11e: Communication avoidance will be positively related to amount of time spent e-mailing.

H11f: Finding communication rewarding will be negatively related to amount of time spent e-mailing.

H12a: Interpersonal communication satisfaction will be negatively related to amount of time spent in online chat rooms.

H12b: Interpersonal communication satisfaction will be positively related to amount of time spent instant messaging.

H12c: Interpersonal communication satisfaction will be positively related to amount of time spent e-mailing.

The second antecedent that will be explored in this study is the offline social networks of college students. As not much prior research regarding social networks and CMC use has been examined, another goal of this study is to explore whether college students who are involved in a large number of offline social relationships/networks have

different motives and uses for e-mail, instant messaging, and online chat rooms, than college students who are not involved in a large number of offline social relationships/networks.

While research has not previously looked at how the size of a person's social network affects Internet or CMC usage, people who are a part of a large social network may be attracted to the convenience of forms of CMC as a way to communicate. This follows with the findings that people use e-mail and instant messaging as a way to maintain relationships. Thus CMC usage may be higher for those types of CMC that enable people with large social networks to be able to easily maintain these large networks. This reasoning prompts the following hypotheses:

H13a: Involvement in offline social relationships/networks will be negatively related to amount of time spent in online chat rooms.

H13b: Involvement in offline relationships/networks will be positively related to amount of time spent instant messaging.

H13c: Involvement in offline relationships/networks will be positively related to amount of time spent e-mailing.

The research that has looked at the types of relationships CMC users are involved in has found that people involved in long distance relationships use mediated communication as a way of maintaining the relationship (Jones, 2002; Matei & Ball-Rokeach, 2001). Another interest of this study is whether the type of offline social relationship affects college students' motives and uses of e-mail, instant messaging, and online chat rooms.

H14a: Involvement in long distance relationships will be positively related to amount of time spent instant messaging.

H14b: Involvement in long distance relationships will be positively related to amount of time spent e-mailing.

The third antecedent that will be examined in this study is college students' level of involvement in student activities such as Greek organizations, service organizations, and student government organizations. Although research has not been conducted to examine this specific antecedent, involvement in student activities may prompt more task-related or instrumental use of forms of CMC. So another goal of this study was to explore if college students who are involved in student activities have different motives and uses for e-mail, instant messaging, and online chat rooms than students who are not involved in student activities.

H15: Involvement in student activities will be positively related to amount of time spent e-mailing.

The final antecedent that will be explored in this study is the demographic characteristics of CMC users. The specific characteristics to be examined in this study are gender, age, and academic major. Females have been found to use e-mail more than males (Weiser, 2000). Males and females report different motives for instant messaging use as well. Males report using instant messaging to pass time; women report using instant messaging to maintain relationships (Leung, 2001). Age of CMC users has also shown a difference in instant messaging use. Whitty (2002) found that people aged 17-20 reported finding less emotional support than people aged 21-55. Another finding

regarding demographic characteristics of CMC users is that college students in the hard science majors are more likely to become dependent on the Internet (Anderson, 2001). So, the final area of study focused on differences in how gender, age, and academic major are revealed in motives and uses of e-mail, instant messaging, and online chat rooms.

H16: Female college students will spend more time e-mailing than male college students.

H17: Males will report passing time as a motive for instant messaging use more than females.

H18: Females will report maintaining relationships as a motive for instant messaging use more than males.

H19: College students who are 17-20 years of age will use instant messaging more than college students 21 years of age and older.

H20: College students who are 17-20 years of age will report emotional support as a motive for using online chat rooms less than college students 21 years of age or older.

H21a: College students in the hard science majors (chemistry, computer science, engineering, math, and physics) will use e-mail more than students in majors other than hard sciences.

H21b: College students in the hard science majors (chemistry, computer science, engineering, math, and physics) will use instant messaging more than students in majors other than hard sciences.

H21c: College students in the hard science majors (chemistry, computer science, engineering, math, and physics) will use online chat rooms more than students in majors other than hard sciences.

These research questions and hypotheses will be tested in the present study.

## Chapter 2

### **METHOD**

#### Procedure

This study was designed to examine college students' uses and motives as well as social and psychological influences for three forms of computer-mediated communication: e-mail, instant messaging, and online chat rooms. In Spring 2003, a questionnaire was distributed to 446 students enrolled in undergraduate communication courses at the University of Delaware. Respondents were asked to complete confidential and anonymous questionnaires during scheduled class meetings or were asked to complete them at home and brought back to class. Respondents were informed that their participation was voluntary.

The questionnaire was designed to measure the following: e-mail, instant messaging, and online chat rooms uses and motives, and the psychological and social antecedents: shyness, loneliness, unwillingness to communicate, interpersonal communication satisfaction, social networks, and involvement in student activities. The following demographic characteristics were also obtained: gender, age, year in school, number of years using computers, type of Internet connection, speed of connection, computer expertise, and academic major.

## The Nature of the Sample

The sample was composed of 446 students enrolled in three separate undergraduate classes at the University of Delaware. The sample was 37.7% ( $n = 168$ ) male and 62.3% ( $n = 278$ ) female. The respondents ranged from 18 to 33 years of age, with the mean age being 19.80 years ( $SD = 1.52$ ). For statistical analysis, the respondents were divided into two age categories: 1) those 17 to 20 years of age and 2) those 21 years of age or older. The sample was 70.2% ( $n = 313$ ) 17 to 20 years of age and 29.7% ( $n = 133$ ) 21 years of age or older.

### *Class and Major*

The respondents were instructed to indicate their year in school by circling it from a list provided. First-years accounted for 30.5% of the sample ( $n = 136$ ), sophomores 33.6% ( $n = 150$ ), juniors 16.6% ( $n = 74$ ), and seniors 18.8% ( $n = 84$ ). Two respondents (0.4%) indicated “Other” as their class standing. The respondents were instructed to indicate their major by writing it into a blank. The overall sample represented 61 majors at the University of Delaware. The largest group was Undeclared/Undecided, which accounted for 15.2% of the sample ( $n = 68$ ). The second largest group was Communication majors, which accounted for 13.9% ( $n = 62$ ). The third largest group was Economics majors, which accounted for 6.5% ( $n = 29$ ). The fourth largest group was Exercise Science majors, which accounted for 6.3% ( $n = 28$ ). In order to test hypothesis 21, the majors were recoded to represent hard science majors (3.6%,  $n = 16$ ) and nonhard science majors (94.8%,  $n = 423$ ).

### *Computer Access and Experience*

The respondents were instructed to indicate whether they had access to a computer and to the Internet where they lived right now. Virtually all students had access to a computer (98.0%,  $n = 437$ ) and to the Internet (97.3%,  $n = 434$ ). The respondents who had access to the Internet were also instructed to indicate the type of Internet connection they had by circling it from a list provided. About half of all respondents (50.9%,  $n = 227$ ) indicated using an Ethernet connection. Cable High Speed Access was the second highest indicated (20.0%,  $n = 89$ ) followed by Dial-up Modem (15.5%,  $n = 69$ ). Respondents were also asked to estimate their own computer expertise on a seven-point scale (from 1 = “Novice,” to 7 = “Expert”). Overall, respondents indicated a slightly higher than average level of expertise ( $M = 4.49$ ,  $SD = 1.06$ ).

### Uses

Uses of e-mail, instant messaging, and online chat rooms were measured by presenting subjects with a list of 5-point Likert-type statements for each of the three forms of CMC being studied. The lists were generated from the findings of a number of studies (Dimmick et al., 2000; Hard af Segerstad & Ljungstrand, 2002; Lenhart et al., 2001; Stafford et al., 1999). Prior to responding to each of the three lists of uses, subjects were asked a conditional question to assess whether they had used the particular form of CMC under question. If so, they then responded to the list of statements, if not, they moved onto the next section. The same statements were used for each of the three forms of CMC, but in a different order to avoid order effects.

The list of uses presented statements that contained task and social-related uses. Task-related uses included statements such as “I use e-mail to ask professors about material covered in class.” Social-related uses included statements such as “I use e-mail to keep in touch with friends.” See Table 1 for the list of statements and descriptive statistics.

Respondents were also asked to report how many minutes they spend online on a typical day using e-mail ( $M = 39.90$ ,  $SD = 139.85$ ), using instant messaging ( $M = 204.34$ ,  $SD = 1006.90$ ), and using online chat rooms ( $M = 68.22$ ,  $SD = 225.28$ ). The length of time, in years, that respondents had used e-mail ( $M = 7.64$ ,  $SD = 13.33$ ), instant messaging ( $M = 6.18$ ,  $SD = 10.72$ ), and online chat rooms ( $M = 10.80$ ,  $SD = 23.40$ ) was also measured.

Table 1

## Descriptive Statistics of CMC Uses

I use (technology) to:	E-mail		Instant messaging		Online chat rooms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Keep in touch with friends.	3.94	0.96	4.60	0.70	2.98	1.33
2. Meet new people.	1.51	0.85	1.69	0.99	2.14	1.17
3. Keep in touch with friends or relatives who live far away.	3.86	1.01	3.87	1.14	2.53	1.33
4. Keep in touch with people I've met online.	1.71	1.05	1.93	1.22	2.09	1.26
5. Let professors know why I missed/will miss class.	3.58	1.05	1.64	1.13	1.62	1.04
6. Ask professors questions about material covered in class.	3.53	1.05	1.65	1.08	1.66	1.10
7. Coordinate group assignments with classmates.	3.36	1.05	3.00	1.17	2.12	1.27
8. Keep in touch with boyfriend/ girlfriend.	2.75	1.40	3.23	1.48	1.99	1.21
9. For a way to do research.	2.59	1.30	2.10	1.28	2.14	1.29
10. Ask classmates questions about material covered in class.	2.98	1.12	3.46	1.01	2.16	1.31
11. Find others who have the same interests.	1.47	0.83	1.76	1.05	2.27	1.24
12. Keep in touch with people I only know online.	1.82	1.22	2.88	1.56	2.33	1.35

Table 1 continued

	E-mail		Instant messaging		Online chat rooms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
I use (technology) to:						
13. Keep in touch with family or relatives.	3.80	1.06	3.77	1.15	2.31	1.32
14. Make friends of the opposite sex.	1.45	0.85	1.86	1.13	2.03	1.22
15. Keep in touch with boyfriend/girlfriend who lives far away.	2.46	1.44	2.96	1.54	1.72	1.11
16. Talk to business and professional contacts.	2.74	1.29	2.05	1.20	1.57	0.99
17. Send and receive files.	3.58	1.01	3.34	1.16	2.20	1.34

*Note.* 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very Frequently.

## Motives

Motives for using e-mail, instant messaging, and online chat rooms were measured using 5-point Likert-type statements for each of the three forms of CMC being studied. The lists of motives have been generated from the findings of a number of different studies (Lenhart et al., 2001; Leung, 2001; Papacharissi & Rubin, 2000; Stone & Pennebaker, 2002; Peris et al., 2002; Stafford et al., 1999; Whitty, 2002). Prior to responding to each of the three lists of uses, subjects were asked a conditional question of whether they have used the particular form of CMC under question. If so, they then responded to the list of statements, if not, they moved onto the next section. The same statements were used for each of the three forms of CMC, but in a different order so as not to sensitize the subjects to the order.

There were four clerical errors in the preparation of the questionnaire. The statement “Because I enjoy answering questions” was inadvertently not included in the instant messaging and online chat rooms lists of motives. The statement “Because I wonder what other people said” was inadvertently not included in the e-mail list of motives. The wording of two statements, “Because people don’t have to be there to receive e-mail” and “Because it is easier to e-mail than to talk to some people,” was not changed to reflect a focus on instant messaging and online chat rooms.

Table 2

## Descriptive Statistics of CMC Motives

	E-mail		Instant messaging		Online chat rooms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
I use (technology):						
1. Because it is entertaining.	3.10	1.10	3.65	1.15	2.92	1.14
2. Because it is enjoyable.	3.21	1.07	3.78	1.03	2.82	1.21
3. Because it is fun.	3.10	1.09	3.74	1.07	2.84	1.20
4. Because it relaxes me.	2.55	1.09	3.14	1.29	2.47	1.21
5. To not look old-fashioned.*	1.83	0.96	1.82	1.07	1.54	0.79
6. To look stylish.*	1.70	0.90	1.72	0.97	1.60	0.84
7. To look fashionable.*	1.64	0.87	1.68	0.95	1.54	0.82
8. To feel involved with what's going on with other people.	3.05	1.23	3.20	1.20	2.20	1.16
9. Because I need someone to talk to or be with.	2.06	1.07	2.65	1.17	1.97	1.06
10. Because I just need to talk about my problems sometimes.	2.20	1.15	2.85	1.22	1.89	1.12
11. To feel less inhibited when I communicate.	2.38	1.13	2.67	1.21	2.28	1.22
12. To help others.	2.73	1.12	3.00	1.14	2.04	1.09
13. Because it is inexpensive.	3.40	1.24	3.62	1.21	2.64	1.33
14. Because people don't have to be there to receive e-mail.**	3.56	1.14	-	-	-	-

Table 2 continued

	E-mail		Instant messaging		Online chat rooms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
I use (technology):						
15. Because it is easier to e-mail than talk to some people.**	3.29	1.19	-	-	-	-
16. To give me something to occupy my time.	2.55	1.16	3.76	1.11	2.90	1.24
17. Just because it is available.	3.14	1.15	3.84	1.03	2.87	1.70
18. When I have nothing better to do.	2.60	1.15	3.80	1.11	2.87	1.22
19. Because it's thrilling.	1.84	1.01	2.33	1.16	1.98	1.04
20. When there is no one else to talk or be with.	2.13	1.10	3.06	1.30	2.35	1.24
21. Because it passes the time away, particularly when I am bored.	2.48	1.19	3.74	1.15	2.76	1.26
22. To show others encouragement.	2.46	1.20	2.98	1.23	2.04	1.10
23. To feel connected to other people.	2.98	1.22	3.36	1.20	2.30	1.14
24. Because it makes me feel less lonely.	1.99	1.07	2.49	1.27	2.04	1.09
25. Because it's a habit, just something I do.	2.88	1.23	3.69	1.15	2.57	1.28
26. Because it is more comfortable than talking to people face to face.	2.49	1.16	2.77	1.21	2.45	1.20
27. So I won't have to feel alone.	1.80	0.94	2.10	1.17	1.88	1.00
28. Because I can express myself freely.	2.56	1.19	2.78	1.22	2.32	1.16
29. To be anonymous.	1.79	0.99	1.77	1.06	2.03	1.09

Table 2 continued

I use (technology):	E-mail		Instant messaging		Online chat rooms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
30. So I can get away from what I'm doing.	2.46	1.80	3.30	1.18	2.54	1.23
31. To tell others what to do.	2.18	1.04	2.41	1.18	1.84	1.07
32. To get someone to do something for me.	2.49	1.11	2.63	1.21	1.79	0.94
33. Because I can pretend to be anyone I want to be when interacting with other people online.	1.57	0.91	1.77	1.11	2.03	1.12
34. To belong to a group.*	1.69	0.98	1.69	1.00	1.89	1.02
35. Because I enjoy answering questions.**	2.01	1.08	-	-	-	-
36. To get more points of view.	2.26	1.15	2.94	1.24	2.13	1.13
37. Because it is easy.	3.58	1.14	4.07	0.95	2.79	1.23
38. To get information for free.	3.20	1.31	2.90	1.36	2.36	1.35
39. To look for information.	3.03	1.26	2.52	1.29	2.14	1.19
40. To see what is out there.	2.66	1.29	2.44	1.21	2.36	1.14
41. I just like to use it.	3.32	1.19	4.16	0.98	2.96	1.31
42. To thank people.	3.39	1.12	3.32	1.18	2.01	1.11
43. To let others know I care about their feelings.	3.08	1.25	3.42	1.23	2.05	1.02
44. Because I am concerned about others.	3.03	1.27	3.38	1.19	2.02	1.10

Table 2 continued

	E-mail		Instant messaging		Online chat rooms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
I use (technology):						
45. Because it is a pleasant rest.	2.44	1.16	3.50	1.08	2.37	1.17
46. Because it makes me feel less tense.	2.18	1.07	3.01	1.18	2.14	1.13
47. To get away from pressures and responsibilities.	2.28	1.15	3.27	1.18	2.35	1.20
48. To put something off that I should be doing.	2.89	1.27	3.98	1.09	2.40	1.27
49. To forget about my problems.	2.05	1.04	2.58	1.17	2.02	1.06
50. So I can have control over when and if I respond.	2.90	1.26	3.22	1.27	2.33	1.17
51. So I can have electronic copies of my correspondence.	2.65	1.26	2.09	1.17	2.23	1.18
52. Because I wonder what other people said.**	-	-	3.02	1.16	2.14	1.16

*Note.* 1 = Strongly Disagree, 2 = Disagree Some, 3 = Agree Some and Disagree Some, 4 = Agree Some, 5 = Strongly Agree.

