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COMPUTER MEDIATED COMMUNICATION:  
INTERACTION AND INTERACTIVITY

by

MARK AGLE

Under the Direction of Merrill Morris

ABSTRACT

This study examines three popular theories of computer-mediated communication (CMC) and how they relate to increased modes of interactivity. The research takes place in a highly interactive virtual world called *There*. A total of 18 participants took part in the study. Using participant-observation and in-depth interviews, the study found that all three perspectives manifested themselves in both the reported and observed behavior. The three perspectives examined are the social information processing theory (SIPT), the social identity model of de-individuation effects (SIDE), and the hyperpersonal perspective. The study found that SIPT and the hyperpersonal perspective did the best job at explaining the observed behavior, although many factors of the SIDE model also helped.

INDEX WORDS: Communication, Computer-mediated, Interactivity, Avatars, Virtual worlds, Interaction

COMPUTER MEDIATED COMMUNICATION:  
INTERACTION AND INTERACTIVITY

by

MARK AGLE

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Master of Arts  
in the College of Arts and Sciences  
Georgia State University

2006

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2006

COMPUTER MEDIATED COMMUNICATION:  
INTERACTION AND INTERACTIVITY

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## LIST OF ABBREVIATIONS

CMC	computer mediated communication
FtF	face-to-face
HTML	hypertext markup language
IM	instant message
MAB	member advisory board
MMOG	massive multiplayer online game
MUD	multi-user dungeon
OLIVE	OnLine Interactive Virtual Environment
PtP or P2P	peer-to-peer
SIDE	social identity model of de-individuation effects
SIPT	social information processing theory
SMS	short message service
VR	virtual reality

## **Computer-Mediated Communication: Interaction and Interactivity**

### **I. INTRODUCTION**

Since its boom in popularity over a decade ago, the Internet and all of its related technologies have become commonplace in our everyday lives. According to Internet World Stats (2005), it is estimated that over 200 million people are connected in the United States today. Furthermore, the global Internet user base is rapidly approaching one billion. The importance of academic research on the Internet has been established due to its widespread impact on economics, politics, and social interaction.

In addition to changing the way we communicate, the landscape of the Internet itself is ever changing, too. The uses of the Internet have expanded dramatically since its inception as a military network designed to withstand a nuclear attack – which incidentally is a reason for its decentralization that in turn has allowed for its diversification and fragmentation of social networks (Castells, 2000). According to Castells, the open standards of the technologies driving the Internet enable widespread access and restrict any one entity from exercising control over a significant portion of the network, resulting in a decentralization of the Internet as a whole. Some of the newer uses that have gained popularity since the commercialization of the Internet include peer-to-peer (P2P) file sharing networks, blogging<sup>1</sup>, and massive multiplayer online games (MMOGs).

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<sup>1</sup> Blogging: The creation of blogs (short for web logs) that usually focus on a specific topic, e.g. politics. Blogs typically combine text, images, hyperlinks, and other media.

Another technology now known as social software also developed alongside the Internet. Social software, according to Allen (2004a), can be traced back to the 1940s when Vannevar Bush wrote of the Memex – a device similar in function to a modern personal computer, along with some hypertext-like features. It was not until the 1960s that computer-aided collaboration was actually applied in the form of ARPANET, the precursor to the modern Internet, and some more work on hypertext-like concepts discussed in Doug Englebart's (1962) *Augmenting Human Intellect: A Conceptual Framework*. The 1970s and 1980s saw “social software” continuing its penetration into the workplace, with IBM's Electronic Information Exchange System, groupware, and Computer-Supported Collaborative Work systems (Allen, 2004a).

At the same time, it seemed that groupware had become more of a marketing term used by Lotus and Microsoft, among others. The time came for a distinction between collaborative systems and social software. Chip Morningstar, a pioneer in collaborative software and virtual worlds, states:

In the 1990s, I know that we (the Xanadu/AMIX community) hated the term ‘groupware,’ as would anyone who has any respect for the English language. Also, at the time, the term was generally applied to things like Lotus Notes, which we felt was in a category distinct from what we were doing (Allen, 2004a, n.p).

This takes us to the current era of social software development that began in the 1990s. Although several people have wrestled over the definition, social

software can be classified as software that supports group interaction, treating triads of people differently than pairs, where groups are considered ‘first-class’ objects in the system (Allen, 2004a). Furthermore, according to Coates (2002), social software augments human socialization and networking abilities. It is important to point out that social software does not – and was never intended to – replace normal face to face (FtF) interaction.

Keeping with this argument, Castells (2002) mentions that sociologist Barry Wellman found the average person in an urban community has about half a dozen intimate interpersonal relationships, as well as hundreds of weaker ties. Therefore, the Internet and social software merely provides another avenue for people to expand their social networks, not replace them. Virtual communities are generally created around a shared interest, but every user is a unique individual with multiple dimensions of interests. They allow users to create new ties with people – albeit most of these ties are of the weaker variety – allowing them to expand their local network of friends. Some argue the Internet allows for a more egalitarian community in which social characteristics lack the influence they would have in person. Castells believes the Internet and virtual communities may expand social bonds in a world that seems to be going in the direction of individualization. He says even weak ties in virtual communities lend themselves to reciprocal supportiveness on the part of community members, but at the same time, the risk of losing friends online is incredibly high due to the ease of closing connections to people permanently behind the Internet’s shield of anonymity (p. 389).

Given this information, another new development that has taken place as a result of computer-mediated communication (CMC), the Internet, and social software is the creation of virtual worlds and virtual communities, in which a person's likeness can be created in or transferred to online social landscapes. Virtual communities are generally defined as self-defined electronic networks of interactive communication organized around a shared interest or purpose (Castells, 2000). A modern virtual world takes the concept of virtual community and places it in an intuitive format, complete with avatars (graphical representation of users), interactive environments, and usually some means of interpersonal and/or small-group communication. However, not all virtual worlds are graphical in nature. Many still rely on text-only interaction with users and objects. Another aspect of virtual worlds that has become more commonplace recently is persistence. Persistent virtual worlds mimic the physical world by remaining available to users at any time, barring maintenance downtime. This means that a change made in the virtual world today will remain in effect indefinitely – the world never reverts to a set state.

The number of virtual communities has taken off into the tens of thousands since the 1990s, and will only continue to grow as more people become connected to the Internet. In her research, Sherry Turkle found that even in virtual worlds in which users created identities and played made-up roles in multi-user dungeon (MUD) games, they still created active feelings of community. On the other hand, some argue that social relationships created on computer networks are

dehumanizing. They believe these virtual communities are merely an escape from real life and lead to alienation and loneliness in reality (Castells, 2000).

In response to this argument, many proponents of social software reiterate that the purpose is not to replace FtF communication. Etzioni (1999) explored the question of whether virtual communities could have the same qualities as FtF communities. He found virtual communities to be lacking in two key areas: identification and accountability. This stems from the anonymity provided by CMC systems, but some of these problems can be overcome by some form of user authentication. At the same time, Etzioni points out that virtual communities have some distinct advantages over FtF communities: interactive broadcasting (sending and receiving messages and feedback from multiple recipients at a time) and memory (retrieval of information, possibly with the aid of a search engine). Finally, Etzioni also supports the idea that the purpose of virtual communities is to augment FtF communities as he brings up the idea of mixed communications systems and states “one would expect that communities that combine both FtF and CMC systems would be able to bond better and share values more effectively than communities that rely upon only one or the other mode of communication.”

In an examination of the quality of contact provided by computer-mediated systems, Bargh & McKenna (2004) discuss in their review of literature that CMC and FtF relationships share similarities in terms of depth and quality. Moreover, over the course of relationships started online, it seems the natural course is to move them to “real-life” encounters – 22% of respondents in a 2002 survey of

randomly selected USENET<sup>2</sup> newsgroup users reported that they “had either married, become engaged to, or were living with someone they initially met on the Internet.”

The primary purpose of virtual worlds can be for social interaction, simulation, or entertainment, but they often overlap. Although virtual worlds may at first appear as leisurely video games, they are having increased uses in businesses, academics, government, and defense. Forterra Systems’ OLIVE (Online Interactive Virtual Environment) is an example of how the United States Army is using virtual worlds for training soldiers in its Asymmetric Warfare Virtual Training Technology program (Forterra Systems, 2005). The multiple uses of virtual world technology underscores the significance of understanding the process of communication in virtual communities and virtual worlds as more people sign on to these services every day.

Examples of virtual worlds designed for socialization include Makena Technologies’ *There* and Linden Research’s *Second Life* – persistent worlds created for people to meet and communicate with each other while at the same time providing a unique and fun opportunity to interact with a virtual environment. Other virtual worlds such as Sony Online Entertainment’s *Everquest* and Blizzard’s *World of Warcraft* also feature chat functions to facilitate cooperation between players, but it is clear that the *primary* focus of these worlds is more along the lines of accomplishing specific objectives (e.g., slaying dragons) rather than pure socialization.

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<sup>2</sup> One of the Internet’s oldest distributed Internet discussion systems.

The concepts and motivation behind creating virtual worlds is nothing new. Neal Stephenson's (1992) bestselling science-fiction novel *Snow Crash* envisions the "Metaverse," thought to be somewhat of a successor to the current Internet, which people connect to either through public or private terminals. The word itself has become more of a general term recently, meaning a universe within a universe, or in other words, a virtual universe. The book makes a clear distinction, however, that those accessing the Metaverse through public terminals do not have the ability to customize their avatar's appearance, unlike those who connect through private terminals. As a result, status is a result of access and technical expertise, which could be read as a reflection of the presentation of the avatar. *There* and many other virtual worlds now mimic this approach, as avatar appearances can be customized, access to exclusive clubs and areas can be regulated, and much like in Stephenson's novel, virtual real estate can be purchased and developed.

### *Purpose & Location of the Study*

The ultimate goal of the current study is to use participant-observation in order to get a different perspective on CMC. Most previous research about impression management, information seeking, de-individuation effects, and interpersonal communication on the Internet has taken place inside laboratory settings. While these studies provide us with valuable data, it is also important to obtain "real-world" data for the growing pool of CMC research on virtual worlds.

In order to conduct the study, the researcher will play the role of participant-as-observer in a virtual world called *There*. Makena Technologies, operators of



*There*, describe the service as “an online getaway where you can hang out with your friends and meet new ones.” This world provides a unique opportunity for conducting participant-observation for understanding human interaction in virtual spaces. In order to access the world, users first register an account/avatar name and download and install the client software from the company’s website located at <http://www.there.com>.

There are a few reasons for choosing this particular virtual world. The first is because it is not designed for any one type of user in particular. This research calls for a “general interest” type of world (compared to a world where people come together based on common interests such as science fiction, academics, professional backgrounds, etc.) The reason for choosing a “general interest” world is because it would naturally provide a better reflection of real communities. Just as real communities bring out multiple dimensions of a person’s character, so does *There*. According to Makena Technologies, *There*’s demographics are largely balanced across gender and age. The service also has a large and diverse enough user base to conduct this study. At the end of May 2006, *There* had a total of 398,263 registrants, 59% male and 41% female. In recent months, the company has seen a greater amount of new users in the 13-to-26 age bracket (83% of new members) and a near-even split in gender (personal communication, June 2006). The benefit this offers to the research is that the participants would likely be more diverse and possibly more varied in their attitudes toward CMC.

*There* also meets another criterion of the research, which is that it is especially useful for interpersonal and small group communication. For interpersonal communication, two avatars can easily join in a conversation either “together” (both avatars standing next to each other) or through instant messages (IM). Small groups of up to eight avatars can be formed just as easily in the “together” setting or through IMs. Past research has shown that group size in CMC can be extremely important. After anthropologist Robin Dunbar (1993) published his paper on the cognitive limits on the number of individuals can maintain relationships at any given time, the research was later adapted to CMC networks. Dunbar theorized a number of around 150 as the estimated mean size of large groups. Applying this to small group sizes, Allen (2004b) cites anecdotal satisfaction ratings for small group sizes based on the Dunbar number and finds that the highest satisfaction was found in groups sized between five and eight, peaking at seven – the maximum standing group size in *There*.

*There* utilizes some of the most advanced communications methods available in any social software to date. Non-verbal communication through gestures, eye gaze, real-time voice chat, as well as an interactive environment provides a more true-to-life setting in which to do this kind of study. Although the goal of *There* is not to imitate real life (e.g., not all of the physics in the world are modeled after the physical world, and some in-world objects could not exist in reality), it is modeled after the physical world more than a lot of other virtual worlds which strive for science-fiction or fantasy settings. This means there are no space aliens or hobbits,

unless someone tried to dress up as one, although the avatar will retain a human form-factor. More importantly, the appearance of avatars in *There* sets it apart from similar worlds such as *Second Life*, where users can appear to be virtually any object they desire.

Finally, *There* has a devoted community. Many of the users who originally beta-tested the world in 2002-2003 are still active participants. Although the world went “live” toward the end of 2003, many users felt the launch was premature, with several bugs still left to work out. Some time in May of 2004, a day known by the *There* community as “Black Friday” occurred. The company announced that it was cutting a large percentage of its staff and that active development of the world would come to almost a complete stop. Members were in shock after the announcement – some were upset, others were offended. However, a large portion of the community stuck together and is still active today. Rather than *There* producing in-world content, more development opportunities were transferred to members. Now any member with skills in either Photoshop and/or three-dimensional rendering software can create objects (clothing, vehicles, furniture, etc.) to use in the world after the object is approved as meeting technical requirements and content guidelines. Several members have even created groups devoted to machinima, or machine cinema, “filming” with avatars and interactive objects in the virtual world (Wikipedia, 2006).

Since May of 2004, the community appears to be thriving once again. The remaining staff continues to actively communicate with a sort of “government” of

nominated community leaders known as the Member Advisory Board (MAB) in order to address community concerns and disseminate information on upcoming patches to the software, events, and in-world content. The continued operation of *There* to this day is a testament to the dedication of its community that differentiates this world from many other virtual worlds and communities that come and go over the years.

The remainder of the paper is organized as follows: Chapter II is a review of the literature relevant to the current research, including the theoretical frameworks that are analyzed. Chapter III outlines the method used to conduct the research. Chapter IV is a two-part chapter that outlines the results of interview data and observed events. Finally, Chapter V concludes the research by answering the research questions and relating the findings back to virtual worlds and CMC theories.

## II. LITERATURE REVIEW

### *Interactivity and Avatars*

The interactivity of *There* as a virtual world was an important criterion for its selection in this study. It is important to point out that in CMC, there are several levels of interactive richness, ranging from text-only interaction to full audiovisual communication through the use of cameras and microphones. According to Cathcart and Gumpert (1983), a lack of nonverbal signals in mediated interpersonal communication limits the amount and quality of information that can be transmitted. This limitation is central to the theoretical frameworks on which this study will be based. Several virtual worlds attempt to remedy this flaw in way such as allowing avatars to gesture in order to give a sense of nonverbal cues.

In a recent study by Ramirez and Burgoon (2004), text-only interaction was compared with audio and videoconferencing. Using interactivity as a conceptual framework, the study investigated whether increased interactivity afforded by audio and videoconferencing influenced initial interactions and outcomes. They found that an increase in the availability of nonverbal cues as well as the valence of the information acquired by both parties significantly affected the overall interaction. Specifically, they found a reduction in uncertainty and changes in the amount of information seeking that took place.

An earlier experiment by Burgoon et al. (2000), tested the interactivity principle in a task-based scenario in human-computer interaction. In the scenario, a sample of 70 college students was randomly assigned to one of five different

computer partners (avatars) or to a human partner. Results showed that the computer partners were more influential than human partners, but that human partners were rated higher on social dimensions of communication. Again, nonverbal cues provided by the increased interactivity played a large role here as participants stated that some features of their interaction were associated with anthropomorphic features such as simulated facial expressions. *There* integrates such features in real-time, changing facial expressions either by specific trigger words (e.g., sad, upset, happy, good) or by intentional action commands, providing a great opportunity for studying how these dynamics can affect social interaction online.

Autonomous movement of avatars is a new development that is just beginning to take shape in worlds like *There*. Avatars in *There* can gesture both by manual commands (e.g., typing `smile or `laugh) and autonomous movement based on specific trigger words used in sentences or vocal inflection in voice chat. For example, if a user were to say “I am upset,” the avatar’s face may display a matching emotion. When using voice chat, the avatar’s mouth moves according to the sound generated by the user’s microphone.

