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# Creating and Maintaining Social Presence via Computer-Mediated Communication: Measuring the Self-Rated Behaviors that Lead to Social Presence

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I am submitting herewith a dissertation written by Scott A. Christen entitled "Creating and Maintaining Social Presence via Computer-Mediated Communication: Measuring the Self-Rated Behaviors that Lead to Social Presence." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Communication.

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Measuring the Self-Rated Behaviors that Lead to Social Presence

A Dissertation Presented for the  
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Degree  
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Scott A. Christen  
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## **Abstract**

This dissertation involved the creation and validation of a new measure of social presence. The first study involved the use of focus groups to create items for the future measure. The focus groups were presented with a set of items that were created based upon past literature; an through discussion of these items, a preliminary measure was created. The second study gathers data concerning the measure that was created from study one and an exploratory factor analysis was performed to eliminate items that did not work well with each other. This reduced the measure from 54 items to 23. The third study involved gathered data to perform a confirmatory factor analysis on the reduced measure from study two to 20 items. The confirmatory factor analysis, also provide construct validity for the measure. The end result of this dissertation is a valid and reliable measure of social presence that can be used to determine if a person has difficulty projecting him or herself as a real individual who is willing to interact with other online communicators.

Keywords: *social presence, computer-mediated communication, online learning*

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## CHAPTER 1: SOCIAL PRESENCE

In face-to-face (FtF) interpersonal communication, an individual adapts messages, adjusts perceptions, interacts, and processes messages instantly based upon the other individual's actions/reactions in pursuit of a social goal (Burlison, 2010). For example, Brian and Mark are discussing a few of their fellow classmates. Brian notices that Mark's nonverbal messages change when a specific student's name is mentioned. Specifically, he looks away and he drops the volume of his voice. Brian makes an assumption based upon these specific nonverbal messages that Mark has a crush on the other student and asks him if he likes her. Mark states that she is just a friend, but begins to blush and tries to change the subject. These additional nonverbal messages reinforce Brian's theory that Mark has a crush on the other student. By adding nonverbal messages to the verbal message, the communicators can develop deep understandings of each other. For example, a smile while talking to another person can imply that the interactant is enjoying talking about the subject or with the other person.

However, in computer-mediated communication (CMC) the interactants may or may not have instant feedback, access to the full range of nonverbal communication cues, the full complement of message production options, effective message processing due to user inexperience with CMC, and concrete social perception because of ambiguous messages. If Brian and Mark were discussing their fellow classmates via email, Brian would be unable to pick up on the nonverbal messages that Mark gave in the first example and would base his understanding of the conversation solely on what text was sent. Thus, Brian would have little or no basis to assume that Mark has a crush on the other student. The inability to view traditional nonverbal messages such as eye contact, vocal cues, body stance, etc. are not the only issue with CMC communication; different channels of CMC have their own unique advantages and

disadvantages.

A person using text messaging for the first time may or may not understand the asynchronous nature of this CMC channel. Asynchronous channels allow interactants to respond when they wish after reflecting upon the message sent instead of within a particular time frame (Walther & Parks, 2002). This misunderstanding can lead to agitation because the other person did not respond instantly. In addition, a communicator may not understand the use of capitalization and its intended effect on the text messages' meaning. Words in all caps usually imply that the other person is stating the message/word loudly, but it also may relate to the other person's lack of experience with CMC or technology in general. The lack of the traditional non-verbal messages, inexperience with CMC messages, as well as the effect of asynchronous vs. synchronous channels being used simultaneously can affect the way messages are interpreted and created. In spite of these limitations, the use of CMC is on the rise and the users of CMC employ FtF communication channels as well as CMC channels to initiate, develop, and maintain interpersonal relationships (Bryant, Marmo, & Ramierez, 2011; Katz & Rice, 2002; Walther & Parks, 2002; Walther & Ramierez, 2009).

Due to technological advances, CMC allows people to make connections, establish friendships, and even fall in love without ever meeting face to face. Friends and family members can have instant contact no matter the distance, and messages can range from a one-letter text message to hundreds of pages of emails. CMC's ability to connect people over distance and time has affected our interpersonal communication, which involves maximizing the presence of the communicators (Stewart, 2006) and is a complex process that involves message production, message processing, interaction coordination, and social perception (Burleson, 2010). The increased use of CMC in interpersonal communication makes understanding how CMC channels

are used to make interpersonal connections important to both CMC and interpersonal communication theory. Yet, very little research has been conducted on individuals' abilities to make interpersonal connections electronically.

Most CMC research has revolved around how the channels/media affect the connection between individuals (Parks, 2009; Walther, 2010). For example, media richness theory (Daft & Lengel, 1986), and its offshoot of channel expansion theory (Carlson & Zmud, 1994), posits that the channel's ability to carry nonverbal messages affects the equivocality of the message, and by choosing a channel that matches the equivocality potential of the message the communicator can be more effective (Carlson & Zmud, 1994; Daft & Lengel, 1984; Kock, 2004; Walther & Parks, 2002). Equivocality refers to the likelihood of a message being misinterpreted, a communication behavior competent communicators attempt to minimize (Carlson & Zmud, 1999; Trevino, Lengel, Bodensteiner, Gerlof, & Muir, 1990). According to this theory, communication events that are low in equivocality could use a channel that contains fewer nonverbal cues (Daft & Lengel, 1984; DeRosa, Hantula, Kock, & D'Arcy, 2004; Walther, 1992; Walther, Gay, & Hancock, 2005; Walther & Parks, 2002). FtF communication is considered the richest channel and is recommended as the channel to transmit messages that are high in equivocality (Carlson & Zmud, 1999; Walther, 1992). However, media theories have issues predicting how users perceive CMC channels, which leads to issues with the theory's premise concerning the reduction of equivocation (Kock, 2004; Parks, 2009; Walther, 2010; Walther & Parks, 2002).

The inconsistent nature of media theories concerning CMC channels is due to the CMC users' abilities to understand the attributes of the chosen channel, which implies that they choose the CMC channel for a specific purpose (Sallnas, Rasmus-Grohn, & Sjostrom, 2000; Spitzberg, 2006). CMC users do not choose a channel based upon the channel's limitations, but rather they

adapt to the channel that is being used. For example, a boy may text a message to a girl concerning his feelings for her instead of writing a note because it is quicker, convenient, and allows him to control when she receives the message. The boy could write a longer, more in-depth message on a piece of paper in an attempt to create an interpersonal connection. The ability of the channel to carry nonverbal messages is not the determining factor; it is the advantage that the channel provides the communicator that affects the channel choice. Even though the boy will have to send more messages attempting to make the same interpersonal connection (text messages tend to be 140 characters long), the effort to adapt to this CMC channel is outweighed by the convenience of the channel. By choosing a CMC channel, CMC users are taking responsibility for developing and maintaining the interpersonal connection because they understand the channel's limitations and adapt to create an interpersonal connection (Kehrwald, 2008).

When using CMC channels, nonverbal cues can be limited, which can affect the message's meaning (Sallnas et al., 2000; Walther, 1996; Walther & Parks, 2002). However, by establishing social presence, CMC users can overcome the limited nonverbal cues and establish a social connection (Harms & Biocca, 2004; Kehrwald, 2008). Social presence involves the feelings, perceptions, and reactions of individuals who are connected via a CMC channel (Biocca, Harms, & Burgoon, 2003; Cutler, 1995; Garrison, Anderson, & Archer, 2000; Tu & McIsaac, 2002). A text message does not have the inherent ability to transfer nonverbal messages that a spoken message can have. A text message cannot transfer nonverbal cues such as tone, rate of speech, and eye contact, which can affect how the message is interpreted; however, CMC users utilize the nonverbal cues that are available in the CMC channel to establish the social connection that would be available in a FtF communication event. For example, a communicator

can use capitalization, emoticons, and/or text language to replace tone and facial expressions that would accompany a verbal message to imply sarcasm/humor or a variety of other emotions. For this investigation, social presence is the degree of interpersonal connection established when communicators are using CMC. To create this connection, the CMC users must be able to establish themselves as individuals who are open to communication with another (Biocca et al., 2003; Biocca, Harms, & Gregg, 2001; Kehrwald, 2008; Swan & Shih, 2005).

Using “language, media, and communication tools” increases or decreases social presence (Kehrwald, 2008, p. 99). The level of social presence can vary from superficial acknowledgement to deep meaningful connections (Biocca et al., 2003); it is established by the communicator’s use of affective, interactive, and cohesive communication (Caples, 2006; Garrison et al., 2000; Rourke, Anderson, Garrison, & Archer, 1999). Affective communication includes messages that share emotions, disclose personal information, and/or display computer-mediated paralinguistics (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). When the CMC users share their feelings and their experiences, they demonstrate that each person is an individual. Sharing personal information also implies a sense of trust in the other individual that can lead the CMC receiver, in turn, to trust the CMC sender. The use of paralinguistics, such as text language, demonstrates that communicators are comfortable using informal language to display their emotions.

Interactive Communication refers to indications the communicator is open to receiving and attending to others’ messages (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The CMC senders create a reciprocal effect on the CMC receivers when they ask questions and/or include messages to which the CMC sender is expecting a response. By supplying feedback to



previous questions or referencing information from previous CMC messages, the CMC sender is acknowledging the prior communication obligation with the CMC receiver.

The third and final way that users adapt to CMC to create social presence is the use of cohesive communication. Cohesive communication concerns the communication behaviors that enhance feelings of being connected to another individual and is established by the use of vocatives and phatics. Vocatives are the use of inclusive pronouns such as *we*, *our*, or *us*, and the use of other communicators' names (Caples, 2006; Rourke et al., 1999). Phatic communication includes messages sent to promote sociability, not to acquire information (Rourke et al., 1999). Small talk such as asking how the others have been, discussions about the weather, or other mundane topics are examples of phatic messages (Garrison et al., 2000). The use of small talk, first names, and personal pronouns helps users adapt to CMC channels and promotes normal conversational styles that the users would experience in FtF communication, which enhances their feelings of being together in the CMC environment (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999).

To summarize, communicators may use CMC or FtF communication to initiate or maintain interpersonal relationships, but the choice of the CMC channel is based upon the communicator's perceptions of the channel. The communicator picks which channel to utilize because it serves a specific, and is not based upon the CMC channel's ability to transmit nonverbal communication. However, the lack of nonverbal cues in some CMC channels can inhibit the CMC user's ability to create a social connection. Projecting a social self when using a CMC channel is the user's responsibility, which is achieved by establishing a social presence through CMC channel adaptation, the use of affective, cohesive, and interactive communication.

## **Rationale**

CMC has become increasingly important in our everyday lives. The diffusion of communication technology into society has made CMC a common channel of communication; most relationships are now maintained via multiple channels of communication, including CMC channels (Katz & Rice, 2002; Ling & Yttri, 2002; Parks, 2009; Walther, 2010; Walther & Parks, 2002). However, there is currently an issue with the way CMC research is conducted. When a new CMC channel becomes popular, there is a rush of researchers to investigate this new channel (Parks, 2009). The problem with this rush to research is CMC channels and their related media change as they become diffused into society (Parks, 2009). Researchers in CMC need to focus on the fundamental assumptions about communication and communication behaviors (Parks, 2009) because focusing on the superficial causes and effects of CMC use leads to theories that are based upon flawed assumptions (Walther, 2010). By focusing on the user's capability to adapt to CMC, the underlying assumptions for research are theoretically driven instead of communication fads (Parks, 2009).

Due to mass acceptance of CMC, it is important that CMC channels not only be understood by researchers, but communication education programs need to instruct communication students on CMC theory. Communication students need to know how to improve their CMC skills as we have in other areas of communication such as public speaking, interviewing, and dyadic/small group communication. Additionally, the increase in CMC use in the workplace requires communication education to prepare students for the skills needed for employment after graduation (Hantula & Pawlowicz, 2004). Communication students benefit by understanding social presence because it explains how communicators can create and maintain interpersonal connections electronically (Kehrwald, 2008). Understanding social presence also

increases their understanding of communication as a field of study because it explains how communicators can adapt and change to meet today's communication-related technology. Finally, understanding social presence increases the effectiveness of communication via CMC, the purpose of communication education.

Enrollment in online education is on the rise with more than 6.7 million students being enrolled in at least one online course during the fall of 2011, which is 32 percent of the total enrollment of all degree-granting postsecondary institutions (Allen & Seaman, 2013). In addition to teaching students how to promote social presence in their everyday lives, online students should be able to project themselves as real individuals. Online educators need to understand social presence and use pedagogical strategies that promote social presence in the online class because the perception of social presence increases the students' satisfaction with their instructor, their perceived learning (Richardson & Swan, 2003), as well as their satisfaction with the class (Gunawardena & Zittle, 1997).

The success rates in online classes are similar to that of the traditional classroom (Mayadas, Bourne, & Bacsich, 2009) due to the instructor's pedagogical strategies and the communication choices of the instructor and students (Garrison, Anderson, & Archer, 2003; Mayadas et al., 2009). Students' motivation is lowered when the instructor and classmates are not perceived as real people (Richardson & Swan, 2003). When students do not feel connection, it creates a sense of isolation (Wegerif, 1998) and can lead students to avoid learning class material (Titsworth, Quinlan, & Mazer, 2010). Online educators who utilize affective communication demonstrate that they are real individuals (Martinez, 2001; Swan & Shih, 2005), which encourages reciprocity by students (Swan & Shih, 2005) and promotes cohesion (Fall, Kelly, & Angle, 2010). For example, an instructor who shares personal experiences in relation to

concepts discussed in class not only relates the material to real life, but also encourages students to share their personal experiences. This allows the communicators in the CMC event to see their instructor and classmates as real individuals instead of just a name or icon. However, understanding the principles and implementing them are two different ideas. To be able to encourage social presence among their students, instructors need to be able to identify students who have difficulty with projecting a social presence when using CMC channels.

To evaluate a theory we must be able to predict and explain a phenomenon (Berger & Chaffee, 1987). Current social presence instruments only measure the perception of social presence that participants perceive in CMC (Bangert, 2009; Biocca & Harms, 2002; Biocca, Harms, & Gregg, 2001), not the participant behaviors that create social presence. These instruments measure the perceptions of social presence that the CMC users felt with others during a CMC event such as a class discussion; because they do not measure each individual's behaviors, we cannot determine whether a single person, small group of people, or everyone created this feeling of being connected. The measurement of social presence that has occurred is important, but it does not allow social presence to be tested. To increase our understanding of social presence, this study focuses on measurement of an *individual's* behaviors when using CMC. Understanding the user's potential to create social presence furthers research in communication and online education. This leads us into the purpose of this investigation, which is the creation of a measure of social presence.

### **Research Purpose**

Since prior research has found that novice CMC channel users may have difficulty creating a social presence or interpreting communication of other CMC users, it is imperative that CMC users are provided with assistance in understanding social presence (Kehrwald, 2008).

To achieve this goal, we must be able to identify individuals with issues concerning social presence. Thus, a social presence measure can help identify individuals who have difficulty establishing social presence. In addition, the individual's scores on the subsections of the instrument can indicate the area(s) of social presence that need improvement.

Creating a new instrument is not a quick process and requires much testing to determine the extent to which a conceptual theory can be measured. Utilizing the recommendations of current literature, which posits that the indicators of social presence are affective, interactive, and cohesive communication (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999), a self-rated measure of social presence was created to address the individual behaviors of CMC users. However, any new instrument needs, at a minimum, to be tested for face, concurrent, convergent, and discriminant validity.

### **Concurrent Validity**

Concurrent validity is an instrument's ability to estimate a behavior that is external to the instrument (Cronbach & Meehl, 1955; Nunnally & Bernstein, 1994). Social Presence theory predicts that people using affective, cohesive, and interactive communication promote social presence, which increases the likelihood that the communicators in a CMC event will establish and maintain interpersonal connections (Kehrwald, 2008). It is logical to assume that users who score high on the social presence measure may choose to utilize CMC more than those who score low because they can establish better connections. The individuals who score higher on creating social presence should also maintain more relationships using CMC channels than those who have lower scores. Thus, users who score higher on the measure should send and receive more messages via CMC channels than those who have lower scores.