\*motive statements with very low salience that were not included in further analyses.

\*\* motive statements that were affected by a clerical error.

## Measures

### *Shyness*

Shyness was measured using the nine-item Shyness Scale (Cheek & Buss, 1981). Respondents were asked to answer on a 5-point Likert-type scale how much they agreed (from 1 = “Strongly Disagree” to 5 = “Strongly Agree”) with the statement. Table 3 summarizes the means and standard deviations of the statements. The scale has been used reliably in prior research ( $\alpha = .79$ , Cheek & Buss, 1981). To create an overall shyness score for each respondent, the responses to the items in the scale were summed and averaged. The mean score was 2.40 ( $SD = 0.76$ ) and the median was 2.44. The Cronbach alpha reliability coefficient for the nine-item scale was .87.

Table 3

Descriptive Statistics of the Shyness Scale

	<i>M</i>	<i>SD</i>
1. I am somewhat socially awkward.	2.17	1.01
2. I find it hard to talk to strangers.	2.40	1.09
3. I feel tense when I'm with people I don't know well.	2.65	1.04
4. When talking, I worry about saying something dumb.	2.67	1.08
5. I feel nervous when speaking to someone in authority.	2.73	1.06
6. I am often uncomfortable at parties and other social functions.	2.29	1.13
7. I feel inhibited in social situations.	2.22	1.02
8. I have trouble looking someone right in the eye.	2.08	1.05
9. I am shyer with members of the opposite sex.	2.41	1.16

*Note.* 1 = Strongly Disagree, 2 = Disagree Some, 3 = Agree Some and Disagree Some, 4 = Agree Some, 5 = Strongly Agree.

### *Loneliness*

Loneliness was measured using the 20-item revised UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1980). Respondents were asked to answer on a 5-point Likert-type scale how much they agreed (from 1 = “Strongly Disagree” to 5 = “Strongly Agree”) with each of the 10 positively-worded and 10 negatively-worded statements. Table 4 summarizes the means and standard deviations of the statements. The scale has been used reliably in prior research ( $\alpha = .94$ , Shaver & Brennan, 1991). To create an overall loneliness score for each respondent, the responses to the items in the scale were summed and averaged. The mean score was 1.97 ( $SD = 0.69$ ) and the median was 1.78. The Cronbach alpha reliability coefficient for the 20-item scale was .94.

Table 4

## Descriptive Statistics of the Loneliness Scale

	<i>M</i>	<i>SD</i>
1. I feel in tune with the people around me.*	2.38	0.89
2. I lack companionship.	1.95	1.03
3. There is no one I can turn to.	1.62	0.92
4. I do not feel alone.*	2.04	1.11
5. I feel part of a group of friends.*	1.85	0.97
6. I have a lot in common with the people around me.*	2.06	1.04
7. I am no longer close to anyone.	1.71	0.92
8. Those around me do not share my interests and ideas.	2.03	1.01
9. I am an outgoing person.*	2.34	1.05
10. There are people I feel close to.*	1.72	0.96
11. I feel left out.	1.91	1.00
12. My social relationships are superficial.	1.99	1.00
13. No one really knows me well.	2.01	1.08
14. I feel isolated from others.	1.80	1.00
15. I can find companionship when I want it.*	2.41	1.15
16. There are people who really understand me.*	1.96	1.00
17. I am unhappy being so withdrawn.	2.02	1.13
18. People are around me but not with me.	2.05	1.02
19. There are people I can talk to.*	1.74	0.98

Table 4 continued

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	<i>M</i>	<i>SD</i>
20. There are people I can turn to.*	1.71	0.94

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*Note.* 1 = Strongly Disagree, 2 = Disagree Some, 3 = Agree Some and Disagree Some, 4 = Agree Some, 5 = Strongly Agree.

\*recoded items.

### *Unwillingness to Communicate*

Unwillingness to communicate was measured using the Unwillingness-to-Communicate Scale. This measure assessed two dimensions using a 20-item scale: 10 items assess Approach-Avoidance, which is how likely it is that a person will engage in interaction with others, and 10 items assess Reward, which is how rewarding people find communication interactions (Rubin, 1994). Respondents indicated their level of agreement (from 1 = “Strongly Disagree” to 5 = “Strongly Agree”) with statements using a 5-point Likert-type scale. Table 5 summarizes the means and standard deviations of the statements. The scale has been used reliably in prior research: coefficient alphas for the Approach-Avoidance dimension of the scale have ranged from .85 to .98 and for the Reward dimension of the scale have ranged from .70 to .95 (Rubin, 1994). To create an overall Approach-Avoidance score for each respondent, the responses to the items that coincide with the Approach-Avoidance dimension in the scale were summed and averaged. To create an overall Reward score for each respondent, the responses to the items that coincide with the Reward dimension in the scale were summed and averaged. The mean score for the Approach-Avoidance dimension was 2.56 ( $SD = 0.72$ ) and the median was 2.60. The Cronbach alpha reliability coefficient for the Approach-Avoidance dimension was .87. The mean score for the Reward dimension was 3.94 ( $SD = 0.58$ ) and the median was 4.00. The Cronbach alpha reliability coefficient for the Reward dimension was .81.

Table 5

## Descriptive Statistics of the Unwillingness to Communicate Scale

	<i>M</i>	<i>SD</i>
Approach-Avoidance Dimension:		
1. I am afraid to speak up in conversations.	2.34	1.06
2. I talk less because I'm shy.	2.38	1.12
3. I like to get involved in group discussions.*	2.64	1.01
4. I talk a lot because I am not shy.*	2.92	1.11
5. I have fears about expressing myself in a group.	2.54	1.07
6. I avoid group discussions.	2.12	1.05
7. I am afraid to express myself in a group.	2.15	1.01
8. During a conversation, I prefer to talk rather than listen.*	3.22	0.86
9. I find it easy to make conversation with strangers.*	2.93	1.08
10. I feel nervous when I have to speak to others.	2.35	1.03
Reward Dimension:		
1. My friends and family don't listen to my ideas and suggestions.*	4.10	0.91
2. I think my friends are truthful with other people.	3.50	1.03
3. I don't ask for advice from family or friends when I have to make decisions.*	3.88	1.04
4. I believe my friends and family understand my feelings.	3.70	0.95
5. My family doesn't enjoy discussing my interests and activities with me.*	4.24	0.95
6. My friends seek my opinions and advice.	3.90	0.92

Table 5 continued

	<i>M</i>	<i>SD</i>
7. Other people are friendly only because they want something out of me.*	3.84	0.96
8. My friends and family listen to my ideas and suggestions.	3.89	0.92
9. Talking to other people is just a waste of time.*	4.35	0.90
10. I don't think my friends are honest in their communication with me.*	4.00	0.99

*Note.* 1 = Strongly Disagree, 2 = Disagree Some, 3 = Agree Some and Disagree Some, 4 = Agree Some, 5 = Strongly Agree.

\*recoded items.

### *Interpersonal Communication Satisfaction*

Interpersonal communication satisfaction was measured using the Interpersonal Communication Satisfaction Inventory as modified to reflect satisfaction with conversation in general (Rubin, Perse, & Barbato, 1988). Respondents indicated their level of satisfaction on a 5-point Likert-type scale (from 1 = “Strongly Disagree” to 5 = “Strongly Agree”). Table 6 summarizes the means and standard deviations of the statements. The Cronbach alpha reliability coefficient for the scale has ranged from .72 to .93 (Graham, 1994). To create an overall interpersonal communication satisfaction score for each respondent, the responses to the items in the scale were summed and averaged. The mean score was 3.80 ( $SD = 0.64$ ) and the median was 3.86. The Cronbach alpha reliability coefficient was .92.

Table 6

## Descriptive Statistics of the Interpersonal Communication Satisfaction Scale

	<i>M</i>	<i>SD</i>
1. Other people let me know that I communicate effectively.	3.22	1.02
2. Other people express a lot of interest in what I have to say.	3.55	0.93
3. Other people genuinely want to get to know me.	3.65	0.88
4. My conversations flow smoothly.	3.49	0.89
5. In conversations, we each get to say what we want to.	3.63	0.92
6. In conversations, I feel that we can laugh easily together.	3.91	0.95
7. During conversations with others, I am able to present myself as I want others to view me.	3.69	0.93
8. I have better things to do than converse with others.*	4.02	0.97
9. I do NOT enjoy conversations.*	4.42	0.86
10. Nothing is ever accomplished in conversations.*	4.42	0.87
11. I am very dissatisfied with my conversations.*	4.32	0.88
12. We usually talk about something I am NOT interested in.*	4.08	0.96
13. I would like to continue having conversations like the ones I have now.	3.70	0.99
14. I feel like I can talk about anything with other people.	3.38	1.10
15. Other people show me they understand what I say.	3.66	0.94
16. I am very satisfied with my conversations.	3.79	0.98

*Note.* 1 = Strongly Disagree, 2 = Disagree Some, 3 = Agree Some and Disagree Some, 4 = Agree Some, 5 = Strongly Agree.

\*recoded items.

### *Social Networks*

Offline and online social networks were measured by providing respondents with a list of eight types of people (family members, boyfriend/girlfriend, friends, classmates, professors, coworkers, employers, strangers/people I haven't met) they may communicate with and asking them to indicate, by writing in, how many people in each of the given groups they communicate with both online and offline on a typical day. The respondents were provided four separate lists, one for each of the technologies being studied: e-mail, instant messaging, and online chat rooms, and one for face-to-face communication used to indicate offline social networks. Some misunderstanding occurred with this measure. Only 57.8% ( $n = 258$ ) filled in numbers, the rest of the sample instead placed an "X" to indicate that they do indeed communicate with people using this technology. For those respondents who filled out the numerical measure the mean score was 31.48 ( $SD = 30.42$ ) and the median was 23.50. So, to test hypothesis 13, the responses were recoded by summing the number of categories (i.e. groups of people) that respondents indicated they communicated with face-to-face in order to get a score for involvement in offline social networks. The mean score was 5.16 ( $SD = 1.75$ ) and the median was 4.00.

### *Involvement in Student Activities*

Involvement in student activities was measured by asking respondents to indicate, by marking with an "X," which activities they take part in both on campus and off campus from a given list of activities. Respondents were also able to write in any activities they are involved in that were not on the given list. In order to get a measure of the number of activities in which respondents were involved, a variable was created that

summed the number of activities in which respondents indicated they were involved. The average number of activities ranged from zero to eight. The mean score was 1.70 ( $SD = 1.60$ ) and the mode was 1.00.

### *Long Distance Relationships*

To test hypothesis 14 a measure for involvement in long distance relationships was needed. This measure was derived by recoding the use statement: “Keep in touch with boyfriend/girlfriend who lives far away” to indicate whether or not a respondent was involved in a long distance relationship. The sample consisted of 53.8% ( $n = 240$ ) of respondents who were not involved in a long distance relationship and 44.6% ( $n = 199$ ) of respondents who were involved in a long distance relationship. This measure proved to be a bad measure for involvement in long distance relationships.

### Statistical Analysis

After scale construction and reliability analyses, several statistical analyses were conducted to answer the research questions and test the hypotheses in this study. To identify the uses and motives for each of the technologies, principal factor analyses with oblique rotation were performed. Paired-sample  $t$ -tests were conducted to compare the technologies in regard to college students’ uses and motives for them (Research Questions 1, 2 and Hypotheses 1, 2, 3, 4, 5, 6, 7, and 8). Pearson correlations were used to assess the relationships between the psychological conditions and amount of time spent using the technologies, as well as between college students’ involvement in offline social networks and in social activities and amount of time spent using the technologies (Research Question 3 and Hypotheses 9, 10, 11, 12, 13, and 15). A Paired sample  $t$ -test

was used to assess the relationship between college students' involvement in long distance relationships and amount of time spent using the technologies (Hypothesis 14). Independent sample *t*-tests were also used to assess relationships between gender and time spent using technologies, gender and motives, age and time spent using technologies, age and motives, major and time spent using technologies (Hypotheses 16, 17, 18, 19, 20, and 21).

## Chapter 3

### **RESULTS**

The purpose of this chapter is to present the findings of this study. The statistical analyses used to test the research questions and hypotheses presented in chapter one and the results of these analyses will be discussed in greater length in the following section. The research questions and hypotheses fall into five main areas of interest: uses, motives, psychological conditions, social conditions, and demographic conditions.

#### Uses

One goal of this study was to understand college students' uses of e-mail, instant messaging, and online chat rooms. The first set of research questions asked what these uses are and whether they differ from one another. Specifically, research question 1a asked about college students' uses for e-mail. An exploratory principal factor analysis with oblique rotation identified three major and two minor factors, which accounted for 56.1% of the variance. The first (eigenvalue = 4.56) was made up of four items marking use of e-mail for task-related school activities. Factor two (eigenvalue = 2.33) was comprised of five items reflecting developing and maintaining relationships online. The third factor (eigenvalue = 1.27) consisted of three items that focused on using e-mail for social contact with friends and relatives. The fourth minor factor (eigenvalue = .90) reflected using e-mail to contact a boyfriend or girlfriend. The final minor factor

(eigenvalue = .48) was made up of three items dealing with task-related activities. Table 7 summarizes the results of the factor analysis.

Table 7

## E-mail Uses Factor Analysis

I use e-mail to:	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1. Ask professors questions about material covered in class.	<b>.92</b>	.00	.00	.00	.00
2. Let professors know why I missed/will miss class.	<b>.74</b>	.00	.00	.00	.00
3. Coordinate group assignments with classmates.	<b>.54</b>	.00	.00	.00	.23
4. Ask classmates questions about material covered in class.	<b>.41</b>	.13	.00	.15	.28
5. Make friends of the opposite sex.	.00	<b>.81</b>	-.11	.00	.00
6. Meet new people.	.00	<b>.78</b>	.00	.00	.00
7. Find others who have the same interests.	.00	<b>.78</b>	.00	.00	.18
8. Keep in touch with people I've met online.	.00	<b>.67</b>	.00	.00	-.11
9. Keep in touch with people I only know online.	.00	<b>.62</b>	.00	.00	.00
10. Keep in touch with friends or relatives who live far away.	.00	.00	<b>.94</b>	.00	.00
11. Keep in touch with family or relatives.	.00	.00	<b>.76</b>	.00	.00
12. Keep in touch with friends.	.00	.00	<b>.61</b>	.17	.00
13. Keep in touch with boyfriend/ girlfriend.	.00	.00	<b>.00</b>	.90	.00
14. Keep in touch with boyfriend/girlfriend who lives far away.	.00	.00	<b>.00</b>	.80	.00

Table 7 continued

I use e-mail to:	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
15. Talk to business and professional contacts.	.00	.00	.00	.00	<b>.68</b>
16. For a way to do research.	.00	.25	.00	.00	<b>.30</b>
17. Send and receive files.	.12	.00	.14	.00	<b>.30</b>
Eigenvalue	4.56	2.33	1.27	.90	.48
Common variance	26.8%	13.7%	7.5%	5.3%	2.8%

*Note.*  $N = 441$

Research question 1b asked about college students' uses for instant messaging. An exploratory principal factor analysis with oblique rotation identified three major and two minor factors, which accounted for 59.9% of the variance. The first (eigenvalue = 4.89) was made up of five items marking use of instant messaging for developing and maintaining relationships online. Factor two (eigenvalue = 2.32) was comprised of three items that focused on using instant messaging for social contact with friends and relatives. The third factor (eigenvalue = 1.24) consisted of four items that focused on using instant messaging for task-related activities. The fourth minor factor (eigenvalue = .95) reflected using instant messaging to contact a boyfriend or girlfriend. The final minor factor (eigenvalue = .77) was made up of three items dealing with task-related activities. Table 8 summarizes the results of the factor analysis.