Previous research on the subject of autonomous communicative behaviors has shown the need for further development of these feature sets. Vilhjálmsón and Cassell (1998) argue that behavior in avatars is crucial for increasing communicative bandwidth. Simply modeling avatars after humans and giving them verbal communication capability is not enough. The authors argue that in order to

make avatars an integral part of the conversation, four stages of generated behavior must be considered – reaction to events, conversational phenomenon, communicative behavior, and animated geometry of the avatar. For example, a message may appear in the conversation, an avatar changes its mood state, after which nonverbal language occurs through client-driven avatar animation effects. Examples of proposed nonverbal communications include nodding, raising eyebrows, and eye gaze. Recognizing the importance of nonverbal cues in virtual worlds, several researchers and developers are looking into methods of enhancing the repertoire and believability of real-time behavior-based animations available to avatars (Perlin & Goldberg, 1996; Lee et al., 2002).

The topic of eye gaze is raised in much of the existing avatar animation literature, for obvious reasons. In a study conducted on random-gaze versus informed-gaze, avatars making use of informed-gaze (looking directly at another avatar as it is speaking, as well as looking at the avatar it is directing its conversation toward) significantly outperformed the random-gaze avatars as well as audio-only settings on a variety of measures. Response variables included natural feel of the conversation, feeling of interactivity, ease of controlling, following or contributing to the conversation, and awareness of communication partners. The researchers concluded that avatar behavior can significantly improve the quality of communication (Garau et al., 2001). *There* makes use of informed-gaze in its software, as avatars tend to look in the direction of avatars that are currently

speaking. In addition, avatar gaze can be manually adjusted by selecting a specific user to look at or by using the mouse to change the angle of gaze.

An important area of research related to the rich feature sets found in systems like *There* is the idea of social presence. The idea of presence in CMC is that the user's avatar, in addition to other users' avatars and the virtual world itself appear nonmediated. In an ideal demonstration of presence, the client software and hardware would be completely transparent, allowing the user to focus only on interacting with people and objects in the virtual world instead of the machine. In effect, the experience of actually being with another person through a computer-mediated mediated environment rivals physical contact. Although virtual reality and virtual world technology are a long way from meeting this challenge, *There's* feature set and level of interactivity provide an excellent opportunity to look at presence.

Despite not being able to create true social presence with existing technology, Biocca et al. (2003) propose that there are varying levels of presence rather than a simple "here or not-here" binary. They place an emphasis on sensory information, claiming that even small amounts of information cause a user to feel the presence of another person. They also acknowledge the requirement of mutual awareness. Social presence involves more than just being in the same place. It requires that users are capable of becoming aware of others through the mediated environment, which requires psychological involvement – sensing intelligence, intimacy, immediacy, and the salience of the interpersonal relationship. As a result, through



the feeling of social presence, we can engage each other through the mediated environment. The extent to which *There* can replicate these feelings among its users will be an important factor.

Since communication features in *There* involve, to a large extent, gesturing and intelligent movement of 3D avatars, it makes sense to consider how these nonverbal cues can add to feelings of social presence. Biocca's (1997) research in virtual reality examines the sensations of physical presence through the use of a VR interface, as well as social presence and self-presence in mediated environments. He found that questions of identity formations and self-consciousness were prevalent as the avatars could give a different social meaning than the user's physical body. Biocca states that the problem of body representation and pursuit of presence closes the gap between the physical and virtual to a degree that "cognition and identity are embodied in the simulations run by our sensors and effectors, then the mind is adapted to the simulation of the cyborg body" (p. 24). In effect, it becomes a question of where we are present – in the virtual space or the in physical space our bodies currently inhabit?

Embodiment is another concept, different from the aforementioned appearances of avatars on screen to other users. Cuddihy and Walters (2000) argue that in order to truly create embodied actions, the virtual world system should be more dynamic by improving the users' ability to control their avatar with intuitive interfaces based at the object level (e.g., interaction with virtual items and avatars) rather than the scene as a whole. This way, a defined set of instructions becomes

available for interacting with each object. As more commands become available, the potential for embodiment and feelings of presence also increases, but so does the difficulty of making the options available to the users without overwhelming them. In *There*, users have access to action bars that change when interacting in different settings, but knowing all commands available at any given time is still more of a learning experience than anything.

In a recent study, Lee and Nass (2005) conducted two experiments with the use of machine-generated voices and generated feelings of social presence. They found that users felt a higher level of presence with the synthesized voices than without. However, in order to make a better connection with the user – that is, to mask the reality that the user is in fact interacting with a machine – the virtual agent had to have a personality similar to the user (e.g., introverted versus extroverted) and speak in a manner consistent with the content of the text spoken. Lee and Nass found that users who interacted with a suitable virtual agent were more attentive and involved as they were able to mentally picture the source of the voice. Relating this to the current study in *There*, rather than synthetic voices, users have the option of speaking with their actual voice. One could assume this would provide a higher level of presence, as users know they are hearing another person speak and no additional emulation is required to achieve this task.

Finally, O'Sullivan's (2000) contribution to the area of research on interactivity focuses on the lack of information and cues provided and how this limitation can be used to ones advantage in impression management and self-

presentation. As the current study will address, some side effects of CMC include de-individuation issues and behavioral changes. O'Sullivan points out that less rich channels of CMC such as email or text-only chat can benefit the person choosing the channel because some unattractive or embarrassing aspects of the communicator can either be obscured entirely. He points out that richer channels including audio/video conferencing as well as FtF communication can help reduce uncertainties, enhance credibility, and thwart the notion that deception is taking place. Furthermore, richer channels can also enhance communication by allowing positive expressions (e.g., smiling) to pass through easier than it would on a less rich mode of CMC. That is not to say, however, that such expressions are not possible in CMC. This is where current theories on CMC come in to play, as they address some of the limitations and how they can be overcome by some novel approaches to interaction.

### *Theories on CMC*

The first such theory is called the social identity model of de-individuation effects, commonly known as SIDE theory. According to Postmes, Spears, and Lea (1998), SIDE theory suggests that people use social categorization processes to form impressions of others online because of the limited amount of information being transmitted. It is closely related to the Social Identity Model's use of stereotyping, gender typing, the creation of social boundaries, and in-group versus out-group norms. SIDE theory argues that de-individuation effects brought on as a result of CMC can reinforce group salience and conformity to group norms. These group

norms are more likely to be those of the social identity of the group itself, and not general norms. Scholars make the argument that when information transmitted about one's self is limited, sensitivity to social norms is increased, and as a result, people in this condition will find people within their group as more attractive socially (in-group favoritism) and engage in stereotyping behavior because of the limited information that is available (Postmes, Spears & Lea, 1998). Based on SIDE's prediction on adherence to group norms, CMC also appears to have a possible effect on an individual's self-awareness. Matheson and Zanna (1988) found that CMC users had an enhanced sense of private self-awareness and reduced sense of public self-awareness.

Related to the idea of in-group favoritism in the SIDE model, Linville et al. (1986) hypothesize that people will view out-group members at varying degrees of stereotypic thinking based on the perceiver's cognitive representation of the out-group's members. Therefore, the processes in the SIDE model could also be based to an extent on pre-existing social knowledge outside of the CMC realm, as well as an understanding of the CMC network in which the communication is taking place.

Beyond in-group favoritism is the process of differentiation from other groups. SIDE theory proposes that further cognitive effects take place within groups as well as between groups. One such "SIDE effect" of anonymous communication online is that as a result of in-group favoritism, out-group hostility is increased. In an earlier experiment by Postmes, members of one group reported a much more negative impression of another group while they were anonymous, whereas in a

non-anonymous situation, these impressions were more positive. It is important to point out that there was no actual interaction between the two groups – all interactions were computer simulated and kept constant over all cases. Postmes concluded that it was the anonymous nature of the interaction that was the cause of the decrease in favorable impressions, not the content of the interactions (Postmes, Spears & Lea, 1998). This type of behavior is also known to lead to “flaming” – using insults or unconstructive criticism to incite anger on computer networks. It is also important to point out that the SIDE model does not always predict that attributions of out-group members will be negative (Walther, 1996).

In a subsequent study by Postmes, Spears, and Lea (2000), the authors examined normative influence in CMC. They argue that according to the SIDE model, groups formed in CMC situations can become very real psychologically, although there is no direct physical contact with members. They argue that SIDE is the best model for examining the effects of visual anonymity in such groups. This “realness” occurs after groups develop a sense of identity through interaction. Some groups can be formed out of a common interest (e.g., science fiction groups), while others may be based on other common characteristics. The authors also point out that group norms are not simply formed by members perception of others in the group, but by “active negotiation and contestation within the group, limited by the group’s historical and ideological continuity (Postmes, Spears & Lea, 2000, p. 344).

Stereotyping based on limited information in CMC transmissions is another area of interest in the SIDE model, as impression formation can be crucial given the

setting in which the communication takes place. Epley and Kruger (2004) conducted a study on limited-mode CMC – in this case text-only email – to see what effect the lack of nonverbal cues would have on peoples' impressions of each other. The experiment was designed to keep the content of the messages the same across two conditions: email and voice communication. They found that racial stereotypes and false expectancies influenced impressions more in email than over voice. This research shows that CMC does not always act as a socially blind medium. The current research looks at CMC from a more interactive setting in order to see what effect media richness has on impressions.

The Social Information Processing Theory explains another take on social interaction in CMC. At its most basic level, it states that people adapt to the limitations of various forms of CMC by finding new ways to express themselves through whatever mode they are using. For example, one of the biggest limitations of text-only interaction is that there is a complete lack of nonverbal cues. To address this weakness, over time emoticons<sup>3</sup> were developed to convey feelings through the use of symbolic text characters that resemble emotions such as happiness or sadness.

Rivera et al. (1996) conducted a study on the use of emoticons in which two groups participated in a simulated CMC decision-making session. One group had the option of using emoticons, while the other did not. The researchers found that the group with the emoticons was more satisfied with the medium than those

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<sup>3</sup> A way of representing emotions using text-based characters, such as a colon and parenthesis to represent a smiling face.

without. Users interpreted the emoticons as symbols that carried significant meanings. This research shows that as SIPT suggests, the development and use of emoticons came naturally as a way of dealing with the limited capabilities of text-only CMC.

Social information processing theory is supported by previous observations that users adapt to the limitations of CMC and create new practices that compensate for them. Anything from the aforementioned emoticons to other forms of electronic paralanguage (e.g., intentional misspellings, strategic capitalization of words, and grammatical markers) are examples of SIPT in action (Walther, 1992; Boudourides, 1995). Rather than accepting CMC as a “cues-filtered-out” medium, the social information processing perspective argues that users create ways to disclose that kind of information.

Huang et al. (1996) found that the levels of media richness in CMC were not fixed, as previously assumed. For example, although text-only CMC may appear socially barren and unable to transmit substantial amounts of information, users begin to share social constructions in an effort to make the medium richer. The researchers found that CMC groups with shared social constructions had higher feelings of social presence and media richness compared to those that did not. Furthermore, the level of richness with the social construction groups began to approach FtF, supporting SIPT.

An example of how SIPT can be applied to *There* would be the widespread use of macros<sup>4</sup>, which allow users to combine several gestures simultaneously or sequentially to convey emotions of great excitement, for instance. Macros in *There* are generally nonverbal, but may include some verbal communication. Experienced members of the community tend to have an easier time deciphering these macros than newer ones.

Some research has also been done on SIPT and uncertainty reduction strategies, which is commonly an information-seeking function in CMC. Studies on the anticipation of future interactions with an online partner (e.g., one-time conversations versus expectations of repeated contact) were shown to be a factor in this kind of information-seeking behavior. According to SIPT, CMC participants are even more sensitive to this variable than are people in an FtF setting. Another finding is that timing of communications – from sender to receiver and back – can also influence a user's perception of his/her partner. For example, the timestamps on an email message can affect a user's idea of a partner's dominance or affection toward them (Ramirez et. al, 2002).

Another perspective proposed by Joseph Walther (1996) also takes into account the limited information transmission common to CMC systems, but takes a different direction when it comes to how people perceive each other online and seek information about one another. It is similar to SIDE theory in that a receiver, based on a given set of information about his/her partner, will use uncertainty reduction processes (Ramirez et. al, 2002). These processes can include mentally applying

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<sup>4</sup> A single command that triggers a series of instructions.



certain kinds of attributes to help cognitively understand what the partner must be like. The question “Just who exactly am I communicating with?” is what the receiver attempts to answer based on the limited information.

It is this process that leads to what is known as a hyperpersonal effect. As mentioned earlier, less-rich forms of CMC allow users to perform impression management functions that would be near impossible to do in a FtF setting. Because of this, in initial interactions, CMC participants may intentionally or unintentionally be putting forward a false sense of who they are. This self-presentation can often be exaggerated. As a result, the receiver of this information, based on the limited cues, will engage in attributional processes on the sender – based on the inflated positive presentation, the receiver thinks highly of the sender. Then, as the receiver replies to the sender, he/she does so with a greater amount of liking for the sender. This goes back and forth in a feedback loop, thus creating the hyperpersonal effect.

In an essay on different utilities of CMC, Walther (1996) points out that depending on how the communication system is implemented, CMC can be designed to be impersonal *or* interpersonal. As he suggests, there are cases where an impersonal setting may be desirable (e.g., task-based situations, equality in CMC groups). However, this is not the case with a lot of modern CMC systems. In his discussion, he discusses the hyperpersonal effect as “exceeding the level of affection and emotion of parallel FtF interaction,” (Walther, 1996, p. 17). Given this ability of CMC interaction processes to exceed FtF in this dimension warrants further

examination. Some reasons for this phenomenon include the receiver's lack of means to verify information, absence of physical exposure (de-individuation effects) to partners, and the sender's optimized self-presentation. See Appendix A for a visual explanation of how the three aforementioned theories operate, as well as how the current study's examination of the increased interactivity levels of virtual worlds fits in.

A study by Markey and Wells (2002) examined perceptions of others in Internet chat rooms. The authors used the Social Relations Model and found that one-on-one interactions had an easier time of finding consensus on traits such as extroversion and agreeableness, whereas in the group interactions, judges tended to view others less favorably. The authors also found that experience with communicating in computer-mediated channels was a moderate predictor of likability. However, this study was conducted in simulated chat room environments in a laboratory setting, whereas the current research will be able to look at how group members judge each other in a less restricted setting.

With the three theories in mind, the study will be conducted to observe how these processes occur in an actual online setting. The theories will be used to observe just how group norms are produced within *There*, as the service itself is not created for any "group" in particular besides those who 1) own a computer that meets the minimum system specifications recommended by the site operator, 2) have basic access to the Internet, and 3) are Internet-savvy enough to have heard of the service and signed up for it. As recent Internet statistics suggest, this

population increases in number every day and is more reflective of the general population than any particular group. With this theoretical framework in place, the study will attempt to address two details: information seeking and personal information sharing of online social partners.

### *Information Seeking and Impression Management*

As has already been mentioned, information seeking is a common strategy of uncertainty reduction in CMC. Tidwell and Walther (2002) conducted an experiment in which 158 individuals, none of whom had met previously, were placed in either an FtF or a CMC encounter. Results showed that participants in the CMC setting (electronic mail) used greater amounts of uncertainty reduction strategies than the FtF subjects. The study also gave further support to SIPT as it verified that some participants adapted to the limitations of the CMC situation and relied on remaining cues in the form of paralanguage and typographic cues (e.g., emoticons) to express their feelings. The authors found that the CMC group produced more questions and higher levels of self-disclosure than the FtF group. Questions produced by the CMC group were also much more direct, bypassing “small talk” and instead engaging in uncertainty reduction by information requests and subsequent self-disclosure. Meanwhile, the FtF group used a wider variety of expressions such as exclamations and imperatives that were not classified as information seeking strategies or self-disclosures.

Although Tidwell and Walther offer some insight into information seeking and self-disclosure in CMC, their condition involved asynchronous communication

via email. It is likely that a real-time (synchronous) CMC interaction could possibly see a different outcome (e.g., more indirect and superficial questions) than what the authors found. Although not necessarily a limitation of the study, it did not test different levels of media richness in CMC, nor did it test for anonymity.