A communication channel is the way a message is transmitted from the sender to the receiver (Ferguson, 2008). FtF communication allows for communicators to utilize nonverbal cues, while some CMC channels limit the amount of nonverbal cues that can be transmitted (Walther & Parks, 2002). Even though CMC channels can differ in the amount of nonverbal communication that can be sent, the choice of a CMC channel by the communicator implies that it serves a particular function (Spitzberg, 2006; Walther & Parks, 2002). For example, asynchronous CMC channels allow the communicator time to think about the response (Sussman & Sproull, 1999), while synchronous channels increase the interactivity, which is one aspect of social presence (Duthler, 2006; Walther & Parks, 2002). Users who understand and practice behaviors that promote social presence should utilize more channels of CMC than those who do not.

Interpersonal communication occurs between people who are acknowledged as unique individuals and the communication is affected by the relationship that the communicators share, while impersonal communication occurs between communicators based upon the communicators' social roles (Burlison, 2010). Prior research has established that CMC users can create and maintain interpersonal relationships (Parks, 2009; Walther, 2010; Walther & Parks, 2002). To create interpersonal connections, CMC users must be able to project themselves as unique individuals, instead of an impersonal social roles, by projecting a social presence to the other communicator. With this understanding, we can predict that CMC users who can establish a social presence would utilize CMC with more types of interpersonal relationships than those who cannot establish a social presence.

### **Convergent Validity**

Individuals who have CMC apprehension should also have difficulty projecting a social presence. CMC apprehension refers to anxiety concerning sending and receiving messages via a computer-mediated channel (Brown, Fuller, & Vician, 2004; Scott & Timmerman, 2005). The CMC anxiety measure (Scott & Timmerman, 2005) predicts CMC technology use. Participants rank their apprehension when using CMC in various communication events.

The CMC apprehension measure predicts the use of new communication technologies in organizational settings (Scott & Timmerman, 2005), visits to social networking sites, and updates to users' profiles (Watson, 2007). Individuals who have anxiety concerning CMC channels would avoid using CMC channels. Furthermore, the anxiety of using these channels would also negatively affect the CMC user's ability to project a social presence (Wrench & Punyanunt-Carter, 2007). This negative relationship tests the convergent validity of the social presence measure. Convergent validity is established when measures correlate together in the way that theory predicts (Kerlinger & Lee, 2000; Nunnally & Bernstein, 1994). Participants who score high on the social presence measure should theoretically have lower CMC apprehension.

### **Discriminant Validity**

Discriminant validity is another type of construct validity, and it involves using two measures that, according to theory, should not correlate (Kerlinger & Lee, 2000; Nunnally & Bernstein, 1994). To assess the discriminant validity of the social presence measure, the Abridged Job in General (AJIG) measure was used. The AJIG is a measure of global satisfaction with a person's job (Russell et al., 2004). The AJIG has been found to correlate with a person's identification and commitment to the company (Russell et al., 2004). Theoretically, there should

not be a relationship between a person's job satisfaction and ability to project oneself as a social individual.

This study endeavors to create a self-rated measure of communication behaviors concerning a person's ability to project oneself as a real individual while using CMC channels. Guided by theory, survey testing ensures its reliability and validity. Using this measure in the classroom allows communication educators to understand and teach students how to be more effective while using CMC and increases the ability of the online educator to enhance the communication between and among the students in class.



## **CHAPTER 2: REVIEW OF LITERATURE**

The widespread acceptance of CMC into our everyday lives has made the use of CMC channels commonplace (Parks, 2009). However a definition of CMC is hard to create because it is a term that grows as new technologies are created and adapted by the users (Walther & Parks, 2002). Because new technologies constantly develop, it is important to investigate how the fundamental process of communication relates to CMC. This dissertation proposes the creation of a social presence measure to help communicators evaluate their communication skills. To understand the need for a new measure of social presence, a review of the fundamental aspects of CMC must be conducted. This chapter looks at the beginning stages of CMC research, specifically a comparison of FtF communication and CMC, the theoretical approaches that have been used to explain and predict CMC use, and the effects of social presence on the CMC communicators.

### **FtF Communication and CMC**

When CMC was first introduced, it was designed and used to transfer simple messages (Walther, 1996); however, communication involves more than the transfer of simple messages. This led to an investigation of the limitation of CMC channels by communication researchers looking to ascertain when and how CMC should be used. This investigation found that CMC lacked the facial and vocal cues that were present in FtF communication (Bordia, 1997; Culnan & Markus, 1987; Walther, 1996, 2010; Walther & Parks, 2002), which led researchers to believe that these missing nonverbal cues would affect the “regulation of interaction, perceptions of the communication partners, and awareness of social context of communication” (Culnan & Markus, 1987, p. 426).

The lack of the nonverbal cues, which was labeled as the cues filtered out perspective, predicted that the missing nonverbal cues would affect the regulation of interaction because the CMC users would be unable to tell when another person was communicating, which could cause communicators to interrupt the interaction or hesitate to communicate (Bordia, 1997; Culnan & Markus, 1987; Lea & Spears, 1995). This inability to tell when or if a communicator was going to send a message could inhibit the message production of the communicators using CMC. Additionally, this perspective predicted that the perceptions of communication partners would be negatively affected because nonverbal cues provide additional information about the communicator (Bordia, 1997; Culnan & Markus, 1987; Lea & Spears, 1995; Short, Williams, & Christie, 1976). In FtF communication, a communicator could interpret nonverbal cues from the other communicator to change or refine messages to ensure that the other communicator understands them. This lack of nonverbal communication also inhibited the ability of the participants to form judgments of other participants (Short et al., 1976).

Finally, the cues filter out perspective predicted that the social awareness of the situation would be hindered due to the lack of understanding of the situation in which the communication was occurring (Bordia, 1997; Culnan & Markus, 1987). FtF communication does not occur in a vacuum and the communicators can assess the location and situation in which the communication is occurring. CMC at this time was primarily text based and eliminated this information from the communication, leaving the communicators unaware of the situation and surroundings that the other communicator was experiencing.

These predictions led to the belief that CMC channels of communication were inferior to FtF communication leading to the investigation of the use of CMC in several areas of communication. Early investigation of group communication using FtF communication and

CMC found that the use of CMC increase the time that it took for groups to complete tasks, reduced the number of remarks by participants within groups, inhibited the perceptions of CMC communicators, decreased the social behaviors leading to rude and unprofessional behavior, and increased the groups focus on arguments that occurred via the discussion (Bordia, 1997). In addition, interpersonal communication would be inhibited because the lack of nonverbal and physical communication would be detrimental to the expression of emotional intimacy (Lea & Spears, 1995).

However, these findings and the “cues filtered out” perspective eventually were rejected (Walther & Parks, 2002). One reason for the rejection of this perspective was that most of the designs comparing FtF communication and CMC limited the time that participants were allowed to interact, thus skewing the results (Walther & Parks, 2002). Initial interest in CMC came from corporations interested in reducing the use of paper and travel costs. This lead to investigation into CMC channels as alternatives to traditional meetings. These studies would break participants up into two groups, some combination of FtF groups and/or CMC groups, and then study the differences in the group’s ability to form teams or complete projects. Due to the limited experience of participants with CMC at this time, it would of course take CMC users longer to replicate the ability of groups that were meeting FtF. The CMC users had to learn the CMC technology as well as adapt to a new channel of communication. This additional burden on CMC groups increased their work load and resulted in the difference between FtF and CMC groups’ performance (Hollingshead, McGrath, & O’Connor, 1993; Walther, 1996).

Additionally, it was predicted that users of CMC would find it difficult to form judgments of other CMC communicators because the lack of nonverbal cues would limit the information that was sent (Short et al., 1976). However, it became clear that CMC users were

creating judgments of others based upon comments that were being left on digital forums and by the comments left by participants from field experiments (Walther & Parks, 2002). Further evidence that CMC users would be able to form impressions of others can be found in the literature concerning interpersonal communication and CMC.

Interpersonal research found that individuals were using CMC to create interpersonal connections, even if those connections were based upon an ideal communication partner and not a realistic one (Walther, 1996). The reasons for this unrealistic perception are that the users of CMC could choose which nonverbal cues in CMC they used and when to use them. This ability to control the amount of nonverbal cues increases the significance of the cues that are available (Bordia, 1997; Walther et al., 2005; Walther & Parks, 2002). For example, a person using text messaging will not try to focus on eye contact, body stance, or vocal tone when they send a message because those cues are not available via a text message. A CMC communicator using text messaging can control how long it takes to provide a response, message length, and/or message tone, allowing them to create the ideal response. CMC communicators have the ability to respond in the way that they wish instead of reacting as they would in a FtF communication. Thus, the CMC communicator may present the ideal communicative partner (O'Sullivan, 2000; Walther, 1996). Although the “cues filtered out” perspective was eventually dismissed, it did lead to the development of several theories of CMC based upon the ability of the CMC channel to transmit nonverbal cues.

## **Theoretical Approaches to CMC**

### **Media Richness Theory**

Early CMC researchers found that face-to-face (FtF) interactions were a richer channel of communication and thus a better communication format than mediated communication,

suggesting that the ability of the channel to transmit nonverbal communication would thus affect the efficiency of the communication (Bordia, 1997; Carlson & Zmud, 1994; Daft & Lengel, 1984; Flaherty, Pearce, & Rubin, 1998; Lea & Spears, 1992, 1995; Short et al., 1976). One of the first theories to address this issue was Media Richness Theory (MRT). MRT predicts that the ability of the channel to carry nonverbal information affects the likelihood of misinterpreting a message (Carlson & Zmud, 1999; Trevino et al., 1990), and messages that are low in equivocality could use a channel that contains fewer nonverbal cues (Daft & Lengel, 1984; DeRosa et al., 2004; Walther, 1992; Walther et al., 2005; Walther & Parks, 2002). The likelihood of a message to be misunderstood is referred to as the equivocality of the message (Carlson & Zmud, 1999; Trevino et al., 1990). FtF communication is considered the richest channel and is recommended as the channel to transmit messages that are high in equivocality due to FtF communication's ability to transmit more nonverbal cues than any other channel of communication (Carlson & Zmud, 1999; Walther, 1992).

MRT was created to give communicators in organizations clear guidelines about which channels to use in specific communication events to improve the effectiveness of the communication (D'Urso & Rains, 2008; Daft & Lengel, 1984; DeRosa et al., 2004; Kock, 2004). Specifically, they were attempting to provide managers and employees a way to determine how information within the organization would be disseminated in the most efficient way without causing misunderstandings. MRT suggests that the choice of a specific channel of communication is important because the channel needs to fit the communication goals and situation (Carlson & Zmud, 1999; D'Ambra, Rice, & O'Connor, 1998). According to the theory, communication events that are low in equivocality could use a channel that contains fewer nonverbal cues (Daft & Lengel, 1984; DeRosa et al., 2004; Walther, 1992; Walther et al., 2005;

Walther & Parks, 2002). For example, a simple memo could be used to inform employees about the due dates for insurance forms to be turned into human resources. However, if the company is making substantial changes to the company's health insurance policy, the manager should call a meeting and allow the employees time to ask questions.

The richness of a channel is judged by four factors. The first is the availability for instant feedback. The media's richness decreases the longer it takes for the feedback to be transmitted back to the sender. The second factor is the use of multiple nonverbal cues. The more nonverbal cues that a medium can give the receiver, such as body language, vocal inflection, etc., the richer the medium is perceived. The third factor is the medium's ability to use natural language to transfer ideas. A memo, which is very scripted and rigid, is less rich to those who read it than a FtF communication event. The final factor is the ability of the medium to present a personal focus upon the receiver. The more personal the focus, the richer the medium is perceived (Ferry, Kydd, & Sawyer, 2001; Sheer & Chen, 2004, p. 77). A get-well card that is signed by the whole department would appear more personalized than a form letter signed by the manager.

Although MRT has been found to be a valid theory when discussing traditional forms of communication such as memos, phone calls, FtF communication, etc., it has had trouble predicting the perceived richness of various forms of CMC (Carlson & Zmud, 1999; D'Urso & Rains, 2008; DeRosa et al., 2004; Kock, 2004). This problem stems from the fact that as users become more experienced with the channel and the other communicators, the CMC channel being used becomes richer to the users (Hollingshead et al., 1993; Timmerman & Madhavapeddi, 2008). Email structure is similar to a memo, but the fact that an email can be responded to allows the communicators to exchange messages that can increase the interpersonal connection. MRT's

inability to consistently predict the perceived richness of CMC led to the development of Channel Expansion Theory.

### **Channel Expansion Theory**

Channel Expansion Theory (Carlson & Zmud, 1994) addresses some of the inconsistency found in MRT when discussing CMC. Channel expansion theory was created by combining the four factors of richness from MRT and the emphasis of personal perceptions from the social influence model (Timmerman & Madhavapeddi, 2008). Social influence model (SIM) purports to predict the use of CMC based upon the perceptions of the CMC channel by people who have social influence over the communicator (Fulk, 1993). By combining MRT and SIM, researchers believed it was possible to account for the perceived richness of a specific communication channel (Timmerman & Madhavapeddi, 2008). The major difference between MRT and channel expansion theory is that perceptions of a channel of communication will vary based upon the user (Carlson & Zmud, 1999; D'Urso & Rains, 2008; Timmerman & Madhavapeddi, 2008), but some of the variance the user perceives in richness is also based upon specific innate qualities of the channel to carry nonverbal communication (Timmerman & Madhavapeddi, 2008).

According to channel expansion theory as the experience with the channel, the topic of the message, the communication partner, and the organizational context increases so will the user's perception of the channel's richness (Carlson & Zmud, 1999; D'Urso & Rains, 2008; Timmerman & Madhavapeddi, 2008). Experience with the channel has been found to be a significant deterrent to CMC channel use if the channel is new to the user; as the CMC channel becomes diffused into society and the user's experience with the channel increases, it has not been found to be a significant deterrent (Carlson & Zmud, 1999; Timmerman & Madhavapeddi, 2008). As experience with communication partners increases, so does the perceived richness of

the channel. This is due to the users' increased knowledge about each other, which allows them to decrease equivocality. Organizational context refers to the rules and norms of the organization. When employees are hired, they start adapting to the rules and norms of the company and the people with whom they interact. For example, if employees receive faster responses from their boss when they use email vs. stopping by the boss' office, the employee will then start using email more because it will be viewed as the preferred channel for their boss. As individuals become more accustomed to the communication practices of an organization, they change their perception of the organization's preferred channel, thus increasing the richness.

In addition to experience and the channel's capacity to transmit nonverbal communication, social influence within an organization affects the perceived richness of a channel (Carlson & Zmud, 1999; D'Urso & Rains, 2008; Timmerman & Madhavapeddi, 2008). Social influence relates to the effects people of power have on the communication practices of others. When communicating with their superior, communicators may choose a channel that the superior prefers rather than choosing a channel based upon their own perceived richness of the available channels. Thus, the CMC channel's capacity to carry nonverbal communication, their experience, and the social influence of other communicators affects the users' perceptions of richness.

Channel expansion theory accounts for some of MRT's conflicts between theory and findings concerning CMC. It extends our understanding of why some channels of communication vary and some do not across individuals, and provides practical methods by suggesting that users need to increase their knowledge about the media, their communication partner, the topic, etc... to increase their communication effectiveness (Timmerman & Madhavapeddi, 2008). However, what happens when channels are altered or when new channels



are created? Channel expansion attempts to discuss this issue by using the channel's ability to transmit nonverbal communication, experience of the user, and the social influence of others to predict how perceptions change, but it does not explain how individuals adapt to CMC channels. Without that understanding, we cannot hope to predict what channel to use and when because we will always be trying to make assumptions about the other communicator's perceptions. Instead of looking at the cues filter out perspective of MRT and Channel Expansion theory, we need to discuss to the cues filter in perspective starting with Social Information processing theory.