Table 8

## Instant Messaging Uses Factor Analysis

I use instant messaging to:	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1. Meet new people.	<b>.86</b>	.00	.00	.00	.00
2. Keep in touch with people I've met online.	<b>.84</b>	.00	.00	.00	.00
3. Find others who have the same interests.	<b>.77</b>	.00	.15	.00	.00
4. Make friends of the opposite sex.	<b>.77</b>	.00	.00	.00	.00
5. Keep in touch with people I only know online.	<b>.54</b>	.00	.00	.00	.11
6. Keep in touch with friends or relatives who live far away.	.00	<b>.84</b>	.00	.00	.00
7. Keep in touch with family or relatives.	.00	<b>.81</b>	.14	.00	.00
8. Keep in touch with friends.	.00	<b>.45</b>	-.17	.00	.13
9. Let professors know why I missed/will miss class.	.00	.00	<b>.93</b>	.00	.00
10. Ask professors questions about material covered in class.	.00	.00	<b>.84</b>	.00	.00
11. For a way to do research.	.00	.18	<b>.54</b>	.00	.00
12. Talk to business and professional contacts.	.19	.14	<b>.42</b>	.00	.00
13. Keep in touch with boyfriend/ girlfriend.	.00	.00	.00	<b>.97</b>	.00
14. Keep in touch with boyfriend/girlfriend who lives far away.	.00	.00	.00	<b>.76</b>	.00

Table 8 continued

I use instant messaging to:	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
15. Coordinate group assignments with classmates.	.00	.00	.00	.00	<b>.88</b>
16. Ask classmates questions about material covered in class.	.00	.00	.00	.00	<b>.72</b>
17. Send and receive files.	.19	.18	.00	.12	<b>.28</b>
Eigenvalue	4.89	2.32	1.24	.95	.77
Common variance	28.8%	13.7%	7.3%	5.6%	4.5%

*Note.*  $N = 394$

Research question 1c focused on college students' uses for online chat rooms. Because only 93 respondents reported using online chat rooms, it was not possible to conduct a reliable exploratory factor analysis.

Because the major focus of many of the study's hypotheses is a differentiation between task and social activities and the maintenance of offline and online relationships, performed using e-mail, instant messaging, and online chat rooms, I created new scales, guided by the results of the factor analyses. Two scales represented using e-mail, instant messaging, and online chat rooms for either task or social activities. The task-related use factor was created from the items that loaded on Factors 1 and 5 in the e-mail factor analysis and on Factors 3 and 5 in the instant messaging factor analysis. The social-related use factor was created from the items that loaded on Factors 2, 3, and 4 in the e-mail factor analysis and on Factors 1, 2, and 4 in the instant messaging factor analysis. Another three scales identified using e-mail, instant messaging, and online chat rooms for maintaining online, offline, and long distance relationships. To create these scales, respondents' scores on items were averaged. The online use factor was created from the items that loaded on Factor 2 in the e-mail factor analysis and on Factor 1 in the instant messaging factor analysis. The offline use factor was created from the items that loaded on Factors 1, 3, 4 and one item from Factor 5 in the e-mail factor analysis and on Factors 2 and 4 and three items from Factor 3 and two items from Factor 5 in the instant messaging factor analysis. The long distance use factor was created from two items that asked about keeping in touch with people who live far away. One item loaded on Factor 4 in the e-mail factor analysis and on Factor 4 in the instant messaging factor analysis and

the second item loaded on Factor 3 in the e-mail factor analysis and on Factor 2 in the instant messaging factor analysis. See Tables 9, 10, 11, 12, and 13 for descriptive statistics.

Table 9

Task-Related Uses

I use (technology) to:	E-mail	Instant messaging	Online chat rooms
1. Let professors know why I missed/will miss class.			
2. Ask professors questions about material covered in class.			
3. Coordinate group assignments with classmates.			
4. For a way to do research.			
5. Ask classmates questions about material covered in class.			
6. Talk to business and professional contacts.			
7. Send and receive files.			
Mean	3.20	2.46	1.92
Standard deviation	.74	.77	.92
Alpha	.77	.79	.86

Table 10

## Social-Related Uses

I use (technology) to:	E-mail	Instant messaging	Online chat rooms
1. Keep in touch with friends.			
2. Meet new people.			
3. Keep in touch with friends or relatives who live far away.			
4. Keep in touch with people I've met online.			
5. Keep in touch with boyfriend/girlfriend.			
6. Find others who have the same interests.			
7. Keep in touch with people I only know online.			
8. Keep in touch with family or relatives.			
9. Make friends of the opposite sex.			
10. Keep in touch with boyfriend/girlfriend who lives far away.			
Mean	2.48	2.78	2.24
Standard deviation	.66	.67	.87
Alpha	.79	.77	.88

Table 11

Online Uses

I use (technology) to:	E-mail	Instant messaging	Online chat rooms
1. Meet new people.			
2. Keep in touch with people I've met online.			
3. Find others who have the same interests.			
4. Keep in touch with people I only know online.			
5. Make friends of the opposite sex.			
Mean	1.59	2.03	2.17
Standard deviation	.76	.96	1.01
Alpha	.84	.85	.87

Table 12

Offline Uses

I use (technology) to:	E-mail	Instant messaging	Online chat rooms
1. Keep in touch with friends.			
2. Keep in touch with friends or relatives who live far away.			
3. Let professors know why I missed/will miss class.			
4. Ask professors questions about material covered in class.			
5. Coordinate group assignments with classmates.			
6. Keep in touch with boyfriend/girlfriend.			
7. Ask classmates questions about material covered in class.			
8. Keep in touch with friends or relatives.			
9. Keep in touch with boyfriend/girlfriend who lives far away.			
10. Talk to business and professional contacts.			
Mean	3.30	3.02	2.06
Standard deviation	.72	.68	.89
Alpha	.83	.77	.91

Table 13

## Long Distance Uses

I use (technology) to:	E-mail	Instant messaging	Online chat rooms
1. Keep in touch with friends or relatives who live far away.			
2. Keep in touch with boyfriend/girlfriend who lives far away.			
Mean	3.15	3.42	2.13
Standard deviation	1.00	1.07	.97
Pearson <i>r</i>	.31	.26	.27
Significance	$p < .01$	$p < .01$	$p < .01$

The first set of hypotheses focused on the differences in the uses of e-mail, instant messaging, and online chat rooms. The means of all uses are summarized in Table 14.

Hypothesis 1a predicted that college students will use e-mail more than instant messaging to communicate with members of their social networks who do not live in the same geographic area. This hypothesis was not supported, in fact, college students used e-mail ( $M = 3.20$ ) significantly less than instant messaging ( $M = 3.42$ ) for communicating long distance:  $t(392) = 4.62, p < .001$ .

Hypothesis 1b predicted that college students will use e-mail more than online chat rooms to communicate with members of their social networks who do not live in the same geographic area. This hypothesis was supported; college students used e-mail ( $M = 3.20$ ) significantly more than online chat rooms ( $M = 2.14$ ) for communicating long distance:  $t(90) = 8.67, p < .001$ .

Hypothesis 2a predicted that college students will use e-mail more than online chat rooms to communicate with people they know offline. This hypothesis was supported; college students used e-mail ( $M = 3.32$ ) significantly more than instant messaging ( $M = 3.42$ ) for communicating with people they know offline:  $t(392) = 8.86, p < .001$ .

Hypothesis 2b predicted that college students will use instant messaging more than online chat rooms to communicate with people they know offline. This hypothesis was supported; college students used instant messaging ( $M = 3.10$ ) significantly more than online chat rooms ( $M = 2.04$ ) for communicating with people they know offline:  $t(85) = 9.43, p < .001$ .

Hypothesis 2c predicted that college students will use online chat rooms more than e-mail to communicate with people they do not know offline. This hypothesis was not supported; college students did not use online chat rooms ( $M = 2.19$ ) significantly more than e-mail ( $M = 2.08$ ) for communicating with people they do not know offline:  $t(90) = 1.15, p = .25$ .

Hypothesis 2d predicted that college students will use online chat rooms more than instant messaging to communicate with people they do not know offline. This hypothesis was not supported, in fact, college students used instant messaging ( $M = 2.63$ ) significantly more than online chat rooms ( $M = 2.19$ ) for communicating with people they do not know offline:  $t(85) = 4.69, p < .001$ .

Hypothesis 3a predicted that college students will use e-mail more than online chat rooms for task-related communication. This hypothesis was supported; college students used e-mail ( $M = 3.24$ ) significantly more than online chat rooms ( $M = 1.92$ ) for task-related communication:  $t(90) = 12.33, p < .001$ .

Hypothesis 3b predicted that college students will use instant messaging more than online chat rooms for task-related communication. This hypothesis was supported; college students used instant messaging ( $M = 2.74$ ) significantly more than online chat rooms ( $M = 1.91$ ) for task-related communication:  $t(90) = 7.91, p < .001$ .

Hypothesis 4a predicted that college students will use online chat rooms more than e-mail for social-related communication. This hypothesis was not supported, in fact, college students used e-mail ( $M = 2.75$ ) significantly more than online chat rooms ( $M = 2.25$ ) for social-related communication:  $t(90) = 6.08, p < .001$ .

Hypothesis 4b predicted that college students will use instant messaging more than e-mail for social-related communication. This hypothesis was supported; college students used instant messaging ( $M = 2.78$ ) significantly more than e-mail ( $M = 2.51$ ) for social-related communication:  $t(392) = 9.20, p < .001$ .

Research question 1d asked about the way the uses of e-mail, instant messaging, and online chat rooms differ from one another. Beyond the differences identified in the tests of Hypotheses 1, 2, 3 and 4, there were several other significant differences. First, college students used e-mail ( $M = 3.19$ ) significantly more than instant messaging ( $M = 2.47$ ) for task-related communication:  $t(392) = 18.19, p < .001$ . Second, college students used instant messaging ( $M = 2.03$ ) significantly more than e-mail ( $M = 1.61$ ) for communicating with people they do not know offline:  $t(392) = 11.59, p < .001$ . Third, college students used e-mail ( $M = 3.32$ ) significantly more than online chat rooms ( $M = 2.07$ ) for communicating with people they know offline:  $t(90) = 11.68, p < .001$ . Fourth, college students used instant messaging ( $M = 3.01$ ) significantly more than online chat rooms ( $M = 2.24$ ) for social-related communication:  $t(85) = 7.80, p < .001$ . Finally, college students used instant messaging ( $M = 3.29$ ) significantly more than online chat rooms ( $M = 2.13$ ) for communicating long distance:  $t(85) = 8.41, p < .001$ .

Other significant results that can be determined from these means are what college students use the technology for the most and for the least. First, e-mail is used most often for communicating with people known offline and least for communicating with people known only online. Second, instant messaging is used most often for communicating long distance and least for communicating with people only known

online. Third, online chat rooms are used most often for social-related communication and least for task-related communication.

Table 14

Summary of Means of Uses

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	E-mail	Instant messaging	Online chat rooms
Task	3.20	2.47	1.92
Social	2.48	2.78	2.25
Online	1.59	2.03	2.19
Offline	3.30	3.03	2.07
Long distance	3.15	3.42	2.14

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## Motives

A second goal of this study was to understand college students' motives for using e-mail, instant messaging, and online chat rooms. The second set of research questions asked what these motives are and whether they differ from one another. Specifically, research question 2a focused on college students' motives for e-mail use. An exploratory principal factor analysis with oblique rotation identified six factors, accounting for 56.9% of the variance. The criteria for factor retention were at least two loadings of at least .45. The first (eigenvalue = 17.71) was made up of five items marking *Interpersonal Utility* as a motive for e-mail use. Factor two (eigenvalue = 2.70) was comprised of four items reflecting *Escape/Relaxation* as a motive for e-mail use. The third factor (eigenvalue = 2.28) consisted of three items that focused on *Entertainment* as a motive for using e-mail. A fourth item was eliminated to increase internal consistency. The fourth factor (eigenvalue = 1.53) consisted of six items which reflected *Passing Time* as a motive for e-mail use. The fifth factor (eigenvalue = 1.37) was made up of three items reflecting *Information Seeking* as a motive for e-mail use. The sixth factor (eigenvalue = 1.14) consisted of five items marking *Convenience* as a motive for e-mail use. Table 15 summarizes the results of the factor analysis. To create measures of e-mail motivation, responses to items loading on each factor were averaged. Descriptive statistics for each factor are summarized in Table 16.

Table 15

## E-mail Motives Factor Analysis

I use e-mail:	IP Utility	Escape	Enter- tainment	Pass Time	Info Seeking	Con- venience
1. Because I am concerned about others.	<b>.75</b>	.16	.00	.00	.11	.00
2. To let others know I care about their feelings.	<b>.71</b>	.15	.00	.00	.00	.00
3. To show others encouragement.	<b>.55</b>	.00	.15	.00	.00	.00
4. To feel connected to other people.	<b>.53</b>	.00	.11	.20	.00	.00
5. To thank people.	<b>.47</b>	.00	.20	.00	.00	.00
6. To feel involved with what's going on with other people.	<b>.45</b>	.00	.19	.00	.00	.00
7. To get away from pressures and responsibilities.	.11	<b>.62</b>	.12	.20	.13	.00
8. Because it makes me feel less tense.	.12	<b>.58</b>	.19	.14	.00	.00
9. Because it is a pleasant rest.	.24	<b>.50</b>	.20	.18	.14	.00
10. To forget about my problems.	.13	<b>.49</b>	.00	.26	.00	.19
11. Because it is fun.	.00	.00	<b>.98</b>	.00	.00	.00
12. Because it is enjoyable.	.00	.00	<b>1.02</b>	.00	.00	.00
13. Because it is entertaining.	.00	.00	<b>.88</b>	.00	.00	.00
14. Because it relaxes me.	.00	.19	<b>.68</b>	.00	.00	.00

Table 15 continued

I use e-mail:	IP Utility	Escape	Enter- tainment	Pass Time	Info Seeking	Con- venience
15. When I have nothing better to do.	.00	.00	.00	<b>.82</b>	.00	.00
16. Because it passes the time away, particularly when I am bored.	.00	.00	.00	<b>.77</b>	.00	.00
17. To give me something to occupy my time.	.00	.00	.15	<b>.67</b>	.00	.00
18. Just because it is available.	.00	.00	.00	<b>.54</b>	.00	.14
19. To put something off that I should be doing.	.16	.27	.00	<b>.49</b>	.00	.11
20. When there is no one else to talk or be with.	.00	.00	.00	<b>.48</b>	.00	.00
21. To look for information.	.00	.00	.00	.00	<b>.99</b>	.00
22. To see what is out there.	.00	.00	.00	.00	<b>.77</b>	.00
23. To get information for free.	.00	-.10	.00	.00	<b>.68</b>	.00
24. Because it is easier to e-mail than talk to some people.	.00	.00	.00	.11	<b>.00</b>	.64
25. Because it is more comfortable than talking to people face to face.	.00	.16	.00	.00	<b>.00</b>	.61
26. Because people don't have to be there to receive e-mail.	.16	-.20	.13	.00	<b>.11</b>	.55
27. To feel less inhibited when I communicate.	.00	.00	.00	.00	<b>.00</b>	.54

Table 15 continued

I use e-mail:	IP Utility	Escape	Enter- tainment	Pass Time	Info Seeking	Con- venience
28. Because I can express myself freely.	.00	.29	.00	.00	.00	<b>.52</b>
29. To help others.	.39	.00	.13	.00	.15	.00
30. Because I just need to talk about my problems sometimes.	.35	.00	.00	.19	.00	.13
31. Because I need someone to talk to or be with.	.28	.00	.00	.21	.00	.00
32. To get more points of view.	.25	.14	.00	.00	.15	.00
33. To tell others what to do.	.18	-.10	.00	.10	.00	.00
34. To get someone to do something for me.	.21	-.13	.00	.00	.00	.10
35. Because it's thrilling.	.00	.26	.20	.14	.00	.00
36. Because it makes me feel less lonely.	.18	.23	.00	.17	.00	.00
37. Because I can pretend to be anyone I want to be when interacting with other people online.	-.24	.16	.12	.00	.00	.00
38. Because it's a habit, just something I do.	.00	.00	.00	.42	.00	.28
39. So I can get away from what I'm doing.	.12	.27	.00	.42	.00	.00
40. I just like to use it.	.13	.11	.27	.29	.14	.19
41. So I can have control over when and if I respond.	.20	.17	.00	.00	.00	.43

Table 15 continued

I use e-mail:	IP Utility	Escape	Enter- tainment	Pass Time	Info Seeking	Con- venience
42. So I can have electronic copies of my correspondence.	.00	.15	.00	.00	.14	.33
43. Because it is inexpensive.	.12	-.22	.11	.13	.13	.29
44. Because it is easy.	.20	-.11	.00	.18	.17	.21
45. So I won't have to feel alone.	.00	.15	.00	.17	.00	.18
46. To be anonymous.	-.22	.10	.00	.00	.15	.16
Eigenvalue	17.71	2.70	2.28	1.53	1.37	1.14
Common Variance	37.7%	5.7%	4.8%	3.3%	2.9%	2.4%

*Note.*  $N = 441$

Table 16

## E-mail Motives Descriptive Statistics

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	IP Utility	Escape	Enter- tainment	Pass Time	Info Seeking	Con- venience
Mean	2.99	2.24	3.14	2.63	2.93	2.86
Standard Deviation	1.01	.97	1.04	.91	1.11	.86
Alpha	.89	.90	.96	.87	.83	.81

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Research question 2b asked about college students' motives for instant messaging use. An exploratory principal factor analysis with oblique rotation identified six factors, accounting for 58.4% of the variance. The criteria for factor retention were at least two loadings of at least .45. The first factor (eigenvalue = 18.06) was made up of six items marking *Companionship* as a motive for instant messaging use. Factor two (eigenvalue = 3.35) was comprised of three items reflecting *Anonymity* as a motive for instant messaging use. The third factor (eigenvalue = 2.02) consisted of three items that focused on *Information Seeking* as a motive for using instant messaging. The fourth factor (eigenvalue = 1.61) consisted of five items, which reflected *Interpersonal Utility* as a motive for instant messaging use. The fifth factor (eigenvalue = 1.31) was made up of five items reflecting *Escape* as a motive for instant messaging use. The sixth factor (eigenvalue = 1.10) consisted of three items marking *Entertainment* as a motive for instant messaging use. Table 17 summarizes the results of the factor analysis. To create measures of instant messaging motivation, responses to items loading on each factor were averaged. Descriptive statistics for each factor are summarized in Table 18.