A study by Joinson (2001) addresses the anonymity question to some extent. In his findings, CMC users who were visually anonymous provided significantly greater amounts of self-disclosure than those who could see each other in a video stream. This gives support to Walther's (1996) idea of hyperpersonal communication – removing visual anonymity also removes some impression management functions, leading to more involuntary self-disclosure and a less positive impression of online partners. Another take on the results of this study could be that a lot of the self-disclosure that was taking place in the anonymous condition was of information that was given automatically in the video condition due to the greater richness of the communication mode. Joinson points out that private self-awareness was higher while public self-awareness was lower when the participants were given greater amounts of anonymity – in line with the SIDE model's suggestion that this leads to CMC users adopt group norms when their social identity is salient. This also supports earlier research by Matheson & Zanna (1988), which came to the same conclusion in a text-only condition.

Studies have been conducted to look at shyness and how users initiate relationships and disclose information online. Stritzke et al. (2004) compared shy and nonshy Internet users and established that a lack of audiovisual cues reduced

the shy users' capability of detecting negative feedback from other users. They found that online environments differed significantly from offline counterparts and that shy users were less shy online. The increased space for impression management in less-interactive forms of CMC also appears to be partly due to the lack of negative feedback cues, according to this research.

Hancock & Dunham (2001) add to existing knowledge of impression formation by looking at synchronous, text-based CMC versus FtF conversations. Supporting the hyperpersonal model, the authors found that although the depth of the impressions in CMC were not as complete as those in the FtF setting, they were more intense. These findings are attributed to a reduction in nonverbal cues. Based on the limited information received in the CMC setting, users stated that they had sufficient information to rate their partners on an average of 36 of 60 items on the NEO-Five Factor Inventory, an instrument used to measure personality traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness. In the FtF condition, users responded to an average of 45 of 60 items.

Indeed, impressions play a large role in CMC, but there is also a question as to the meaning of those impressions. Sherry Turkle (1995) raises these ideas in her book, *Life on the Screen*, as she examines how people interact in MUDs. She states that users explore and understand other avatars at surface value, where we "suspend disbelief and become absorbed in what is happening on the screen." In a sense, the line between virtual life and physical life becomes so vague that "life is made up of many windows and real life is only one of them." What this means for

the user is that they become any number of personas online, where we spend countless hours constructing lives that can be even more expansive than the ones we live in the physical world. Therefore, the impressions we do form online do have profound meaning for both the user and other members who inhabit the virtual world. According to Turkle, “MUDs blur the boundaries between self and game, self and role, self and simulation.”

In a study on impression management over a variety of mediated channels including electronic mail, O’Sullivan (2000) found that a person’s preference for mediated channels shows that they can be used as a tool for “managing self-relevant information in pursuit of self-presentational goals.” The 133 participants in the study showed a preference for mediated channels if they were presented with a situation in which their ability to maintain a positive self-presentation was threatened. Again, this supports the idea that some level of visual anonymity enhances the user’s self-presentational ability to a degree.

Information flow in CMC is not limited to a sender-receiver system of communication. Members of CMC groups often rely on more than just immediate information presented in order to gain enough information to make judgment calls. Ramirez et al. (2002) propose four ways in which CMC users engage in information seeking processes: interactive, active, passive, and extractive. Interactive information seeking typically involves direct questioning from sender to receiver, e.g., “What state do you live in?” If the receiver replies “I live in California, and you?,” this is a reciprocal method of interactive information seeking. Active

strategies involve asking other people for information on someone. Extractive strategies are similar, but rather than asking other people, they usually involve the use of a search engine or other data-mining tool. Finally, passive information seeking is done by observation only. The information seeker never directly engages the person he or she is attempting to learn about, but instead watches and listens carefully to gather information as other people ask questions or the target exhibits behaviors indicative of his or her personality traits.

Since *There* is a virtual world in which users have the choice to engage in either text-only communication, voice chat, or both, it is also important to discuss the concept of impression management and information seeking as it relates to avatars. As is common in most virtual worlds, users can customize the appearance of their avatars quite considerably. In *There*, facial features, body type, clothing, and accessories can be changed to fit the needs of the user. Some would ask the question of whether or not this can lead to deception as an impression management function common to most of the CMC theories already mentioned. As Filiciak (2003) points out, the “majority of users create avatars bearing their resemblance to simplify identification... nevertheless, users take advantage of a game’s possibilities to improve their representations.” Furthermore, Elizabeth Reid states that avatars “are much more than a few bytes of computer data – they are cyborgs, a manifestation of the self beyond the realms of the physical, existing in a space where identity is self defined rather than pre-ordained,” (Filiciak, 2003, p. 90). Therefore, while an avatar may have the potential to deceive, they do carry within

them a part of who we are. This concept is known as transference – the process of transferring our real emotions, often unconsciously, to a fictional character such as an avatar in a virtual world (Filiciak, 2003). One of the questions this study will attempt to address is why people create avatars the way they do and what purpose, in their opinion, they serve.

Given all this information on interactivity, avatars, CMC theories, information seeking, and personal information sharing, it makes sense to conduct a survey of a virtual world in order to better understand the currently competing theories behind CMC and see how they apply to real-world applications in social software. An added benefit is the insight this research will provide for future developers of social software.



### III. METHOD

#### *Research Questions*

Based on the literature reviewed, we can begin to develop specific research questions that the study will address. The purpose of the study is to examine three widely used CMC theories in a virtual world that provides a high level of interactivity. Because of this, a basic question on the effects of increased interactivity must be asked. For example, does the availability of highly detailed graphical avatars help with uncertainty reduction strategies that take place in new encounters? Perhaps there might be some influence on the de-invididuation effects described in SIDE theory. Therefore, this study asks the following question:

RQ1: Does the level of interactivity have an observed effect on the way people approach each other in CMC encounters?

All of the theories discussed in the literature review mention some kind of problem with limited information in CMC, whether it is the unknowns that we try to figure out about our communication partners or the lack of cues that we are used to in FtF communication. This study would like to address this by asking the following:

RQ2: What kinds of strategies do CMC users use to deal with an initial lack of information of their communication partner(s)?

The social information processing theory also mentions the use of new forms of communication to cope with a limited medium. Examples of this range from the use of emoticons to cryptic abbreviations and acronyms used in Short Message Services (SMS). This study would like to examine whether the variety of

communication options provided by *There* are deemed as sufficient enough to allow “normal” communication as we see it in FtF situations or if users still attempt to create new signs and symbols to aid their communication.

RQ3: Do CMC users attempt to create new strategies of information seeking and sharing information about themselves, or is the interactivity level of a modern virtual world sufficient to allow an acceptable variety of information seeking and personal information sharing methods?

Finally, the hyperpersonal theory addresses how we form images in our minds of our communication partner(s). The high level of impression management afforded by CMC is part of what makes the medium unique. However, what happens to this aspect when interactivity levels are increased (e.g., text-only versus graphical avatars with voice chat)? This opens up a few questions to be addressed regarding the hyperpersonal perspective, interactivity, and impression management:

RQ4a: How salient is impression management in an initial CMC encounter?

RQ4b: How reflective of the actual user is the avatar?

RQ4c: Based on the limited information received in CMC, do users become more or less affectionate toward their communication partner(s)?

### *Permissions and Informed Consent*

Methods for conducting the study are relatively straightforward. Before data collection began, written approval was obtained from Makena Technologies, the company that operates *There*, the virtual world that was used as the location for this research. Furthermore, IRB approval was obtained to go ahead with human subjects research.

The following section will detail exactly what kind of interaction and treatment the study participants encountered. The primary objective was to gain as much information on a user's CMC experience while keeping any potential risk to a minimum. All participant selection and data collection methods were created with this goal in mind.

Informed consent was obtained from each individual who participated in the study. All pre-screened individuals (see "Participant Selection" below) were first contacted in the virtual world (*There*) by the researcher and asked if they were interested in such a study. Those who indicated a willingness to learn more about the study were provided with some basic information about the research goals and what is expected of them in the study. Those who were interested were also emailed a PDF copy of the consent form that they were obligated to read before continuing with the study. In an online setting, establishing trust can sometimes prove to be difficult, but no major problems were encountered in this project.

### *Participant Selection*

The sampling method used in this study was a convenience sample (at the researcher's discretion) with some key criteria. The impracticality of random selection and the exploratory nature of this study were both reasons for choosing a convenience sample rather than a sample that would provide greater external validity. Some of the criteria in selecting participants include:

*Frequency of use.* Due to the ongoing observation and interviewing this research involved, participants had to be frequent users; defined as users who visit *There* at least three times a week during the course of this research project.

*Length of use.* Participants required a good understanding of how *There* operates as a community (e.g., knowing jargon and cues unique to *There*, having a general understanding of their virtual surroundings, and being familiar with the user interface and software features). Many interview questions asked members to reflect on their past use of *There*. Therefore, the researcher decided that participants should have been a part of the community for at least three months. This information can be obtained and verified on the user's profile.

*User's age.* All participants in this study were over the age of 18. By agreeing to the terms of the consent form, users indicated that they met the age requirement of the study. Participants indicated agreement by responding to the email message containing the consent form (see Appendix A) with their willingness to participate in the project after reading the terms stated in the consent form.

*Number of participants.* The original number of participants for the study was anywhere from 15 to 20. Of the 23 people initially approached for inclusion in the study, two declined and three others dropped out due to a lack of time commitment. In the end, a total of 18 members signed up to take part in the research. This number worked out well for two reasons. First, this was a manageable sample size considering the large amount of data collected from each person. This allowed the researcher to find common themes or trends in group

participation and how CMC theories applied to the observed interactions. Second, the sample size of 18 worked well for the observation stage of the study, allowing three separate groups of optimal size – six participants and one observer –to look for consistency in observed results (Allen, 2004b).

### *Data Collection*

The role of the researcher in this study was based on what Lindlof & Taylor (2002) call the “participant-as-observer.” Their guide to tactical observing was particularly useful, so it was used as a sort of framework for the observation component. The basics of tactical observing involve first getting a good understanding of the area and its distinguishing characteristics in order to develop a perspective on the field as well as understanding the full range of behaviors that occur in the field. The researcher’s previous experience with *There* ensured a deep understanding of these essential pieces of information prior to delving into the research process.

Tactical observing also involves keeping some questions in mind while observing. For example, knowing the nominal status of participants in the community, understanding how the scene is set up (*There* has a broad range of places in which interactions take place), how initial interactions occur (probably the most important part of this research), how actors claim attention, where and when they interact, and what events are deemed as significant (Lindlof & Taylor, 2002). Through the use of this, the researcher will be able to keep detailed field notes, as well as the data gathered from the in-depth interviews.

Interview questions are based on the research questions of information seeking, impression management, and uncertainty reduction strategies. Most of the interviewing was conducted in a semi-structured, open-ended, one-on-one format that gave the researcher some freedom to guide the direction of the interview while addressing key points with every participant (see Appendix B). In cases that participants gave particularly insightful responses, the researcher gave follow-up questions to gather more information.

In addition to the interviews, the study includes a component for observation of CMC interaction. Most group interaction observation took place in public spaces that were not too crowded in order to minimize surrounding (non-participant) group conversations from “leaking” into the observed chat. Similar to the physical world, *There* has different “zones” that range from crowded plazas to private homes. To give a better idea of how *There*’s zones compare to the real world in terms of privacy, see Table 3.1. All observed text interaction was automatically logged into an HTML file on the researcher’s computer by the client software, as it does by default. In case participants preferred to speak rather than type, voice chat can also be recorded and transcribed. In either case, participants were fully aware of recording if it was taking place – both from the informed consent as well as notification from the researcher.

Table 3.1

	Real world setting	<i>There</i> setting
Reasonable expectation of privacy	Private residences, telephone conversations, whispering to a friend, remote areas	Private residences, instant message (IM) conversations, remote areas
Higher chance of eavesdropping	Restaurant table, sidewalks, social functions, parks	High population areas, social functions, “Funzones,” “Portazones”

For group observation sessions, the 18 participants were randomly assigned to three groups of six. This worked out perfectly since *There* chat groups typically max out at seven users, allowing six participants and the researcher to interact at once. This process was used across all three groups and field notes were taken keeping in mind the theoretical models (see Appendices C, D, and E). The client software’s event scheduling system allowed the researcher to create three separate events – one for each group – to take place in a virtual house. After inviting the three groups of six, they each received an email message with the time and location of the event. The reasoning for this was to allow for easier access control in order to prevent non-participants from accidentally disrupting the study as well as helping participants get to the event quickly and easily. At the start of each event, the software prompted participants to “teleport” to the house where the event was taking place in case they were not there already. Although there were no problems encountered, this was just a precaution. The observation sessions took place over the course of one week, with each session lasting approximately one hour. The researcher acted as the host of the event, although not in a way that would push for

any particular outcome of the conversations. All discussion topics emerged as a result of the participants' input, not the researcher's.

Participants were asked to treat the event just as any other – they would be meeting new people and possibly seeing some old friends. It was intended to have a mix of some new encounters as well as some existing friendships in order to see how the theoretical models worked on a number of levels. In particular, aspects of how members presented themselves, use of nonverbal cues, sharing of and responses to personal information were among the data recorded. The goal was to collect this information to see the processes of the various models in action to better answer the original research questions. Field notes were recording during the group sessions and later revisited by the researcher to give additional thought to what was observed.

One-on-one in-depth interviews were conducted in a private setting – either through IM, in a private zone, or in a secluded area without much user traffic. Chat logging and voice recording methods remained the same for the private interviews. Again, members were fully aware of when recording or chat logging occurred. In the event that a non-participant's voice or text chat "leaked" into what was recorded (as the result of a non-participant being too close in proximity to the research group), anything identified as originating from a non-participant was discarded from the chat logs. Of course, using less-crowded areas minimized the risk of this from happening.



To ensure privacy, chat logs and voice chat recordings and transcripts were stored on external media storage that was not accessible via the Internet. All data on this disk was also encrypted and remained with the researcher at all times. For use in describing events in group settings, any avatar names/pseudonyms *There* members created were altered to prevent the likelihood that a participant could be identified. Using an online random name generator ([behindthename.com/random](http://behindthename.com/random)), each of the 18 participants was assigned a new random name. Male avatars had a name generated from the “masculine, English” pool while female avatars received new names from the “feminine, English” name pool. The newly randomly generated names were used only by the researcher.

### *Analysis*

Once the interviews and observations were completed, the next step was to analyze it. Analysis of the results is also fairly straightforward, although it was a multi-stage process. The goal was to find some type of recurring pattern or theme across the responses of the abundance of data provided by participants to answer the original research questions. This data would shed some light on the three theories and how they can apply to virtual worlds. Since the interview questions were all organized in sections, based upon the research questions, it was easier to find answers based on what the participants reported to the researcher. After all 18 participants' interviews and follow-up questions were completed, all results were entered into an Excel file by question to find commonalities among the responses. Any additional follow-up information was also entered to be considered in the

analysis. In some cases, particularly insightful responses were highlighted in order to be given more attention when compiling the final results.

In addition to this, the researcher cross-referenced the observed behavior with interview question responses – especially with regard to how participants engaged in information seeking strategies and forms of impression management. Again using some of Lindlof's (2004) suggestions on methods of data analysis, the researcher was able to find common themes in responses from all participants and draw conclusions from the given data.

In the first half of the Chapter IV, each interview topic is addressed and trends are analyzed. Notable cases are mentioned, and all responses are tied back to the theoretical models. This process was used in preparation for answering the research questions stated earlier in this chapter. The second half of the Results chapter contains detailed information on the exchanges that took place in the group sessions. For the most part, findings remained consistent across the three groups, but any cases that deviated from the norm are also discussed in the findings.

Each research question is addressed individually in the Chapter V, citing specific examples of behavior that was observed and how it related to the three theories (e.g., what part applies, if one theory was more relevant than another, if interactivity had any observed influence on information seeking or impression management, etc.).

Finally, the researcher provides information on the practical implications of the results in the Conclusion chapter. This is where, based on the findings,

suggestions are made for the development of new virtual worlds that can address any problems or lack of capability that might be encountered during CMC encounters. Limitations and suggestions for future research are also offered in this section.