### **Social Information Processing Theory**

Social information processing theory (SIP) asserts that communicators using CMC are equally motivated to reduce uncertainty, form impressions, and develop affinity as in any other communication situation (Walther & Parks, 2002). The main components to this theory are the nonverbal cues that are present in text-based CMC (e.g., word choice, message length, emoticons, and timing) can be used to develop relationships between users of CMC (Thompson, 2008; Walther, 1993; Walther & Parks, 2002). The length of time it takes to develop relationships is longer in CMC than in FtF communication, but this theory proposes that the relationships can be equal to FtF communication if enough time is allowed for the relationship to develop (Thompson, 2008; Walther, 1993; Walther & Parks, 2002). This theory explains how communicators can adapt to the nonverbal cues that are available in CMC and utilize them to develop relationships. It can also be used to explain why certain relationships do not develop via CMC. However, this theory still makes the assumption that FtF communication is a better channel of communication because it takes longer to develop relationships via CMC (Walther, 1996). It also does not address the fact that most users of CMC employ both FtF and CMC channels to create and maintain interpersonal relationships (Bryant et al., 2011; Katz & Rice,

2002; Walther & Parks, 2002; Walther & Ramirez, 2009). SIP theory can be used in combination with hyperpersonal communication theory to explain why some CMC relationships develop and exceed relationships occurring FtF.

### **Hyperpersonal Communication**

The hyperpersonal theory (Walther, 1996) is comprised of four ideas as to why CMC can become more personal than FtF communication. It also accounts for the fundamental aspects of communication (Walther, 1996). The first idea involves the ability of the *sender's* to choose what they send (Walther, 1996; Thurlow, Lengel, & Tomic, 2007). This allows the participants in CMC to select which “face” they wish to present to achieve their communication and relationship goals (Duthler, 2006; Walther, 1996). The term “face” is in reference to Goffman’s (1959) theories on the presentation of the self. Goffman states that individuals present a public face that others see and a private face that few, if any, are privy to (1959). He explains that the face we share controls and is controlled by the social, relational, and political situations that the participants are involved in (Goffman, 1959). As that situation changes, the individual will act out certain roles depending upon the relationship with the other participants in the interaction; and likewise those other participants will do the same.

In CMC, the sender’s ability to control what is sent allows one to present an idealized communication partner. The lack of FtF interaction in CMC communication frees the individual from having to present a specific face and allows him/her to share a selective image or face. This gives them greater control over the roles he/she play in an interaction. The sender can edit, eliminate, alter, or provide falsehoods to the other participants in CMC because he/she feels they are anonymous. This anonymous feeling can lead the user to feel a level of distance, thus

allowing the *sender* to focus on what they want to say, instead of focusing on the other person or the surroundings (Walther, Gay, & Hancock, 2005).

The key element to this idea revolves around the feeling of being anonymous. When we are in a situation with individuals that we will not interact with again, we feel free to make choices that could be proven wrong or to suffer humiliation because we will not have to deal with these specific individuals again (Goffman, 2005). Since users feel anonymous, they can disclose intimate details that they otherwise would not share for fear of violating relationship taboos (Bargh, McKenna, & Fitzsimons, 2002). It gives them the ability to present their true feelings and thus find closer initial friendships than they would in FtF interactions (Bargh, et al., 2002).

The second idea involves what is called “Idealized Perception” or the tendency to perceive people less critically if they interact using CMC (Thurlow, Lengel, & Tomic, 2007; Walther, 1996). This involves the *receiver’s* creation of stereotypes concerning the people with whom they interact (Walther, 1996). Without any FtF communication to contradict the idea a communication partner presented via CMC, the receiver begins to form impressions solely based upon the context of the message, leading to a heightened sense of similarity and liking (Walther, 1996).

Time is the third idea of the hyperpersonal theory. In FtF communication, participants must schedule time away to participate in a communication event, thus putting a strain on the limited time the participants have (Walther, 1996). By using CMC, the participants can choose a *channel* that allows them to communicate at their leisure, and the communication is on task and focused on the other person (Walther, 1996; Thurlow, Lengel, & Tomic, 2007). Asynchronous

CMC allows participants “to plan, compose, edit, and review message content, as well as to time self-disclosure and message exchange with more forethought” (Duthler, 2006, p. 504).

The last idea of this model concerns *feedback* (Walther, 1996). Feedback is the response to an initial message. The response may not be instantaneous, but the user of CMC receives the feedback to the original message. This affects the way users respond to one another, thus changing the communication and the relationship (Walther, 1996). The participants feel that they are having a private conversation and that the other person is focused on them (Thurlow et al., 2007). For example, a person may send a text message to a friend across the room. The response to the message comes directly to the first communicator’s phone/computer, giving the sense that private messages sent and received are not accessible by others, even if he/she are in the same room as the communicator.

Hyperpersonal communication theory explains how intimate interpersonal relationships in CMC can exceed the intimacy of similar FtF communication relationships. This theory can be used to discuss interpersonal relationships that occur completely through CMC, including friendships, intimate relationships, etc... Yet, the major limitation to this theory is its inability to predict behavior consistently (Walther, 1996).

### **CMC Competency Model**

Spitzberg’s CMC Competency model (2006) was developed to assess the user’s competency with CMC and to identify what areas the participant needs to develop (Bubasˇ, 2005). This theory is related to the interpersonal communication competence model developed by Spitzberg and revolves around three main components: *motivation*, *knowledge*, and *skills*, all of which have been tested before under interpersonal communication competence (Bubasˇ, 2005;

Spano & Zimmermann, 1995; Spitzberg, 1991, 2006, 2007). The remaining components are *context factors*, *message factors*, *media factors*, and *outcomes* (Bubas, 2005; Spitzberg, 2006).

Motivation is the driving force for a successful communication event (Bubas, 2005; Spano & Zimmermann, 1995; Spitzberg, 1991, 2006). Spitzberg defines CMC motivation as “the ratio of approach to avoidance attitudes, beliefs, and values in a given CMC context” (Spitzberg, 2006, p. 640). A willingness to interact with others using CMC is necessary for a participant to be competent in CMC (Spitzberg, 2006). Motivation can be positive or negative, depending upon the participant’s experiences and goals (Bubas, 2005). Negative motivations can lead to CMC avoidance and can stem from technophobia or the “fear of technology” (Spitzberg & Birdman). This fear can stem from a person’s experiences or the lack of experience, but studies have shown that as motivation, knowledge, and skills increase technophobia decreases (Spitzberg & Birdman). Positive motivation is demonstrated by a person’s use of CMC (Bubas, 2005; Spitzberg, 2006).

Knowledge is defined by Spitzberg as “the cognitive comprehension of content and procedural processes involved in conducting appropriate and effective interaction in the computer-mediated context” (Spitzberg, 2006, p. 641). In other words, participants in CMC must have an understanding of the technology and the context of the situation (Bubas, 2005). The more a user participates in CMC the more knowledge they will attain (Spitzberg & Birdman). There is also a link between motivation and knowledge, because a participant’s motivation to utilize CMC will directly affect if and how they acquire knowledge concerning CMC (Bubas, 2005; Spitzberg, 2006; Spitzberg & Birdman, 2006).

Skills are “repeatable, goal-oriented behaviors” (Bubas, 2005). They are also affected by the motivation and the knowledge of the person using CMC (Bubas, 2005; Spitzberg, 2006,

2007; Spitzberg & Birdman, 2006). There are several types of skills that can be identified and clustered into attentiveness, composure, coordination, and expressiveness (Bubasˇ, 2005; Spitzberg, 2006, 2007).

Attentiveness refers to a participant's attention to the conversation and their willingness to engage with others via CMC (Bubasˇ, 2005; Spitzberg, 2006). Attentiveness is about responding and relating to the other participants in a CMC event; composure is about promoting your own ideas and leading the conversation towards your goals (Bubasˇ, 2005; Spitzberg, 2006). Managing time, responses, and the social commitments that are involved in any communication is coordination (Bubasˇ, 2005; Spitzberg, 2006). Expressiveness involves the depth and breadth of emotion and self-disclosure that is involved in the CMC (Bubasˇ, 2005; Spitzberg, 2006).

The context factor is based on cultural, chronological, relational, environmental, and functional features that Spitzberg calls "typological facets" (2006, p. 642). The cultural facet is used to describe the variance in communication based on the participant's "attitude, belief, value, nationality, ethnicity, race, religion, gender, etc..." (Bubasˇ, 2005, p. 7). Chronological facets are used to describe the sequence of messages and time delay for responses (Bubasˇ, 2005; Spitzberg, 2006). The relationship's type, intensity, and quality make up the relational facet (Bubasˇ, 2005; Spitzberg, 2006). Environmental facets are the physical settings, situation, and medium used (Bubasˇ, 2005; Spitzberg, 2006). The final facet of context is function and it refers to the task or reason for the communication occurring (social, romantic, task, etc.) (Bubasˇ, 2005; Spitzberg, 2006).

Message factors involve the message's content and deal with the task orientation, the socioemotional-orientation, and openness (Bubasˇ, 2005; Spitzberg, 2006). Media factors

involve the level of interactivity, adaptability, and the efficiency of the medium (Bubas<sup>˘</sup>, 2005; Spitzberg, 2006). The final component of the model is outcomes. Outcomes refer to the competence of the interaction via CMC and can include appropriateness, effectiveness, the co-orientation or the level of understanding, the satisfaction, and relationship development of the interaction that the person achieves by using CMC (Bubas<sup>˘</sup>, 2005; Spitzberg, 2006).

The major issue with the CMC competency model is the lack of verification of the measure. Very few articles concerning the theory have been published (Bubas<sup>˘</sup>, 2005; Spitzberg, 2006).. This leads into another theory concerning adaptation to the CMC environment: Social Presence. Although Social presence is one of the original “cues filter out” theories, it has been revised to address the communicator’s ability to adapt to CMC or the cues filtered in perspective.

### **Social Presence Theory**

Short, William, and Christy (1976) investigated the effects of media on the ability of individuals to interact. In their investigation, they studied four channels of communication: group audio systems (conference calling), video telephones, conference television systems, and computer-mediated conferencing systems (Short et al., 1976). Their premise was that nonverbal cues were important in certain circumstances and that the removal of the nonverbal cues would inhibit the ability of individuals to communicate (Short et al., 1976). Thus, they developed social presence theory and defined it as "the degree of salience of the other individual in the interaction and the consequent salience of the interpersonal relationship" (Short et al., 1976, p. 65). The ability of the other person to be socially present in a mediated environment affected the interpersonal relationship. Under the original theory, social presence was based upon the communication channel’s ability to transfer nonverbal cues (Short et al., 1976). The theory also proclaimed that communicators understand the limitations of the channel and choose not to use

specific communication channels for certain communication interactions (Short et al., 1976). An individual using a phone to communicate understands that facial movements will not be transmitted to the other person so he or she does not attempt to supplement the messages by smiling or making eye contact but does use expressive language and change tone and pitch to enhance the communication.

However, the original theory of social presence failed to predict CMC use (Walther & Parks, 2002) due to its focus on the channel's ability to transfer nonverbal cues. Early CMC research found that face to face (FtF) interactions were more socially present because they allow for more immediate feedback than CMC channels (Flaherty et al., 1998; Short et al., 1976), which were created for the transfer of information not interaction (Herring, 1999). The advancement of communication technology has increased the diffusion of CMC within society, and thus the use of CMC channels. CMC is not only used for information transfer but also interpersonal communication, entertainment, education, and work. Many relationships are now being maintained by the use of both traditional communication and CMC channels (Bryant et al., 2011; Parks, 2009; Walther & Parks, 2002). This has led to reexamination of social presence theory.

Scholars began by redefining social presence as "a sense of being together" while using CMC channels (Biocca et al., 2003; Zhao, 2003). This definition expanded to "the degree of feeling, perception, and reaction while being connected by CMC to another intellectual entity" (Tu & McIsaac, 2002, p. 140), which is consistent with other definitions promoted by social presence scholars (Biocca et al., 2003; Cutler, 1995; Garrison et al., 2000). The key difference between the original theory and its current structure is that social presence is now linked to the



communicator's ability and effort instead of the communication channel's capacity to transfer nonverbal cues to another communicator (Kehrwald, 2008).

### **Presence**

This ability to adapt to the CMC allows users to establish themselves as real individuals available to other CMC communicators (Biocca et al., 2003; Biocca, Harms, et al., 2001; Kehrwald, 2008; Swan & Shih, 2005). This adaptation allows CMC users to create connections that can vary from significant interpersonal relationships to impersonal social conventions (Biocca et al., 2003). The development of social presence within the class influences online communication, however the frequency of interaction does not indicate higher levels of social presence (Tu & McIsaac, 2002). It is not the number of interactions but the depth of connection that is attained between the interactants that influences the perceptions of social presence (Tu & McIsaac, 2002). In addition, social presence is a continuous process that must be initiated and maintained (Kehrwald, 2007). It cannot occur without providing the communicators the opportunity to interact freely (Kehrwald, 2007, 2008); unless the communicators are allowed to interact naturally, social presence cannot be achieved.

The lack of social presence in an online course can negatively affect the student's perception of learning in an online class (Gunawardena & Zittle, 1997; Jones, 2010; Kear, 2010; Richardson & Swan, 2003; Woods, 2002). It is also essential that novice online students receive guidance to develop social presence (Kehrwald, 2008). Thus it is suggested that instructors of online courses should encourage interactions between students with discussions boards and instant messaging (Kehrwald, 2008; Swan & Shih, 2005) specifically focusing on encouraging students to share personal experiences (Swan & Shih, 2005). The ability to adapt to CMC

channels and develop social presence is accomplished by the use of affective, interactive, and cohesive communication (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999).

## CHAPTER 3: FOCUS GROUPS

### Study 1: Focus Group Method

Focus groups are used in the initial stage of instrument development for several reasons. They allow for participants to review items together to ensure that the items represent the domain of interest, are easily comprehended, and thus provide face validity and potentially improve a measure's reliability (Morgan, 1997; Ritchie & Lewis, 2005; Stewart, Shamdasani, & Rook, 2007). Focus groups help a researcher discover the domains to measure, the potential indicators of the domains, and proper wording of items (Morgan, 1997). According to previous research, the domains of social presence are *affective*, *cohesive*, and *interactive* communication (Garrison et al., 2000; Garrison, Anderson, & Archer, 2003; Rourke et al., 1999; Swan, 2002). Since three prior domains and several indicators of those domains have been defined previously (Garrison et al., 2000, 2003; Rourke et al., 1999; Swan, 2002), the focus groups were utilized to develop/enhance the wording of items within each of these domains.

#### Participants

The size of the focus groups affects the quality and depth of the discussion (Morgan, 1997; Ritchie & Lewis, 2005; Stewart et al., 2007). Although there is not one standard required number of participants, experts recommend that a focus group should consist of at least 5 and no more than 12 participants (Morgan, 1997; Ritchie & Lewis, 2005; Stewart et al., 2007). This range is suggested because fewer than 5 impedes discussion and more than 12 can be unmanageable and prevent some people from being able to participate fully (Morgan, 1997; Ritchie & Lewis, 2005; D. W. Stewart et al., 2007). To ensure there were enough participants for each group, 10 participants were recruited for each focus group session. However, two participants rescheduled to later focus group sessions due to changes in their schedule, bringing

one focus group's numbers up to 12 participants (see table 3-1). The number of recommended focus groups is three to five to allow for the researcher to find redundancy while maintaining control (Morgan, 1997). Redundancy occurs when new sources of information do not bring forth new categories of information (Patton, 2002).