Table 17

## Instant Messaging Motives Factor Analysis

I use instant messaging:	Com- panion	Ano- nymity	Info Seeking	IP Utility	Escape	Enter- tainment
1. Because it makes me feel less lonely.	<b>.75</b>	.00	.00	.00	.00	.18
2. Because I just need to talk about my problems sometimes.	<b>.73</b>	.00	.00	.18	.00	.00
3. Because I need someone to talk to or be with.	<b>.67</b>	.00	.00	.00	.00	.00
4. So I won't have to feel alone.	<b>.60</b>	.31	.00	.00	.00	.00
5. When there is no one else to talk or be with.	<b>.54</b>	.00	.15	.00	.00	.00
6. To feel less inhibited when I communicate.	<b>.51</b>	.21	.00	.13	.00	.00
7. Because I can pretend to be anyone I want to be when interacting with other people online.	.00	<b>.79</b>	.00	.00	.00	.00
8. To be anonymous.	.18	<b>.66</b>	.00	.00	.00	.00
9. So I can have electronic copies of my correspondence.	.00	<b>.51</b>	.24	.00	.00	.12
10. To look for information.	.00	<b>.00</b>	.88	.00	.00	.00
11. To get information for free.	.00	<b>.00</b>	.85	.00	.00	.00
12. To see what is out there.	.00	<b>.14</b>	.79	.00	.00	.00

Table 17 continued

I use instant messaging:	Companion	Anonymity	Info Seeking	IP Utility	Escape	Entertainment
13. To let others know I care about their feelings.	.00	.00	.00	<b>.84</b>	.00	.00
14. Because I am concerned about others.	.00	.00	.00	<b>.78</b>	.11	.00
15. To show others encouragement.	.00	.00	.00	<b>.71</b>	.00	.10
16. To help others.	.20	.00	.00	<b>.67</b>	.00	.00
17. To thank people.	-.12	.00	.13	<b>.66</b>	.00	.00
18. Because it makes me feel less tense.	.00	.14	.00	.00	<b>.76</b>	.10
19. Because it is a pleasant rest.	.00	.00	.00	.00	<b>.69</b>	.00
20. To get away from pressures and responsibilities.	.12	.00	.16	.00	<b>.65</b>	.00
21. To forget about my problems.	.18	.12	.15	.11	<b>.52</b>	.00
22. Because it relaxes me.	.00	.00	.00	.00	<b>.45</b>	.44
23. Because it is enjoyable.	.00	.00	.00	.00	<b>.00</b>	.93
24. Because it is fun.	.00	.00	.00	.00	<b>.00</b>	.92
25. Because it is entertaining.	.00	.00	.00	.00	<b>.00</b>	.81
26. To feel involved with what's going on with other people.	.28	.00	-.11	.32	<b>.00</b>	.10
27. Because it is inexpensive.	.00	.00	.16	.15	<b>-.11</b>	.18

Table 17 continued

I use instant messaging:	Com- panion	Ano- nymity	Info Seeking	IP Utility	Escape	Enter- tainment
28. Because people don't have to be there to receive e-mail.	.15	.11	.22	.10	-.19	.26
29. Because it is easier to e-mail than talk to some people.	.00	.19	.00	.22	.00	.00
30. To give me something to occupy my time.	.00	.00	.00	.00	.17	.19
31. Just because it is available.	.00	.00	.13	.00	.00	.22
32. When I have nothing better to do.	.18	-.13	.00	-.16	.00	.17
33. Because it's thrilling.	.19	.16	.18	.00	.31	.24
34. Because it passes the time away, particularly when I am bored.	.16	.00	.00	.00	.16	.16
35. To feel connected to other people.	.27	.00	.00	.40	.17	.19
36. Because it's a habit, just something I do.	.00	.00	.00	.00	.00	.29
37. Because it is more comfortable than talking to people face to face.	.22	.43	.00	.00	.00	.00
38. Because I can express myself freely.	.30	.32	.00	.24	.00	.00
39. So I can get away from what I'm doing.	.18	.00	.00	.10	.30	.00
40. To tell others what to do.	.00	.29	.00	.30	.00	.00

Table 17 continued

I use instant messaging:	Companion	Anonymity	Info Seeking	IP Utility	Escape	Entertainment
41. To get someone to do something for me.	.00	.28	.00	.37	.00	.00
42. To get more points of view.	.12	.00	.19	.44	.15	.00
43. Because it is easy.	.00	.00	.00	.00	.00	.14
44. I just like to use it.	.00	-.10	.00	.00	.15	.26
45. To put something off that I should be doing.	.00	-.10	.00	.00	.40	.00
46. So I can have control over when and if I respond.	.19	.17	.28	.17	.00	.00
Eigenvalue	18.06	3.35	2.02	1.61	1.31	1.10
Common variance	38.4%	7.1%	4.3%	3.4%	2.8%	2.3%

*Note.*  $N = 394$

Table 18

Instant Messaging Motives Descriptive Statistics

	Com- panion	Ano- nymity	Info seeking	IP utility	Escape	Enter- tainment
Mean	2.64	1.88	2.62	3.22	3.10	3.72
Standard deviation	.99	.95	1.17	1.02	.99	1.03
Alpha	.89	.80	.90	.91	.89	.94

Research question 2c asked about college students' motives for online chat rooms use. An exploratory principal factor analysis with oblique rotation identified five factors, accounting for 65.4% of the variance. Because of the fact that there were only 93 respondents for online chat rooms, the factor analysis included only the items that loaded on the e-mail motive factor analysis and the instant messaging motive factor analysis. The first factor (eigenvalue = 16.00) was made up of 10 items marking *Chat Room Benefits* as a motive for online chat room use. Factor two (eigenvalue = 2.80) was comprised of six items reflecting *Passing Time* as a motive for online chat room use. The third factor (eigenvalue = 1.97) consisted of four items that focused on *Information Seeking* as a motive for using online chat rooms. The fourth factor (eigenvalue = 1.26) consisted of five items, which reflected *Interpersonal Utility* as a motive for online chat room use. The fifth factor (eigenvalue = 1.02) was made up of four items reflecting *Entertainment* as a motive for online chat room use. Table 19 summarizes the results of the factor analysis. To create measures of online chat room motivation, responses to items loading on each factor were averaged. Descriptive statistics for each factor are summarized in Table 20. One item that cross-loaded on both the third and fourth factors was used in creating the mean for *Interpersonal Utility* from the third factor to the fourth factor because it conceptually made sense, as well increased internal consistency.

Table 19

## Online Chat Rooms Motives Factor Analysis

I use online chat rooms:	Chat room	Pass time	Info seeking	IP utility	Enter-tainment
1. Because it is more comfortable than talking to people face to face.	<b>.85</b>	.11	.00	.00	.00
2. To forget about my problems.	<b>.77</b>	.00	.00	.00	.00
3. So I won't have to feel alone.	<b>.74</b>	.00	.14	.21	.00
4. To feel less inhibited when I communicate.	<b>.73</b>	.00	.00	.00	.00
5. To be anonymous.	<b>.63</b>	.00	.15	.00	.00
6. Because I can express myself freely.	<b>.61</b>	.18	.00	.14	.13
7. Because I need someone to talk to or be with.	<b>.56</b>	.23	.00	.16	-.10
8. Because I can pretend to be anyone I want to be when interacting with other people online.	<b>.53</b>	.00	.00	.00	.17
9. Because I just need to talk about my problems sometimes.	<b>.52</b>	.00	.00	.24	.00
10. So I can have control over when and if I respond.	<b>.47</b>	.31	-.17	.13	.18
11. When I have nothing better to do.	.11	<b>.76</b>	.10	-.11	.22
12. Because it passes the time away, particularly when I am bored.	.00	<b>.75</b>	.00	.10	.00
13. To give me something to occupy my time.	.00	<b>.73</b>	.16	.00	.31
14. To put something off that I should be doing.	.00	<b>.57</b>	.00	.00	.00

Table 19 continued

I use online chat rooms:	Chat room	Pass time	Info seeking	IP utility	Entertainment
15. Just because it is available.	.12	<b>.54</b>	.13	.00	.42
16. When there is no one else to talk or be with.	.28	<b>.53</b>	-.13	.30	-.11
17. To look for information.	.15	.00	<b>.84</b>	.00	.00
18. To thank people.	.00	.00	<b>.75</b>	.36	.00
19. So I can have electronic copies of my correspondence.	.00	.17	<b>.61</b>	.10	.00
20. To see what is out there.	.29	.00	<b>.55</b>	-.15	.11
21. To get information for free.	.33	-.11	<b>.53</b>	.00	.28
22. Because I am concerned about others.	.00	.00	.00	<b>.85</b>	.13
23. To let others know I care about their feelings.	.15	.00	.21	<b>.66</b>	.14
24. Because it makes me feel less lonely.	.22	.11	.00	<b>.56</b>	.00
25. To show others encouragement.	.00	.00	.38	<b>.47</b>	.00
26. Because it is enjoyable.	.00	.12	.00	<b>.00</b>	.86
27. Because it is fun.	.00	.00	.00	<b>.20</b>	.85
28. Because it is entertaining.	.00	.21	.00	<b>.00</b>	.79
29. Because it relaxes me.	.23	.00	.25	<b>.00</b>	.48
30. To feel involved with what's going on with other people.	.00	.00	.24	<b>.33</b>	.36

Table 19 continued

I use online chat rooms:	Chat room	Pass time	Info seeking	IP utility	Enter- tainment
31. To help others.	.19	-.14	.33	.41	.26
32. Because it is a pleasant rest.	.34	.10	-.10	.15	.37
33. Because it makes me feel less tense.	.34	.00	.00	.28	.22
34. To get away from pressures and responsibilities.	.26	.12	.25	.00	.23
Eigenvalue	16.00	2.80	1.97	1.26	1.02
Common variance	47.1%	8.2%	5.8%	3.7%	3.0%

*Note.*  $N = 92$

Table 20

## Online Chat Rooms Motives Descriptive Statistics

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	Chat room	Pass time	Info seeking	IP utility	Enter- tainment
Mean	2.09	2.69	2.27	2.09	2.85
Standard deviation	.92	1.02	1.01	.91	1.12
Alpha	.94	.91	.85	.89	.91

---

The next set of hypotheses focused on the differences in the motives for e-mail, instant messaging, and online chat rooms. The means of all motives are summarized in Table 21.

Hypothesis 5 predicted that college students would report convenience as a motive for using e-mail more than for using online chat rooms. This hypothesis could not be tested because no motive of convenience was found for online chat rooms.

Hypothesis 6a predicted that college students would report maintaining relationships as a motive for using e-mail more than for using online chat rooms. This hypothesis could not be tested because no motive for maintaining relationships was found.

Hypothesis 6b predicted that college students would report maintaining relationships as a motive for using instant messaging more than for using online chat rooms. Once again, this hypothesis could not be tested because no motive for maintaining relationships was found.

Hypothesis 7 predicted that college students would report emotional support as a motive for using online chat rooms than for using e-mail. This hypothesis could not be tested because no motive of emotional support was found.

Hypothesis 8a predicted that college students would report information seeking as a motive for e-mail more than for online chat rooms. This hypothesis was supported; college students reported information seeking as a motive for e-mail ( $M = 3.02$ ) significantly more than for online chat rooms ( $M = 2.28$ ):  $t(89) = 5.70, p < .001$ .

Hypothesis 8b predicted that college students would report interpersonal utility as a motive for e-mail more than for online chat rooms. This hypothesis was supported; college students reported interpersonal utility as a motive for e-mail ( $M = 2.90$ ) significantly more than for online chat rooms ( $M = 2.04$ ):  $t(90) = 7.32, p < .001$ .

Hypothesis 8c predicted that college students would report convenience as a motive for instant messaging more than for e-mail. This hypothesis could not be tested because no motive of convenience was found for instant messaging.

Hypothesis 8d predicted that college students would report passing time as a motive for instant messaging more than for e-mail. This hypothesis could not be tested because no motive of passing time was found for instant messaging.

Hypothesis 8e predicted that college students would report entertainment as a motive for instant messaging more than for e-mail. This hypothesis was supported; college students reported entertainment as a motive for instant messaging ( $M = 3.73$ ) significantly more than for e-mail ( $M = 3.17$ ):  $t(390) = 10.62, p < .001$ .

Hypothesis 8f predicted that college students would report passing time as a motive for online chat rooms more than for e-mail. This hypothesis was not supported; college students did not report passing time as a motive for online chat rooms ( $M = 2.71$ ) significantly more than for e-mail ( $M = 2.81$ ):  $t(90) = .83, p = .41$ .

Hypothesis 8g predicted that college students would report entertainment as a motive for online chat rooms more than for e-mail. This hypothesis was not supported; in fact college students reported entertainment as a motive for e-mail ( $M = 3.33$ ) significantly more than for online chat rooms ( $M = 2.85$ ):  $t(90) = 3.43, p < .001$ .

Research question 2d asked if there are differences between college students' motives for using e-mail, instant messaging, and online chat rooms. Beyond the differences identified in the tests of the hypotheses, there were several other non-hypothesized differences. First, college students reported entertainment as a motive for instant messaging ( $M = 3.83$ ) significantly more than for online chat rooms ( $M = 2.83$ ):  $t(85) = 7.23, p < .001$ . Second, college students reported information seeking as a motive for instant messaging ( $M = 2.88$ ) significantly more than for online chat rooms ( $M = 2.29$ ):  $t(85) = 4.58, p < .001$ . Third, college students reported information seeking as a motive for e-mail ( $M = 2.97$ ) significantly more than for instant messaging ( $M = 2.62$ ):  $t(391) = 5.66, p < .001$ . Fourth, college students reported interpersonal utility as a motive for instant messaging ( $M = 3.22$ ) significantly more than for e-mail ( $M = 3.01$ ):  $t(392) = 5.21, p < .001$ . Finally, college students reported escape as a motive for instant messaging ( $M = 3.10$ ) significantly more than for e-mail ( $M = 2.28$ ):  $t(392) = 18.78, p < .001$ . Other significant results that can be determined from these means are what motives college students report the most and the least for each technology. Entertainment is reported most as a motive for all three forms of CMC, e-mail, instant messaging, and online chat rooms. For e-mail escape is reported least, for instant messaging, anonymity is reported least, and for online chat rooms, interpersonal utility is reported least.

Table 21

## Summary of Means of Motives

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	E-mail	Instant messaging	Online chat rooms
Convenience	2.86	-	-
Information seeking	2.97	2.62	2.28
Passing time	2.63	-	2.69
Interpersonal utility	2.99	3.22	2.03
Escape	2.24	3.10	-
Entertainment	3.14	3.72	2.85
Companionship	-	2.64	-
Anonymity	-	1.88	-
Chat room	-	-	2.13

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## Psychological Antecedents

A third goal of this study was to understand how psychological antecedents of shyness, loneliness, unwillingness to communicate, and interpersonal communication satisfaction affect college students' uses and motives for using e-mail, instant messaging, and online chat rooms.

Hypothesis 9a predicted that shyness will be positively related to amount of time spent in online chat rooms. This hypothesis was not supported; there was no significant relationship between shyness and time spent in online chat rooms:  $r = .08, p = .22$ .

Hypothesis 9b predicted that shyness will be negatively related to amount of time spent instant messaging. This hypothesis was not supported; there was no significant relationship between shyness and time spent instant messaging:  $r = -.05, p = .15$ .

Hypothesis 9c predicted that shyness will be positively related to amount of time spent e-mailing. This hypothesis was not supported; there was no significant relationship between shyness and time spent e-mailing:  $r = -.04, p = .23$ .

Hypothesis 10a predicted that loneliness will be positively related to amount of time spent in online chat rooms. This hypothesis was supported; loneliness was significantly and positively related to time spent in online chat rooms:  $r = .27, p < .01$ .