### *Ethical Concerns*

There were no major ethical problems in the study that have not already been addressed. Since privacy issues have been tackled, the only issue was establishing credibility in the community as a researcher and letting participants become aware of the goals of the research. Since many participants of this study recalled or had participated in other research projects that took place in *There*, they felt more comfortable with the idea of researchers conducting studies in their world. Most people initially approached for inclusion were comfortable with participating in this research study – no forms of deception were required.

Concerning social desirability effects, the researcher acknowledges that this study potentially puts participants at risk of generating answers or behaviors that hide socially undesirable traits or qualities in order to gain social approval. Crowne & Marlowe define this as “the need of subjects to respond in culturally sanctioned ways” (Phillips & Clancy, 1972). The authors state in their research that even when taking typical precautions in sociological research such as interviews, surveys, observations, and laboratory experiments, social desirability effects are never fully eliminated.

Especially in the group observation sessions, knowing that they are participating in a research session, members may act in a more socially desirable way that may mask some of the negative effects associated with the SIDE model and/or the hyperpersonal perspective. Keeping this in mind, this study is not expected to produce results that can be generalized to a larger population. Instead, it is designed to explore how the theories apply to media-rich interactive virtual worlds. In addition, the use of three separate observation groups helps find consistency across observed data, and the ability to tie observed data back to the interview data adds benefit to the study.

## IV. RESULTS

### *Interviews*

#### *Background Information*

In the end, a total of 18 participants agreed to take part in the study. The sample represented a wide spread in terms of the amount of usage among participants. On the low end of the scale, some spent as little as six hours a week in *There* and other virtual worlds, while the most active members reported spending 100 hours or more per week. The mean usage among all participants turned out to be 35.2 hours, skewed heavily by three highly active respondents. Most responses fell below the mean, in the range of four to 30 hours a week. Although these numbers appear high, many users of *There* keep the software running as they multitask with other applications, thus staying connected for extended periods of time.

Of the 18 participants, 55% said they found *There* through other virtual worlds and massive multiplayer online games such as *The Sims Online*, 22% learned about it from friends or family who had already experienced using *There*, and 16% heard about it on computer-oriented television programming. Length of use ranged from beta testers (early 2003) to people who had joined as recently as late 2005. Users who did not have at least three months of experience using *There* were not included in the study.

When asked to describe their favorite aspects of *There*, all responses fell into five categories: interaction with people – simply being able to communicate with

friends around the world; interaction with the world – including use of virtual objects such as vehicles, houses, clothing, etc.; communication features – technologies such as voice chat or real time effects on three-dimensional avatars; the “feel” of *There* – the idea that the world does not *require* you to perform tasks or slay monsters to level up; and customer service – the ability of *There* staff and member advisory boards to respond to the needs of the community. Participants were allowed to mention as many of their favorite features as they wished in their response.

Participants rated interaction with people as the most liked feature of *There*. Half of all respondents explicitly mentioned this in their interviews, and another 33% commented on the enjoyment of communicating with people in other parts of the world. The second highest rated feature was interaction with the world, mentioned by 44% of respondents. One third of the sample said they especially liked the “feel” of the world. Interestingly, only 11% directly mentioned specific features such as voice chat. Finally, another 11% commented on the job *There* is doing with customer service.

The last question regarding basic information and thoughts on *There* was to rate the adequacy of a few of *There*’s core features such as voice chat, text chat including gestures (emotes), and avatar customization. An overwhelming 78% said voice chat was a great feature that “sets *There* apart” from other virtual worlds. Text chat and gestures were rated highly at 72%, but of those people, 35% would

have liked to see this feature expanded, especially in avatar movements that involve two or more people (e.g., handshakes or hugs).

### *There and Avatars*

Next, participants were asked a series of questions relating to the level of interactivity in *There* compared to other means of CMC. To begin, participants explained how their initial encounters are influenced by the highly interactive world. Most respondents (78%) claimed that the additional interactivity did not have any effect on how they approached people in first encounters compared with other CMC chat systems. One user mentioned that the direction of the encounter is more based on mood than anything, while others thought more of the feel of *There's* community as a whole rather than the interactivity when meeting people (e.g., “it’s a friendly community, so assume people you meet are going to be friendly too”). The 22% who stated a different opinion claimed that they found first encounters to be a more active watching and listening experience compared to other methods of CMC. This could involve everything from “reading” avatars by inspecting the types of clothing they are wearing – “newbies<sup>5</sup>” in *There* have a bland white T-shirt, which could have a negative impact on how much time a veteran user is willing to invest in them – to seeing if your look has anything in common with another avatar, which could provide a starting point for conversation.

In terms of members disclosing information about themselves in *There*, most respondents reported seeing much more of this taking place. Participants attributed this to the feeling of anonymity that is created by the online experience, which goes

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<sup>5</sup> An inexperienced newcomer.

along with the Social Identity model of Deindividuation Effects (SIDE). At the same time, some users said that *There* felt more personal with the use of voice chat, which made them more comfortable and willing to divulge information about themselves online that they otherwise would not readily provide in other settings. As mentioned in the literature review, a respondent also brought up the idea of synchronous communication, which adds to the “personal” feeling of *There* that several members reported. The literature review suggested that synchronous communication would result in a series of indirect rapid-fire questions (small talk) to gain superficial knowledge of the other person. Based on the responses, users in *There* appear to reveal lots of information this way in order to paint a picture of who they are, but at the same time, participants raised a lot of questions as to the truthfulness of the information they are provided. In some reported cases, relationships that have developed over long periods of time will eventually have a higher level of trust as they move beyond the virtual world (e.g., *There* conventions, telephone conversations). Again, this goes back to the anonymity principle – we do not know much about people we first meet online, so naturally we will want to find out, but without any means for verifying information, people may not always be who they claim.

This has a large part to do with the way people design their avatars. The first question that comes to mind with a lot of members is whether the avatar is either an accurate representation of the user behind it (replication of their own physical appearance) or if it is based more on a fantasy the user may have. Going back to the



idea of transference (transferring our real emotions to fictional characters), some respondents believed that avatars are, in fact, extensions of us. However, they are more of an image we try to project rather than what we really are. Several respondents said avatars are an “ideal” representation, but not real ones. They are an embodiment of ideas we may believe in or hold before others. For example, the high amount of male avatars with a muscular physique could imply that the users behind them find these traits to be important, but it does not necessarily mean they actually look like this in person. In another respondent’s words, avatars are actually a representation of what we are not – avatars hide who we really are.

In some other cases, the look of an avatar is not always to be taken at face value. *There* provides users with the ability to create more than one lookset<sup>6</sup>, which may be used at different themed events. It is not uncommon to see people dressed as pirates or superheroes from time to time. This does not necessarily mean the user is a pirate in the physical world, or even that they are avid collectors of comic books. Some users, however, choose to stay in these costumes a majority of the time, which would leave other members more inclined to believe that the costume is an extension of their personality.

When asked to describe their own avatar, most participants acknowledged that it was an important decision in how they wanted to display themselves virtually. As avatar design is a matter of personal preference, the spectrum of responses was also varied. Some elected to model the avatar after their physical

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<sup>6</sup> A predefined set of variables to alter the look of an avatar. Can include facial features and body shape. Can also be combined with a different appearance through the use of clothing.

appearance, while others settled for anything that was “pleasant to look at.” Some tried as much as possible to “blend in” by basing their avatar design on popular looks, while others wanted to be as unique as possible, wishing *There* could provide more customization options. Some participants claimed that avatars were a way of expressing themselves – for example, different apparel based on the groups they are a part of, or getting to be the personality behind the avatar. Those who chose to base the avatars after their physical appearance were primarily the ones who hoped for expanded configurability. Some people started with their physical look as a starting point but then loosely deviated from it when creating their avatar either due to technical limitations or personal choice. Whether the replication of physical appearance is to serve as a reminder to the user is another question. When asked to elaborate on their choice, one respondent wanted to “impose reality on a fantasy world.” Finally, some respondents enjoyed creating unconventional looks just to have fun, claiming *There* is an escape from the stress of everyday life and that they do not always need a reminder of reality as they explore a fantasy world.

### *Meeting New People*

Another area of the participant interviews covered several aspects of the SIDE model by trying to uncover what kinds of processes occur when a user of a computer-mediated channel does not have sufficient information about another member. The first question involved a hypothetical scenario in which the member experiences an initial encounter with another person. The respondents were asked

to explain what they would immediately do in order to deal with the scarcity of information that is a core component of the SIDE model.

As discussed in the literature review, there are a number of ways online users can collect information. The responses gathered in the study supported this research. Methods mentioned in interviews covered active, interactive, extractive, and passive information seeking strategies. Several people said they always checked profiles first. The typical *There* profile can provide basic demographic information, length of use, a personal bio, pictures, hyperlinks, as well as a listing of all groups to which a member belongs. Some users choose to make their profiles private – which means only people on their contacts list are allowed to view them. Interview respondents saw this as more of a barrier to communication, saying that the lack of provided information makes the initial encounter less worthwhile because they either do not want to ask too many questions or that they do not want to be at a disadvantage when it comes to who knows more about the other person.

Others had different approaches to initial encounters, such as direct questioning. This method usually started with perfunctory questions, which later evolved into personality questions or topic discussions. After enough basic data is gathered, members then decide whether to add the user to their contacts list for future conversation or to slowly distance themselves and find another person to communicate with. A few reported exercising extra caution when dealing with unknown people online. These users typically meet new people through existing friends, who in turn also gather information about the new member of their social

network through existing friends. This also supports research by Ramirez et al. (2002) on data gathering. Finally, the use of external hyperlinks is growing in popularity as a means of learning about new people. In particular, online social networking sites such as *MySpace* and *Facebook* provide users with more room to discuss their personal and professional interests when compared to the basic information found in the average *There* profile, and as a result, it is becoming more common to find these links in member profiles.

The two most commonly sought after pieces of information in an initial encounter as reported by study participants are age and location. Although they did not always ask for age directly, they attempted to guess an age based on the demeanor (e.g., childish, polite) of the member. Respondents were basically looking for people who were not actively attempting to cause grief among chat groups and could respond intelligently to topics at hand. After age and location, the most requested information was interests/clubs and past experience with virtual worlds. All but one of the respondents tried to avoid topics of religion and politics in initial encounters, which could potentially have a divisive effect.

In a different approach to the SIDE theory, another scenario involving initial encounters – this time with newbies – was proposed to participants. Since SIDE theory posits that the anonymity in CMC can lead to antinormative behavior as users are not held accountable for their actions, this scenario was intended to look at how users of an existing chat group of veteran members would approach a newbie. Would the existing group see a heightened sensitivity to the social norms of

the group, resulting in ingroup favoritism and outgroup hostility toward the newbie? According to the respondents, this was highly dependent on the “quality” of the newbie. In cases where the newbie exhibited insensitive behavior, most members of the group would immediately distance themselves rather than confront the behavior openly or privately (through user-to-user channels). However, if the newbie was polite, members would be much more willing to assist in answering questions. Even then, most respondents claimed they do not appreciate newbies asking for virtual objects, no matter how nice they are about it. So, what we do see is a small amount of stereotyping based on limited information (“newbies are cheap;” “newbies are obnoxious”) and users feeling at ease with immediately shutting newbies out of a conversation by either flaming them or putting them on ignore status. Ignore status will hide text, mute voice transmissions, and block instant messages sent by the ignored member. At the same time, several newbies do tend to act erratically as the Internet affords them relative anonymity, as the SIDE model suggests. Some respondents believed that a handful of newbies could actually be veteran members who have created secondary accounts either to grief<sup>7</sup> members without risk of tarnishing their reputation or to harvest virtual items via handouts, which could in turn get sent to their main accounts.

When participants were asked to describe their own experiences with online hostility, a wide variety of answers emerged. Although the majority of respondents never had a serious problem with this kind of behavior in *There*, a few had

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<sup>7</sup> To intentionally cause trouble for other members, typically by breaking established rules of conduct.

experienced grieving that later escalated into bigger problems, such as stalking or threats. At the same time, most of these issues were easily resolved by either moving away from the person to a private area, confronting them, contacting customer service, or placing the user on ignore status. In other examples, some existing chat groups acted with spite against members who were not a member of a particular social circle. Again, this does show the SIDE model manifesting itself, as members of a group are more aware of the specific identity of the group itself, rather than general social norms. One participant mentioned that she is actually a self-proclaimed griever at times, but does so for fun rather than to consciously act in a hostile manner. In this case, most of the grieving was directed at newbies who displayed ignorance of the virtual world. Just as in the physical world, grieving in *There* can be both verbal and physical, ranging from insults to physical attacks with vehicles and paintball guns. The system provides ways of inhibiting both forms of harassment – ignore status for verbal insults and force fields for physical attacks. Force fields act as invisible barriers that prevent avatars from being knocked back when it makes physical contact with vehicles, paintballs, etc.

### *Communication Features and Limitations*

The next section of the interview dealt with features of the Social Information Processing Theory, mostly addressing issues of the rate and depth of information exchange, timing of communication, quality of CMC relationships over time, and limitations of communicating in an interactive virtual world. To begin, members were asked to simply recall a time, if any, that they felt *There's* communication

features were insufficient to express a thought or feeling either verbally or nonverbally.

Answers to this were split – exactly half of the respondents reported the features to be fully adequate for their needs, while the other half felt there were problems with a plethora of areas when compared to FtF settings. This included issues in semantics, sarcasm, varying levels of emotion, and gestures involving more than one person (e.g., a handshake). Although participants, for the most part, acknowledged *There* as being a step in the right direction, they felt it could be further expanded. Semantics have always been an issue in CMC realms. For example, typing in all capital letters can imply that one is yelling, which in many online circles is commonly understood as rude behavior. Many novices tend to make this mistake either by accident or completely unaware of the implications. On the other hand, voice chat is making it easier to understand people better by allowing others to read inflections in the voice. As for varying levels of emotion, *There* has begun to address this issue by allowing some emotions to become stronger by adding an additional “tick” before it (e.g., `sad, ``sad). According to half of the respondents in this study, members would like to see these kinds of features expanded in the future.

Respondents who noted inadequacies in *There's* features were asked to explain how they addressed these problems. Most stated they ended up having to use voice chat, although this is not always a viable option as not all members have access to this feature. In other cases, members created or used macros to simulate

the appearance of gestures that do not yet exist in *There*. One member mentioned that she had created a macro to mimic the look of a hug by combining two or more existing gestures in rapid succession. This kind of ingenuity has become more commonplace across *There*, although it is more confined to veterans of the community than newcomers. This potentially poses a challenge to newbies, as they may have trouble deciphering and/or responding to custom macros.

Members also recalled changing the look of their avatars to reflect their moods. This goes back to the discussion earlier on transference through avatars and how they can act as an extension of our physical and mental state. Finally, some members mentioned that rather than creating new forms of expression through CMC as SIPT predicts, they actually reverted to spelling out their feelings directly in order to express themselves. Although *There* has apparently dealt with some of the core problems of earlier modes of CMC, such as communicating asynchronously, it now becomes more a problem with the depth of information exchange, rather than the rate.

Since macros seemed to be one of the most prevalent and accessible ways of expanding forms of expression as suggested by SIPT, respondents were asked to elaborate on their use of macros. This included everything from the motivation behind creating the macro to the purpose of executing it. As discussed before, many people created macros to help directly with communicating. However, it seems that there were more purposes behind macros than originally thought. *There* is an interactive world that goes beyond just “communicating” by actually interacting



with other people and the world around them. Members used macros for everything from creating movies for one of many virtual film studios in *There*, dancing, modeling items for commercial activities in world, to automating mundane and time consuming tasks such as training their virtual pets.

Whether or not this makes CMC more personal when compared to FtF is up for discussion. All but two participants said that they understood gestures and macros as actual nonverbal forms of expression as opposed to being simply utilitarian. One member responded that they “make chatting a little more real” via giving avatars a better means of showing presence of thought behind a virtual character. This includes varying levels of emotion and cleverly thought out body language that feels natural to the flow of conversation. Others gave similar responses, but at the same time pointed out a potential negative side of macros. Some members use macros just because they can, whether it is for novelty purposes or to amuse themselves. According to respondents, this can actually lead to an impersonal atmosphere – going against SIPT’s prediction of these forms of expression in CMC rivaling FtF in levels of intimacy over an extended period of time.