There were seven focus groups with a total of 62 participants. Groups consisted of 42 percent females with males made up the remaining 58 percent. Participant ages ranged from 19 to 33 years old ( $M = 20.82$ ,  $SD = 2.73$ ). Focus group members self-selected into the seven available time slots that ranged over three days with times in the morning and afternoon to allow participants ample opportunity to participate. The sex composition for each group is included in Table 3-1.

The participants, who received extra credit for their participation, were recruited from general education communication classes to obtain a cross section of the student population. The participants were recruited for ease of access and purposive sampling with the goal of ensuring that all of them had experience with the phenomenon central to the research investigation (Patton, 2002). Because college students tend to be early adopters of CMC and use it more than the general population (Jones & Madden, 2002), the recruitment of college students increased the likelihood that the participants were frequent users of CMC. Just over 62 percent of the participants rated themselves as somewhat frequent to frequent users of CMC.

### **Procedures**

Focus groups met in a vacant classroom and were seated in a circle to enhance conversational style. The focus group meetings consisted of five sections. The first section was a welcoming where the purpose of the focus groups was explained and the consent forms were distributed and collected (see Table 3-2 Focus Group Plan). The second, third and fourth sections

were discussions concerning the three indicators of social presence. During these three sections, participants were given a document containing the definition of the indicator and a list of potential items for that indicator. Order bias, where topic or item sequencing affects the participants' responses (Easton, Easton, & Belch, 2003), was minimized in this situation by rotating the three sections (Onwuegbuzie & Leech, 2007). The moderator then asked the participants to provide input on the wording of the items. Notes of the items discussed were taken by the moderator and a research assistant. The notes were reviewed and used to adjust the wording of the items for the scale and to add items suggested by the participants. The fifth section was the closing, which involved answering participants' questions and ensuring that the extra credit was recorded correctly. For specific wording, definitions, and the preliminary items that were presented to the focus groups, see Table 3-2 Focus Group Plan.

The preliminary measure consisted of 30 items that were developed from a review of literature concerning social presence (Biocca et al., 2003; Biocca, Harms, & Gregg, 2001; Caples, 2006; Garrison et al., 2000, 2003; Kehrwald, 2007, 2008; Swan, 2002; Swan & Shih, 2005). Previous research identified three domains of social presence and the researcher provided the participants with short definitions (see Table 3-2 Focus Group Plan) prior to discussing each section. The definitions were used as a reference point by the participants so they could review the preliminary items of the proposed measure.

Participants were asked to read through the items individually and given highlighters and pens to make notes on their individual copies of any item(s) that they had difficulty comprehending. After the participants had lowered their pen and highlighters, the moderator ask which items, if any, were confusing or needed to be adjusted. Individual participants would then discuss the issues they had with the items, which would lead other participants to include their

thoughts. All seven focus groups were presented with the original 30 items, of which several items were consistently identified as problematic by the participants in several/all of the groups. Each focus group member was asked to provide suggestions that would clarify the item for future research participants. Suggestions that were made by earlier focus groups would be brought up in other focus groups, but only after the discussion in that focus group became stagnant.

## **Results**

### **Affective Items**

For the affective section of the potential measure, participants reviewed 10 initial questions (see Appendix A). Affective communication refers to the disclosure of emotions, experiences, and the use of paralinguistics to share emotion (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). Issues emerged around several items that involved paralinguistics. Previous research stated that the use of abbreviations and nonstandard grammar to transfer nonverbal communication is referred to as paralinguistics (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999).

All seven focus groups identified the term “text speak” used in items seven and eight of the affective measure as being confusing. Several participants in multiple focus groups asked for clarification of the phrase. The term “lol” (laugh out loud) was provided as an example of text speak to help to clarify the issue. Students were asked if they could provide another term and “text slang” was offered by a participant in focus group 2, but this term could not be agreed upon by the other participants in focus group 2. When the remaining focus groups identified this issue, the suggestion of “text slang” was offered by the moderator. After the focus groups had discussed the issue in-depth, all focus groups agreed that this term was not suitable. Since the

example “lol” helped the participants to understand the term “text speak,” “lol” was added as an example after all items that contained the term “text speak” in the final measure.

The second issue with the affective questions was the use of the term “icon” in items 10, which was brought up by several participants in all of the focus groups. A participant in the second focus group asked if the question was referring to the term “emoticon.” However, that term appeared to be too academic to the researcher and the term “icon” was used in its place. Apparently the replacement term “icon” was not an appropriate replacement. Groups one and two both identified the term of “icon” as confusing, but neither group provided an alternative term to replace “icon.” When this issue was brought up in groups three through seven, the moderator asked if the term “emoticon” would be a better fit. Groups three through seven agreed that replacing the term “icon” with “emoticons” did improve the clarity of the items. All items containing the term “icon” were reworded and the term “emoticons” was used in its place. The remaining affective items were discussed by the focus groups, but none of the participants identified any other issues with the items concerning clarity or the items relevance to affective communication. These items were left unchanged.

### **Interactive Items**

Interactive communication (see Appendix B), which refers to indications that the communicator is open to receiving and attending to messages, garnered only one confusing item (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). Participants in all of the focus groups had issues with the term “quote” which was item 5 of the interactive items. Through discussion with the participants in all focus groups the word “quote” was determined to be too strong of a term. Several participants stated that they would never quote someone specifically. After the discussion seemed to stall, the moderator asked all of the focus groups about the phrase

“referencing past conversations” because this phrase was created to capture the same information as the term “quote.” All of the participants agreed that the phrase “referencing past conversations” increased the clarity of the items. Thus, all items containing the term “quote” were updated, and the term “quote” was substituted with the phrase “referencing past conversations.” All other items were reviewed by all of the focus groups, but the participants did not identify any other issues with clarity or the concept of interactive communication, thus the remaining interactive items were untouched.

### **Cohesion Items**

Social presence theory predicts that cohesion is established by using first names, personal pronouns, and the use of small talk (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). There was only one issue that arose and it concerned the use of first names (see Appendix C for a list of items). Participants in all seven focus groups had issues with the items that discussed the use of first names in CMC. Participants stated that they rarely use names when they communicate with others via CMC because the name of the person that they are communicating with usually appears on the screen of their phone or computer. Upon reflection, items concerning first names were retained since previous literature has suggested it is an important aspect of presence (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The focus groups reviewed all of the other cohesive items but did not find any issue with the items relating to cohesive comprehension. So the remaining cohesive items remained unchanged.

### **Final Scale**

After the initial items were updated to reflect the findings of the focus group, additional items that were consistent with the same content and wording suggested by the focus groups were created for each section of the proposed measure. For example, the item(s) with the term



“quote” were replaced with “referencing past conversations” from the interactive section of the scale. Originally the focus groups were given 30 items, 10 from each subsection. Because the goal of this research was to create a new measure, additional items were created to ensure that the construct was captured (Pett, Lackey, & Sullivan, 2003). There are an infinite number of items that represent any abstract construct and it is the goal of measurement theory to identify items that best capture the construct of interest (Nunnally & Bernstein, 1994). Focus groups were used to identify symbols that best represent constructs and synonyms for those symbols were used to create new items. Using the original 30 items that were agreed upon by the focus groups as templates, an additional 23 items were created. The additional items were reflections of the original items. For example, the original item "I encourage others to send me computer-mediated messages” was used to create “I let people know that they can send me computer-mediated messages.”

To better capture the affective communication domain of social presence, an additional twelve items were added (see Appendix D). Six of the items concerned the idea of sharing emotions and or experiences. The next six items that were added involved the concept of paralinguistics. Additional eight items were added to the interactive communication subsection. These items revolved around the concepts of initiating or responding to messages (See Appendix F). Due to the discussion by the participants in several of the focus groups four items were added that involved the use of pictures and informal language (see Appendix G). These items were not added to the original hypothesized areas of affective, cohesive, or interactive communication, because it could not be determined where the items should fit. This process brought the social presence behavior measure to 53 items (see Appendix H).

## CHAPTER 4: EXPLORATORY FACTOR ANALYSIS

### Study 2: Exploratory Factor Analysis

Exploratory factor analysis (EFA) is used when the total number of factors needed to fully explain the relationship between items is unknown and the researcher needs to examine the fundamental structure of the construct (Pett et al., 2003). EFA compares the items in terms of best fit to account for the most variance (Nunnally & Bernstein, 1994). Thus, an EFA is used to identify items that work well together and to identify items that need to be eliminated from a measure.

#### Participants

Participants were recruited via general education courses and were offered either research credit or extra credit to participate in the study. The number of participants needed for an EFA is currently open for debate (Pett et al., 2003); however, 300 participants have been suggested as a good rule of thumb (Tabachnick & Fidell, 2000). A total of 400 participants were recruited via purposive sampling. Because the study constitutes an investigation of CMC, high CMC users were needed as study participants. Jones and Madden (2002) noted that college students tend to use CMC more than the general population (Jones & Madden, 2002). Therefore, recruitment of high CMC users took place on college campuses, known to be populated by above-average CMC users. Over 82 percent of the participants identified themselves as moderate to frequent users of CMC. When asked about their experience with CMC, 78 percent of the participants ranked themselves as experienced or very experienced. Additionally, 54 percent consider themselves experts or near experts with CMC. The sample of participants was comprised of 48 percent females and 52 percent males, and they ranged in age from 19 to 63 ( $M = 23$ ;  $SD = 6.24$ ) years old.

## **Procedures**

Participants were provided a hyperlink to an online questionnaire. The questionnaire contained a description of the study, a consent form, and 116 survey questions with 53 being directly related to the EFA. Other items were included as part of a larger study and not analyzed with these data. The survey included the social presence measure (see Appendix H) and demographic questions concerning their use of CMC. The questionnaire took approximately 20 minutes to complete.

## **Results**

Currently, social presence theory predicts that there are three overarching domains: affective, interactive, and cohesive communication. Research concerning those domains (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999; Swan, 2002; Swan & Shih, 2005) led to this measure's creation. However, most of this research is based upon online discussions and may not be capturing all aspects of social presence. Focus groups were used to ensure that the measure is a reflection of the language of the focus group participants to increase the likelihood that the measure is understood by the survey participants (Patton, 2002). Exploratory factor analysis compares the items in terms of best fit to account for the most variance (Nunnally & Bernstein, 1994).

Due to the fact that three overarching domains have not been verified other than using content analysis, an exploratory factor analysis was conducted on the measure. The first phase was to run an EFA on the three separate hypothesized dimensions to reduce the number items before running an exploratory factor analysis on the entire measure. During this process items were eliminated based upon the following criteria. First, items that did not load  $>.32$  on any of the components were deleted (Tabachnick & Fidell, 2000). In addition, any item that did not load

with more than a .20 difference between multiple loadings was also eliminated (Hair, 2010). Since all of the items for this measure deal with communication, it is highly likely that they will be related to one another. Thus, Principal Axis Factor Analysis was used because this method does not assume that the factors are unrelated (Allen, Titsworth, & Hunt, 2009 ). Varimax rotation was chosen because the factors that were to be generated should be independent (Pett et al., 2003).

### **Affective Communication**

The items for the three hypothesized dimensions were created after an analysis of the data obtained during the focus groups from study one. Affective communication consisted of 22 items (see Appendix D ) constructed to represent the communicator's disclosure of emotions, experiences, and the use of paralinguistics to share their emotions (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The rotated matrix for Affective communication contains all affective communication items and their factor loadings (see table 4-1). The affective communication subset was reduced to 13 items with two factors (see table 4-2); none of the original 10 items considered and adapted by the focus groups was eliminated.

The first factor was sharing of experience and/or emotion, which makes sense because the items all involve the act of disclosing information. For example, one of the disclosing items is "I tend to share my feelings with others via computer-mediated communication" and another item from this factor is "I share my opinions via computer-mediated communication." The second factor all had to do with the use of paralinguistics. One example of paralinguistics items was "I use capitalization to stress certain points when using computer-mediated communication channels." Of note is the fact that the retained items did not reference the term "text speak" or emoticons, both of which were terms agreed upon by the focus groups.

**Cohesive Communication.** Cohesive communication consisted of 10 items (see Appendix E) that were created to reflect the communicator's use of first names, personal pronouns, and small talk (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The rotated factor matrix for Cohesive Communication can be found in table 4-3. The EFA reduced the cohesive subset to 8 items on 2 factors (see table 4-4). The two items that were eliminated had multiple loadings that did not have a .20 difference between loadings. These items were also from the original 10 items discussed by the focus groups. However, neither of the two items eliminated concerned the use of first names, the concept with which the focus groups had issues.

The first factor contains items concerning the use of small talk, for example "I use small talk to make my computer mediated messages more personal." The second factor concerned the use of first names, which according to the focus groups should have been eliminated. The retention of these items was based upon the importance that was given in the literature concerning the use of first names as an indicator of social presence. An example of the items from this factor is "I encourage others to use my first name in computer mediated communication if the communication channel does not provide it automatically." The use of personal pronouns, originally predicted to be an indicator of social presence (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999), was eliminated.

### **Interactive Communication**

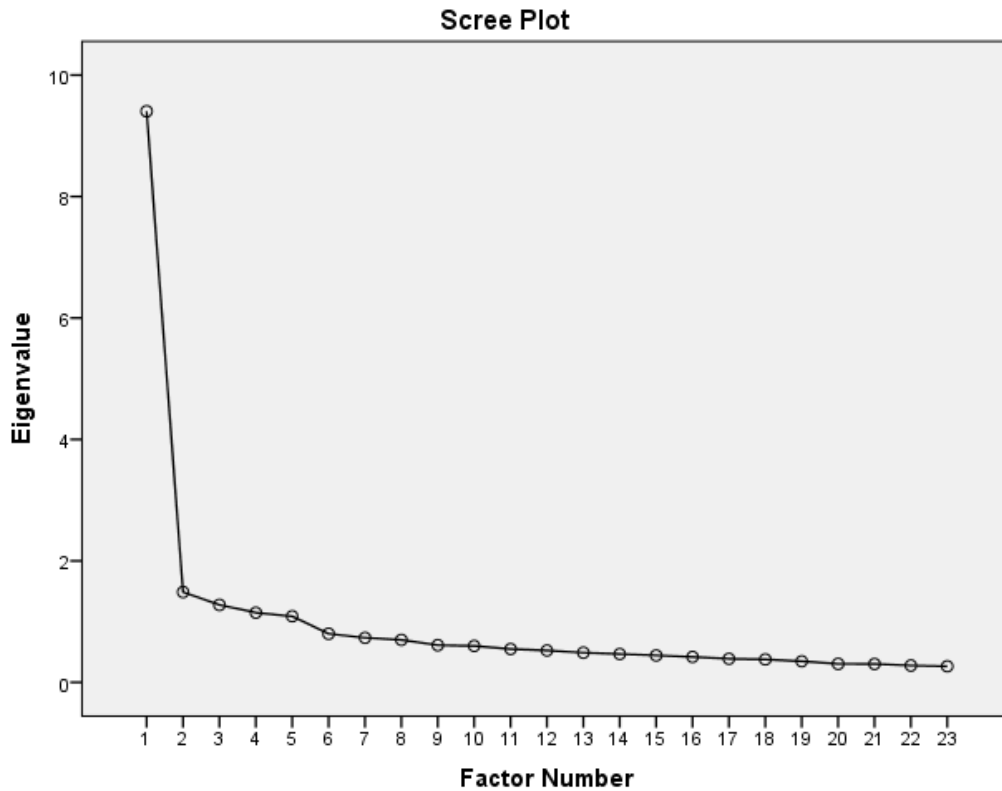
The last subset was interactive communication. This subset originally consisted of 18 items (see Appendix F) that were constructed to capture the participant's use of indicators that signal they are open to receiving and attending to messages (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The rotated factor for Interactive communication can be found in table 4-5. This subset was reduced to 12 items on one factor (see table 4-6), The six items that were

eliminated had multiple loadings that did not have a .20 difference between loadings. All of the remaining items referred to being open to receiving and responding to CMC messages. For example, one of the items is “I encourage others to send me computer-mediated messages.”