Hypothesis 10b predicted that loneliness will be negatively related to amount of time spent instant messaging. This hypothesis was not supported; there was no significant relationship between loneliness and time spent instant messaging:  $r = -.04, p = .24$ .

Hypothesis 10c predicted that loneliness will be negatively related to amount of time spent e-mailing. This hypothesis was not supported; there was no significant relationship between loneliness and time spent e-mailing:  $r = -.03, p = .25$ .

Hypothesis 11a predicted that communication avoidance will be positively related to amount of time spent in online chat rooms. This hypothesis was not supported; there was no significant relationship between communication avoidance and time spent in online chat rooms:  $r = .10, p = .17$ .

Hypothesis 11b predicted that finding communication rewarding will be negatively related to amount of time spent in online chat rooms. This hypothesis was supported; finding communication rewarding was significantly and negatively related to time spent in online chat rooms:  $r = -.29, p < .01$ .

Hypothesis 11c predicted that communication avoidance will be positively related to amount of time spent instant messaging. This hypothesis was not supported; there was no significant relationship between communication avoidance and time spent instant messaging:  $r = -.01, p = .42$ .

Hypothesis 11d predicted that finding communication rewarding will be negatively related to amount of time spent instant messaging. This hypothesis was not supported; there was no significant relationship between finding communication rewarding and time spent instant messaging:  $r = -.01, p = .39$ .

Hypothesis 11e predicted that communication avoidance will be positively related to amount of time spent e-mailing. This hypothesis was not supported; there was no

significant relationship between communication avoidance and time spent e-mailing:  
 $r = -.03, p = .29$ .

Hypothesis 11f predicted that finding communication rewarding will be negatively related to amount of time spent e-mailing. This hypothesis was not supported; there was no significant relationship between finding communication rewarding and time spent e-mailing:  $r = -.03, p = .29$ .

Hypothesis 12a predicted that interpersonal communication satisfaction will be negatively related to amount of time spent in online chat rooms. This hypothesis was supported; interpersonal communication satisfaction was significantly and negatively related to time spent in online chat rooms:  $r = -.23, p < .05$ .

Hypothesis 12b predicted that interpersonal communication satisfaction will be positively related to amount of time spent instant messaging. This hypothesis was not supported; there was no significant relationship between interpersonal communication satisfaction and time spent instant messaging:  $r = .03, p = .31$ .

Hypothesis 12c predicted that interpersonal communication satisfaction will be positively related to amount of time spent e-mailing. This hypothesis was not supported; there was no significant relationship between interpersonal communication satisfaction and time spent e-mailing:  $r = .06, p = .10$ .

Research questions 3a, b, c, d, and e asked if these psychological antecedents are related to college students' uses and motives for e-mail, instant messaging, and online chat rooms. Several significant relationships between these variables were identified. First, there was a significant positive relationship between loneliness and using e-mail for

social-related communication:  $r = .15, p < .01$ . Second, there was a significant positive relationship between shyness and using e-mail to communicate with people only known online:  $r = .24, p < .01$ . Third, there was a significant negative relationship between finding communication rewarding and reporting companionship as a motive for instant messaging:  $r = -.25, p < .01$ . Fourth, there was a significant positive relationship between communication avoidance and reporting anonymity as a motive for instant messaging:  $r = .13, p < .01$ . Fifth, there was a significant negative relationship between interpersonal communication satisfaction and using online chat rooms to communicate with people known offline:  $r = -.28, p < .01$ . Finally, there was a significant positive relationship between loneliness and reporting interpersonal utility as a motive for online chat rooms:  $r = .33, p < .01$ . See Tables 22, 23, and 24 for a summarized list of all correlations.

Table 22

## Correlations of E-mail and Psychological and Social Antecedents

	Loneliness	Shyness	Reward	Avoidance	IP satisfaction	Involvement in activities	Offline social network
<b>Uses</b>							
Task	-.04	-.02	-.04	-.09	.07	.20**	.11*
Social	.15**	.10*	-.22**	.02	-.11*	.16**	.02
Online	.32**	.24**	-.39**	.12*	-.27**	.03	-.03
Offline	-.08	-.06	-.00	-.10*	.10*	.26**	.10*
Long distance	-.03	-.06	-.01	-.07	.06	.20**	.02
<b>Motives</b>							
Convenience	.06	.31**	-.13**	.20**	-.03	.07	.03
Info seeking	-.01	.08	-.06	.00	.09	.05	.08
Passing time	.04	.19**	-.10*	.09	-.03	.02	-.02
IP utility	-.09	.15**	.04	.07	.14**	.15**	.04
Escape	.12**	.23**	-.17**	.10*	-.06	.08	-.02
Entertainment	-.06	.07	.02	-.02	.07	.09	.01
Time spent	-.03	-.04	-.03	-.03	.06	.17**	.04

Note. \*  $p < .05$ . \*\*  $p < .01$ .

Table 23

## Correlations of Instant Messaging and Psychological and Social Antecedents

	Loneliness	Shyness	Reward	Avoidance	IP satisfaction	Involvement in activities	Offline social network
<b>Uses</b>							
Task	.12*	.10*	-.19**	-.04	-.12*	.09	.03
Social	.09	.09	-.16**	-.02	-.06	.13**	.03
Online	.26**	.19**	-.33**	.05	-.21**	.03	-.01
Offline	-.02	.01	-.03	-.08	.03	.15**	.04
Long distance	-.06	-.04	.05	-.05	.06	.14**	-.01
<b>Motives</b>							
Anonymity	.37**	.28**	-.41**	.13**	-.27**	.02	.00
Info seeking	.07	.09	-.12*	.00	-.02	.04	.04
Companion	.24**	.29**	-.25**	.16**	-.12*	.11*	.00
IP utility	-.03	.15**	.03	.03	.14**	.18**	.02
Escape	.02	.15**	-.08	.07	.02	.08	.03
Entertainment	-.14**	.07	.09	-.01	.17**	.15**	.03
Time Spent	-.04	-.05	-.01	-.01	.03	-.00	-.00

Note. \*  $p < .05$ . \*\*  $p < .01$

Table 24

## Correlations of Online Chat Rooms and Psychological and Social Antecedents

	Loneliness	Shyness	Reward	Avoidance	IP satisfaction	Involvement in activities	Offline social network
<b>Uses</b>							
Task	.30**	.19	-.37**	.08	-.26*	.02	-.02
Social	.27**	.11	-.30**	.05	-.29**	-.12	-.01
Online	.21*	.06	-.27**	-.01	-.23*	-.08	-.01
Offline	.30**	.17	-.34**	.10	-.28**	-.04	-.03
Long distance	.35**	.20	-.31**	.15	-.33**	-.08	-.06
<b>Motives</b>							
Passing time	.09	.09	-.07	-.07	.05	.04	-.07
Info seeking	.29**	.30**	-.30**	.12	-.22*	.06	.11
Chat room	.30**	.30**	-.38**	.16	-.20	.13	.10
IP utility	.33**	.23*	-.42**	.12	-.21*	.12	-.05
Entertainment	.01	-.02	-.01	-.18	.10	.02	.16
Time Spent	.27**	.08	-.29**	.10	-.23*	-.14	.04

Note. \*  $p < .05$ . \*\*  $p < .01$

## Social Antecedents

A fourth goal of this study was to understand how social antecedents affect college students' uses and motives for using e-mail, instant messaging, and online chat rooms.

Hypothesis 13a predicted that involvement in offline social relationships/networks will be negatively related to amount of time spent in online chat rooms. This hypothesis was not supported; there was no significant relationship between involvement in offline social relationships/networks and time spent in online chat rooms:  $r = .04, p = .35$ .

Hypothesis 13b predicted that involvement in offline social relationships/networks will be positively related to amount of time spent instant messaging. This hypothesis was not supported; there was no significant relationship between involvement in offline social relationships/networks and time spent instant messaging:  $r = -.00, p = .48$ .

Hypothesis 13c predicted that involvement in offline social relationships/networks will be positively related to amount of time spent e-mailing. This hypothesis was not supported; there was no significant relationship between involvement in offline social relationships/networks and time spent e-mailing:  $r = .04, p = .23$

Hypothesis 14a predicted that involvement in long distance relationships will be positively related to amount of time spent instant messaging. This hypothesis was not supported; people who are involved in long distance relationships ( $M = 119.77$ ) did not spend significantly more time instant messaging than those not involved in a long distance relationship ( $M = 90.41$ ):  $t(385) = 1.73, p = .08$ .

Hypothesis 14b predicted that involvement in long distance relationships will be positively related to amount of time spent e-mailing. This hypothesis was not supported, people who are involved in long distance relationships ( $M = 21.76$ ) did not spend significantly more time e-mailing than people not involved in a long distance relationship ( $M = 18.43$ ):  $t(428) = 1.82, p = .07$ .

Hypothesis 15 predicted that involvement in student activities will be positively related to amount of time spent e-mailing. This hypothesis was supported; involvement in student activities was significantly and positively related to time spent e-mailing:  $r = .17, p < .01$ .

#### Demographic Antecedents

A fifth goal of this study was to understand how demographic antecedents affect college students' uses and motives for using e-mail, instant messaging, and online chat rooms.

Hypothesis 16 predicted that female college students will spend more time e-mailing than male college students. This hypothesis was supported; female college students ( $M = 22.81$ ) spent significantly more time e-mailing than male college students ( $M = 15.02$ ):  $t(405) = 4.53, p < .001$ .

Hypothesis 17 predicted that male college students will report passing time as a motive for instant messaging use more than female college students. This hypothesis could not be tested since no motive of passing time was found for instant messaging.

Hypothesis 18 predicted that female college students will report maintaining relationships as a motive for instant messaging use more than male college students.

Since no motive of maintaining relationships was found, the motive of interpersonal utility was used instead to test this hypothesis. This hypothesis was supported; female college students ( $M = 3.33$ ) reported interpersonal utility as a motive for instant messaging significantly more than male college students ( $M = 3.03$ ):  $t(392) = 2.90$ ,  $p < .004$ .

Hypothesis 19 predicted that college students who are 17-20 years of age will use instant messaging more than college students 21 years of age and older. This hypothesis was supported; college students 17-20 years of age ( $M = 113.45$ ) used instant messaging more than college students 21 years of age or older ( $M = 74.17$ ):  $t(388) = 2.01$ ,  $p < .05$ .

Hypothesis 20 predicted that college students 21 years of age or older will report emotional support as a motive for using online chat rooms more than college students 17-20 years of age. This hypothesis could not be tested since no motive of emotional support was found for online chat rooms.

Hypothesis 21a predicted that college students in the hard science majors will use e-mail more than college students in majors other than hard sciences. This hypothesis was not supported; college students in the hard science majors ( $M = 20.00$ ) did not use e-mail significantly more than college students in majors other than hard sciences ( $M = 19.85$ ):  $t(423) = .03$ ,  $p = .98$ .

Hypothesis 21b predicted that college students in the hard science majors will use instant messaging more than college students in majors other than hard sciences. This hypothesis was not supported; college students in the hard science majors ( $M = 61.33$ )

did not use instant messaging significantly more than college students in majors other than hard sciences ( $M = 106.45$ ):  $t(382) = 1.02, p = .31$ .

Hypothesis 21c predicted that college students in the hard science majors will use online chat rooms more than college students in majors other than hard sciences. This hypothesis was not supported; college students in the hard science majors ( $M = 14.00$ ) did not use online chat rooms significantly more than college students in majors other than hard sciences ( $M = 15.73$ ):  $t(84) = .11, p = .91$ .

Beyond the differences identified in the tests of Hypotheses 16-21, there were several other significant differences in regards to demographic conditions. The means for gender, age, and major are summarized in Tables 25, 26, and 27, respectively. First, college students 21 years of age and older ( $M = 3.31$ ) used e-mail significantly more than college students 17 to 20 years of age ( $M = 3.15$ ) for task-related communication:  $t(439) = 2.13, p < .03$ . Second, college students 17 to 20 years of age ( $M = 3.08$ ) used instant messaging significantly more than college students 21 years of age and older ( $M = 2.85$ ) to communicate with people they know offline:  $t(392) = 2.89, p < .004$ . Third, college students in majors other than hard science ( $M = 3.01$ ) reported interpersonal utility as a motive for using e-mail significantly more than college students in the hard science majors ( $M = 2.46$ ):  $t(432) = 2.13, p < .03$ . Fourth, college students in majors other than hard science ( $M = 3.45$ ) used instant messaging significantly more than college students in the hard science majors ( $M = 2.83$ ) for communicating long distance:  $t(386) = 2.18, p < .03$ . Fifth, male college students ( $M = 2.15$ ) reported anonymity as a motive for using instant messaging significantly more than female college students

( $M = 1.74$ ):  $t(244.48) = 3.98, p < .001$ . Finally, male college students ( $M = 2.21$ ) used online chat rooms significantly more than female college students ( $M = 1.69$ ) for task-related communication:  $t(90) = 2.82, p < .006$ .

Table 25

## T-tests of Gender and Uses and Motives

	<i>M</i> male	<i>M</i> female	<i>t</i>	df	<i>P</i>
<b>E-mail Uses</b>					
Task	3.10	3.25	2.06	439	.04
Social	2.48	2.48	.06	289.90	.96
Online	1.77	1.49	3.48	269.43	.001
Offline	3.15	3.39	3.34	439	.001
Long distance	3.01	3.24	2.40	439	.02
<b>E-mail Motives</b>					
Convenience	2.69	2.95	2.98	438	.003
Info seeking	2.80	3.06	2.41	438	.02
Passing time	2.38	2.77	4.44	439	.000
IP utility	2.66	3.18	5.39	439	.000
Escape	2.08	2.33	2.72	439	.007
Entertainment	2.82	3.32	5.04	438	.000
Time spent e-mailing (minutes)	15.02	22.81	4.53	405.05	.000
<b>Instant Messaging Uses</b>					
Task	2.49	2.45	.54	392	.59
Social	2.85	2.74	1.53	392	.13
Online	2.34	1.85	4.83	254.86	.000

Table 25 continued

	<i>M</i> male	<i>M</i> female	<i>t</i>	df	<i>P</i>
<b>Instant Messaging Uses continued</b>					
Offline	2.96	3.06	1.42	392	.16
Long distance	3.26	3.50	2.15	392	.03
<b>Instant Messaging Motives</b>					
Info seeking	2.68	2.58	.82	392	.42
IP utility	3.03	3.33	2.90	392	.004
Escape	2.98	3.17	1.78	392	.08
Entertainment	3.49	3.85	3.38	391	.001
Companion	2.69	2.61	.82	392	.41
Anonymity	2.15	1.74	3.98	244.48	.000
Time spent instant messaging (minutes)	96.59	107.88	.64	388	.52
<b>Online Chat Room Uses</b>					
Task	2.21	1.69	2.82	90	.006
Social	2.45	2.07	2.15	90	.03
Online	2.41	1.98	2.09	90	.04
Offline	2.29	1.88	2.21	90	.03
Long distance	2.37	1.93	2.17	90	.03
<b>Online Chat Room Motives</b>					
Info seeking	2.57	2.03	2.60	77.15	.01

Table 25 continued

	<i>M</i> male	<i>M</i> female	<i>t</i>	df	<i>P</i>
Online Chat Room Motives continued					
Passing time	2.64	2.74	.48	90	.63
IP utility	2.32	1.90	2.24	90	.03
Entertainment	2.66	3.01	1.50	90	.14
Chat room	2.22	1.99	1.22	90	.23
Time spent in online chat rooms (minutes)	21.68	10.73	1.51	63.13	.14

Table 26

## T-tests of Age and Uses and Motives

	<i>M</i> younger students*	<i>M</i> older students**	<i>t</i>	df	<i>p</i>
E-mail Uses					
Task	3.15	3.31	2.13	439	.03
Social	2.50	2.42	1.24	439	.22
Online	1.61	1.56	.67	439	.50
Offline	3.29	3.32	.45	439	.65
Long distance	3.19	3.07	1.10	439	.27
E-mail Motives					
Convenience	2.84	2.89	.55	438	.58
Info seeking	2.95	2.99	.33	438	.75
Passing time	2.68	2.51	1.82	439	.07
IP utility	3.03	2.88	1.47	439	.14
Escape	2.28	2.13	1.53	439	.13
Entertainment	3.16	3.09	.59	438	.56
Time Spent E-mailing (Minutes)	20.28	19.06	.61	430	.54
Instant Messaging Uses					
Task	2.53	2.25	3.19	392	.002
Social	2.80	2.69	1.43	392	.15

Table 26 continued

	<i>M</i> younger students*	<i>M</i> older students**	<i>t</i>	df	<i>p</i>
Instant Messaging Uses continued					
Online	2.02	2.04	.15	392	.89
Offline	3.08	2.85	2.89	392	.004
Long distance	3.45	3.32	1.04	392	.30
Instant Messaging Motives					
Info seeking	2.63	2.58	.40	392	.69
IP utility	3.28	3.06	1.87	392	.06
Escape	3.13	3.00	1.18	392	.24
Entertainment	3.77	3.57	1.60	144.30	.11
Companion	2.67	2.52	1.36	392	.17
Anonymity	1.85	1.98	1.19	392	.24
Time Spent Instant Messaging (Minutes)	113.45	74.17	2.01	388	.05
Online Chat Room Uses					
Task	1.84	2.15	1.45	90	.15
Social	2.19	2.38	.92	90	.36
Online	2.09	2.39	1.28	90	.21
Offline	2.01	2.20	.89	90	.38
Long distance	2.10	2.20	.45	90	.65

Table 26 continued

	<i>M</i> younger students*	<i>M</i> older students**	<i>t</i>	df	<i>p</i>
Online Chat Room Motives					
Info seeking	2.16	2.58	1.81	90	.07
Passing time	2.57	3.03	1.95	90	.06
IP utility	1.99	2.35	1.71	90	.09
Entertainment	2.70	3.25	2.15	90	.03
Chat room	2.03	2.24	.97	90	.34
Time Spent in Online Chat Rooms (Minutes)	12.16	23.79	1.51	86	.13

*Note.* \*Younger students were 17-20 years old. \*\*Older students were 21 years or older.