Members were also asked to discuss the way timing of communication and levels of interactivity, as compared to other forms of CMC and/or FtF, affects the way they interact in *There*. Respondents rated *There* on a much more personal level than emails and instant messaging services, saying the synchronous communication makes conversation more like a real FtF encounter because we have less time to

think through what we want to say – some participants regretted having said some things in *There*. Some members mentioned that asynchronous media like email can lead to a greater amount of misrepresentation, but are better for those who don't communicate well extemporaneously.

*There's* level of interactivity seemed to fit somewhere between FtF and other modes of communication for many respondents. One member said that *There* fits in well as a “second world for real time visualization activities and communication.” Another group reported using *There* instead of email and telephone conversations as a way of complementing existing relationships in the physical world. As for SIPT, these members were more readily able to visualize emotions on their conversation partners than people whose relationships were solely based in the CMC realm. Given this information, some members still claimed to be able to form more accurate representations of people in the long run using *There* compared to other modes of CMC, although one member was sure to point out that this is still a process that requires ongoing conversation over the long term. Again, this ties in to another factor of SIPT, anticipation of future interaction.

To learn more about the quality of long-term friendships in *There* and whether they measured up to FtF relationships or less-interactive forms of CMC, users were asked to rate *There* and give details on the quality of relationships they have made in-world. According to the responses, this is where *There* really shines. Over half of the respondents either reported spending more time communicating with friends through *There* than FtF or having made very close friends in *There*

that they would rate as equal to or higher than FtF relationships. One person said friendships made in *There* are much like friendships made in the physical world, but you do not physically see the person. However, seeing the avatar gave the member the feeling that she was, in fact, seeing the person. Another member reported having made a small number of “very close” friends whose feelings affected him on a personal level.

Regarding the interactivity factor, some members reported that online friendships work best when everyone has the time to stay in touch, but instant messaging and email lack the element of “sharing experiences,” whereas *There* provides users with a way of doing things together just as they would FtF. This, according to members, sets the user experience of *There* apart and deepens the level of intimacy of CMC relationships.

Other CMC tools such as *AOL Instant Messenger*, VoIP<sup>8</sup>, and email were also used by some as a way of both synchronously and asynchronously complementing communication in *There*, but many people also rated the long-term quality of relationships made in these modes equal to *There*. It would seem that the higher level of interactivity in *There* results in a faster rate and depth of information exchange, which brings the speed of relationship development up closer to FtF settings, but as SIPT predicts, CMC will eventually become just as personal as FtF – only in this case, *There* seems to reach this level faster than other modes of CMC.

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<sup>8</sup> Voice Over IP – allows the routing of voice conversations over the Internet or other IP based networks.

In cases where anticipation of future interaction was low, users reported treating encounters much more casually, limiting what kind of information they wanted to share because of a lack of trust and willingness to invest time in someone they do not see as being worth it. Of course, this affects the rate of information exchange, limiting the effectiveness of communication, which shows further relevance for SIPT.

### *First Impressions*

In the final interview section, questions were asked to explore the impact of the hyperpersonal model of CMC. Questions were designed to examine the role of impression management (optimization of self-presentation), importance of first impressions, kinds of trait information being sought, attributions placed on information received, and feedback to the sender – the “intensification loop.”

To begin, users were asked to describe their method of handling first encounters, keeping in mind the salience of impression management. As expected, all respondents reported using some form of management to limit the amount of information they revealed about themselves. While most did so out of privacy concerns, just as one would in an initial FtF encounter, others used a limited information sharing strategy in order to get other people to talk about themselves. This method of information gathering allows the user to gain valuable details before making the decision to continue or end a conversation with someone they just met. Many participants suggested that they would become more open to sharing

information after they have established some common ground with a new acquaintance.

As far as the type of information people are looking for and willing to divulge in initial interactions, the overwhelming majority of respondents said they were looking for positive trait information. This also fits in well with the hyperpersonal perspective because this sharing of information on both sides is a key factor in the chain of behavioral confirmation and magnification that eventually leads to inflated perceptions of the person on the other end. Although further research is required to learn more about how this could have an opposite effect if given negative trait information, it is safe to assume that most impression management in CMC first encounters will focus on positive traits unless a user is a griever. In cases where users exhibit grieving behavior, they display negative traits commonly associated with immature or inexperienced users. At least, in the hyperpersonal model, the process is based on an “optimization” of self-presentation.

In an effort to explore the possibility of a negative intensification loop, members were given a hypothetical situation in which they are meeting a new person who chooses to divulge negative trait information about himself. The responses given all fell into two broad categories, with each category receiving about one half of the responses. First, some decided to either ignore the user either mentally or through the client software. This strategy would at least ensure that the hyperpersonal intensification loop is cut off before it started. Those who chose to mentally ignore the negative information were of the opinion that they would not

take the information very seriously, since they look at CMC in virtual worlds as more of a leisure activity. The other half of respondents decided that when given negative information, they would react negatively by throwing out an opinion or causing an argument. As research has suggested, online “flaming” can often get out of hand, given the lack of repercussions resulting from a user’s perceived anonymity or a lack of cues beyond the text (Allen, 2006).

Other potential factors in the hyperpersonal model include the timing of communication, which in this case is synchronous, as well as the interactivity of the medium. If more information about the user is given through the medium (three-dimensional avatars with voice as opposed to text-only communication), then we can assume that there is less room for impression management. This is not to say it is impossible, since even in a FtF scenario, limiting information and many forms of deception are possible. What makes CMC a bit different, however, is the level of importance placed on first impressions.

While over two thirds of participants agreed that they placed a high value of importance on first impressions, they also admitted that there is more room to alter those impressions in the future in *There* than in physical encounters. The other third of participants stated that first impressions in *There* were not important at all. Many said that even in extreme cases, it would not be out of the question to readily give people a second chance, while, according to one member, in a FtF setting, this would not be the case. When asked to describe what qualities they would describe as positive and most important in initial encounters, the top two

responses were friendliness and intelligence. When dealing with new members in *There*, technical issues, slow response times, and the learning curve of the client software could hide these two qualities. Therefore, users were sure to point out that they would be willing to give people more time to make an impression before deciding whether to stay or move on.

In conclusion, the responses go in line with the idea of intensification loops as suggested by the hyperpersonal model. Exploratory research in this study also suggests that the removal of optimization of self-presentation and addition of sharing negative traits will lead to a negative perception of the user, which, in turn, cancels out the behavioral confirmation and magnification. In order to learn more about the three models, the second part of the study uses participant-observation to understand their processes in action.

### *Group Observation Sessions*

The second component of data collection involved putting all 18 participants into one of three randomly assigned groups. As mentioned before, all avatar names used in this section have been altered. Random group assignments turned out to be balanced among gender. Group A was composed of 3 male and 3 female avatars, Group B had 4 female and 2 male avatars, and Group C was made up of 3 male and 3 female avatars. All groups had the researcher (male avatar) acting as the seventh participant. For an illustration of how the groups were composed by gender, as well as a visual approximation of the semicircle chat formation *There* uses, see Appendix E. This group composition matches closely with *There's* overall demographics. The

following section makes use of the randomly generated names for each participant when describing events that occurred. Appendix E shows each avatar's name and location as they stood during the observation sessions.

### *Social Information Processing Theory (SIPT)*

In order to analyze what was observed in the three sessions, this section is broken down to three areas – one for each theoretical model. To begin, the SIPT model is considered. At the heart of this theory are factors of the rate and/or depth of information exchange. Possible influences to this variable include the timing of communication and anticipation of further interaction. Some past research has also pointed to time limitations of CMC as being an influence too, as one would assume it takes more time to transmit the same amount of information in CMC than it would in a FtF setting. However, this study uses interactivity as an additional factor, as many previous studies were based on less-interactive modes of communication.

For example, one immediate difference between *There* and most other forms of CMC is the user's avatar. In the interviews, most participants mentioned that the design of their avatar was significant in some way. Each member of the group had a distinct look that carried information about the user. For example, Hans from Group A chose to wear a suit which he mentioned earlier in his interview as reflecting his real life career. The speed at which members learn about each other is central to the SIPT, so it seems apparent that the increased level of interactivity also increases the depth of information exchanged. The real-time communication in



*There* also addresses the timing of communication to a large extent, barring technical difficulties. Finally, the availability of online profile information seemed to play a large part in the initial encounters. Many questions were pulled from user profiles, for example, Adelle of Group C asked Steven, “Your profile says you enjoy photography, what kind of photography do you do?” In another case, Rastus of Group B had a private profile, and other members of that group either asked why the profile was marked private or expressed slight disappointment that they could not gather information on that person.

Across all groups, as soon as the events began, a group conversation was formed, with all seven participants standing in a semicircle for easier viewing of each person’s chat text. All but Group B had full voice chat capability. Katherine of Group B had technical problems getting voice chat to work, so she was unable to hear voice transmissions that members used initially. After pointing out that she could not hear, the group used text chat for the remainder of the session. Initially, conversations started off slowly – members first had to “break the ice” with those they had not met before. Groups B and C had two or more members who had already met in *There*, so those conversations began with recognition of the other member as well as some recollection of past events between those parties. Shortly thereafter, the subgroups opened up to the other participants present in order to direct the flow of conversation.

Most of the communication initially observed between all participants was close to what was expected based on the review of literature. The timing was quite

rapid initially, but slowed down toward the end as more substantial questions began to emerge. It appears that the slowdown was more due to more time and thought being put into questions before they were asked rather than reluctance to answer them. Viewing timestamps in the chat logs or voice communications in a digital recording of the session served as a way of measuring timing of communication. Across all groups, the first 30 minutes had an average of 8.4 questions asked per member and 6.7 questions answered per member. The second 30 minutes saw a decline to 5.6 questions asked and 4.8 answered per member. This suggests that although the rate declined, the depth increased.

Initial questions matched the interview results, as most participants started off with simple questions of age and location. Other initial questions included occupation and how long people have been a member of *There*. Interestingly, after basic information gathering, Groups A and C both moved on to discussing topics related to experiences within the virtual world before shifting to issues concerning the physical world. Group B did not focus on topics involving *There* besides length of use questions and two questions about a user group listed in Pam's member profile. Closer to the second half of the sessions, more focused questions began to emerge. For example, Hans of Group A began asking Zackery specific technical questions about web site design tools.

SIPT suggests that in order to address limitations in any given mode of CMC, users would either use features or create new means of expression. Supporting what was said in the interviews, most users appeared to be content with the

communication features *There* provides, although two long-term members, Lynette of Group A and Erin of Group B, used additional macros during the observed time period. Almost all participants made use of some form of nonverbal cues. More experienced, long-term members chose to “hide” their gesture commands from displaying in chat bubbles by adding an additional tick mark (e.g. `smile`). Although hidden from view, these commands were still recorded in the chat log by the client software. The reason for hiding gesture commands is to make facial expressions and other gestures appear more natural and subtle.

Users also made use of voice chat when possible. With the exception of Group B, those who felt comfortable used voice chat. Groups A and C had a higher rate of exchange than Group B, which is most likely due to the ease of voice chat. This added another layer to the interactivity level and allowed for more information to be transmitted, both on a questions-per-minute basis as well as by reading inflections in peoples’ voices. Those who used voice chat were able to have multiple conversations as they responded vocally to non-voice users’ text chat bubbles. This means that it takes less time for the same amount of information to be sent and processed. However, one would assume that according to SIPT, users who can send and process information more readily (through voice chat) would also be less likely to require the use of macros, emoticons, acronyms and other new forms of expression unique to CMC to address a deficiency in the rate and/or depth of information exchange. This was not the case in observed sessions – users of voice

chat used gestures and custom macros the same amount as users without voice chat.

The factor of anticipated future interaction appeared to play a limited role across all observed sessions. Each session saw the formation of at least one new friendship. In these cases, members asked if it would be acceptable to add each other to their friends list. These members also had a higher number of exchanges compared to the mean and also appeared to find several things in common. In contrast, Rastus of Group B had a private profile, which appeared to turn off other members. The number of personal questions asked and answered by Rastus fell below the mean at 3.5 and 3.2 respectively. This could be explained by SIPT as a reduction in both depth and rate of information exchange affecting anticipated future interaction between Group B's members and Rastus. Parting comments were also used as a way of measuring an indication of willingness to have future interaction. In many cases, users who found appealing chat partners left with phrases such as "See you tomorrow," or "I'll look for you at my event later." Those who did not indicate any willingness for future interaction with group members tended to only say goodbye to the host, rather than others in the group.

In conclusion, the relevance of SIPT with the added factor of interactivity was fairly strong. Rate and depth of information exchange appeared to be quite high, although further research would be needed to compare these levels to other modes of CMC and FtF encounters. Group B had a less media-rich environment due to the lack of voice chat, and the rate of information exchange reflected that, but the depth

of questions and responses given followed the same pattern as the other groups. There was evidence of participants using intuitive means of expression (macros, third-party software add-ons) as SIPT predicts, although the increase of interactivity and thus rate of information exchange did not seem to have any impact on their use. Group B used the same amount of these tools as the voice Groups A and C. Finally, the researcher observed a higher than average amount of communication between users who anticipated future contact.

*Social Identity Model of De-individuation Effects (SIDE)*

The second set of factors observed relates to the SIDE model. The core part of this model suggests that the initial lack of information about others resulting from visual anonymity and a lack of cues compared to FtF interaction leads to a number of effects, ranging from the creation of social identities for groups that are not based on general norms, ingroup favoritism, stereotyping, and hostility to outgroup members.

In the observed sessions, several members immediately began to engage in uncertainty reduction strategies by gathering information about others in the chat group. As discussed before, this began with the most basic questions, in addition to browsing member profiles. However, the SIDE model also involves the way in which members present themselves not just by the information they decide to share, but also by their behavior. Although the majority of members chose to act politely during the course of the hour, Group C provided a unique opportunity for examining the SIDE model.

Shortly after people introduced themselves, Jerrold of Group C began to engage in some erratic behavior. This ranged from asking oddball questions to moving around the chat group semicircle to stand next to other people in an attempt to repeatedly execute gestures in a way that was unbeneficial to the conversations taking place. This could be noted as one of the de-individuation effects mentioned in the SIDE model. What is even more interesting to note is how quickly the rest of the group shut him out of the conversation. About half way through the session, Jerrold started behaving normally again, which could possibly be the result of Jerrold becoming more aware of the norms and behaviors expected by others in the group. This also supports what members reported regarding the reduced importance of first impressions and how they can often be overshadowed by a change in behavior.

SIDE predicts that based on the limited amount of information that flows in initial CMC encounters, people begin to form group identities to help as guidelines of what is acceptable. Also, in this case, the group appeared to be reinforced in response to Jerrold's behavior. Although polite behavior is considered to be more of a societal norm, it is important to point out that in this case, it just happened to also become a group norm. For example, if more people in the group were misbehaving, SIDE predicts that Jerrold would have felt less inclined to conform to the group norms that were being established.

Continuing with the observation of the formation of group norms, Group B had a similar case where a member named Amanda was streaming music through voice chat. What makes Group B different was that although assignment was

random, four of the six group members were veteran users who already met each other at some point in their time in *There*. The general consensus in *There* is to avoid streaming music in voice chat unless the rest of the group approves it. Almost instantly, the four veteran members carried over their experience from *There's* “society” as a whole which helped establish the group’s identity. They kindly asked Amanda to stop, after which she did. The veteran members were quick to explain why streaming was a problem. The last member of the group, Katherine, appeared to be indifferent to the whole situation since her voice chat capability was not functioning properly.