### **Thirty-seven Item Measure**

After the separate hypothesized dimensions were reduced in phase one of the EFA, the remaining items from each subsection (affective, cohesive, and interactive) were combined with the four items that involved the use of pictures and informal language (see Appendix G), for a total of 37 items. The second phase was to run an EFA on the 37-item measure (See Table 4-7). The extraction method was Principal Axis Factor Analysis using Direct Oblimin rotation. This method was used because the underlying factors should theoretically be correlated (Allen, Titsworth, & Hunt, 2009; McCroskey & Young, 1979; Pett et al., 2003). Similar to the first phase, the items that did not load  $>.32$  on any of the components were deleted (Tabachnick & Fidell, 2000), and any items that loaded on multiple factors that did not have a difference greater than .2 were also deleted (Hair, 2010).

There were three items concerning the sharing of experience or feelings that were deleted from the affective communication subset. The cohesive communication subset was reduced by two items, both of which dealt with small talk. There were five items eliminated from the interactive communication subset, and the items eliminated concerned either the initiation of communication or responding to a previous CMC message. Finally, the four items that were suggested by the focus groups were all eliminated. All the items that were deleted loaded on multiple factors, but the loadings did not differ by at least .2. This reduced the measure to 23 items. ( $\alpha = .93$  see table 4-8). An examination of the Scree Plot showed there was a distinctive



**Figure 4-1: Scree Plot**

difference between the three factor and the five factor solutions (see figure 4-1), thereby suggesting that the measure could contain either three or five factors. To determine which solution to use, the measure was forced into three-factor and five-factor solutions. An examination of the three-factor and five-factor solution showed that the five-factor solution aligned with previous theoretical assumptions more than the three-factor solution. That is, the three-factor solution placed affective items on the same factor as cohesive items, while the five-factor solution separated affective, cohesive, and interactive items on different factors. Thus, the five-factor solution was chosen because it was a better fit theoretically than the three-factor solution. .

The five factors identified by the EFA are open to interacting, use of paralinguistics, use

of first names, use of small talk, and the sharing of emotion and experience. To ensure that the items in the matrix that was identified do have a relationship, Bartlett's test of sphericity was conducted. The test was statistically significant,  $X^2(253) = 3,244.19, p = .000$ . To ensure the sampling size was adequate, the Kaiser-Meyer-Olkin measure of sampling adequacy was conducted. The result was .94, which is considered an excellent sample size (Pett et al., 2003). This five-component solution accounted for 62% of the variance. See Table 4-9 for scale loadings, Table 10 for factor correlations and Appendix I for the scale items.



## **CHAPTER 5: CONFIRMATORY FACTOR ANALYSIS**

### **Study 3: Confirmatory Factor Analysis and Validity Testing**

Confirmatory factor analysis (CFA) determines how the hypothesized factors fit the data (Nunnally & Bernstein, 1994). To perform a CFA, it is essential to have assumptions about the underlying structure of the measurement model (Allen et al., 2009; Nunnally & Bernstein, 1994). In addition, a CFA provides other types of validity tests to provide a strong case for the measurement model.

One type of validity provided by the CFA is construct validity. Construct validity is the ability of the measure to correlate with another measure as predicted by the theory (Cronbach & Meehl, 1955; Nunnally & Bernstein, 1994). Scores on the CMC anxiety measure should correlate negatively with the self-rated social presence measure because CMC anxiety should be reduced as a CMC user adapts to CMC channels. Additionally, there should not be a relationship between a person's job satisfaction and ability to project oneself as a real person in a CMC conversation, so the Abridged Job in General (AJIG) scale should not correlate with the self-rated measure of social presence.

Concurrent validity is an instrument's ability to estimate a behavior that is external to the instrument (Cronbach & Meehl, 1955; Nunnally & Bernstein, 1994). The M.I.N.D. Labs Social Presence measure assesses the perceptions of social presence achieved between communicators in a communication event. Participants taking the self-rated social presence measure developed for this study should have similar scores on the M.I.N.D. Labs Social Presence measure.

#### **Participants**

Purposive sampling was used to recruit college students because they tend to use CMC more than the general population (Jones & Madden, 2002). Participants were recruited via

general education courses and were offered either research credit or extra credit to participate in the study. A total of 331 participants completed the survey. Any sample size over 200 participants for a CFA is considered to be a large sample (Kline, 2005). The sample of participants was comprised of 55 percent females and 45 percent males, and they ranged in age from 19 to 62 ( $M = 23$ ;  $SD = 6.77$ ) years old. Specifically, for the CFA, over 85 percent of the participants identified themselves as moderate to frequent users of CMC. When asked about their experience with CMC, 71 percent of the participants ranked themselves as experienced or very experienced. Additionally, 55 percent consider themselves expert or near experts with CMC.

### **Procedures**

Participants were provided a hyperlink to an online questionnaire. The questionnaire contained a description of the study, a consent form, and 80 survey questions. The preliminary social presence behavior measure consisted of 23 items (see Table 5-3); the job satisfaction scale consisted of 8 items (Harms & Biocca, 2004); the M.I.N.D. Labs social presence measure consisted of 36 items; there were a total of 8 items for the CMC anxiety measure (Watson, 2007); and demographic question concerning age, sex, and CMC knowledge consisted of 5 items. The questionnaire, which was randomized to prevent order bias, took approximately 20 minutes to complete.

The way in which participants were recruited reduced the amount of missing data because students did not receive their extra credit/research credit if they did not complete the survey. In addition, because students were offered extra/research credit for participation, the participants entered a code that allowed list-wise deletion of data to prevent the data from the same participant from being used. Some participants may have had technical difficulties outside the researcher's control such as power failures, internet outages, etc...; thus by removing data

that were not completed or had duplicate participation codes, list-wise deletion prevented duplicate data by the same participant from skewing the results.

### **Instruments and Measures**

CMC apprehension refers to anxiety concerning sending and receiving messages via a computer-mediated system (Brown et al., 2004; Scott & Timmerman, 2005). When first created by Scott and Timmerman (2005), it had 10 items and was considered reliable ( $\alpha = .79$ ), but 5 of the items need to be dropped due to low reliability. Watson (2007) dropped 2 of the original 10 items to improve reliability ( $\alpha = .81$ ). So, for this study the Watson (2007) version of the CMCA scale was used (see Appendix K). This measure has face validity and some predictive validity. The CMC apprehension measure has been found to predict the use of new communication technologies in organizational settings (Scott & Timmerman, 2005), visits to social networking sites, and also updates to the user's profiles (Watson, 2007). There is a negative relationship between CMC apprehension and social presence (Wrench & Punyanunt-Carter, 2007). This negative relationship assesses the construct validity of the social presence aptitude measure.

The AJIG is a measure of global satisfaction with a person's job (Russell et al., 2004). The AJIG has been found to correlate with a person's identification and commitment to the company (Russell et al., 2004). With eight items, the measure has achieved acceptable reliability ( $\alpha = .85$ ) and been shown to have construct validity (Russell et al., 2004). Theoretically, there should not be a relationship between a person's job satisfaction and ability to project oneself as a social individual (see Appendix N).

The M.I.N.D. lab social presence measure is based upon the definitions and reviews of other measures of social presence (Biocca, Burgoon, Harms, & Stoner, 2001). The researchers then created an initial pool of 80 items that were narrowed down 69 items by researchers in the

field of presence for content validity and face validity (Harms & Biocca, 2004). The next step was to perform a pilot test of the measure and complete a factor analysis eliminating items that did not factor together. That scale was narrowed down to 36 items (Harms & Biocca, 2004) with acceptable reliability ( $\alpha = .81$ ). The confirmatory factor analysis provided support for the six factors. The six factors include co-presence (sense of being in an online environment with another person), attention allocation, perceived message understanding, perceived emotional interdependence, and perceived behavioral interdependence (Harms & Biocca, 2004) (see Appendix M). The measure has criterion validity to the extent that it can tell the difference in the social presence between face-to-face interactions and mediated interactions (Harms & Biocca, 2004). It failed, however, to find a difference in different forms of mediation, specifically video and text-based mediation (Harms & Biocca, 2004).

## **Results**

A CFA was conducted on the preliminary social presence behavior measure. CFA involves first a test of internal consistency and then a test of parallelism. Each of the five factors identified in the EFA was tested with the AMOS maximum likelihood parameter estimation algorithm. An examination of the standardized residual covariances was conducted if the model fit did not meet the standards of a close to approximate fit established by Kline (2005). This was done to determine if any items were greater than 2.58 (Byrne, 2001), which is a sign of internal consistency issue within the measure. The item “I use punctuation like capitalization to communicate my feelings” from the subsection of affective communication was removed due to internal consistency issues. All remaining items were retained, which reduced the social presence measure to 22 items (see Appendix O).

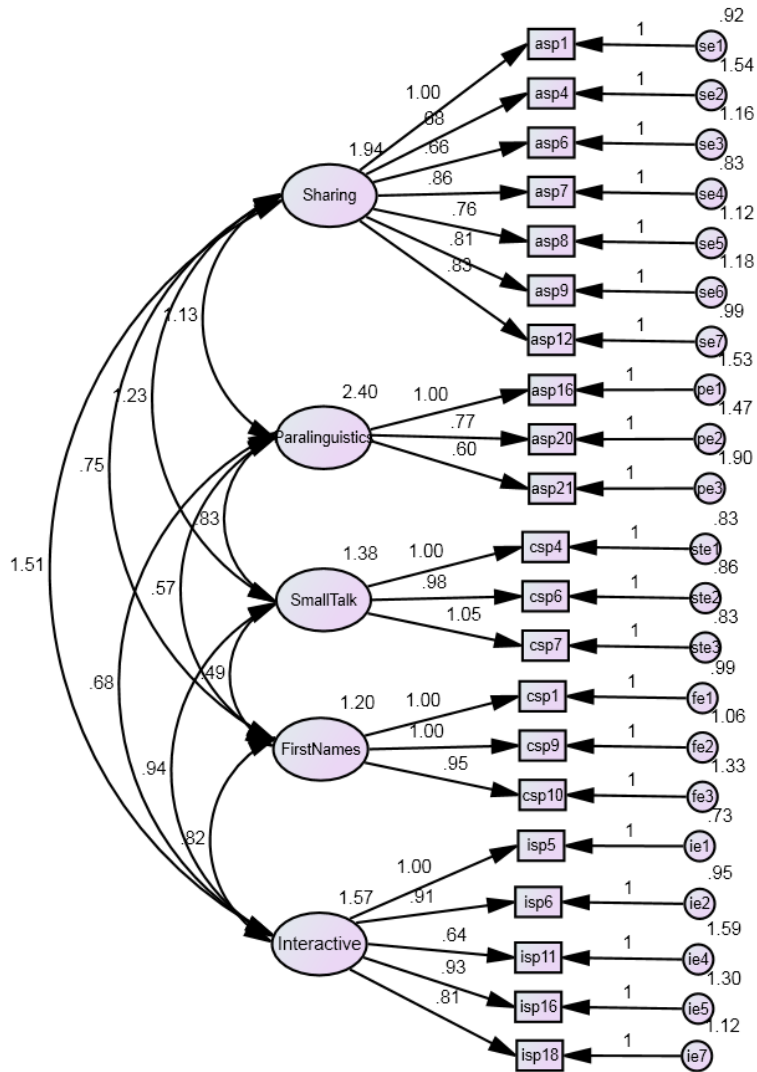
To determine if the model was second-order unidimensional or multidimensional, a CFA

was conducted on the preliminary social presence behavior measure (see Appendix K). Both models indicated that they were a close to approximate fit (Kline, 2005), but the multidimensional model was a better fit  $\chi^2(220, N = 331) = 345.82, p = .01$ . RMSEA = .053 (90% CI: .045-.062), GFI = .91 than the second order unidimensional model  $\chi^2(184, N = 331) = 376.240, p = .01$  RMSEA = .056 (90% CI: .048-.064), GFI = .90. The multidimensional model was a better fit because it had lower chi square and RMSEA values and the GFI was higher than the unidimensional model; however, the differences between the fit of the unidimensional and the multidimensional model were very small. To help determine which model was preferred, an examination of the reliability of the entire measure (unidimensional) and the subsections (multidimensional) were examined (see Table 5-1). The unidimensional model  $\alpha = .92$  while the sub-sections of the multidimensional model are between  $.71 \leq \alpha \leq .88$ . Since the subsections of the multidimensional model have acceptable reliability and had lower chi square and RMSEA values and the GFI was higher than the unidimensional model, the multidimensional model was chosen.

A test of parallelism was conducted on the social presence measure, the CMC anxiety measure, the AJIG measure, and the M.I.N.D. Labs social presence measure. This was done to establish concurrent and discriminant validity. This process involves performing a CFA on all the measures at once. The model fit did not meet the standards of a close to approximate fit established by Kline (2005), so an examination of the standardized residual covariances from all the measures was conducted and any item that was causing an internal consistency issue within the measure was removed.

One item was removed from the preliminary social presence behavior measure, reducing the measure to 21 items (see Appendix P). The finalized version of the measure showed a close

to approximate fit according to Kline (2005)  $\chi^2(161, N = 331) = 283, p < .05$ . RMSEA = .046 (90% CI: .036-.055), GFI= .92. The final model can be found in Figure 5-1.



**Figure 5-1: Social Presence Model**

One type of construct validity is convergent validity (Nunnally & Bernstein, 1994). It is established when two measures correlate together in the way that theory predicts (Kerlinger & Lee, 2000; Nunnally & Bernstein, 1994). The CMC anxiety measure that was identified after the test of parallelism was used to establish convergent validity because of the negative relationship that it has with social presence (Wrench & Punyanunt-Carter, 2007). Logically, as social presence increases, anxiety due to the use of CMC should decrease. The CMC anxiety measure is calculated differently than other anxiety measures. Specifically, scores on the measure will be higher as anxiety lowers. This negative relationship between CMC apprehension and the social presence behavior measure was confirmed [ $r(331) = .40, p = .000$ ; corrected for attenuation due to measurement error ( $\hat{r}$ )  $\hat{r} = .52, p = .000$ ], with 16 percent of the variance in social presence being explained by CMC anxiety. Corrected and uncorrected correlations can be seen in in Table 5-3.

Discriminant validity is a type of construct validity that uses two measures that theoretically should not correlate (Kerlinger & Lee, 2000; Nunnally & Bernstein, 1994). Discriminant validity of the social presence measure was tested using the AJIG because there should not be a relationship between a person's job satisfaction and their ability to project oneself as a social individual. As predicted there was not a statistically significant correlation between AJIB that was identified after the test of parallelism and the social presence measure [ $r(331) = .09, n.s. ; \hat{r} = .10, .n.s.$ ].

To establish concurrent validity of the measure, CMC usage demographics and the relationship between the M.I.N.D. Labs social presence measure and the preliminary social presence behavior measure were examined. Participants were asked three questions concerning their experience, use, and knowledge concerning CMC. The three questions were combined to

create the participants' CMC Experience score ( $\alpha = .78$ ;  $M = 17.45$ ;  $SD = 3.096$ ). As experience with CMC increased, so should the participants' social presence. This prediction was correct [ $r(331) = .323, p = .000$ ;  $r = .38, p = .000$ ] with CMC experience scores explaining 10.4% of the variance in social presence scores. In addition, theory predicts that the M.I.N.D. Labs Social Presence Measure should be positively correlated with the preliminary social presence behavior measure [ $r(331) = .55, p = .000$ ;  $r = .55, p = .000$ ]; social presence perceptions explained 30 percent of the variance in social presence. Descriptive statistics for all measures can be found in Table 5-2

In conclusion, this study reduced the social presence measure identified in study two to 21 items and confirmed the five-factor solution. The CFA also established the convergent, discriminate, and concurrent validity of the measure. This results in a 21-item measure that can be used to identify individuals that have issues with creating a social presence (See Appendix P).



## **CHAPTER 6: CONCLUSION**

This series of studies was conducted to create and validate a social presence measure. The initial step was to perform a thorough review of the literature to produce initial items that could be presented to focus groups to guide the creation of the initial measure. Data was collected using the initial measure and an EFA was performed to identify items that worked well as well as identify the items that were not. Data was collected using the items that worked well according to the EFA and a CFA was conducted. The result of this series of studies produced a valid and reliable self-rated measure of social presence.

### **Discussion**

#### **Study One: Focus Groups**

In study one, focus groups were used to provide face validity. Face validity is the extent that the instrument appears to measure what it is designed to measure (Nunnally & Bernstein, 1994). The practice of restructuring or borrowing items from other surveys can cause a loss of validity. By using focus groups for study one it ensured that the items had face validity in the context that they are being used (Morgan, 1997; Ritchie & Lewis, 2005; Stewart, Shamdasani, & Rook, 2007). This was accomplished by presenting the focus groups with ten items from the three hypothesized areas that create social presence (affective, cohesive, and interactive communication). The focus groups were crucial to the development of this measure, because they helped to identify the original items.

After reviewing the 10 original items the focus groups provided guidance on the development of the future measure. The seven focus groups helped to identify issues with wording and terminology. For example, several participants in the focus groups identified the term “text speak” as confusing but could not provide a suitable term to replace it. Using the focus

groups that occurred after the term “text speak” was identified as an issue the researcher was able to add examples (lol) to the questions to help the future participants understand the questions. Using the terms and wording identified by the focus groups the researcher to create additional items using the agreed upon terms and wording to create the initial measure. This measure consisted of 53 items.

### **Study Two: Exploratory Factor Analysis**

According to previous literature, there should have only been a three factor solution to the measure, but the EFA separated Affective and Cohesive communication respectively into two separate factors. This produced a five factor measure covering sharing of emotion/feelings, paralinguistics, small talk, use of first names and interactive communication. Originally, it was predicted that affective communication, which concerned the sharing of experiences, emotions, and the use of paralinguistics, would be one factor (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999), but the EFA identified two factors: one concerning the sharing of experience and/or emotion and one concerning the use of paralinguistics.

Since the use of paralinguistics involves informal language and non-alphabetic symbols to display emotions, theoretically it should have factored with the sharing of emotions and/or experiences. After the EFA the results showed that Affective communication contained two separate factors, which strongly suggest that the users of CMC view the sharing of emotion through text as something different from showing it via paralinguistics. The focus groups from study one also had an issue with the concept of paralinguistics in CMC. The issue concerned the use of terms to define paralinguistics. Both the term “text speak” and “icon” caused the participants to have issues with items under review. It was decided that example would be added to the items to help participant understand. Since the purpose of paralinguistics is to replace non-

verbal communication that is not transmitted via CMC channels, it is possible that the users of CMC view text as the verbal component to CMC and paralinguistics as the non-verbal component to this channel of communication. This varies greatly from past research concerning social presence, and needs to be investigated further.

The use of inclusive pronouns was predicted to be an indicator of cohesive communication. Cohesive communication involved the feelings of being connected to another individual, and it consisted of vocative and phatic communication (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). Vocatives was defined as the use of personal pronouns (we, us, our) and the use of first names. However, this study eliminated the use of inclusive pronouns. The original researchers identified personal pronouns by analyzing transcripts of CMC discussions, and they were specifically looking for telltale signs of a connection. The act of looking for signs of connection may have led the original researchers to become biased. Another option could be that the use of personal pronouns may be a little too subtle for the users of CMC to identify. To determine if personal pronouns is in fact a component of social presence theory additional research must be done, which will be discussed in the future research section of this chapter.

The other aspect identified as vocatives was the use of first names, which factor out separately from the use of short talk or phatic communication. This created two separate factors for cohesive communication which differs from previous research (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The items concerning the use of first names were almost eliminated due to discussion with the focus groups. Several members of the focus groups stated that they did not use first names when using CMC, because the technology that they use to have computer-mediated conversations tends to include the name of the interactants on the screen. Thus there was no need to include first names when using CMC. When asked about other channels of CMC

such as email the focus groups did state that they used first names when they knew the other interactants first names. However, several of the examples brought up by the focus group participants referenced situations in which the use of first names would be inappropriate, such as contacting a professor. Since there were some conflicting ideas concerning the decision to retain the items, the researcher based the decision upon to the weight that was given to the topic in prior research. Considering the results of the measure the decision to retain the cohesion items concerning first names are justified.

The third area identified from previous research was interactive communication. Interactive communication involved the use of indicators that demonstrated to other CMC users that the sender was open to receiving and attending to messages (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). CMC users demonstrate interactive communication by asking/answering questions and referencing past conversation, thus showing to the other communicators that they are open to interacting. This area contained one factor which corresponds with previous research concerning social presence (Caples, 2006; Garrison et al., 2000; Rourke et al., 1999). The EFA identified five factors and reduced the measure from fifty three items to twenty two items.

### **Study Three: Confirmatory Factor Analysis**

The CFA conducted on the social presence measure reduced the measure by two items, to produce a five factor measure with 20 items. Additionally the CFA tested the convergent, discriminate, and concurrent validity of the social presence measure. This was done by comparing the new measure with pre-established measures to determine if the social presence measure was evaluating the unique construct that it was designed to measure.

Concurrent validity was measured by the experience with CMC that the participants had and their scores on the M.I.N.D. Labs Social Presence measure. The social measure correlated highly with experienced CMC communicators, which indicates that as experience with CMC increases so does the CMC users' ability to project themselves as real individuals willing to interact. This is a logical assumption because the more experience with CMC the easier it is for CMC users to adapt to the CMC channel. Further investigation concerning the experience with CMC and the ability of CMC user to create social presence will be discussed in the future research section of this chapter.

Additionally concurrent validity was established by using the M.I.N.D. Labs social presence measure. The perceptions of social presence on a previous CMC interaction correlated positively with the CMC user's score on the social presence measure. This implies that the social presence measure created in this series of studies can help to identify participants who have difficulty projecting themselves as real individuals that are open to interacting. However, to truly test this position, the use of experimental design would be needed, which will be discussed in the future research section.

Discriminate validity was established for the social presence measure by comparing it to the AJIB measure. The AJIB measure evaluated the job satisfaction of the participants. Theoretically there should not be a correlation between the participant's job satisfaction and their ability to establish social presence. The two measures did not correlate, which suggests that there is no relationship between the two measures.

The CMC apprehension measure helped to establish the convergent validity of the social presence measure, because the ability to adapt to CMC theoretically should reduce the CMC user's anxiety. The social presence measure positively correlated with the CMC apprehension

measure, because scores on the CMC apprehension measure increases if the participant feels less anxiety. Thus CMC users that can establish social presence have lower CMC apprehension, but to fully examine this relationship will be discussed in the future research section.

This series of studies created and provide validity testing to a self-rated social presence measure. This measure's intend purpose is to identify individuals that have trouble initiating social presence, and the areas of social presence that they have difficulty. This measure can be used as a tool in online education to screen and provide additional training to students. It can also be used to broaden are understanding of interpersonal interaction that occur in CMC.

### **Future Research and Limitations**

The first limitation is the use of the purposive sample to recruit CMC users that are very experienced with CMC. The lack of participants with little CMC experience prevents us from investigating whether those with little CMC experience adapt the same way that experience CMC users do. .By recruiting participants with very little experience with CMC, research could be conducted to determine if the measure would be as helpful with individuals who refrain from interacting via CMC channels.

Another limitation to this series of studies is the fact that previous research has focused on content analysis/interpretive analysis to determine the indicator of social presence. This may have led to the idea that the use of personal pronouns is an indicator of social presence. Personal pronouns may have an effect on social presence, or they may be a little too subtle for the participants to identify. Future research should be conducted to determine if personal pronouns do have an effect on social presence.

Further research could be conducted concerning the five areas of social presence identified in this series of studies. CMC scenarios could be created with varied levels of the five

areas social presence identified. For example, a series of CMC scenarios using paralinguistics and textual references to emotion could be created. One scenario using both paralinguistics and textual references equally, two scenarios using either paralinguistics or textual reference to emotion, and two scenarios using both one would include more examples of paralinguistics and the other would include more textual references to emotion. The scenarios would then be ranked according to the level of social presence that the participants perceived. This would let us determine if paralinguistics or textual references varies the level of social presence that CMC users experience. Additional scenarios concerning interactive communication, the use of first names, the use of small talk, and the use of personal pronouns that was eliminated by the EFA. If we can determine what communication actions have the largest effect on social presence we can then teach CMC users which indicator of social presence that they should focus. We would also be able to examine social presence theory in relation to other communication theories.

The relationship between social presence and CMC apprehension should be investigated as well. The two measures correlated according to theory, but does CMC apprehension lower due to the establishment social presence. To investigate this, users with high levels of apprehension and who score low on the social measure should be recruited. A series of trainings could be designed to lower CMC apprehension or increase social presence and given to the participants. By providing certain groups with training on CMC apprehension and/or social presence we could determine if CMC apprehension has an effect on social presence, or if social presence lowers CMC apprehension.

The use of experimental design could be utilized to help establish the predictive validity of the measure. Predictive validity is the instrument's ability to predict an outcome beyond itself (Nunnally & Bernstein, 1994). The social presence measure that was established could be

administered to participants prior to a CMC interaction. After the interaction the M.I.N.D. Labs measure could be used to determine the amount of social presence that the interactants experienced. Thus giving us the ability to place participants into predetermined groups to determine if all user's in a CMC event must projected themselves as real individuals, or if only a select few are needed to increase social presence. If it was determined that it only takes a few CMC users with the ability to projected themselves to create a sense of social presence, groups of individuals in online environments such as online class could be grouped based upon their scores on the social presence measure.

Online education is another area that can benefit from this measure. The measure can be used to determine student's ability to project themselves as real individuals. This would help instructors access the ability of their classes and assign groups based on communication ability. It would also allow students to be given individualized training to help them improve their ability to project themselves as an individual in CMC. In addition online educators that have issues with social presence can be identified. Allowing online educational institutions to pick instructors that will adapt well to the online environment. It would also allow instructors that would have issues adapting to CMC environments to receive training.

Organizational communication is becoming more reliant on CMC and it is important that companies understand how social presence can be used to improve the business relations between employees, other organizations, and the public. The use of CMC to increase efficiency, time management, and lower costs has increase the use of CMC in work place, but being able to establish a social presence has not. Most of the research in organizational communication has focused on the CMC channel's ability and not how the user's ability. This measure can help



organizations to identify employees that have difficulties establishing a social presence and provide them with training.

Finally this measure allows us to investigate the link between social presence and other theories of communication. By using this measure future research investigating how other theories of communication relate to an individual's ability to create social presence.

Additionally, the theory of social presence can now be refined to give us a better understanding of the key components and the overall structure of social presence theory.

### **Contributions and Implications**

The development of this measure allows us to measure individual ability to create social presence, which in future research can be used to determine if all participants need to produce a social presence or if a select few are needed to help all communicators feel connected. This measure also allows us to identify online students that may have issues with projecting a social presence. By understanding what communicators need to do to project a social presence training modules could then be created to help students to adapt to CMC. Online educators also need to be able to establish social presence and this measure will help in identifying educators that need help establishing a social presence. Additionally, a large number of companies are moving to online meeting software, and it will be imperative that employees understand how to establish social presence. Finally this measure helps social presence theory by providing us additional measurement tools to compare to other communication constructs. Allowing future research to be conducted to see how social presence relates to other theories of communication.

### **Conclusion**

In summary, it is necessary to identify and provide assistance to novice CMC users to provide them with the skills to create and maintain connections via CMC (Kehrwald, 2008). The

social presence measure developed in this series of studies can be used as a self-rated evaluation identify individuals who have difficulty establishing social presence, as well as identifying the specific areas of social presence that they have issues. In addition, the use of this measure in future research can help communication scholars further there understanding of CMC and social presence theory.

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## Appendices

## **Appendix A: Potential Items for Social Presence Measure Concerning Affective Communication**

1. I tend to share my feelings with others via computer mediated communication
2. I enjoy when other online communicators share their feelings.
3. It is easy for me to understand others' feelings when using computer mediated communication.
4. I tend to disclose my past experiences and opinions with other online communicators.
5. I like it when other online communicators disclose past experiences and opinions.
6. When other online communicators share personal information, it improves the communication.
7. I understand and use text speak to reinforce my messages
8. Text speak helps me to understand others.
9. I use capitalization to stress certain points when using computer-mediated communication channels.
10. I shorten words and use icons to add meaning to my computer mediated messages.



## **Appendix B: Potential Items for Social Presence Measure Concerning Interactive Communication**

1. I encourage others to send me computer mediated messages.
2. I like to send others computer mediated messages.
3. I like to receive messages from others via computer mediated communication.
4. I try to respond to questions when asked via computer mediated channels
5. I prefer to quote others in computer mediated communication to ensure the message is correctly understood.
6. When senders refer to past conversations in computer mediated messages it prevents confusion.
7. I send thank you responses when someone answers a question that I asked via computer-mediated communication.
8. I send messages to let others know that I received their computer-mediated message.
9. I usually include the previous message with new messages on the same topic.
10. I let people know that they can send me computer-mediated messages.

## **Appendix C: Potential Items for Social Presence Measure Concerning Cohesive Communication**

1. I like it when people refer to me by first name in computer mediated communication
2. I feel comfortable chit chatting about the everyday details via computer mediated communication.
3. It feels natural for me to use pronouns such as “*we*,” “*ours*,” and “*us*” when sending messages via computer mediated channels.
4. Using first names in computer mediated messages is natural for me
5. I use small talk to make my computer mediated messages more personal.
6. I send messages to others about my day or what I am doing via computer mediated communication.
7. I usually include small talk in computer mediated communication
8. I enjoy it when people use small talk in computer mediated communication.
9. If I know the other person’s first name, I use that in my computer mediated messages with them.
10. I encourage others to use my first name in computer mediated communication.

## Appendix D: Affective Communication Items

- asp1 I tend to share my feelings with others via computer-mediated communication.
- asp2 I enjoy when other online communicators share their feelings.
- asp3 It is easy for me to understand others' feelings when using computer-mediated communication.
- asp4 I tend to disclose my past experiences and opinions with other online communicators.
- asp5 I like it when other online communicators disclose past experiences and opinions.
- asp6 When other online communicators share personal information, it improves the communication.
- asp7 I initiate conversations concerning how others think/feel via computer-mediated communication.
- asp8 I ask other people their opinion via computer-mediated communication.
- asp9 I share my opinions via computer-mediated communication.
- asp10 I use humor in my computer-mediated communication.
- asp11 I like it when others use humor in computer-mediated communication.
- asp12 I discuss my thoughts and feelings when appropriate with others via computer-mediated communication
- asp13 I understand text speak (lol, etc...).
- asp14 I use text speak (lol, etc...) to reinforce my messages.
- asp15 I use punctuation like capitalization to communicate my feelings.
- asp16 I over use punctuations (!!!, ???, etc...) to convey my feelings.
- asp17 I use smiley faces and other emoticons to convey my feelings.
- asp18 When others use text speak (lol, etc...) it helps me to understand their feelings/thoughts.
- asp19 Emoticons are important because they help me to understand the other person's feelings.
- asp20 I like it when others over use punctuation (!!!, ???, etc...) to convey feelings.
- asp21 I use capitalization to stress certain points when using computer-mediated communication channels.
- asp22 I shorten words to add meaning to my computer-mediated messages.

## Appendix E: Cohesive Communication items

- csp1 I like it when people refer to me by first name in computer-mediated communication if the communication channel does not automatically include my name.
- csp2 I feel comfortable chit chatting about the everyday details via computer-mediated communication.
- csp3 It feels natural for me to use pronouns such as “we,” “ours,” and “us” when sending messages via computer-mediated channels.
- csp4 I use small talk to make my computer-mediated messages more personal.
- csp5 I discuss everyday events via computer-mediated communication.
- csp6 I usually include small talk in computer-mediated communication.
- csp7 I enjoy it when people use small talk in computer-mediated communication.
- csp8 I like it when people share their everyday events with me because it helps me understand them.
- csp9 If I know the other person’s first name, I use that in my computer-mediated messages with them if the communication channel does not include it automatically.
- csp10 I encourage others to use my first name in computer-mediated communication if the communication channel does not provide it automatically.

## Appendix F: Interactive Communication Items

- isp1 I initiate conversations via computer-mediated messages.
- isp2 I send computer-mediated messages regularly to check in with other people.
- isp3 I like when people send regular computer-mediated messages to see how I am doing.
- isp4 I encourage others to send me computer-mediated messages.
- isp5 I like to send others computer-mediated messages.
- isp6 I like to receive messages from others via computer-mediated communication.
- isp7 I try to respond to questions when asked via computer-mediated channels.
- isp8 I refer to past conversations in computer-mediated communication to ensure my messages are understood correctly.
- isp9 When senders refer to past conversations in computer-mediated messages it prevents confusion.
- isp10 I send responses when someone answers a question that I asked via computer-mediated communication.
- isp11 I send messages to let others know that I received their computer-mediated message.
- isp12 I respond to others with a quick note to let them know that I received their message.
- isp13 I usually include the previous message with the new messages on the same topic if communication channel allows.
- isp14 I comment on other posts.
- isp16 I ask others for their contact information so I can use computer-mediated communication to contact them later.
- isp17 I give people my contact information so they can contact me using computer-mediated communication.
- isp18 I let people know that they can send me computer-mediated messages.

## **Appendix G: Focus Group Items**

- Pic1 I upload pictures of myself so that others can see me when using computer-mediated channels.
- Pic2 I like it when other share photos so I know what they look like when I use computer-mediated channels.
- Lang1 I like it when others use informal language via in computer-mediated messages.
- Lang2 I use informal language in computer-mediated messages.

## Appendix H: Preliminary Social Presence Measure after Focus Groups

1. I like when people send regular computer-mediated messages to see how I am doing.
2. I ask other people their opinion via computer-mediated communication.
3. I initiate conversations concerning how others think/feel via computer-mediated communication.
4. I enjoy it when people use small talk in computer-mediated communication.
5. I usually include the previous message with the new messages on the same topic if communication channel allows.
6. I enjoy when other online communicators share their feelings.
7. I try to respond to questions when asked via computer-mediated channels.
8. I like it when other share photos so I know what they look like when I use computer-mediated channels.
9. I like it when people share their everyday events with me because it helps me understand them.
10. I encourage others to use my first name in computer-mediated communication if the communication channel does not provide it automatically.
11. I respond to others with a quick note to let them know that I received their message.
12. I use humor in my computer-mediated communication.
13. I shorten words to add meaning to my computer-mediated messages.
14. Emoticons are important because they help me to understand the other person's feelings.
15. I initiate conversations via computer-mediated messages.
16. I like it when others over use punctuation (!!!, ???, etc...) to convey feelings.
17. I use informal language in computer-mediated messages.
18. I use punctuation like capitalization to communicate my feelings.
19. I discuss everyday events via computer-mediated communication.
20. It is easy for me to understand others' feelings when using computer-mediated communication.
21. I send computer-mediated messages regularly to check in with other people.
22. I send messages to let others know that I received their computer-mediated message.
23. When senders refer to past conversations in computer-mediated messages it prevents confusion.
24. I give people my contact information so they can contact me using computer-mediated communication.
25. I discuss my thoughts and feelings when appropriate with others via computer-mediated communication
26. I send responses when someone answers a question that I asked via computer-mediated communication.
27. I like to send others computer-mediated messages.
28. I like it when others use informal language via in computer-mediated messages.
29. I tend to disclose my past experiences and opinions with other online communicators.
30. I share my opinions via computer-mediated communication.
31. It feels natural for me to use pronouns such as "we," "ours," and "us" when sending messages via computer-mediated channels.
32. I refer to past conversations in computer-mediated communication to ensure my messages are understood correctly.

33. I like to receive messages from others via computer-mediated communication.
34. I use capitalization to stress certain points when using computer-mediated communication channels.
35. I ask others for their contact information so I can use computer-mediated communication to contact them later.
36. If I know the other person's first name, I use that in my computer-mediated messages with them if the communication channel does not include it automatically.
37. I usually include small talk in computer-mediated communication.
38. I use smiley faces and other emoticons to convey my feelings.
39. I like it when people refer to me by first name in computer-mediated communication if the communication channel does not automatically include my name.
40. I encourage others to send me computer-mediated messages.
41. I use small talk to make my computer-mediated messages more personal.
42. I upload pictures of myself so that others can see me when using computer-mediated channels.
43. I comment on other posts.
44. I let people know that they can send me computer-mediated messages.
45. I feel comfortable chit chatting about the everyday details via computer-mediated communication.
46. I tend to share my feelings with others via computer-mediated communication.
47. I understand text speak (lol, etc...).
48. When other online communicators share personal information, it improves the communication.
49. I use text speak (lol, etc...) to reinforce my messages.
50. I like it when others use humor in computer-mediated communication.
51. I over use punctuations (!!!, ???, etc...) to convey my feelings.
52. I like it when other online communicators disclose past experiences and opinions.
53. When others use text speak (lol, etc...) it helps me to understand their feelings/thoughts.



## Appendix I: Final Social Presence Measure after EFA

- asp1 I tend to share my feelings with others via computer-mediated communication.
- asp4 I tend to disclose my past experiences and opinions with other online communicators.
- asp6 When other online communicators share personal information, it improves the communication.
- asp7 I initiate conversations concerning how others think/feel via computer-mediated communication.
- asp8 I ask other people their opinion via computer-mediated communication.
- asp9 I share my opinions via computer-mediated communication.
- asp12 I discuss my thoughts and feelings when appropriate with others via computer-mediated communication
- asp16 I over use punctuations (!!!, ???, etc...) to convey my feelings.
- asp20 I like it when others over use punctuation (!!!, ???, etc...) to convey feelings.
- asp21 I use capitalization to stress certain points when using computer-mediated communication channels.
- csp1 I like it when people refer to me by first name in computer-mediated communication if the communication channel does not automatically include my name.
- csp4 I use small talk to make my computer-mediated messages more personal.
- csp6 I usually include small talk in computer-mediated communication.
- csp7 I enjoy it when people use small talk in computer-mediated communication.
- csp9 If I know the other person's first name, I use that in my computer-mediated messages with them if the communication channel does not include it automatically.
- csp10 I encourage others to use my first name in computer-mediated communication if the communication channel does not provide it automatically.
- isp5 I like to send others computer-mediated messages.
- isp6 I like to receive messages from others via computer-mediated communication.
- isp8 I refer to past conversations in computer-mediated communication to ensure my messages are understood correctly.
- isp11 I send messages to let others know that I received their computer-mediated message.
- isp16 I ask others for their contact information so I can use computer-mediated communication to contact them later.
- isp17 I give people my contact information so they can contact me using computer-mediated communication.
- isp18 I let people know that they can send me computer-mediated messages.

## Appendix J: Preliminary Social Presence Measure after EFA

**Directions:** The following scale concerns your behaviors when using computer-mediated communication. Computer mediated communication is the use of communication channels such as email, text messaging, social networks, chat, etc... Please respond to the following statements as they apply to your use of computer-mediated communication using the following scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

1. I tend to share my feelings with others via computer-mediated communication.
2. I tend to disclose my past experiences and opinions with other online communicators.
3. When other online communicators share personal information, it improves the communication.
4. I initiate conversations concerning how others think/feel via computer-mediated communication.
5. I ask other people their opinion via computer-mediated communication.
6. I share my opinions via computer-mediated communication.
7. I discuss my thoughts and feelings when appropriate with others via computer-mediated communication
8. I over use punctuations (!!!, ???, etc...) to convey my feelings.
9. I like it when others over use punctuation (!!!, ???, etc...) to convey feelings.
10. I use capitalization to stress certain points when using computer-mediated communication channels.
11. I like it when people refer to me by first name in computer-mediated communication if the communication channel does not automatically include my name.
12. I use small talk to make my computer-mediated messages more personal.
13. I usually include small talk in computer-mediated communication.
14. I enjoy it when people use small talk in computer-mediated communication.
15. If I know the other person's first name, I use that in my computer-mediated messages with them if the communication channel does not include it automatically.
16. I encourage others to use my first name in computer-mediated communication if the communication channel does not provide it automatically.
17. I like to send others computer-mediated messages.
18. I like to receive messages from others via computer-mediated communication.
19. I refer to past conversations in computer-mediated communication to ensure my messages are understood correctly.
20. I send messages to let others know that I received their computer-mediated message.
21. I ask others for their contact information so I can use computer-mediated communication to contact them later.
22. I give people my contact information so they can contact me using computer-mediated communication.
23. I let people know that they can send me computer-mediated messages.

## **Appendix K: CMC Anxiety**

1. I look forward to the opportunity to interact with others via computer-mediated communication.
  2. I would enjoy giving a presentation to others online.
  3. I look forward to expressing myself during online meetings.
-

## Appendix M: M.I.N.D. Labs Social Presence

**Directions:** The following questions concern your experiences when using computer-mediated communication. Computer-mediated communication is the use of communication channels such as email, text messaging, social networks, chat, etc. When responding to the following questions, please think of a recent conversation using computer-mediated communication that was significant. Respond to the statements using the following scale.

1	2	3	4	5	6	7
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neither Agree nor Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

1. (My partner) remained focused on me throughout our interaction.
  2. I caught (my partner's) attention.
  3. (My partner) reciprocated my actions.
  4. (My partner's) thoughts were clear to me.
  5. (My partner's) presence was obvious to me.
  6. (My partner) did not receive my full attention. a
  7. My emotions were not clear to (my partner). a
  8. My attitudes influenced how (my partner) felt.
  9. (My partner) noticed me.
  10. My behavior was closely tied to (my partner's) behavior.
  11. (My partner) caught my attention.
  12. I was sometimes influenced by (my partner's) moods.
  13. (My partner) found it easy to understand me.
  14. It was easy to understand (my partner).
  15. (My partner) could tell how I felt.
  16. I could describe (my partner's) feelings accurately.
  17. My thoughts were clear to (my partner).
  18. I noticed (my partner).
  19. My behavior was often in direct response to (my partner's) behavior.
  20. I reciprocated (my partner's) actions.
  21. (My partner's) emotions were not clear to me. a
  22. I could tell how (my partner) felt.
  23. (My partner's) attitudes influenced how I felt.
  24. (My partner's) feelings influenced the mood of our interaction.
  25. The behavior of (my partner) was often in direct response to my behavior.
  26. (My partner) was sometimes influenced by my moods.
  27. (My partner's) behavior was closely tied to my behavior.
  28. (My partner) could describe my feelings accurately.
  29. My feelings influenced the mood of our interaction.
  30. My presence was obvious to (my partner).
- a= is reverse coded items

## Appendix N: Job Satisfaction Measure

**Directions:** Please think about your most recent/current job. All in all, what is it like most of the time? Please read the following phrases/adjectives and circle the best answer for you using the following scale:

**“Yes” if it describes your job**

**“Undecided” if you cannot decide.**

**“No” if it does not describe it**

1. Good:
2. Undesirable: *a*
3. Better than most:
4. Disagreeable: *a*
5. Makes me content:
6. Excellent:
7. Enjoyable:

## Appendix L: Demographic Questions

1. What year were you born?
2. Sex  Male  Female
3. Experience Very Little Experience    2   3   4   5   6    Very Experience
4. Knowledge Novice                            2   3   4   5   6    Expert
5. Use                    In-frequent user                    2   3   4   5   6    Frequent User

## Appendix O: Preliminary Social Presence Measure after CFA

**Directions:** The following scale concerns your behaviors when using computer-mediated communication. Computer mediated communication is the use of communication channels such as email, text messaging, social networks, chat, etc... Please respond to the following statements as they apply to your use of computer-mediated communication using the following scale:

1. I tend to share my feelings with others via computer-mediated communication.
2. I tend to disclose my past experiences and opinions with other online communicators.
3. When other online communicators share personal information, it improves the communication.
4. I initiate conversations concerning how others think/feel via computer-mediated communication.
5. I ask other people their opinion via computer-mediated communication.
6. I share my opinions via computer-mediated communication.
7. I discuss my thoughts and feelings when appropriate with others via computer-mediated communication
8. I over use punctuations (!!!, ???, etc...) to convey my feelings.
9. I like it when others over use punctuation (!!!, ???, etc...) to convey feelings.
10. I like it when people refer to me by first name in computer-mediated communication if the communication channel does not automatically include my name.
11. I use small talk to make my computer-mediated messages more personal.
12. I usually include small talk in computer-mediated communication.
13. I enjoy it when people use small talk in computer-mediated communication.
14. If I know the other person's first name, I use that in my computer-mediated messages with them if the communication channel does not include it automatically.
15. I encourage others to use my first name in computer-mediated communication if the communication channel does not provide it automatically.
16. I like to send others computer-mediated messages.
17. I like to receive messages from others via computer-mediated communication.
18. I refer to past conversations in computer-mediated communication to ensure my messages are understood correctly.
19. I send messages to let others know that I received their computer-mediated message.
20. I ask others for their contact information so I can use computer-mediated communication to contact them later.
21. I give people my contact information so they can contact me using computer-mediated communication.
22. I let people know that they can send me computer-mediated messages.

## Appendix P: Social Presence Measure after CFA

**Directions:** The following scale concerns your behaviors when using computer-mediated communication. Computer mediated communication is the use of communication channels such as email, text messaging, social networks, chat, etc... Please respond to the following statements as they apply to your use of computer-mediated communication using the following scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree

1. I tend to share my feelings with others via computer-mediated communication (*asp1*)
2. I tend to disclose my past experiences and opinions with other online communicators. (*asp4*)
3. When other online communicators share personal information, it improves the communication. (*asp6*)
4. I initiate conversations concerning how others think/feel via computer-mediated communication. (*asp7*)
5. I ask other people their opinion via computer-mediated communication. (*asp8*)
6. I share my opinions via computer-mediated communication. (*asp9*)
7. I discuss my thoughts and feelings when appropriate with others via computer-mediated communication (*asp12*)
8. I over use punctuations (!!!, ???, etc...) to convey my feelings. (*asp16*)
9. I like it when others over use punctuation (!!!, ???, etc...) to convey feelings. (*asp20*)
10. I use capitalization to stress certain points when using computer-mediated communication channels. (*asp21*)
11. I like it when people refer to me by first name in computer-mediated communication if the communication channel does not automatically include my name. (*csp1*)
12. I use small talk to make my computer-mediated messages more personal. (*csp4*)
13. I usually include small talk in computer-mediated communication. (*csp6*).
14. I enjoy it when people use small talk in computer-mediated communication. (*csp7*)
15. If I know the other person's first name, I use that in my computer-mediated messages with them if the communication channel does not include it automatically. (*csp9*)
16. I encourage others to use my first name in computer-mediated communication if the communication channel does not provide it automatically. (*csp10*)
17. I like to send others computer-mediated messages. (*isp5*)
18. I like to receive messages from others via computer-mediated communication. (*isp6*)
19. I send messages to let others know that I received their computer-mediated message. (*isp11*)
20. I ask others for their contact information so I can use computer-mediated communication to contact them later. (*isp16*)
21. I let people know that they can send me computer-mediated messages. (*isp18*)



**Table 3-1: Focus Group Participants Totals**

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Totals
Men	9	6	5	3	2	4	5	34
Women	1	1	4	2	8	8	4	28
Total	10	7	9	5	10	12	9	62

**Table 3-2: Focus Group Plan**

<p><b>Welcome</b></p> <p>5 minutes</p>	<p>I would like to welcome all of you today. My name is Scott Christen and I will be the moderator of today’s meeting. _____ will be assisting me today in taking notes and ensuring that we stay on schedule.</p> <p>The reason that you have been invited here is to talk about computer mediated communication or CMC. Specifically, we will be discussing social presence. Social presence has been defined in a variety of ways, but for our discussion today it will be defined as <i>person’s ability to project themselves as a real person and perceive others as real individuals in a mediated environment.</i></p> <p>Social presence is an important aspect of CMC because without the concept of social presence it is hard for individuals to move past impersonal communication to make meaningful interpersonal connections. An example of impersonal communication is the communication that you share with a teller at a bank or the check-out person at a grocery store. The interaction is to accomplish a task not to make a meaningful connection that will last beyond this encounter or build an ongoing relationship. With that in mind, I am looking for your guidance on creating a survey that measures the behaviors people use to promote social presence in CMC.</p> <p>I have created a personal report measure of social presence. What I need your help with is to evaluate the items looking at not only wording, but also your opinions about their effectiveness.</p>
<p><b>Ground Rules</b></p> <p>5 minutes</p>	<p>Before beginning I would like to discuss a few ground rules.</p> <ol style="list-style-type: none"> <li>1. I am asking that you refrain from discussing the information from today’s group outside of this group. Since this material is still in the development stage, your discussion with others may affect other potential participant’s views.</li> <li>2. I am seeking your opinion, so feel free to be honest in your discussions. Your answers will help to shape the development of this research and I would appreciate it if you were honest.</li> <li>3. Feel free to disagree with one another. The purpose of this group is to find areas of disagreement and to improve the research.</li> <li>4. During the discussion I will be asking questions not only to gather information but also to clarify answers/summaries of the discussion.</li> </ol>

	<p>Feel free to ask me to re-state any questions I ask or to correct any statements that I rephrase.</p> <p>5. Both _____ and I will be taking notes during the discussion. However we will not be documenting the identity of any of the participants. We will only be documenting the summaries and suggestions that you provide. After the research has been published, all notes will be destroyed. So feel free to speak your minds.</p>
<p><b>Introduction</b></p> <p>5 minutes</p>	<p>To break the ice, let's introduce ourselves. Please state your first name, major, and class status (freshman, sophomore, junior, senior) and your experience with computer mediated communication such as texting, email, Facebook, etc...</p> <p>As I stated earlier my name is Scott Christen, I am Ph. D. candidate in communication studies. _____ is also a _____ student in communication I am not an avid texter, but I do text. I check Facebook regularly, and I use email both at work and for social reasons.</p>
<p><b>Discussion of Affective Communication Items</b></p> <p>10 – 15 minutes</p>	<p><b>Affective Communication is communication that shares emotions, discloses personal information, and/or displays computer-mediated paralinguistics such as the text language or the use of capitalization to express emotions (ex. Lol, l8tr, NO!).</b></p> <ul style="list-style-type: none"> <li>a) Expressions of emotion include statements concerning the communicator's own emotion and use of humor</li> <li>b) Self-disclosure involves revealing feelings, attitudes, and interests that create an environment where others reciprocate.</li> <li>c) Paralinguistic is defined as the use of text in various manners that do not conform to traditional syntax (Swan, 2002). Commonly referred to as text speak, text language, sms language, and/or chat speak.</li> </ul> <p><b>Potential Items for Social Presence Measure Concerning Affective Communication</b></p> <ul style="list-style-type: none"> <li>1. I tend to share my feelings with others via computer mediated communication</li> <li>2. I enjoy when other online communicators share their feelings.</li> <li>3. It is easy for me to understand others' feelings when using computer mediated communication.</li> <li>4. I tend to disclose my past experiences and opinions with other online communicators.</li> <li>5. I like it when other online communicators disclose past experiences and opinions.</li> </ul>

	<ol style="list-style-type: none"> <li>6. When other online communicators share personal information, it improves the communication.</li> <li>7. I understand and use text speak to reinforce my messages</li> <li>8. Text speak helps me to understand others.</li> <li>9. I use capitalization to stress certain points when using computer-mediated communication channels.</li> <li>10. I shorten words and use icons to add meaning to my computer mediated messages.</li> </ol>
<p><b>Discussion of Interactive Communication Items</b></p> <p>10 – 15 minutes</p>	<p><b>Interactive Communication refers to indications that the communicator is open to receive and attending to messages by others.</b></p> <ol style="list-style-type: none"> <li>a) Open communication is defined as acts that encourage others to communicate (Garrison et al., 2000; Rourke et al., 1999; Swan, 2002). Examples of open communication are explicit statements concerning appreciation, agreement, as well as compliments.</li> <li>b) Attending responses are responses that reference specific communications. Examples are quoting others, asking or answering questions, or referencing past conversations.</li> </ol> <p><b>Potential Items for Social Presence Measure Concerning Interactive Communication</b></p> <ol style="list-style-type: none"> <li>1. I encourage others to send me computer mediated messages.</li> <li>2. I like to send others computer mediated messages.</li> <li>3. I like to receive messages from others via computer mediated communication.</li> <li>4. I try to respond to questions when asked via computer mediated channels</li> <li>5. I prefer to quote others in computer mediated communication to ensure the message is correctly understood.</li> <li>6. When senders refer to past conversations in computer mediated messages it prevents confusion.</li> <li>7. I send thank you responses when someone answers a question that I asked via computer-mediated communication.</li> <li>8. I send messages to let others know that I received their computer-mediated message.</li> <li>9. I usually include the previous message with new messages on the same topic.</li> <li>10. I let people know that they can send me computer-mediated messages.</li> </ol>
<p><b>Discussion of Cohesive</b></p>	<p><b>Cohesive communication is the use of vocatives and phatics. The purpose vocative and phatics is to create and maintain a sense of cohesion between the communicators. Vocatives are the use of first names and or inclusive pronouns like “us” or “we”. Phatics are messages that are social in nature such as asking about work or the</b></p>

<p><b>Communication Items</b></p> <p>10 – 15 minutes</p>	<p><b>weather.</b></p> <ul style="list-style-type: none"> <li>a) Vocatives are the use of inclusive pronouns such as <i>we</i>, <i>our</i>, or <i>us</i>, and the use of other communicators' names.</li> <li>b) Phatic communication are messages that are sent not to acquire information but to promote sociability (Rourke et al., 1999). Small talk such as asking how the others have been, discussions about the weather and or other insignificant communication topics are examples of phatic messages.</li> </ul> <p><b>Potential Items for Social Presence Measure Concerning Cohesive Communication</b></p> <ul style="list-style-type: none"> <li>1. I like it when people refer to me by first name in computer mediated communication</li> <li>2. I feel comfortable chit chatting about the everyday details via computer mediated communication.</li> <li>3. It feels natural for me to use pronouns such as “<i>we</i>,” “<i>ours</i>,” and “<i>us</i>” when sending messages via computer mediated channels.</li> <li>4. Using first names in computer mediated messages is natural for me</li> <li>5. I use small talk to make my computer mediated messages more personal.</li> <li>6. I send messages to others about my day or what I am doing via computer mediated communication.</li> <li>7. I usually include small talk in computer mediated communication</li> <li>8. I enjoy it when people use small talk in computer mediated communication.</li> <li>9. If I know the other person’s first name, I use that in my computer mediated messages with them.</li> <li>10. I encourage others to use my first name in computer mediated communication.</li> </ul>
<p><b>Review and Wrap Up</b></p> <p>5 minutes</p>	<p>It seems that we have run out of time. I would like to thank you all for your participation. Do any of you have anything that you would like to add? (Wait for responses, and answer any questions) I will be uploading your research credit to the database soon. If you have any questions or need to discuss this process feel free to contact me using the information located at the bottom of the informed consent I gave you at the beginning of session.</p>

**Table 4-1: Affective Communication**

	Factor			
	1	2	3	4
asp9	.727			
asp8	.666	.254		
asp5	.662			
asp6	.662			
asp12	.656			
asp2	.645			
asp1	.632	.325		
asp7	.610	.304		
asp4	.599			
asp3	.475			
asp16		.768		
asp20		.692		
asp21		.546	.299	
asp15		.492	.386	
asp19		.460	.297	
asp17		.455	.449	
asp22	.266	.441		.253
asp11			.686	
asp10	.288		.627	
asp13			.454	.364
asp18	.261	.301		.754
asp14		.376	.269	.583

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 6 iterations.

**Table 4-2: Final Subset for Affective Communication**

	Factor	
	Sharing Experience & Emotion	Use Paralinguistics
asp9	.744	
asp8	.705	
asp12	.687	
asp5	.678	.281
asp2	.671	
asp6	.669	
asp1	.659	.314
asp7	.639	.321
asp4	.597	
asp3	.499	
asp16		.869
asp20		.729
asp21	.285	.520

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 3 iterations.

**Table 4-3: Cohesive Communication subset**

	Factor	
	1	2
csp1		.694
csp2	.632	.318
csp3	.411	.268
csp4	.742	
csp5	.639	.371
csp6	.697	
csp7	.658	
csp8	.575	.382
csp9		.593
csp10		.661

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 3 iterations.



**Table 4-4: Final Subset for Cohesive Communication**

	Factor	
	Use of Small Talk	Use of First Names
csp1		.736
csp2	.629	.318
csp4	.754	
csp5	.616	.357
csp6	.720	
csp7	.671	
csp9	.250	.543
csp10		.698

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 3 iterations.

**Table 4-5: Rotated Factor Matrix<sup>a</sup>**

	Factor	
	1	2
isp1	.640	.329
isp2	.589	.379
isp3	.528	.372
isp4	.770	
isp5	.670	.381
isp6	.700	.335
isp7	.507	.409
isp8	.531	.261
isp9	.463	.282
isp10	.471	.407
isp11	.277	.629
isp12		.764
isp13	.402	
isp14	.521	.281
isp16	.667	
isp17	.709	
isp18	.681	

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 3 iterations.

**Table 4-6: Final Subset for Interactive Communicaiton<sup>a</sup>**

	Factor
	Open to Interacting
isp1	.715
isp4	.756
isp5	.752
isp6	.747
isp7	.643
isp8	.590
isp11	.548
isp12	.494
isp13	.469
isp16	.688
isp17	.747
isp18	.721

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 4 iterations required.

**Table 4-7: Rotated Factor Matrix<sup>a</sup>**

	Factor					
	1	2	3	4	5	6
asp1	.602					
asp2	.448	.261	.372	.260		
asp3	.309	.260	.325			
asp4	.552					
asp5	.526		.375			
asp6	.521					
asp7	.520	.310				
asp8	.605	.284				
asp9	.632		.267	.273		
asp12	.523	.381				
asp16					.862	
asp20					.692	
asp21	.306				.481	
csp1				.663		
csp2	.432	.281	.424			
csp4	.293	.253	.606			
csp5	.472	.289	.343			
csp6			.619			
csp7			.693			
csp9				.548		
csp10	.252			.605		
isp1	.380	.427	.252			
isp4	.430	.600				
isp5	.311	.470	.302	.304		
isp6	.339	.498	.271	.300		
isp7		.361		.432		.260
isp8	.267	.354	.258			
isp11		.251				.654
isp12						.675
isp13	.334	.266				
isp16		.708				
isp17	.265	.713				
isp18		.593	.273			
Pic 1	.301	.263		.224	.254	
Pic 2		.279	.265	.343	.228	
Lang 1			.363		.397	
Lang 2			.322		.369	.338

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 7 iterations.

**Table 4-8: Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
asp1	98.93	479.239	.673	.926
asp4	99.21	487.399	.571	.928
asp6	98.65	490.937	.616	.927
asp7	98.81	482.482	.680	.926
asp8	98.65	480.789	.688	.926
asp9	98.46	481.982	.685	.926
asp12	98.47	486.551	.648	.927
asp16	98.87	481.786	.503	.930
asp20	98.70	488.029	.486	.930
asp21	98.20	494.047	.461	.930
csp1	98.30	487.654	.560	.928
csp4	98.54	490.737	.642	.927
csp6	98.46	490.858	.591	.928
csp7	98.51	493.796	.538	.928
csp9	98.27	496.773	.469	.930
csp10	98.55	495.265	.489	.929
isp5	98.28	482.809	.686	.926
isp6	98.00	484.334	.707	.926
isp8	98.46	491.928	.551	.928
isp11	98.58	494.913	.489	.929
isp16	98.49	485.682	.583	.928
isp17	98.37	481.412	.620	.927
isp18	98.16	485.265	.646	.927

**Table 4-9: Final Social Presence Measure**

	Factor				
	Open to Interacting	Use of Paralinguistics	Use of First Names	Use of Small Talk	Share Emotion & Experience
asp1					-.724
asp4					-.632
asp6					-.530
asp7					-.563
asp8					-.675
asp9					-.718
asp12					-.574
asp16		.868			
asp20		.735			
asp21		.479			
csp1			.779		
csp4				-.650	
csp6				-.685	
csp7				-.767	
csp9			.557		
csp10			.706		
isp5	.354				
isp6	.388				
isp8	.259				
isp11	.253				
isp16	.801				
isp17	.767				
isp18	.574				

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.<sup>a</sup>

a. Rotation converged in 12 iterations.

**Table 4-10: Social Presence Measure Factor Correlations**

		Sharing	Paralinguistics	First Names	Small Talk	Interacting
Sharing	Pearson Correlation					
	Sig. (2-tailed)					
	N	331				
Paralinguistics	Pearson Correlation	.440**				
	Sig. (2-tailed)	.000				
	N	331	331			
First Names	Pearson Correlation	.413**	.280**			
	Sig. (2-tailed)	.000	.000			
	N	331	331	331		
Small Talk	Pearson Correlation	.649**	.380**	.306**		
	Sig. (2-tailed)	.000	.000	.000		
	N	331	331	331	331	
Interacting	Pearson Correlation	.756**	.303**	.508**	.539**	
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	331	331	331	331	331

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 5-1: Reliability Statistic**

The Unidimensional Model	Cronbach's $\alpha$
Social Presence	.92

The Subsection of the Multidimensional Model	Cronbach's $\alpha$
Sharing	.88
Paralinguistics	.71
Small Talk	.83
First Names	.75
Interactive	.83



**Table 5-2: Study 3 Instrument Descriptive Statistics**

Measure	Mean	S.D.	Min.-Max.	Skew	Kurtosis	Cronbach's $\alpha$
Social Presence Measure	4.56	.97	1.70-7.00	-.059	.049	.92
M.I.N.D. Labs Social Presence	4.57	.83	1.00-7.00	-.159	2.00	.95
AJIB	2.53	.47	1.00-7.00	-1.13	-.754	.83
CMC Anxiety	4.4	.86	2.00-7.00	.183	-.206	.77
CMC Experience	5.82	1.03	2.33-7.00	-.789	-.009	.78

**Table 5-3: Correlations for All Measures***Correlations: Observed*

Factor	Correlations			
Social Presence Measure				
Job Satisfaction	0.09			
M.I.N.D. Labs Social Presence	0.51*	0.08		
CMC Anxiety	0.40*	-0.10	-0.11	
CMC Experience	.323*	.207*	.216*	.36*

\*  $p < .01$ *Correlations: Corrected for Attenuation due to Measurement Error*

Factor	Correlations			
Social Presence Measure				
Job Satisfaction	0.10			
M.I.N.D. Labs Social Presence	0.55*	0.09		
CMC Anxiety	0.52*	-0.13	-0.14	
CMC Experience	.38*	.26*	.25*	.50*

\*  $p < .01$

## **Vita**

Scott's research interests are in computer mediated communication in relation to the instructional, interpersonal, and organizational communication. His primary interest is in how individuals adapt to use computer-mediated communication in various communication settings. His past research has focused on the various ways in which computer mediated communication has affected the instructional communication between students and teacher. In addition he also investigated the computer mediated identity that students project to potential employers. Currently, his research agenda involves the use of computer mediated communication in the online education, as well as how it affects the interpersonal relationships that people maintain through computer mediated communication.