Table 27

## T-tests of Academic Major and Uses and Motives

	<i>M</i> nonhard science	<i>M</i> hard science	<i>t</i>	df	<i>p</i>
E-mail Uses					
Task	3.20	2.96	1.26	432	.21
Social	2.49	2.08	2.48	432	.01
Online	1.59	1.43	.84	432	.40
Offline	3.32	2.86	2.53	432	.01
Long distance	3.19	2.38	3.19	432	.002
E-mail Motives					
Convenience	2.88	2.26	2.73	431	.007
Info seeking	2.97	2.85	.40	431	.69
Passing time	2.63	2.32	1.34	432	.18
IP utility	3.01	2.46	2.13	432	.03
Escape	2.24	2.06	.72	432	.47
Entertainment	3.15	2.60	2.06	431	.04
Time Spent E-mailing (Minutes)	19.85	20.00	.03	423	.98
Instant Messaging Uses					
Task	2.47	2.29	.92	386	.36
Social	2.79	2.62	.92	386	.36

Table 27 continued

	<i>M</i> nonhard science	<i>M</i> hard science	<i>t</i>	df	<i>p</i>
Instant Messaging Uses continued					
Online	2.01	2.24	.90	386	.37
Offline	3.04	2.73	1.76	386	.08
Long distance	3.45	2.83	2.18	386	.03
Instant Messaging Motives					
Info seeking	2.63	2.36	.89	386	.37
IP utility	3.23	3.07	.63	386	.53
Escape	3.10	3.08	.08	386	.94
Entertainment	3.73	3.80	.27	385	.79
Companion	2.63	2.87	.91	386	.36
Anonymity	1.88	1.73	.61	386	.55
Time Spent Instant Messaging (Minutes)	106.45	61.33	1.02	382	.31
Online Chat Room Uses					
Task	1.91	2.03	.28	88	.78
Social	2.24	2.28	.11	88	.91
Online	2.16	2.36	.43	88	.67
Offline	2.07	1.96	.26	88	.80
Long distance	2.14	1.80	.76	88	.45

Table 27 continued

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	<i>M</i> nonhard science	<i>M</i> hard science	<i>t</i>	df	<i>p</i>
<hr/>					
Online Chat Room Motives					
Info seeking	2.26	2.30	.08	88	.94
Passing time	2.72	2.37	1.81	8.71	.11
IP utility	2.11	1.72	.94	88	.35
Entertainment	2.85	3.27	1.79	7.80	.11
Chat room	2.12	1.51	1.46	88	.15
Time Spent in Online Chat Rooms (Minutes)	15.73	14.00	.11	84	.91

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## Chapter 4

### **DISCUSSION**

The purpose of this study was to examine why college students are using computer-mediated communication, specifically, e-mail, instant messaging, and online chat rooms, and who, of these college students, is using each of the three forms of CMC. Grounded in the uses and gratifications perspective, this study examined five main areas of CMC: uses, motives, psychological antecedents, social antecedents, and demographic antecedents. This chapter, first, presents the hypothesized and nonhypothesized findings in each of these areas. It discusses the theoretical implications of the results of this study. Then it examines future directions of research based on the findings. Finally, this chapter examines the limitations of the methodology used in this study.

#### Summary of Results

This study found many interesting results, both hypothesized and nonhypothesized, which suggest directions for future CMC research. Before discussing the various directions for future research, it is necessary to look at the findings and their implications. This section discusses the general findings of each of the five areas of this study. Many of the findings in this study support previous findings by researchers and also expand the research in the areas of CMC and uses and gratifications.

## *Uses*

A use, as defined within the uses and gratifications perspective, is a person's selection of a certain communication channel to perform a particular activity. This study found five general uses for e-mail, instant messaging, and online chat rooms: task-related communication, social-related communication, communicating with people known online, communicating with people known offline, and long distance communication. The uses that were found in this study for e-mail, instant messaging, and online chat rooms coincided with many of those found in previous research (Dainton & Aylor, 2002; Hard af Segerstad & Ljungstrand, 2002; Jones, 2002; McKenna et al., 2002; Lenhart, et al., 2001; Stafford et al., 1999).

While earlier research had explored the uses of CMC, few studies had considered several different forms of CMC. Many of the hypothesized findings in this study expanded on previous research in the area of CMC by comparing the uses of the different types of mediated communication. For example, when comparing e-mail and instant messaging, this study found that college students use instant messaging more than e-mail for communicating long distance and for social-related communication, but they use e-mail more than instant messaging for communicating with people they know offline. This finding is an indication that in future research, types of CMC should be studied separately, as this study attempted to do. This study found that even though e-mail, instant messaging, and online chat rooms share the same general uses, college students do not use each type of CMC the same.

For task-related communication, such as asking a professor about material covered in class, e-mail is used by college students significantly more than instant messaging and online chat rooms. This finding might be explained by the more formal and also asynchronous nature of e-mail compared to instant messaging and online chat rooms, which are more informal and allow for synchronous communication to occur. E-mail is similar to sending letters or memos, so it conceptually makes sense that when using a form of CMC for task-related communication, students would choose e-mail. E-mail allows people the chance to think about what they want to say, so, college students might feel more comfortable using e-mail to contact professors. Westmyer, DiCioccio, and Rubin (1998) also concluded that task-related needs might be more effectively fulfilled through written or asynchronous communication channels such as e-mail. A direction for future research would be to look at how relationship types, such as professor/student, influence communication channel choice.

For social-related communication such as communicating with friends, instant messaging is used by college students significantly more than e-mail and online chat rooms. This finding may suggest that there are aspects of instant messaging that make it more likely that college students will use it to communicate socially with others. It may be the synchronous nature of the technology as compared to the asynchronous nature of e-mail and it may be the ability to have multiple, spontaneous one-on-one conversations with others that online chat rooms do not allow.

For communicating with people known offline, e-mail is used by college students significantly more than instant messaging and online chat rooms. Given that college

students are using e-mail for task-related communication, such as communicating with professors, classmates, coworkers, and business contacts, it might make sense that they are using it more than the other two forms of CMC to communicate with people known offline. As Dimmick, Kline, and Stafford (2000) concluded, the asynchronous nature of e-mail allows people the opportunity to keep in touch with and communicate with others regardless of times zones or work schedules.

For communicating long distance, instant messaging is used by college students significantly more than e-mail and online chat rooms. One reason for this finding may be simply that it allows for synchronous communication to occur, but at a much cheaper price than a long distance telephone call. Future research might want to look at whether instant messaging is causing displacement of the telephone.

### *Motives*

A motive, as defined within the uses and gratifications perspective, is a reason that prompts use of a particular communication channel to fulfill a need. Much of the research regarding motives for using the Internet and for using CMC have been based upon traditional uses and gratifications research on television viewing (e.g. Conway & Rubin, 1991; Palmgreen, Wenner, & Rayburn, 1981; Rubin, 1984; Rubin & Perse, 1987) however, as Rubin (2003) points out, there might be other motives for the Internet that have not been considered yet. This study found some motives that the three forms of CMC had in common and some motives that were unique to either one or two of the forms of CMC.

Similar to prior research on computer-mediated communication (Papacharissi & Rubin, 2000; Stafford et al., 1999), college students reported such motives as entertainment, information seeking, and interpersonal utility for using e-mail, instant messaging, and online chat rooms. This study's attempt to identify motives specific for each of the three forms of CMC examined was meant to build on past research, which had started to examine the specific motives of particular CMC technology.

The results of this study identified motives unique to each form of CMC. Four motives reported in this study were unique to only one form of CMC: convenience for e-mail, companionship and anonymity for instant messaging, and chat rooms benefits for online chat rooms. Two motives were reported for only two of the three forms of CMC studied: passing time for e-mail and online chat rooms and escape for e-mail and instant messaging. The unique motives found for each channel of CMC supports the uses and gratifications approach that says that people use different channels because they are motivated by different reasons (Katz et al., 1974; Rosengren, 1974). The Internet is no longer a single channel of communication; it now has many different channels involved in it. The unique attributes of these channels give rise to different motives and uses indicating that each form of CMC should be studied individually in future research.

However, given that e-mail, instant messaging, and online chat rooms are all found on the Internet, it makes sense that they would share some of the same motives. Three motives were common to all three forms of CMC studied: information seeking, interpersonal utility, and entertainment. Although all three forms of CMC studied reported these three motives, the amount by which college students were motivated by

them differed depending upon the technology. College students were motivated to use e-mail more than instant messaging and online chat rooms to seek out information. Also, college students were motivated to use instant messaging more than e-mail and online chat rooms for entertainment and for communicating interpersonally. Although users of all three forms of CMC reported both instrumental and ritualized motives, given that information seeking was reported as a motive for e-mail more often than for instant messaging and online chat rooms there is some support for the idea that e-mail might be more instrumental in use than instant messaging and online chat rooms, which both might be more ritualized forms of CMC. This study has found that the orientations towards instrumental and ritualized use exist within CMC; however, it needs to be explored further. Theoretical concepts such as audience activity could be helpful in attempting to expand these findings (Katz et. al., 1974; Perse, 1990; Rubin & Perse, 1987). One such way would be by examining intentionality, selectivity, and involvement in relation to audience activity and CMC use, similar to the way Rubin and Perse (1987) used them to look at audience activity and television news gratifications.

#### *Psychological Antecedents*

This study found that certain psychological antecedents are related to computer-mediated communication use, which supports prior research in the area (Caplan, 2002; Markey & Wells, 2002; McKenna et al., 2002; Papacharissi & Rubin, 2000). This finding also lends support to uses and gratifications, which claims that psychological antecedents have an effect on people's use of communication channels (Katz et al., 1974; Rosengren, 1974).

The findings in this study support prior research that indicates that those people who are lonely tend to be more likely to use CMC (Caplan, 2002; McKenna et al., 2002). Specifically, this study found that there is a positive relationship between loneliness and amount of time college students spend using online chat rooms. This may be because people who are lonely can better express themselves on the Internet rather than in face-to-face interactions (McKenna et al., 2002). College students who are lonely may find comfort in forming relationships with people they meet in chat rooms. Other research that may point to a different explanation for the relationship between loneliness and time spent using online chat rooms is that of Caplan (2002) who found that people with a higher preference for online communication also had higher levels of loneliness, shyness, and depression. These findings indicate that further research needs to explore the attributes of online chat rooms that attract people who experience feelings such as loneliness to them.

Other findings relating the effect of psychological antecedents on chat room use lend some support to Papacharissi and Rubin's (2000) finding that CMC is a functional alternative to face-to-face communication. People who find communication to be less rewarding and who are less satisfied with interpersonal communication spend more time in online chat rooms. So, for these people online chat rooms might be a functional alternative to face-to-face communication. However, given Flaherty, Pearce, and Rubin's (1998) contradictory finding that indeed the Internet and face-to-face communication are not functional alternatives more research needs to be done. As Flaherty, Pearce, and Rubin's (1998) data was collected in the Spring of 1996, it would be safe to assume that

more people are using CMC and that it is more readily available to a larger group of people, so their findings may be outdated. Future research might want to concentrate on exploring whether some forms of CMC are functional alternatives to face-to-face communication and others are not.

This study did not find that psychological antecedents were related to amount of time spent e-mailing or instant messaging. This might indicate that previous contradictory findings relating to whether psychological antecedents such as shyness, loneliness, and emotional instability were characteristics of Internet chat users (Markey & Wells, 2002; Peris et al., 2002) may be because the technologies were not studied separately. These antecedents might only be related to online chat room use as was found in this study. Certain attributes of chat rooms such as the lack of nonverbal cues and its anonymous nature, which allow meeting new people to be easier, might be attractive to people who are lonely or shy, but might not necessarily attract an e-mail or instant messaging user who communicates via CMC with people that they already know offline.

This study hypothesized only about psychological antecedents and the amount of time college students spend using the various forms of CMC. However, this study also allows some conclusions to be drawn about the relationships between psychological antecedents and the specific uses and motives found for e-mail and instant messaging. The uses and gratifications approach says that psychological antecedents can affect the needs that produce motives and this study found this to be true.

When looking at e-mail uses and motives, loneliness and shyness both related positively to social-related communication, communicating with people known only

online, and with the motive of escape. In contrast, the psychological antecedent of finding communicating rewarding related negatively to these uses and motives for e-mail. These findings indicate that people who are shy and lonely are more likely to have developed relationships online and thus use e-mail to communicate socially with these people. They also might use e-mail as a way to escape their face-to-face communication. The relationships between e-mail uses and motives and the psychological antecedents mentioned indicate that while psychological antecedents might have little effect on total amount of time spent e-mailing, they could have some effect in terms of what college students use e-mail for and what types of motives drive them to use e-mail. Future research needs to look not only look at the relationship that exists between psychological antecedents and the amount of time people spend using a particular form of CMC, but also look at how psychological antecedents relate to motives and uses as past uses and gratifications research asserts (Conway & Rubin, 1991; Perse & Rubin, 1990). Certain psychological antecedents might produce different needs and motives for different people. Examining the motives reported by people who are lonely or shy might produce results that enable researchers to more fully understand the positive and negative effects of the Internet and its many technologies.

Two motives, unique to instant messaging, related either positively or negatively to all of the psychological antecedents looked at in this study. Both anonymity and companionship related positively to loneliness, shyness, and the approach-avoidance dimension of the unwillingness to communicate antecedent. People who experience shyness, loneliness, and who avoid communication use instant messaging to feel

companionship with others, while at the same time enjoying the anonymity of the Internet. So, those people who are not as comfortable in face-to-face interactions find comfort in the anonymous companionship they receive through CMC. The motives of companionship and anonymity also related negatively to the psychological antecedents, finding communication rewarding and interpersonal communication satisfaction. So, people who enjoy face-to-face communication do not necessarily use instant messaging because of its anonymity nor because of the companionship they experience. They might have companionship in their face-to-face communication and choose to use instant messaging for other reasons.

Again these relationships indicate that while psychological antecedents may have little effect on total amount of time instant messaging, they might have an effect on what motivates people to use instant messaging. These relationships also indicate that there are aspects of instant messaging that make it unique from other forms of CMC given that these two motives that are exclusive to instant messaging have such significant relationships with all of the psychological antecedents. Once again, the results of this study show that future research needs to separate the various forms of CMC to identify new and unique uses and motives of each form.

Three of the psychological antecedents studied related to all of the uses identified in this study for online chat rooms. Loneliness related positively with all five uses. So, people who are lonely use online chat rooms for a number of different reasons: to communicate long distance, to engage in task- and social-related communication, and to communicate with people known online and offline. On the other hand the psychological

antecedents, finding communication rewarding and interpersonal communication satisfaction related negatively with all five uses. People who are comfortable in face-to-face interactions tend not to use online chat rooms for much of their communication behavior. This may indicate that there is something about online chat rooms that draws in people who are lonely, but not people who find communication rewarding and satisfactory. As mentioned previously, these findings indicate that it is important to study the forms of CMC separately. Online chat rooms seem to be used by different types of people. Understanding the motives and psychological antecedents of the people who do use online chat rooms will provide researchers with knowledge and insight into how this type of CMC can be valuable in people's lives.