Group A was the only group where nobody knew each other coming into the session. Two of the most active contributors to the conversation were computer hobbyists. Zackery and Jaden’s avatars were also dressed to represent their interests, one wearing a shirt similar to the black and green patterns seen in the science-fiction film *The Matrix*. Although three of the other group members commented that they did not understand the computer jargon Zackery and Jaden were using, they soon began to abandon their side conversations and join Zackery and Jaden. Hans began asking several questions about building computers, and although Zackery and Jaden had to alter their communications to be understandable to the group as a whole, what we saw was the emergence of a group identity of computer hobbyists. Not only did the conversation just turn to the topic of computers, members were also asked to join related clubs and attend future events. Attempts to bring up other topics appeared to fail, as those conversations

were either drowned out by the current topic of discussion or by general disinterest. Other parts of the SIDE model also came into play. One member, Sherrie, tried for most of the hour to distance herself from the computer conversation, but soon found that others were making assumptions about her lack of expertise. Other members of the group became less willing to engage her in conversations until she began to show interest in the group discussion, showing signs of ingroup favoritism and the use of stereotypes based on limited information – in this case, Sherrie’s relative lack of computer knowledge.

Other aspects of the SIDE model appeared to have no relevance in any of the sessions. The use of cues did not have any observed change in how people reduced uncertainties of each other. Although many people used gestures to express feelings during their conversations, they did not have a noticeable impact on group identity or scarcity of information on others. Members did acknowledge gestures, for example, noting that a humorous comment was well received (e.g., lol or rofl<sup>9</sup>), but they did not appear to carry information relevant to the establishment of group norms. In the case of Jerrold or Amanda, other group members used more direct means of establishing acceptable norms of behavior.

Other pieces of the SIDE model were also relevant as it appeared that the higher level of interactivity in *There* influenced the outcome of Group A to an extent, as avatar design carried with it some information about the users behind them. Several de-individuation effects were also observed, such as antinormative behavior and assumed unaccountability for actions. This behavior changed over

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<sup>9</sup> Commonly used chat acronyms for “laughing out loud,” and “rolling on floor laughing”



time to match group norms, and, as SIDE predicts, people who did not conform to group norms were viewed as outsiders. Although there was no direct outgroup hostility in any of the observed sessions, the researcher observed generalizations being made of some members by the group in general. There was definite evidence for increased social attraction to conforming group members, especially in cases where members had existing knowledge of each other prior to the observation events.

### *Hyperpersonal Perspective*

Finally, the last model examined is the hyperpersonal perspective. This view is highly dependent upon characteristics of the channel, so the observation sessions provide a good way of seeing how *There* compares to less-rich forms of CMC. There was evidence of members in all groups engaging in some form of impression management. Naturally, aside from the two users who were initially disruptive in Groups B and C, people opted to share only neutral or positive aspects of their personalities.

There was also strong evidence for the intensification loop concept. For the most part, users displayed direct acknowledgement to positive statements people made about themselves during the impression formation process. Those who primarily shared more information about themselves – the senders – continued along their lines of discussion as the receivers of that information continued to ask more questions and become socially attracted to the senders. Given the synchronous characteristic of *There*, these loops were done at a much higher rate, giving senders

less time to come up with responses. Although nobody stumbled in their responses to rapid fire questioning during observed sessions, those who were less articulate in their communication through *There* had a reduced ability to manage impressions, and as an observed result, had less intensive feedback loops.

One example that took place helps examine the role of increased interactivity versus reduced cues in the hyperpersonal model. There was a conflict between the appearance of a Justin's avatar and the information he was providing about his personality. Although there was nothing wrong with the statements he made about himself, his avatar was still wearing a lookset that at least two other members of the group read as conflicting with his personality. The user in question described himself with an exaggerated sense of toughness and aggressiveness, yet according to those who questioned him, his avatar looked innocent and harmless. After the questions of his identity, the feedback loop appeared to cease – fewer questions were directed toward Justin and he became more distanced from the group.

In another case, interactivity provided more cues that were used to form impressions. Hans of Group A's decision to wear a suit led to him receiving a number of compliments on his appearance. Lynette in particular asked Hans many questions, first wanting to know who designed the virtual suit and later wanting to know more about Hans' real life interests. There was obvious evidence that an intensification loop was beginning between the two, reinforced by Hans' physical life description's confirmation of his avatar appearance. Users focused on the appearance of avatars and regarded them as symbolic of the physical users behind

them. People with non-default avatar appearances also created inflated perceptions across the loop, whereas there was less attraction to people who wore basic, non-designer clothing. Furthermore, people with a good working knowledge of macros and gestures appeared to be able to share more information and improve their image to recipients.

Again, supporting what was reported in interview responses, there was no evidence of negative feedback loops, such as negative responses leading to arguments that get out of hand. However, the removal of optimizing self-presentation appeared to prevent loops from occurring. Jerrold, the member in Group C who acted unpredictably, at first did not take part in the conversation as other members chose to ignore him. Later on, when Jerrold changed his behavior, he did in fact become a sender who had a positive feedback loop start with Caroline. Unfortunately, this process started too late into the observation session to tell where it was headed. This does provide evidence for reduced importance on first impressions and greater importance on impression management based on group identity and responses from participants' interview data, as SIDE suggests.

Interview data largely supported the observation sessions. For the most part, people chose to share positive aspects of their personalities in the initial encounters. Although they put some weight on the importance of impression management, participants also appeared to be more open to giving others more flexibility in the ways they choose to present themselves. As members described before, first impressions were capable of being altered, as even disruptive group members were

given a second chance to participate later in the conversations. Positive and neutral trait information was almost always sought, whereas negative trait information was avoided when possible. This supports the interview responses, as participants claimed that they normally look for politeness, intelligence, and humor. During the group events, these claims were supported as these positive traits helped start positive feedback loops between senders and receivers.

What this means for the hyperpersonal perspective as a whole is that all parts of the model did, in fact, come in to play during the observed time periods. As can be expected, the synchronous communication capability of *There* could have reduced some of the ambiguity of user-to-user communication, as a second medium is not required for transmission (Chan, 2005). This also helped some, especially the veteran users who had more experience and a higher level of comfort with the software, make positive impressions on other users and begin intensification loops. Interactivity also appeared to play a large part, as use of voice chat, gestures, and macros helped in impression management. Again, no signs of a negative feedback loop was evident, though this could be due to the richness of *There's* communication features preventing such problems from erupting. According to Allen (2006), flaming is largely the result of lack of visual context. Users in text-only CMC often misinterpret communications, such as irony or sarcasm, which lead to mild insults, and then escalate from there into flaming wars. In all, the hyperpersonal perspective was supported by the observed data.

## V. DISCUSSION & CONCLUSION

### *Answering Research Questions*

Based on the findings, we can begin to answer the original research questions mentioned earlier. The primary purpose of the study was to examine what role interactivity had in the three theoretical perspectives on CMC. The first research question asked if interactivity had an observed effect on how people approached each other in CMC encounters.

Interview data shows that members rated interactivity features highly, recognizing their important role in a world like *There*. However, in specific reference to first encounters, the majority of respondents did not feel that the interactivity level had an effect. Instead, they reported basing these encounters more on mood and a feeling of community. However, in other follow-up questions, members mentioned first encounters to be a more active and personal experience given the richness of the channel. Furthermore, the stereotyping behavior members reported about newbies being read by their avatar's appearance is also an example of interactivity having an effect on initial encounters. In this case, the newbie is at an immediate disadvantage because of his appearance. Expanding on this, participants also acknowledged the importance of their avatar's look, which could play a role in CMC encounters.

Based on observed data, members made extensive use of interactive features during the group sessions. Groups that used voice chat had a higher rate of information exchange, which in turn influenced the quality of the conversation as a

whole. The faster users could get past the initial stage of exchanging basic information about each other, the sooner they could start asking more specific, meaningful questions. There was also general support for interactivity having an effect on the avatar level. The hyperpersonal perspective shows that members who had a higher level of mastery of the client software had better first encounters than those who did not. The SIPT showed members having a higher rate and depth of communication with increased channel richness, and the SIDE model showed some evidence of avatars being read at face value, leading to stereotyping behaviors. To answer RQ1, depending on which perspective you look at, interactivity played a small to substantial role in CMC encounters.

To better understand the fundamental problem of information scarcity that the three theoretical perspectives mention, the second question was to look at the strategies CMC users use to deal with the initial lack of information on their communication partners. As discussed in the interviews, members made use of the four information-seeking strategies mentioned by Ramirez et al. (2002). This was also supported in the observed sessions, evident by the fact that users raised concern about one member's private profile.

Members reported using a balanced approach to uncertainty reduction, including giving limited information upon request, not openly volunteering personal information, and attempting to know at least as much about other users as they know about the member. Obviously, members felt the need to have an idea of whom they were talking to. This was supported in the observed sessions, as members

initially requested basic information about each other before feeling comfortable enough to move on to other topics.

Each model mentions an information limitation in CMC. SIPT is mostly concerned with the rate and depth of information exchange, not the cues filtered out by the channel. SIDE is based on the limited amount of information on others, and the hyperpersonal perspective is based on impression management and what information people choose to make available. Answering RQ2, across all perspectives, uncertainty reduction strategies were observed – extensive use of *There's* most interactive features to address limitations in SIPT, multiple modes of information gathering to address limitations in SIDE, and impression management in the hyperpersonal perspective.

The next research question dealt mainly with the SIPT. It asks if CMC users create new strategies of information seeking and sharing or if the interactivity level of *There* is sufficient to allow an acceptable variety of methods for doing so. Since *There* provides a highly interactive, synchronous platform for communication, members were mostly satisfied with what the technology had to offer. Most importantly, it seems the addition of voice chat eliminates a lot of the earlier problems with expression, although access to this feature is somewhat limited. As predicted by SIPT, users will find ways of addressing channel limitations. Although *There* is much less limited than the text-only channels that were common many years ago, users were observed doing this through the use of macros. At the moment, members feel a limitation of *There* is the lack of gestures involving more

than one avatar. Since most of the currently available gestures involve avatars moving within their personal space, macro developers have created movements to simulate avatars interacting with each other physically to provide an extra level of interactivity.

To answer RQ3, it would appear that users, for the most part, are satisfied with the level of interactivity when given the option of voice chat, but it is clear that users are actively dealing with any limitations just as SIPT predicts. As communication technologies become more complex, the access and expertise required to address limitations also becomes more of a problem. For example, voice chat in *There* does not work as well for members who have slower connections and older computer systems, and at the moment it remains an extra feature that members need to sign up for. Use of third-party macro programs requires knowledge of installing and setting them up for use, which for some casual users of the virtual world may be too much trouble. Therefore, although SIPT continues to take shape across different modes of CMC, it is not always as easy as typing an emoticon.

The last set of research questions examined the hyperpersonal perspective's idea of intensification loops. To begin, RQ4a asks the question of how salient impression management is in initial CMC encounters. The research shows clear evidence for users employing active impression management strategies. All respondents indicated in their interviews that they consciously limited what information they choose to share. Although CMC afforded them relative anonymity,



participants still made choices about what they wanted to say about themselves and what others might think about them when given the information. As expected, most people were looking for positive trait information, and in turn, that is what people were most likely to share.

Answering RQ4b, avatar design was important to most participants, although the question of how “reflective” of the actual user can give mixed answers. The conclusion most respondents arrived at was that avatars do not necessarily have to be a reflection of our physical form, but instead can be a means of expressing any dimension of our personalities, including interests, beliefs, moods, and values. Although some people choose to design their avatar’s looks from their own, those who do not are not actively engaging in any form of deception. Rather, they are still using the avatar as an extension of their personality, just in a different way. This also supports the idea of transference, discussed in the literature review.

Finally, RQ4c asks if users become more or less affectionate toward communication partners in CMC based on the limited information provided by other users. More specifically, in this research, this could mean a greater willingness to engage in conversation with another person, a showing of positive support for expressed behaviors, or interest in continuing communication after the initial encounter. For the most part, the interactivity level did not have an effect on how involved people became – which actually goes back to SIPT, which discards the

cues filtered out approach and suggests that any mode of CMC can eventually rival FtF, noting that some just take more time than others.

However, what did have an observed effect on people becoming closer to each other was impression management. Users who did a good job of presenting themselves to the group – including mastery of the software and providing smart responses to questions – had a much easier time making new friends than those who did not. Based on the limited information users had on each other, they began basing impressions on what little information they had – which in almost all cases was positive. Therefore, recipients of this information would often focus on the primary information senders, acknowledging the positive trait information they were sharing and encouraging more as they expressed more interest. All of the participants who primarily played the role of information sender had at least one other person in the group who anticipated future interaction after the observation session.

This makes it clear that the ability in CMC to manage limited information can improve the outcome of initial encounters. Use of gestures and macros seemed to have a small effect on how users evaluated each other's self-presentation. As the hyperpersonal perspective would suggest, voice chat also appeared to make a difference here. Users are, in a sense, providing more information by using their voice. Voice chat helped with the speed at which participants could share information, which meant that they were able to get to deeper questions sooner than those who did not. It also helped by providing extra conversational cues,

removing some ambiguity that could have resulted in a text-only setting. Further observation is necessary to tell if voice users are equally able to use impression management strategies when compared to text-only users.

### *Application of Theories*

In conclusion, all three theories were considerably relevant in the new CMC setting, although this research suggests that interactivity may play a larger role than originally thought. Even though many participants commented that increased interactivity did not play a large role in CMC encounters compared to other channels such as instant messaging and email, they acknowledged the importance of the enhanced feature set that virtual worlds like *There* provide. Furthermore, observations seemed to contradict the supposedly small role interactivity played in the encounters. The influence of avatar movement, voice chat, macro usage, and interaction with virtual objects was constant across all groups and largely supported by the three theoretical perspectives used by the study (Postmes, Spears, and Lea, 1998; Walther, 1992, 1996).

Relevance of SIPT overall was high, with several elements, including anticipated future contact, time limitations of CMC, timing of communication, and rate/depth of exchange all playing some part in the recorded data. As SIPT predicts, CMC will rival FtF, but that is more of a question of “when,” not “if.” As suggested by the theory, the greater rate and depth of exchange allowed by a rich channel (which carries more information) allows these “FtF quality” relationships to form much faster than older CMC channels. Also, there was evidence of users addressing

limitations in the channel by creating macros and other paralanguage exclusive to the medium. In the end, we can conclude that interactivity does, in fact, play a large role in SIPT.

The SIDE model was also generally relevant in most cases. Although there was not much antinormative behavior observed, those who did engage in such behavior were quickly singled out. The role of visual anonymity in *There* as it relates to avatars became an interesting question. Although avatars provide other users with a humanoid character representation of a person, interview data and observed data suggests that the avatar is not always a physical representation of a person. Avatars do, however, act as a representation of some dimension of our personality. Further research is necessary in studying grieving behavior brought on as a result of de-individuating effects of CMC as it relates to avatar use. At the core of the SIDE model is the lack of information on others. *There*, to a large degree, makes finding the most sought after information readily available. As conversations progressed, the lack of information was reduced, but we still saw clear signs of group norm development. Although at times the group norms reflected more common norms found across the community, it seems possible that the opposite effect could easily have taken place. It is important to note that from observed data, the level of interactivity itself did not appear to influence the formation of group norms, although it did increase the speed at which group norms were created. Small signs of in-group favoritism and out-group stereotyping were evident, although future observation sessions would have helped to see these scenarios play out.

Finally, the hyperpersonal model appeared to have the strongest relevance of the three. At the heart of the perspective is a dependency upon channel characteristics. Therefore, as assumed, the higher interactivity provided by *There* had a direct influence on how well members were able to engage in impression management skills. The members who had a better mastery of the software, including avatar design and avatar movement as well as conversational skills, had an easier time finding other people to talk to. In turn, the subgroups that engaged in side conversations began to display signs of behavioral confirmation and magnification as predicted by the hyperpersonal model. In Group B's case, voice chat was kept to a minimum by choice of the other members in the group to address Katherine's inability to participate in voice conversation. There was no noticeable difference as a result across the three groups, although more information was exchanged in the voice chat groups. Timing of communication tends to be a factor in the hyperpersonal model, so further research could also look at impression management capability in virtual worlds between text chat and voice chat.

### *Limitations*

Although this study does show varying levels of relevance for the three perspectives, there were some limitations that must be acknowledged. First, the length of the observation sessions was only one hour for each group. Anything longer would have exceeded the scope of the research, as analyzing the data can be time consuming. In a perfect situation, members would have been observed over longer periods of time to allow further examination of affection toward

communication partners and the role of the hyperpersonal perspective's intensification loops. This would also allow for a better understanding of the quality of long-term CMC relationships versus FtF.

Relating to this is the fact that this study only involved members who were willing to participate. The original goal of the project was to conduct a true ethnography, but this turned out to be unfeasible due to the amount of data that would need to be collected and the difficulty of getting permission from everybody in a large online community of thousands of people. Perhaps looking at behavior in an unplanned observation event would provide researchers with a better look at antinormative behaviors and reduce some of the expected social desirability effects. Even so, the exploratory nature of this study provides valuable data on how people interact in rich CMC environments. Although the data from this study cannot be expanded to cover a general population, future research with larger sample sizes can build on this study to look at other virtual worlds and communication technologies to look for consistency.

Another possible limitation of the study is that there were no follow-up questionnaires given after the observation sessions to ask evaluative questions. Questions could have been focused on the quality of contact users made during their conversations, specific use of *There's* communication features, and more elaboration on anticipated future interaction.

### *Suggestions for Further Study*

Since this research gives us some more insight into interactivity and its effect on CMC, there are several ways that future research could expand on this study. For example, there was no real opportunity in this study to examine grieving activity. A question of whether grievers' choice of communicating when given the option of richer channels such as voice chat could be one such idea. For example, do grievers use less-rich modes of CMC in order to protect a sense of anonymity?

Another study could look at voice chat and impression management strategies. In this study, voice chat did not seem to have an effect on impression management capability. Unfortunately, the question of why this is the case remains. More observation needs to be conducted in order to tell if this is always the case.

Another area of research involves improving interfaces between the user and the virtual world. This already seems like the natural direction of virtual world development. With this progression comes the concept of interface transparency, embodiment of avatars and its surrounding effects. Further study is needed to fully understand what happens when people can "become" their avatars on a higher level, for example, controlling the avatar's movement by advanced virtual reality-types of input devices.

All three perspectives were relevant even as interactivity played a large role. This would imply that developers of virtual worlds should concentrate on developing user interfaces that reduce the learning curve of mastering avatar control, thus

allowing the user to participate more freely in conversations. At the same time, allowing avatars more capability in the way of movement and customization would also allow for more information to be carried by the channel. Finding a balance between available options and ease of use remains a challenge for developers of all kinds of software. At the moment, standard keyboard and mouse input devices can act as a barrier to experiencing truly transparent user-to-avatar control. It remains to be seen what new technologies can add to our experience in computer-mediated environments. The theoretical capabilities are limitless – and if *There* is any indication of where we are going, the future will be an exciting time as virtual worlds become more commonplace in our use of the Internet.



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## APPENDIX A

**Georgia State University  
Department of Communication  
Informed Consent Form**

In this study, you will be asked to answer questions about your use of the online service *There*. You will also join in chats with other participants. There is no known risk in this study. We would like you to share your thoughts honestly and completely. There are no direct benefits to you in the study. However, your input may help improve virtual worlds in the future. This study may help understand how people interact with each other in virtual worlds.

For the purpose of the research, the interview will ask about your use of *There*. Examples of this include your thoughts of its features, learning about new people, and adapting to the community. The interview portion of the study should take about two hours to complete.

You will also group with other participants and an observer. Observations will focus on topics from the interview. Observations made during chats can be used as data for the study. This includes the observer's field notes and chat logs recorded by the *There* software.

This research is anonymous. We will keep your records private to the extent allowed by law. Your personal information such as your avatar name or real name will not appear when we present this study or publish its results. The findings will be summarized and if identifying information is used, an alternate alias will be used when referring to you in the study.

Participation in this research is voluntary, but you must be at least 18 years old. You can refuse to participate in the study. If you decide to be a part of the study and change your mind, you have the right to drop out at any time. However, any information already provided to the point when you withdraw consent will not be removed.

**If you have any questions about this study, contact:**

Mark Agle, Department of Communication, 404-651-4146

Dr. Merrill Morris, Department of Communication, 404-463-9524

**If you have questions about your rights in this study, contact:**

Susan Vogtner, Institutional Review Board, 404-463-0674

☐ I am 18 or older, and I have read the above information and agree to participate in this study.

## APPENDIX B

### Interview Questions Semi-Structured Interview Format

#### *Basic Information*

1. On average, how many hours a week do you spend using virtual worlds such as *There*?
2. Tell me a little about how you found this community and why you decided to join. When did you join?
3. What aspects of *There* do you like the most?
4. What do you think of the communication features *There* provides (e.g., voice chat, text chat, avatars, interactivity)? Do they meet your needs?

#### *Information Seeking and General Questions*

5. Does the increased interactivity provided by *There* have any effect on how you might approach somebody in an initial encounter?
6. Think about other forms of anonymous communication such as instant messages or e-mail. Do you see more or less people disclosing information about themselves in places like *There*?
7. Think about the appearance of avatars and what that might say about someone. Do you see this as a way people disclose information about themselves?
8. How about your own avatar? What kind of thought did you put into the design of it? How important to you is the appearance of your avatar? What is its significance?

#### *Social Identity Model of De-Individuation Effects*

9. When you initially encounter somebody new on *There*, how do you deal with the lack of information you have on the person?
10. When you are in a group with friends and a “newbie” joins your group, how do you react? How does the group react? How do you evaluate new people based on limited information?
11. What kind of information do you tend to immediately seek on new people in order to get a better idea of who they are?



12. What is your experience with hostility to other community members? This can include “griefers,” as well as already established groups flaming non-group members (outsiders) as they join a conversation.

### *Social Information Processing Theory*

13. Has there ever been a time that you felt *There*’s communication features were inadequate to express your feelings? This can include both verbal and nonverbal expressions.

14. How did you address this limitation?

15. Have you ever used or created your own macros in *There*? If so, what was the motivation behind the use of the macros?

16. When you chat in group settings, do you read gestures and macros used by other avatars as nonverbal forms of expression?

17. If computer-mediated communication systems allow us to manage the impressions we make of ourselves, where would *There* fit in? Think about e-mail (where you have more time to think about what you are going to say), or other text-based forms of interaction where visual information on the other user is limited.

18. How would you rate the quality of long-term communication in *There* compared to less interactive modes of communication through the computer? Have you made any close friends? How do these friendships compare to your real life friendships?

### *Hyperpersonal Perspective*

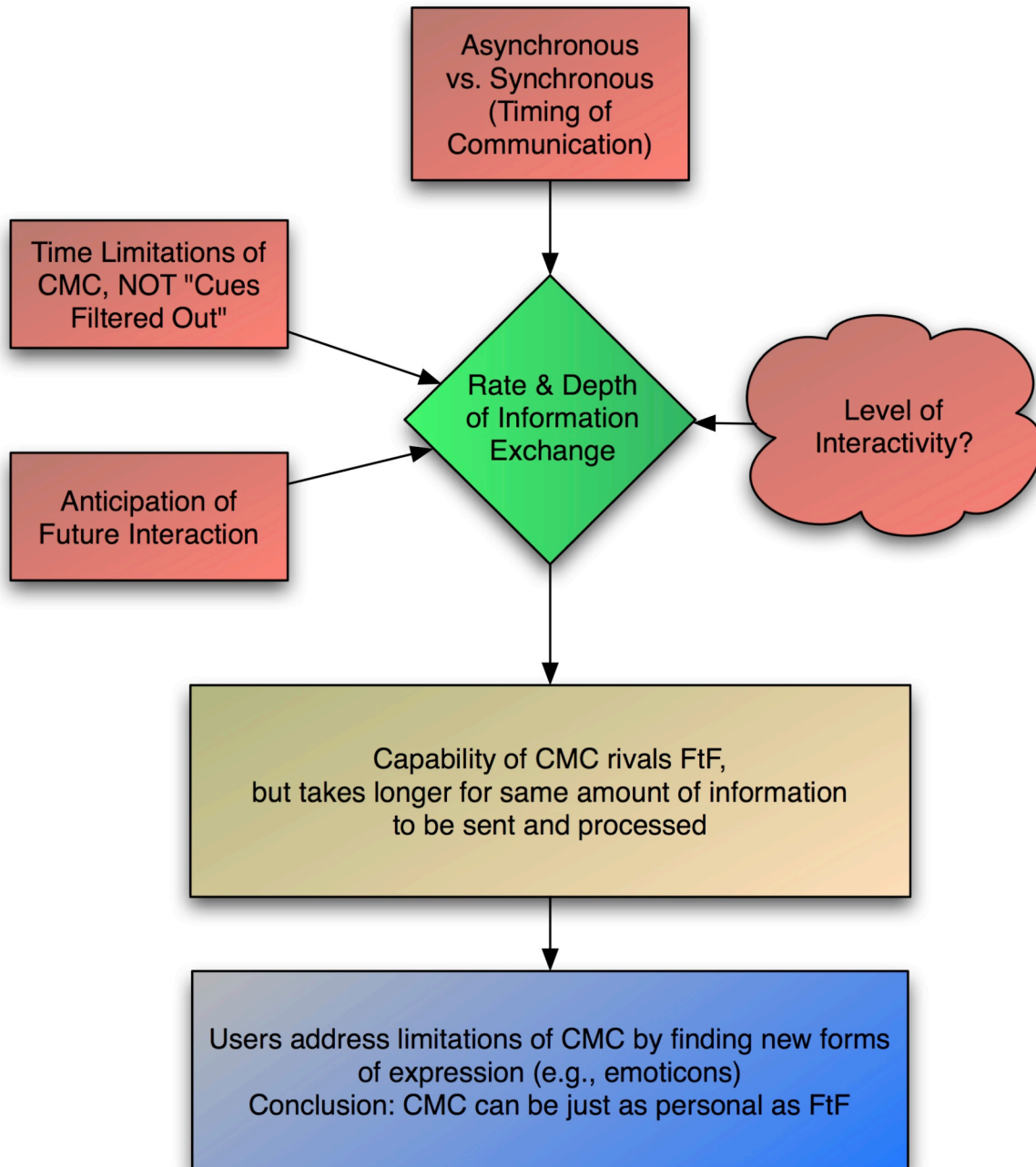
19. In an initial encounter with somebody, how salient is impression management? Would you say that you purposefully attempt to convey certain aspects of your personality while at the same time choosing not to reveal others?

20. When you are interacting with another person, what kinds of trait information are you trying to seek? Positive, negative? Think about what kinds of questions you ask people and how you would react to either a positive statement or a negative statement.

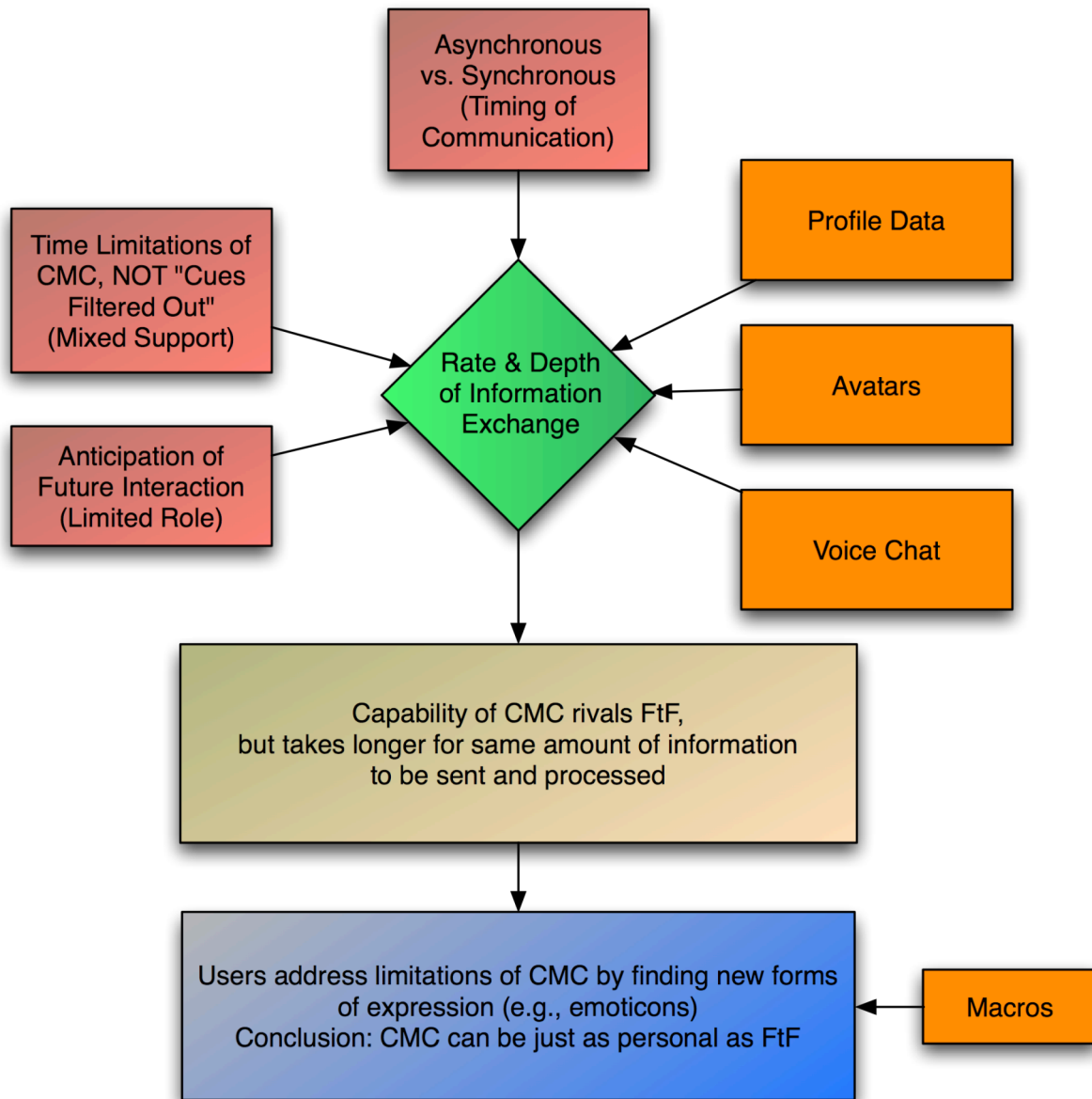
21. How important are first impressions in *There* encounters?