#### *Social Antecedents*

While no support was found for involvement in offline social networks and relationships being related to amount of time spent using the three forms of CMC as originally hypothesized, there were some other nonhypothesized findings relating this social antecedent to specific uses of CMC. People involved in offline social networks use e-mail for task-related communication and for communicating with people they know offline. Also, they use instant messaging for social-related communication and communicating with people they know offline. So, while this study did not confirm past research that found that people involved in offline social networks also tend to form relationships online (Matei & Ball-Rokeach, 2001; McKenna et al., 2002), it does indicate that social networks are an antecedent for CMC use and deserve to be explored further in future research.

This study also found that college students' involvement in student activities is an antecedent for CMC use. Prior research in CMC technologies did not look at how involvement in student activities would affect CMC use. Given that this study focused on college students' uses and motives for CMC, it seems natural to examine how this social antecedent might affect their CMC use. This study found that the more students are involved in student activities the more time they spend e-mailing. Many student organizations, just like many course professors, choose to communicate with members through electronic means such as e-mail. Therefore, the more activities a student is involved in, the more likely they will use e-mail to communicate with other members of their groups. This supports a key aspect of uses and gratifications, which states that social antecedents affect people's choice of communication channel (Katz et al., 1974; Rosengren, 1974).

This study also allows for conclusions to be made regarding relationships between involvement in student activities and the uses and motives found for each form of CMC. In particular the more students are involved in student activities the more they use e-mail for task-related communication, social-related communication, and communicating with people known offline. This conceptually makes sense because if students are involved in activities, e-mail may be one mode of communication that groups use to keep members aware of information. Also, if students are involved in student activities, they might have a large number of people to communicate with and e-mail may provide one mode of communication for doing this. Another finding in this study is that the more students are involved in student activities the more they use instant messaging for social-related

communication and communicating with people known offline. However, unlike with e-mail, involvement in student activities was not related to using instant messaging for task-related communication. While students may use instant messaging to communicate with people that they know in the groups they are a part of, they may not use it to conduct any group business. Since involvement in student activities is not an antecedent that has been explored previously, future research should look to expand upon the findings in this study. Also, future research should examine whether other social conditions of college students' lives are antecedents for CMC use.

#### *Demographic Antecedents*

In past research, certain demographic characteristics have been found to be antecedents of Internet usage, as is claimed by uses and gratifications. This study concludes that indeed this is true for CMC usage. Gender and age appear to have an effect on college students' use of CMC.

Similar to past research (Weiser, 2000) this study found that female college students spend more time using e-mail than male college students. Another finding that is specific to instant messaging but that supports general CMC findings (Weiser, 2000) is that female college students report interpersonal utility as a motive for instant messaging more than male college students. This finding also supports Rubin, Perse, and Barbato's (1988) finding that women use communication more often to express affection and to seek inclusion. Males used online chat rooms for all five uses found in this study significantly more than females. Males also reported anonymity as a motive for using instant messaging significantly more than females. Coincidentally, they also used instant

messaging significantly more than females to communicate with people known online. This might indicate that males feel comfortable using instant messaging because of its anonymity as a way to meet people online and establish relationships online. This relates to Rawlins' (1991) finding in the interpersonal communication research area of dialectics that male friendships exhibit much more protectiveness than female friendships, which exhibit more expressiveness. Through the anonymity of online communication men are able to be both expressive and protective in their online relationships, thus relieving the tension of this dialectic. Future research should employ interpersonal theories to explore gender differences in CMC use.

A finding of this study that expands previous research by Weiser (2000) is the finding that younger college students, those 17-20 years of age use instant messaging more than older college students, those over 21 years of age. Weiser (2000) found that e-mail tends to be a technology used more often by a younger population. This study also finds that instant messaging is a technology used by a younger population and in general supports the idea that the Internet as a whole is used more often by younger people. One important and interesting area of future research is to look at whether instant messaging is displacing other forms of interpersonal communication, such as the telephone and face-to-face, for its younger users. Are teenagers and college students who use instant messaging, using other forms of interpersonal communication less often? Additional findings in this area include that students 21 years of age and older used e-mail for task-related communication more than those 17-20 years of age. One reason for this finding is that students 21 years of age and older might just have more task-related communication

to do. By that age, most students are nearing the end of their college years and are therefore deeply involved in their major courses as well as possibly looking for jobs and internships. Another finding related to instant messaging and age differences is that students 17-20 years of age use instant messaging for communicating with people known offline and report interpersonal utility as a motive for instant messaging more than students 21 years of age and older. This finding makes sense given that instant messaging tends to be a young person's activity (Rainie, 2000). So, while the younger users may not have a need to use instant messaging for task-related communication as much as older users, they do still enjoy using it for social reasons. Future research should explore the findings related to instant messaging use and age further by asking the question: Is it age or generation differences?

Not many significant differences were found between those students in the hard science majors and those in nonhard science majors in regards to their CMC usage as originally thought. However, this study did find that students in nonhard science majors used e-mail significantly more than those in hard science majors for social-related communication and for communicating with people known offline. This slightly contradicts Anderson's (2001) finding that students in hard science majors are more likely to become dependent on the Internet. Given that these students are not reporting using e-mail, instant messaging, and online chat rooms for social communication more than students in majors other than the hard sciences and are in fact reporting it less, there does not seem to be any support from this study for Anderson's (2001) finding. However, future research should explore the relationship between academic major and

CMC usage more in depth. Researchers should differentiate between more than just hard science and nonhard science majors. At the time of data collection, the University of Delaware is the second most wired university in the United States, which indicates that a student certainly does not need to be a hard science major to have access to the Internet and CMC channels.

#### Directions for Future Research

Since researchers have just begun to look at computer-mediated communication, this study was exploratory in nature. Its purpose was to examine the way in which college students use CMC technology and to find aspects of their lives that affect their use of such communication tools. The findings of this study are rich and plentiful and should aid researchers in future study of the Internet. While many directions for future research were mentioned previously, this next section focuses on general areas for researchers to focus.

One area for future research would be to expand on the findings regarding uses of e-mail, instant messaging, and online chat rooms. While it was found from this study that college students are using certain forms of CMC more than others for certain uses, one question that researchers might ask is why. What is it about these technologies that prompt this type of use? For example, what is it about e-mail that causes students to use it more often than instant messaging and online chat rooms to communicate with people known offline?

Another area for future research to look at is the area of motives related to computer-mediated communication. This study found that there are some motives that

e-mail, instant messaging, and online chat rooms have in common, but there are other motives that are unique to each of these three forms of CMC. Similar to the questions posed in the previous paragraph about uses, researchers need to ask why in regards to motives. Why are college students reporting convenience as a motive for e-mail but not for instant messaging and online chat rooms? One specific motive that requires more examination is the motive of chat room benefits. This motive consisted of many of the benefits that have been reported about online chat rooms in past research (Markey & Wells, 2002). When factored, these benefits did not disperse out into many different motives, but rather correlated together as one defining motive. This finding indicates that online chat rooms may be more different from other forms of CMC than researchers have previously thought and therefore deserves much more attention in research.

Given the contradictory findings in the research regarding psychological antecedents, future research into the relationship between psychological antecedents and CMC technology use is needed. Many nonhypothesized findings in this study deserve further examination. While this study did not find that overall use of e-mail and instant messaging are related to the psychological antecedents, it did find that certain uses and motives were related. Further exploration into these relationships between uses, motives, and psychological antecedents is necessary. Also, further study into the use of online chat rooms and psychological antecedents is needed since it was found that they are related.

It is clear from this study that social antecedents have some effect on the CMC usage of college students. Since involvement in student activities is one social antecedent

that has not been studied before, it is necessary for future research to be done to confirm the findings of this study. But also, research should look at the social networks that students are a part of including the activities they are involved in and examine how these networks and relationships affect their use of CMC technology. Research needs to look more specifically at the types of networks and relationships that students have in their lives. It may be useful for future research to look at how students use CMC to communicate with professors and business contacts and how that use differs from their use of CMC to communicate with friends and family.

This study has shown that certain demographic antecedents affect college students' use of CMC technology. However, much more research in this area is needed. More specific research needs to look at gender and age and the specific uses and motives for CMC. Although little was found in regard to academic major, there were some slight differences between the two groups. More differentiation between majors may provide further insight into how this antecedent affects students' CMC use.

One type of CMC that was looked at in this study, but that deserves further mention in terms of future research is online chat rooms. This form of CMC was not able to be tested fully in this study given the small amount of respondents who indicated using online chat rooms. However, some interesting findings emerged and deserve further exploration. For example, the motive of chat room benefits was quite unique to online chat rooms and requires further examination. Also, given the still contradictory findings in past research regarding psychological antecedents and their effect on chat room use, more research needs to look at who is using online chat rooms and what uses do they

have for them. One other interesting area of research in regards to online chat rooms is to look at maybe why college students are not using this form of CMC as much as other forms. Do online chat rooms have a negative connotation attached to them? Are they seen as a dysfunctional way to use the Internet? These are questions that should be explored further by researchers.

### Limitations

Although this study has contributed greatly to the literature on the Internet and computer-mediated communication, it is not without limitations. This next section touches on some of the limitations of the methodology used in this study.

Like other uses and gratifications research, this study used a self-report method, which in itself has some drawbacks. Self-report methods such as the survey used in this study rely on respondents to answer honestly. The chance researchers take with this type of method is that respondents might not always answer questions truthfully or be able to accurately estimate measures. The time measures used in this study asked respondents to estimate how many minutes per week they spend using a particular form of CMC and how many years they had been using that form of CMC. These measures provided numbers that indicate that the respondents were not able to accurately estimate time or years and thus are a limitation to this study. One reason that the respondents were not able to accurately measure their time using CMC might be because it is a mundane behavior, similar to Ferguson's (1994) finding that respondents were unable to accurately report how often they changed the channel while watching television, also a mundane behavior.

One major limitation of this study is that there were only 93 respondents who reported using online chat rooms. While this finding is somewhat informative in the fact that it signals that college students are not large users of chat rooms, it also did not allow for rich testing to be done. In future studies, it might be helpful to find a large number of online chat room users in order to adequately compare them to users of e-mail and instant messaging. However, it was unforeseen that so few respondents in this study would be users of online chat rooms.

Another limitation of this study is the manner in which some measures were determined. The measures for long distance and social networks were not adequate for assessing what they were intended to evaluate. The long distance measure was computed from only one item on the uses list. A more comprehensive measure would most likely have helped to assess involvement in a long distance relationship more easily. The social networks measure was not filled out correctly by many of the respondents. This may have been because the wording was confusing or that it was at the end of the survey. The incompleteness of many of the surveys did not allow for a proper measuring of social networks. A better measure for this factor would be helpful in future research to determine whether social networks have an effect on CMC usage.

A fourth limitation of this study is the lack of random sampling. The sampling used in this study was convenience sampling in order to obtain a large number of respondents given the exploratory nature of the sample. In future research a random sample may help to find even more information about college students' use of CMC and would allow the results to be generalized.

Finally, this study was intended to examine college students' use of computer-mediated communication. This is an important population to study because they are such wide users of the technology and they are the future users of CMC. So, studying how college students use the technologies now will help predict how they will use it later in their lives. However, having such a narrow focus does not allow the results of this study to be generalized past college students. Further exploration into how the general population uses CMC would provide even greater depth into this area of research.

### Conclusion

Despite the limitations mentioned, this study provides a wealth of information about college students' uses and motives for CMC. The exploratory nature of the study allowed for numerous areas to be examined including psychological, social, and demographic antecedents. More research still needs to be done in the area of the Internet and more specifically, computer-mediated communication; however, this study provides a great starting point for researchers. There are numerous questions and topics that could be and should be explored to further understand how college students and the general population use CMC technologies in their lives. The Internet is fast becoming a major part of most people's daily lives. Therefore, it is important for researchers and scholars to understand how it is being used and why.

Appendix  
SURVEY INSTRUMENT



<u>I use e-mail to:</u>		Very Frequently	Often	Sometimes	Rarely	Never
11.	Find others who have the same interests	5	4	3	2	1
12.	Keep in touch with people I only know online	5	4	3	2	1
13.	To keep in touch with family or relatives	5	4	3	2	1
14.	To make friends of the opposite sex	5	4	3	2	1
15.	Keep in touch with boyfriend/girlfriend who lives far away	5	4	3	2	1
16.	To talk to business and professional contacts	5	4	3	2	1
17.	To send and receive files	5	4	3	2	1

**DIRECTIONS:** For each statement below, please CIRCLE the number that best expresses your own reasons for using e-mail.

<u>I use e-mail:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
1.	Because it is entertaining	5	4	3	2	1
2.	Because it is enjoyable	5	4	3	2	1
3.	Because it is fun	5	4	3	2	1
4.	Because it relaxes me	5	4	3	2	1
5.	To not look old-fashioned	5	4	3	2	1
6.	To look stylish	5	4	3	2	1
7.	To look fashionable	5	4	3	2	1
8.	To feel involved with what's going on with other people	5	4	3	2	1
9.	Because I need someone to talk to or be with	5	4	3	2	1
10.	Because I just need to talk about my problems sometimes	5	4	3	2	1
11.	To feel less inhibited when I communicate	5	4	3	2	1
12.	To help others	5	4	3	2	1
13.	Because it is inexpensive	5	4	3	2	1
14.	Because people don't have to be there to receive e-mail	5	4	3	2	1

<u>I use e-mail:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
15.	Because it is easier to e-mail than talk to some people	5	4	3	2	1
16.	To give me something to occupy my time	5	4	3	2	1
17.	Just because it is available	5	4	3	2	1
18.	When I have nothing better to do	5	4	3	2	1
19.	Because it's thrilling	5	4	3	2	1
20.	When there is no one else to talk or be with	5	4	3	2	1
21.	Because it passes the time away, particularly when I am bored	5	4	3	2	1
22.	To show others encouragement	5	4	3	2	1
23.	To feel connected to other people	5	4	3	2	1
24.	Because it makes me feel less lonely	5	4	3	2	1
25.	Because it's a habit, just something I do	5	4	3	2	1
26.	Because it is more comfortable than talking to people face to face	5	4	3	2	1
27.	So I won't have to feel alone	5	4	3	2	1
28.	Because I can express myself freely	5	4	3	2	1
29.	To be anonymous	5	4	3	2	1
30.	So I can get away from what I'm doing	5	4	3	2	1
31.	To tell others what to do	5	4	3	2	1
32.	To get someone to do something for me	5	4	3	2	1
33.	Because I can pretend to be anyone I want to be when interacting with other people online	5	4	3	2	1
34.	To belong to a group	5	4	3	2	1
35.	Because I enjoy answering questions	5	4	3	2	1
36.	To get more points of view	5	4	3	2	1
37.	Because it is easy	5	4	3	2	1
38.	To get information for free	5	4	3	2	1

<u>I use e-mail:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
39.	To look for information	5	4	3	2	1
40.	To see what is out there	5	4	3	2	1
41.	I just like to use it	5	4	3	2	1
42.	To thank people	5	4	3	2	1
43.	To let others know I care about their feelings	5	4	3	2	1
44.	Because I am concerned about others	5	4	3	2	1
45.	Because it is a pleasant rest	5	4	3	2	1
46.	Because it makes me feel less tense	5	4	3	2	1
47.	To get away from pressures and responsibilities	5	4	3	2	1
48.	To put something off that I should be doing	5	4	3	2	1
49.	To forget about my problems	5	4	3	2	1
50.	So I can have control over when and if I respond	5	4	3	2	1
51.	So I can have electronic copies of my correspondence	5	4	3	2	1

**INSTANT MESSAGING SECTION:**

Do you use instant messaging?    Yes    or    No

If you responded "Yes" please continue on to the next question, if you responded "No" please skip to the next section (page 6).

About how many minutes do you spend instant messaging on a typical day? \_\_\_\_\_ minutes

About how long have you been using instant messaging? \_\_\_\_\_ years

**DIRECTIONS:** For each statement below, please CIRCLE the number that represents your response.

<u>I use instant messaging to:</u>		Very Frequently	Often	Sometimes	Rarely	Never
1.	Ask classmates questions about material covered in class	5	4	3	2	1
2.	Keep in touch with people I only know online	5	4	3	2	1
3.	Find others who have the same interests	5	4	3	2	1

<u>I use instant messaging to:</u>		Very Frequently	Often	Sometimes	Rarely	Never
4.	Keep in touch with friends	5	4	3	2	1
5.	To talk to business and professional contacts	5	4	3	2	1
6.	Meet new people	5	4	3	2	1
7.	Keep in touch with boyfriend/girlfriend who lives far away	5	4	3	2	1
8.	Ask professors questions about material covered in class	5	4	3	2	1
9.	Coordinate group assignments with classmates	5	4	3	2	1
10.	To make friends of the opposite sex	5	4	3	2	1
11.	To send and receive files	5	4	3	2	1
12.	Keep in touch with boyfriend/girlfriend	5	4	3	2	1
13.	Let professors know why I missed/will miss class	5	4	3	2	1
14.	Keep in touch with people I've met online	5	4	3	2	1
15.	Keep in touch with friends or relatives who live far away	5	4	3	2	1
16.	Keep in touch with family or relatives	5	4	3	2	1
17.	For a way to do research	5	4	3	2	1

**DIRECTIONS:** For each statement below, please CIRCLE the number that best expresses your own reasons for using instant messaging.

<u>I use instant messaging:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
1.	Because it is a pleasant rest	5	4	3	2	1
2.	Because it makes me feel less tense	5	4	3	2	1
3.	To get away from pressures and responsibilities	5	4	3	2	1
4.	To put something off that I should be doing	5	4	3	2	1
5.	To forget about my problems	5	4	3	2	1
6.	To get more points of view	5	4	3	2	1
7.	Because I wonder what other people said	5	4	3	2	1
8.	Because it is easy	5	4	3	2	1

<u>I use instant messaging:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
9.	To get information for free	5	4	3	2	1
10.	To look for information	5	4	3	2	1
11.	To see what is out there	5	4	3	2	1
12.	So I can have control over when and if I respond	5	4	3	2	1
13.	I just like to use it	5	4	3	2	1
14.	To thank people	5	4	3	2	1
15.	To let others know I care about their feelings	5	4	3	2	1
16.	Because I am concerned about others	5	4	3	2	1
17.	Because it is easier to e-mail than talk to some people	5	4	3	2	1
18.	To give me something to occupy my time	5	4	3	2	1
19.	Just because it is available	5	4	3	2	1
20.	When I have nothing better to do	5	4	3	2	1
21.	Because it's thrilling	5	4	3	2	1
22.	When there is no one else to talk or be with	5	4	3	2	1
23.	Because it passes the time away, particularly when I am bored	5	4	3	2	1
24.	To tell others what to do	5	4	3	2	1
25.	To get someone to do something for me	5	4	3	2	1
26.	So I can have electronic copies of my correspondence	5	4	3	2	1
27.	Because I can pretend to be anyone I want to be when interacting with other people online	5	4	3	2	1
28.	To belong to a group	5	4	3	2	1
29.	So I won't have to feel alone	5	4	3	2	1
30.	Because I can express myself freely	5	4	3	2	1
31.	To be anonymous	5	4	3	2	1
32.	So I can get away from what I'm doing	5	4	3	2	1
33.	To show others encouragement	5	4	3	2	1

<u>I use instant messaging:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
34.	To feel connected to other people	5	4	3	2	1
35.	Because it makes me feel less lonely	5	4	3	2	1
36.	Because it's a habit, just something I do	5	4	3	2	1
37.	Because it is more comfortable than talking to people face to face	5	4	3	2	1
38.	To look stylish	5	4	3	2	1
39.	To look fashionable	5	4	3	2	1
40.	To feel involved with what's going on with other people	5	4	3	2	1
41.	Because I need someone to talk to or be with	5	4	3	2	1
42.	Because I just need to talk about my problems sometimes	5	4	3	2	1
43.	To feel less inhibited when I communicate	5	4	3	2	1
44.	To help others	5	4	3	2	1
45.	Because it is inexpensive	5	4	3	2	1
46.	Because people don't have to be there to receive e-mail	5	4	3	2	1
47.	Because it is entertaining	5	4	3	2	1
48.	Because it is enjoyable	5	4	3	2	1
49.	Because it is fun	5	4	3	2	1
50.	Because it relaxes me	5	4	3	2	1
51.	To not look old-fashioned	5	4	3	2	1

### ONLINE CHAT ROOMS SECTION:

Have you used online chat rooms? Yes or No

If you responded "Yes" please continue on to the next question, if you responded "No" please skip to the next section (page 9).

About how many minutes do you spend in online chat rooms on a typical day? \_\_\_\_\_ minutes

About how long have you been using online chat rooms? \_\_\_\_\_ years

**DIRECTIONS:** For each statement below, please CIRCLE the number that represents your response.

<u>I use online chat rooms to:</u>		Very Frequently	Often	Sometimes	Rarely	Never
1.	Coordinate group assignments with classmates	5	4	3	2	1
2.	To talk to business and professional contacts	5	4	3	2	1
3.	Find others who have the same interests	5	4	3	2	1
4.	To make friends of the opposite sex	5	4	3	2	1
5.	Keep in touch with people I only know online	5	4	3	2	1
6.	Keep in touch with boyfriend/girlfriend	5	4	3	2	1
7.	Meet new people	5	4	3	2	1
8.	Keep in touch with friends	5	4	3	2	1
9.	Ask classmates questions about material covered in class	5	4	3	2	1
10.	Keep in touch with friends or relatives who live far away	5	4	3	2	1
11.	For a way to do research	5	4	3	2	1
12.	Keep in touch with boyfriend/girlfriend who lives far away	5	4	3	2	1
13.	Keep in touch with family or relatives	5	4	3	2	1
14.	To send and receive files	5	4	3	2	1
15.	Let professors know why I missed/will miss class	5	4	3	2	1
16.	Keep in touch with people I've met online	5	4	3	2	1
17.	Ask professors questions about material covered in class	5	4	3	2	1

**DIRECTIONS:** For each statement below, please CIRCLE the number that best expresses your own reasons for using online chat rooms.

<u>I use online chat rooms:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
1.	When there is no one else to talk or be with	5	4	3	2	1
2.	Because it passes the time away, particularly when I am bored	5	4	3	2	1
3.	So I can have control over when and if I respond	5	4	3	2	1

<u>I use online chat rooms:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
4.	To show others encouragement	5	4	3	2	1
5.	To feel connected to other people	5	4	3	2	1
6.	Because it makes me feel less lonely	5	4	3	2	1
7.	Because I am concerned about others	5	4	3	2	1
8.	Because it is a pleasant rest	5	4	3	2	1
9.	Because it makes me feel less tense	5	4	3	2	1
10.	To get away from pressures and responsibilities	5	4	3	2	1
11.	So I can have electronic copies of my correspondence	5	4	3	2	1
12.	To put something off that I should be doing	5	4	3	2	1
13.	To look stylish	5	4	3	2	1
14.	To look fashionable	5	4	3	2	1
15.	To feel involved with what's going on with other people	5	4	3	2	1
16.	Because I need someone to talk to or be with	5	4	3	2	1
17.	Because I just need to talk about my problems sometimes	5	4	3	2	1
18.	To be anonymous	5	4	3	2	1
19.	So I can get away from what I'm doing	5	4	3	2	1
20.	To tell others what to do	5	4	3	2	1
21.	To get someone to do something for me	5	4	3	2	1
22.	Because I can pretend to be anyone I want to be when interacting with other people online	5	4	3	2	1
23.	Because it is entertaining	5	4	3	2	1
24.	Because it is enjoyable	5	4	3	2	1
25.	Because it is fun	5	4	3	2	1
26.	Because it relaxes me	5	4	3	2	1
27.	To not look old-fashioned	5	4	3	2	1
28.	To look for information	5	4	3	2	1

<u>I use online chat rooms:</u>		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
29.	To see what is out there	5	4	3	2	1
30.	I just like to use it	5	4	3	2	1
31.	To thank people	5	4	3	2	1
32.	To let others know I care about their feelings	5	4	3	2	1
33.	Because it is easier to e-mail than talk to some people	5	4	3	2	1
34.	To give me something to occupy my time	5	4	3	2	1
35.	Just because it is available	5	4	3	2	1
36.	When I have nothing better to do	5	4	3	2	1
37.	Because it's thrilling	5	4	3	2	1
38.	To belong to a group	5	4	3	2	1
39.	To get more points of view	5	4	3	2	1
40.	Because I wonder what other people said	5	4	3	2	1
41.	Because it is easy	5	4	3	2	1
42.	To get information for free	5	4	3	2	1
43.	To feel less inhibited when I communicate	5	4	3	2	1
44.	To help others	5	4	3	2	1
45.	Because it is inexpensive	5	4	3	2	1
46.	Because people don't have to be there to receive e-mail	5	4	3	2	1
47.	Because it's a habit, just something I do	5	4	3	2	1
48.	Because it is more comfortable than talking to people face to face	5	4	3	2	1
49.	So I won't have to feel alone	5	4	3	2	1
50.	Because I can express myself freely	5	4	3	2	1
51.	To forget about my problems	5	4	3	2	1

**DIRECTIONS:** The next section of this questionnaire asks you questions about yourself and about your beliefs. For each item below, please indicate the extent to which you **agree or disagree** with each statement.

		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
1.	I am afraid to speak up in conversations.	5	4	3	2	1
2.	I talk less because I'm shy.	5	4	3	2	1
3.	I like to get involved in group discussions.	5	4	3	2	1
4.	I talk a lot because I am not shy.	5	4	3	2	1
5.	My friends and family don't listen to my ideas and suggestions.	5	4	3	2	1
6.	I think my friends are truthful with other people.	5	4	3	2	1
7.	I don't ask for advice from family or friends when I have to make decisions.	5	4	3	2	1
8.	I believe my friends and family understand my feelings.	5	4	3	2	1
9.	I have fears about expressing myself in a group.	5	4	3	2	1
10.	My family doesn't enjoy discussing my interests and activities with me.	5	4	3	2	1
11.	I avoid group discussions.	5	4	3	2	1
12.	My friends seek my opinions and advice.	5	4	3	2	1
13.	I am afraid to express myself in a group.	5	4	3	2	1
14.	During a conversation, I prefer to talk rather than listen.	5	4	3	2	1
15.	Other people are friendly only because they want something out of me.	5	4	3	2	1
16.	I find it easy to make conversation with strangers.	5	4	3	2	1
17.	My friends and family listen to my ideas and suggestions.	5	4	3	2	1
18.	Talking to other people is just a waste of time.	5	4	3	2	1
19.	I feel nervous when I have to speak to others.	5	4	3	2	1
20.	I don't think my friends are honest in their communication with me.	5	4	3	2	1
21.	I feel in tune with the people around me.	5	4	3	2	1
22.	I lack companionship.	5	4	3	2	1
23.	There is no one I can turn to.	5	4	3	2	1
24.	I do not feel alone.	5	4	3	2	1
25.	I feel part of a group of friends.	5	4	3	2	1

		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
26.	I have a lot in common with the people around me.	5	4	3	2	1
27.	I am no longer close to anyone.	5	4	3	2	1
28.	Those around me do not share my interests and ideas.	5	4	3	2	1
29.	I am an outgoing person.	5	4	3	2	1
30.	There are people I feel close to.	5	4	3	2	1
31.	I feel left out.	5	4	3	2	1
32.	My social relationships are superficial.	5	4	3	2	1
33.	No one really knows me well.	5	4	3	2	1
34.	I feel isolated from others.	5	4	3	2	1
35.	I can find companionship when I want it.	5	4	3	2	1
36.	There are people who really understand me.	5	4	3	2	1
37.	I am unhappy being so withdrawn.	5	4	3	2	1
38.	People are around me but not with me.	5	4	3	2	1
39.	There are people I can talk to.	5	4	3	2	1
40.	There are people I can turn to.	5	4	3	2	1
41.	I am somewhat socially awkward.	5	4	3	2	1
42.	I find it hard to talk to strangers.	5	4	3	2	1
43.	I feel tense when I'm with people I don't know well.	5	4	3	2	1
44.	When talking, I worry about saying something dumb.	5	4	3	2	1
45.	I feel nervous when speaking to someone in authority.	5	4	3	2	1
46.	I am often uncomfortable at parties and other social functions.	5	4	3	2	1
47.	I feel inhibited in social situations.	5	4	3	2	1
48.	I have trouble looking someone right in the eye.	5	4	3	2	1
49.	I am shy with members of the opposite sex.	5	4	3	2	1
50.	Other people let me know that I communicate effectively.	5	4	3	2	1
51.	Other people express a lot of interest in what I have to say.	5	4	3	2	1
52.	Other people genuinely want to get to know me.	5	4	3	2	1
53.	My conversations flow smoothly.	5	4	3	2	1
54.	In conversations, we each get to say what we want to.	5	4	3	2	1
55.	In conversations, I feel that we can laugh easily together.	5	4	3	2	1

		Strongly Agree	Agree Some	Agree Some and Disagree Some	Disagree Some	Strongly Disagree
56.	During conversations with others, I am able to present myself as I want others to view me.	5	4	3	2	1
57.	I have better things to do than converse with others.	5	4	3	2	1
58.	I do NOT enjoy conversations.	5	4	3	2	1
59.	Nothing is ever accomplished in conversations.	5	4	3	2	1
60.	I am very dissatisfied with my conversations.	5	4	3	2	1
61.	We usually talk about something I am NOT interested in.	5	4	3	2	1
62.	I would like to continue having conversations like the ones I have now.	5	4	3	2	1
63.	I feel like I can talk about anything with other people.	5	4	3	2	1
64.	Other people show me they understand what I say.	5	4	3	2	1
65.	I am very satisfied with my conversations.	5	4	3	2	1

**DIRECTIONS:** The next section of this questionnaire asks you questions about your involvement in student activities. For each item below, please indicate whether you are involved in the listed activity by placing an "X" next to the activity. Please check all that apply.

- |  |  |
|--|--|
| <input type="checkbox"/> Campus Programming              | <input type="checkbox"/> Partisan Political Groups           |
| <input type="checkbox"/> Club Sports                     | <input type="checkbox"/> Religious Organizations             |
| <input type="checkbox"/> Co-curricular Organizations     | <input type="checkbox"/> Residence Hall Governments          |
| <input type="checkbox"/> Community Service Organizations | <input type="checkbox"/> Special Interest Organizations      |
| <input type="checkbox"/> Culture and Performance Groups  | <input type="checkbox"/> Sports and Recreation Organizations |
| <input type="checkbox"/> Fraternities & Sororities       | <input type="checkbox"/> Student Government                  |
| <input type="checkbox"/> Graduate Student Organizations  | <input type="checkbox"/> Student Media                       |
| <input type="checkbox"/> Honor Societies                 | <input type="checkbox"/> Other: _____                        |
| <input type="checkbox"/> Multicultural Organizations     | <input type="checkbox"/> Other: _____                        |

**DIRECTIONS:** The next section of this questionnaire asks you questions about the people you communicate with face-to-face and also online. For each category below, please indicate about how many people in each category you communicate with on a typical day by writing in the number next to the category.

In Face-to-face:

- \_\_\_\_\_ Family members
- \_\_\_\_\_ Boyfriend/Girlfriend
- \_\_\_\_\_ Friends
- \_\_\_\_\_ Classmates
- \_\_\_\_\_ Professors
- \_\_\_\_\_ Coworkers
- \_\_\_\_\_ Employers
- \_\_\_\_\_ Strangers/People I haven't met

Through instant messaging:

- \_\_\_\_\_ Family members
- \_\_\_\_\_ Boyfriend/Girlfriend
- \_\_\_\_\_ Friends
- \_\_\_\_\_ Classmates
- \_\_\_\_\_ Professors
- \_\_\_\_\_ Coworkers
- \_\_\_\_\_ Employers
- \_\_\_\_\_ Strangers/People I haven't met

Over E-mail:

- \_\_\_\_\_ Family members
- \_\_\_\_\_ Boyfriend/Girlfriend
- \_\_\_\_\_ Friends
- \_\_\_\_\_ Classmates
- \_\_\_\_\_ Professors
- \_\_\_\_\_ Coworkers
- \_\_\_\_\_ Employers
- \_\_\_\_\_ Strangers/People I haven't met

In online chat rooms:

- \_\_\_\_\_ Family members
- \_\_\_\_\_ Boyfriend/Girlfriend
- \_\_\_\_\_ Friends
- \_\_\_\_\_ Classmates
- \_\_\_\_\_ Professors
- \_\_\_\_\_ Coworkers
- \_\_\_\_\_ Employers
- \_\_\_\_\_ Strangers/People I haven't met

**DIRECTIONS: This final section asks you to provide some basic information about yourself.**

1. How old are you? (As of your last birthday) \_\_\_\_\_ years
2. Please CIRCLE the number to indicate if you are: **Female** or **Male**
3. How long have you been using computers? \_\_\_\_\_ years
4. Do you have a computer where you live right now? (CIRCLE your response) **Yes** or **No**
5. Do you have Internet access where you live right now? (CIRCLE your response) **Yes** or **No**
6. If you have Internet access where you live right now, how do you connect to the Internet? (CIRCLE your response below)

<b>Dial-up Modem</b>	<b>Ethernet</b>	<b>High Speed DSL</b>	<b>Cable High Speed Access</b>	<b>Other</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>

7. How fast would you estimate the speed of your connection to the Internet where you live right now? (CIRCLE your response below)

<b>Very slow</b>						<b>Very fast</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>



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