22. What kind of attributions do you place on people you meet in *There* based on the information you are given?

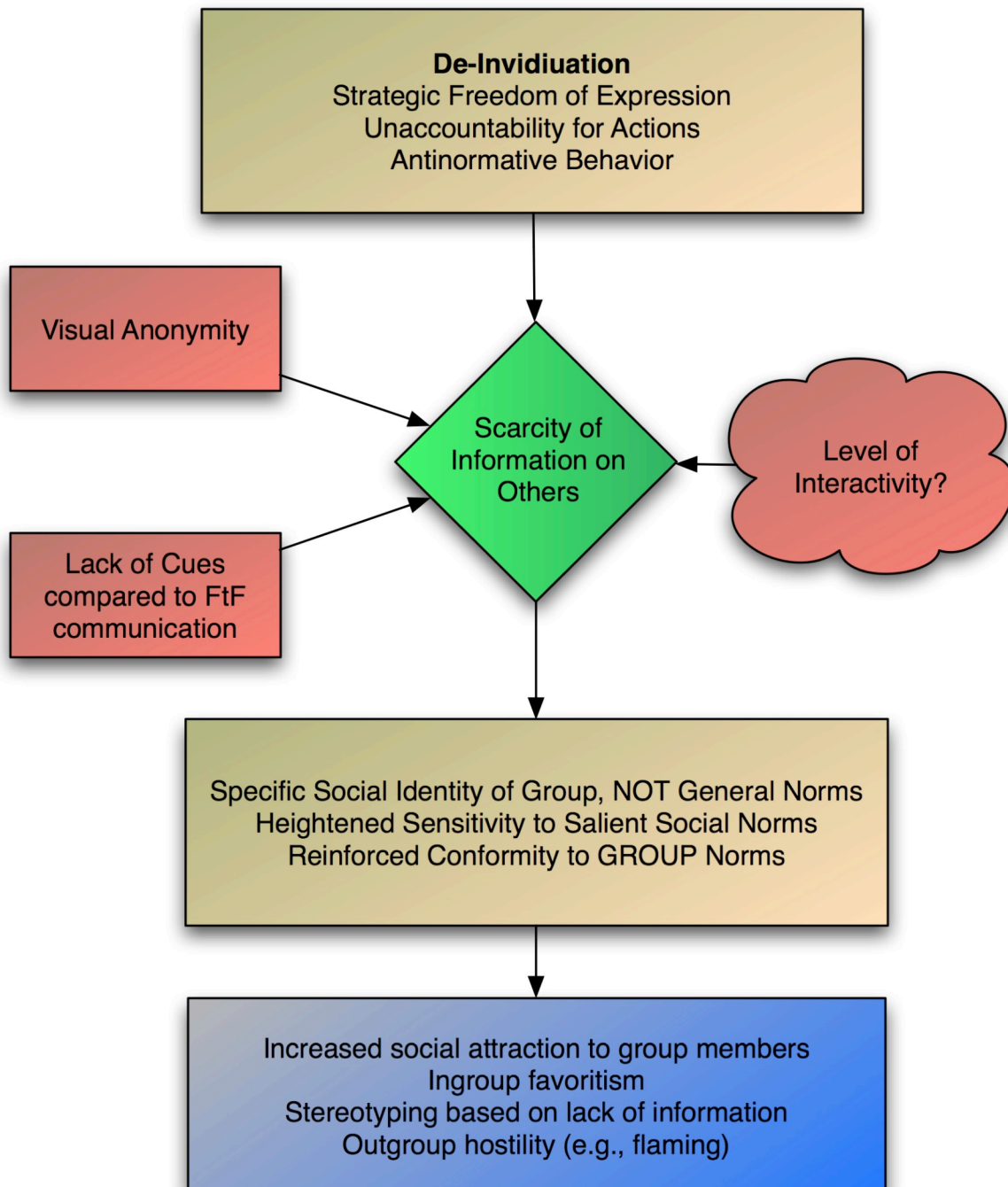
## APPENDIX C

**Social Information Processing Theory**

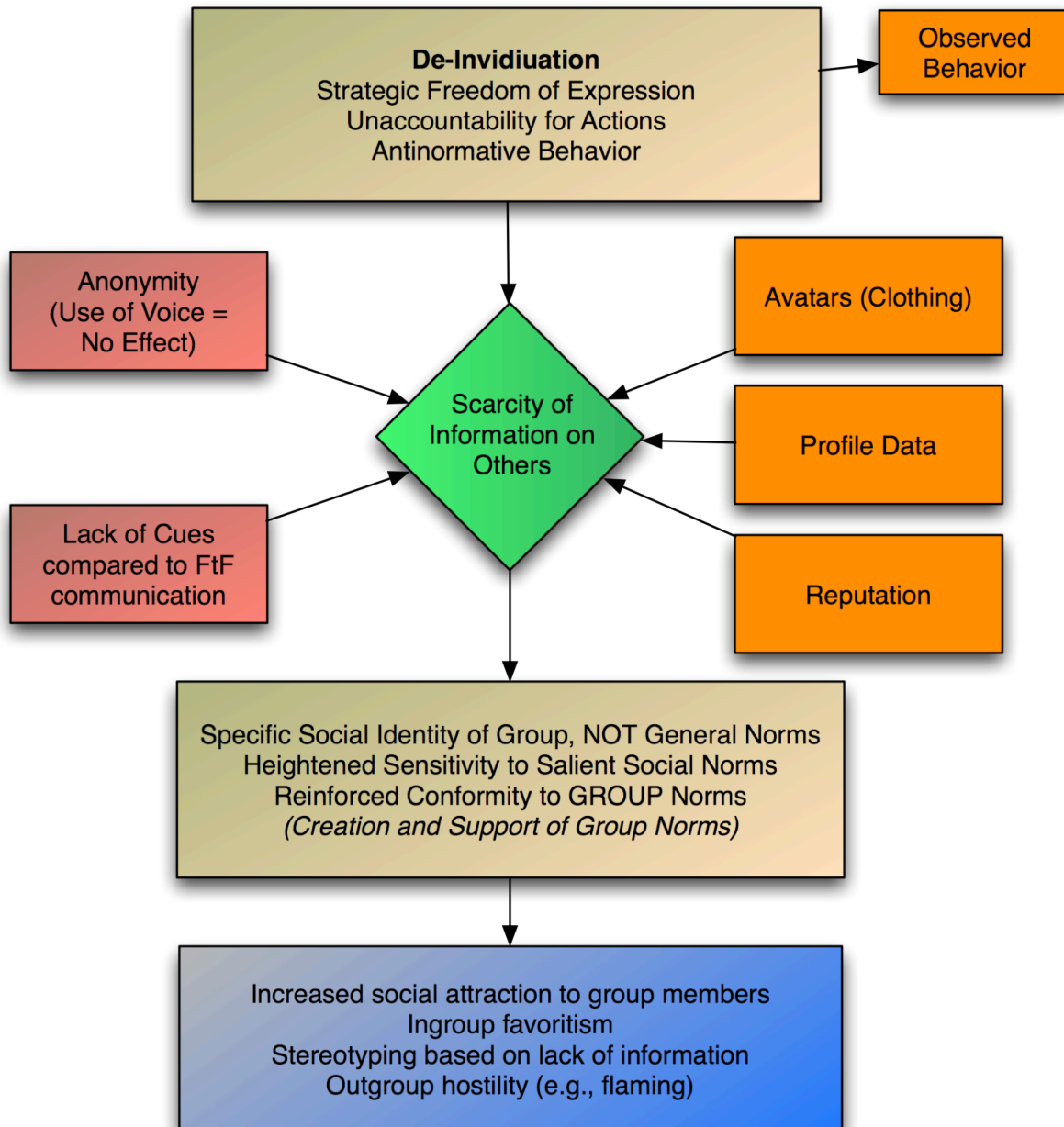
## Social Information Processing Theory - Conclusion



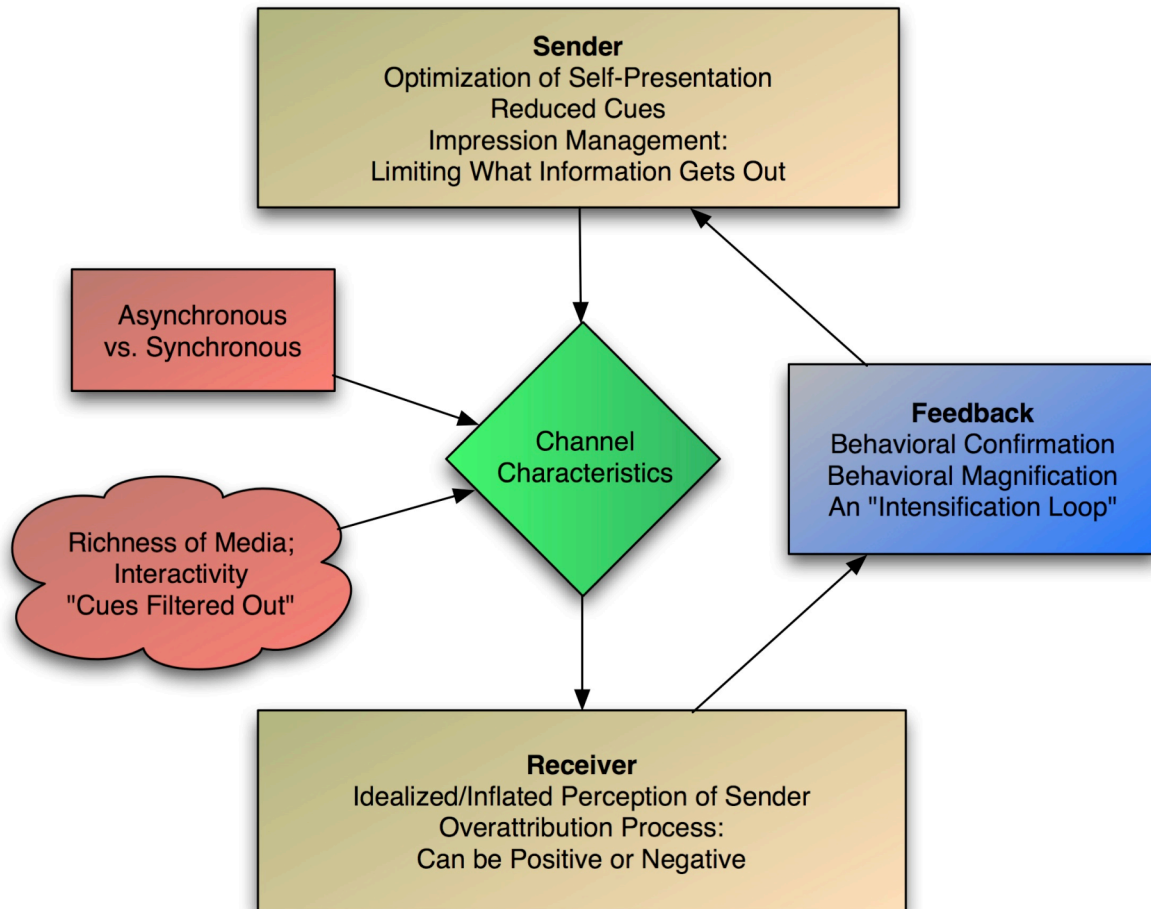
## APPENDIX D

**Social Identity Model of De-Individuation Effects**

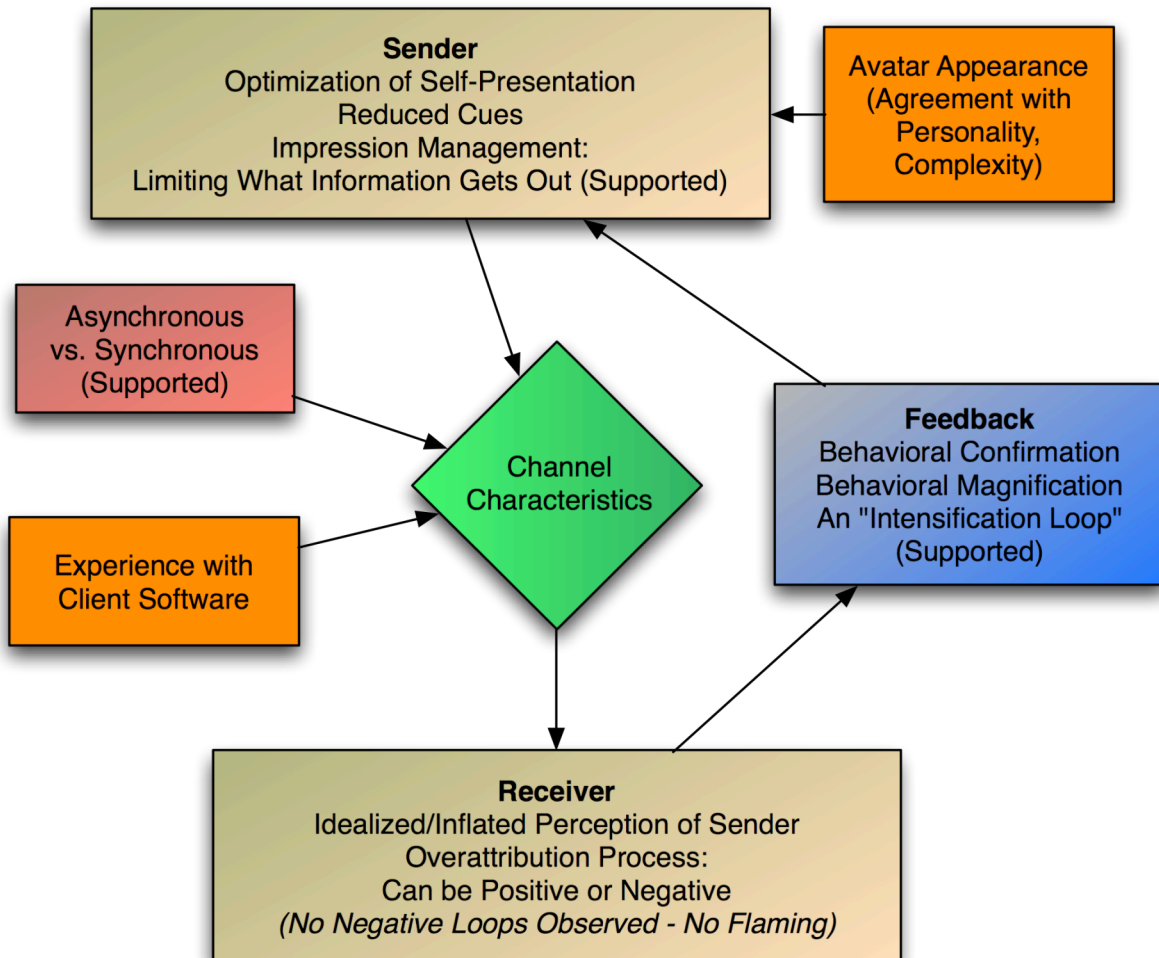
## Social Identity Model of De-Individuation Effects – Conclusion



## APPENDIX E

**Hyperpersonal Perspective**

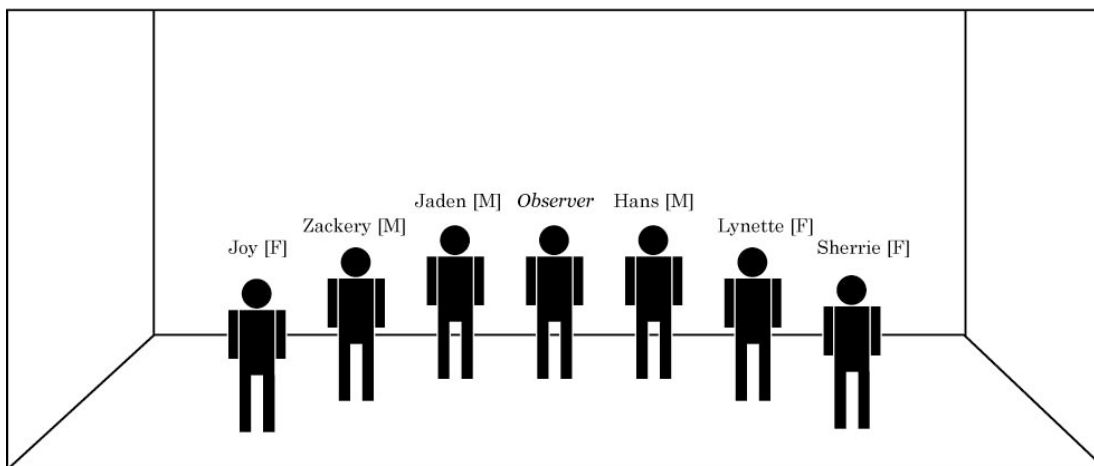
## Hyperpersonal Perspective – Conclusion



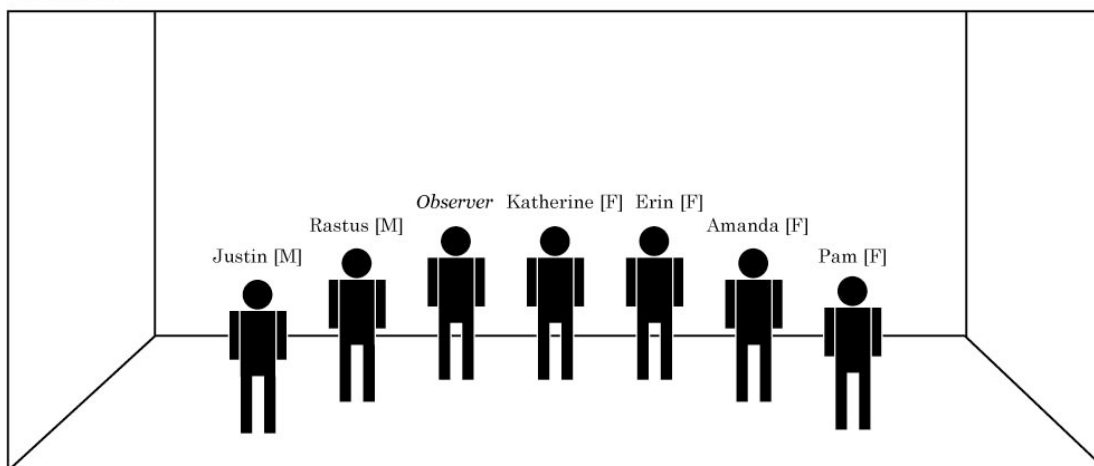
## APPENDIX F

## Group Diagrams

Group A:



Group B:



Group C:

