



**THE INTENSIFYING EFFECT OF COMPUTER-MEDIATED
COMMUNICATION ON IDENTITY SHIFT: PERCEPTIONS OF AUDIENCE
SIZE, ACQUAINTANCESHIP AND SELF-PRESENTATION CERTAINTY AS
INDICATORS OF SELF-CONCEPT CHANGE**

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Two studies were performed that explore the effects of internet self-presentations on *identity shift*, in which a person's self-concept is changed based on self-presentation (e.g., conceptualizing oneself as more extroverted). Study 1 demonstrates that identity shift is enhanced after self-presentation online relative to an offline self-presentation. Study 2 explores the mechanism behind this effect by manipulating perceptions of audience and time available for constructing a text-based, online self-presentation. The results of Study 2 revealed that perceptions of audience size and participants' expectations of acquaintanceship with the audience predict identity shift. In both studies, certainty in the task and ease of the also task increased identity shift. These results support previous work on biased scanning as a mechanism of identity shift and expand the boundary conditions of the public commitment model. Implications for real world internet users and future system designs are discussed.

BIOGRAPHICAL SKETCH

Amy Gonzales received her B.A. in 2001 from the University of California, San Diego in Psychology. She received a M.S. in 2006 from Cornell University in Communication and a M.A. in 2007 from the University of Texas at Austin in Psychology. She is originally from Delano, California. In addition to graduate research, Amy has worked as a medical translator, an elementary school substitute teacher and at the GAP, but she likes research the best. She lives with her wife, Catherine Taylor.

To Papa Lolo and Grandma Parsons

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TABLE OF CONTENTS

Biographical Sketch	iii
Dedication.....	iv
Acknowledgements	v
Table of Contents	vi
List of Figures	vii
List of Tables	viii
Chapter 1: Introduction	1
Chapter 2: Study 1: Does Text-Based Communication Enhance Identity Shift?	14
Chapter 3: Study 2: Do perceptions of audience enhance identity shift?	26
Chapter 4: General Discussion	55
Chapter 5: Conclusion	66
Appendices	70
References	77

LIST OF FIGURES

Figure 1	10
Figure 2	57

LIST OF TABLES

Table 1.....	21
Table 2.....	43
Table 3.....	44

CHAPTER 1

INTRODUCTION

What is ‘the self’? How do we come to have an understanding of who we are or how we exist in the world? One approach to these questions comes from research in social psychology on the self-concept (see Markus & Wurf, 1987 for review). The self-concept is a multi-faceted structure composed of different aspects of self (Carver & Scheier, 1981; Greenwald & Pratkanis, 1984; Markus & Kunda, 1986; Martindale, 1980). A person may have a different self-concept across multiple dimensions, including things like athleticism, intelligence, sociability, and so on. And although some people view the different aspects of self-concept as relatively stable (Maracek, & Mettee, 1972; McFarlin, & Blascovich, 1981; Swann & Hill, 1982; Swann & Read, 1981), others assume the self-concept is an ever changing composition of identities and attitudes that depend on a history of experiences and social contexts.

The idea of a multi-dimensional, dynamic self can be traced to symbolic interactionists (Cooley, 1902; Mead, 1934). These theorists believed that the self is borne out of social interactions, and that only through social interactions do people learn to view the self as an object in the world (Mead, 1934). Cooley referred to this phenomenon as the “looking-glass self” (Cooley, 1902). From this perspective, others act as a mirror that reflects the different self-presentations and gives a person insight into the self. When a person sees herself through the eyes of her mother, professor, or wife, her self-presentation changes with each person, and each of those self-presentations contributes to the overall self-concept.¹

The symbolic interactionist idea that self-presentations are instrumental in determining self-views is largely responsible for work in social psychology that arose

¹ Although there is ongoing debate in the literature about the definition and differences between self, self-concept, identity, personality, etc., I use the first three terms interchangeably in this paper to refer to a malleable, dynamic structure that defines individual self-awareness. This has primarily been referred to as the “self-concept” or “global self-concept.”

decades later on self-concept change (Bem, 1967; Festinger & Carlsmith, 1959; Janis & King, 1954). Theories of cognitive dissonance (Festinger & Carlsmith, 1959), self-perception (Bem, 1967), and biased scanning (Janis & King, 1954), are just a few of the theories that demonstrate that self-presentation behavior prompts a change in attitudes that is consistent with the self-presentation. In other words, if Anna is giving a presentation at work she may activate a “professional” self-concept and her attitudes become aligned with the self-presentation. On the other hand, a few hours later, at the after-work happy hour, while laughing and talking with friends she may activate a “fun” self-concept. Although each of these theories emphasizes a slightly different mechanism to explain attitude change, each theory relies on the basic assumption that internal psychological states are contingent on external, social circumstances.

If self-presentation behavior is central to self and identity, the question arises: how do modern, digital self-presentations affect the self-concept? Self-presentation is prevalent across the internet, making the question of its effects an important but understudied topic of research. Not surprisingly, internet researchers have found evidence of presentation tactics across a variety of internet sites that parallel the tactics used in offline communication (Dominick, 1999; Papacharissi, 2002). People are carefully considering self-presentations for their online audiences, just as they would offline. An intelligent comment on the Times’ discussion board or an insightful suggestion about a new restaurant on Yelp are both carefully designed to appeal to their specific audiences (e.g. Times v. Yelp readers). These findings are in keeping with offline work on self-presentation motives and behaviors (Goffman, 1959). What are the effects of these digital presentations on the individual that posted them?

The internet is not just another source of self-presentation; it is in many ways an amalgam of highly self-oriented communications. *Ego-centric networks*, or networks in which a single individual is at the center of the flow of information,

dominate many internet applications, including blogs, social network sites and personal homepages (Stefanone & Yang, 2008). Each of these is an example of a system that emphasizes the individual and is designed for the primary purpose of self-presentation. The growing emphasis on the self across the internet has prompted questions of increased narcissism due to the information age and inspired Time magazine to name “You” person of the year in 2006 (Buffardi & Campbell, 2008).

In all, the emphasis on self-presentation on the internet provides a ripe setting for understanding modern applications of theories of self-concept change. In addition to the prevalence of self-presentation today, the features of digital communication may also alter self-concept change processes in new and unexpected ways. For example, Sherry Turkle (1995) was one of the first authors to address the question of how the internet influences the self, with an emphasis on the fact that visual anonymity gave internet users the opportunity to be more exploratory with self-presentations. Not being able to see one’s audience generates a freedom of self-expression that lends itself to creative, novel identity investigation. As one early Internet user put it, “Part of me, a very important part of me, only exists in [the online Multi-User Domain (MUD) environment],” (p.12).

More recently computer-mediated communication (CMC) research has explored how the unique features of the internet not only shape the quality of social interactions, but also how those interactions act back on the self-concept (Gonzales & Hancock, 2008; Yee & Bailenson, 2007, 2009). For example, interactions in virtual reality alter the self-concept as indicated by subsequent behavior (Yee & Bailenson, 2007, 2009), and self-presentations in blogs redefine aspects of the self-concept as indicated by changes in attitudes and language (Gonzales & Hancock, 2008). These studies provide evidence that social interaction has the same effect on self-concept online that it does offline. As people construct self-presentations in a social interaction

online, the self-presentation will then shape self-awareness and identity.

The studies presented here address whether the process of self-concept change is exaggerated online due to features common to internet communication. The first study examines the intensification of self-concept change in CMC. The second study begins to explore the mechanisms that cause intensification by examining specific features of CMC and their effect on self-concept. I begin by discussing the theoretical mechanism behind self-concept change and the reasons that self-concept may be intensified online. This will involve a review of research on how self-presentation online is unique and a small body of work that has begun to look at the effect of digital self-presentations on the self.

Self-Concept Change

Multiple attribution theories have developed over the years to describe how human behavior, including self-presentation behaviors, influences self-concept and attitudes. Cognitive dissonance theory was developed to describe how peoples' attitudes about something change after exhibiting a behavior that is inconsistent with those attitudes (Festinger & Carlsmith, 1959). For example, if Jules gives a speech in favor of war even though he is against war he is likely to shift his attitudes towards a more pro-war stance after giving the speech. Festinger and Carlsmith (1959) argue that the inconsistency between attitudes and behaviors causes a state of discomfort, or *cognitive dissonance*. Because it is impossible to change behaviors after the fact, people will adapt their attitudes to match behavior to relieve this discomfort.

Self-perception theory was formed as an alternative explanation to cognitive dissonance theory to explain why attitudes often follow behavior. Bem (1967) argued that cognitive dissonance is unnecessary for attitude change. Instead he argued that people adapt attitudes to behavior any time an alternative explanation for the behavior is unavailable. From that perspective, Jules becomes *more* pro-war only if his initial

stance on war is not firmly held, and even if he was already in favor of the war. In other words, attitudes and identity are determined and reinforced *post hoc* as a function of behavior regardless of initial attitudes.

Related to self-perception and other attribution theories (e.g. cognitive dissonance, Festinger & Carlsmith, 1959), *biased scanning* describes how people change attitudes through cognitive processing associated with behavior. Biased scanning is the presentation of a specific attitude, which “increases the salience of [that attitude] and therefore increases the chances of acceptance of the new attitude position” (Janis & King, 1965, p.18). If Jules articulates a pro-war stance, the process of creating a logical argument and articulating that argument causes that argument to alter attitudes in favor of war. Biased scanning refers to the cognitive attention given to a self-presentation (opposed to any other presentation) that determines attitude change.

In addition to the necessary act of presentation itself, evaluations of one’s presentation moderate its effect on attitudes. For example, one’s interest in the self-presentation and satisfaction with performance influence the degree of attitude change following self-presentation (Girodo & Strickland, 1974; Janis & King, 1954). If Jules thinks that war is an important topic to start, and he is satisfied with his argument, he is more likely to be influenced by his presentation. Also, people that report being comfortable or certain with the presentation are also more likely to shift attitudes following a self-presentation (Steiner & Darroch, 1969). If Jules felt certain of the quality of his presentation he is more likely to become more pro-war than if he was uncertain. Attitudes about the presentation in part determine attitudes as a consequence of the presentation.

Early research on biased scanning often used political issues to demonstrate attitude change. Study participants were typically asked to articulate a ‘pro-’ or ‘con-’

attitude about issues such as capital punishment, bilingualism or the harmful effects of smoking marijuana, which typically resulted in attitude shift in the direction of the articulated argument (Heslin & Amo, 1972; O'Neill & Levings, 1979). Eventually researchers applied the theory towards attitudes about the self (Fazio, Effrein, & Falender, 1981; Jones, Rhodewalt, Berglas, & Skelton, 1981; Rhodewalt & Augustsdottir, 1986; Tice, 1992). As noted above, the self is a dynamic system made up of different perspectives and attitudes (Markus & Kunda, 1986). Through articulation of a particular self-presentation, people can change attitudes about the self, including levels of self esteem or self-perceptions of extroversion (Fazio et al., 1981; Tice, 1992).

There are limits to the degree of change within the working self-concept, however. The behavior that is presented must be related to the self, though it may not currently be central to the existing self-concept. For example, people that have normal or high self-esteem can be prompted into having higher self-esteem (Fazio et al., 1981). On the other hand, depressed individuals can be prompted to have lower self-esteem but not higher self-esteem (Rhodewalt & Augustsdottir, 1986). In other words, there is a *latitude of acceptance* for behaviors that will influence the self-concept. If an attitude about the self is difficult to access, that attitude will not influence the resultant attitude (Schwarz et al., 1991). The initial state of one's overall self-concept determines subsequent shifts in self-concept.

Biased scanning differs from cognitive dissonance theory in that it does not require negative psychological states to take effect (Janis & Gilmore, 1965). And unlike self-perception theory, biased scanning explicitly addresses the cognitive process associated with attitude shift. Biased scanning and self-perception theory are very similar, but self-perception theory does not address the cognitive processes associated with self-perception. It focuses on the observation of behavior, not the

mental state associated with that observation. Biased scanning, on the other hand, emphasizes the mental state associated with self-observation.

Biased scanning is particularly useful for understanding self-concept change in CMC because there is little physical enactment of behavior in CMC. For example, if Tyrel is talking to a group of friends about how well he played in his band last night he is likely to use physical motions and sound to emphasize his excellent guitar playing. On the other hand, if he shares this in his blog, the self-presentation is only constructed internally and punctuated only by the sound of the keys. Behavior in CMC is often the typing of words on a screen and the mental elaboration that goes along with that. Therefore a theory of attitude and self-concept change that emphasizes mental processes is particularly useful for describing attitude and self-concept change in CMC.

Self-presentation online. Given that features of digital media create a unique environment for constructing self-presentations, online self-presentations should have important implications for biased scanning and identity shift. For example, one effect of CMC environments is that self-presentations are generally asynchronously constructed. That is, self-presentation in CMC is not always extemporaneous as it is face-to-face, in which self-presentation is communicated as it is produced. When CMC is asynchronous, people can spend time laboring over what to say and how to say it before it is communicated. If Tyrel is writing a status update, for example, he can write and re-write the update before he posts it. If Jessica is making a video for YouTube, she can record and re-record the video until she feels that she has perfected her presentation. Digital media necessitates that people spend more time constructing a message because of the lag time between interactions. According to Walther (1996), this extra time contributes to a more carefully considered self-presentation, which may also result in more biased scanning.

Another feature of digital media that may influence biased scanning is the reduction of cues used to build self-presentations. Because digital communication is often text-based, people typically cannot hear the other person or see what they look like and vice versa. Even when visual information is available in CMC it does not always occur in real-time (e.g. Facebook profile picture). As Walther notes, in digital communication one does not have to “hold in one’s waist, nod, smile, remember to ‘look interested,’ and so on,” (1996, p.22). We do not have to be worried about what we look like or how we sound in most CMC environments². In text a person can reallocate the attention that would typically be given to non-verbal cues, to the self-presentation. If attitude change is a result of the cognitive processes associated with self-presentation, having more attention during self-presentation might also increase biased scanning.

The combined effect of having more time for self-presentation and fewer cues to distract from the self-presentation means that online, people have the opportunity to construct *selective self-presentations* (Walther, 1996). Selective self-presentation refers to the optimization of self-presentation. Because Walther is primarily interested in interpersonal impression formation he argues that selective self-presentations are one way that online impression formation is exaggerated compared to offline impression formation. Selective self-presentations, combined with a tendency for receivers to overemphasis information in CMC, can lead to more extreme interpersonal impressions in CMC compared to face-to-face (Boucher, Hancock, & Dunham, 2008; Douglas & McGarty, 2001; Epley & Kruger, 2005; Hancock & Dunham, 2001; Jiang, Bazarova & Hancock, in press; Peña, Walther & Hancock,

² Of course, this assumes that CMC is text-based, and does not include video or audio cues. Video and audio cues are not uncommon forms of CMC. CMC is used here synonymously with “internet,” “online,” and “digital technology,” and there are millions of systems that vary in thousands of ways, that fall into some or all of these categories. Because I do not test all of those here, I use the term broadly with the assumption that the processes outlined here would vary somewhat across system, (just as the manifestation of any laboratory findings depend on real-world contexts.)

2007). For example, participants that were given a joint task used less information to form more intense impressions of in CMC compared to face-to-face (Hancock & Dunham, 2001). In CMC, people over rely on the little information they have to form overall impressions of each other, which are often exaggerated.

If interpersonal impressions are intensified online due to selective self-presentation, is it possible that impressions of self are also intensified in CMC? As noted above, biased scanning is intensified by increasing the amount of confidence and certainty that a person has in his or her self-presentation (Janis & King, 1954; Steiner & Darroch, 1969). When people feel more certain about their self-presentation they are more likely to see a shift in attitudes. In CMC, the same features that allow for selective self-presentation—greater time and attention—should also contribute to certainty (Barden & Petty, 2008). Evidence of this has been found in groups that spend more time and detail deliberating a task in CMC than in face-to-face (Di Blasio & Milani, 2008). Mental elaboration contributes to both the strength and certainty of attitudes, and, according to Walther (1996), people can elaborate more on self-presentations in CMC than in face-to-face (Barden & Petty, 2008; Petty, Haugtvedt, & Smith, 1995). In other words, CMC may enhance certainty through selective self-presentation and enhanced certainty may intensify the change in attitudes about the self that typically follows self-presentation (Figure 1).

Some research in CMC has examined the relationship between CMC and the self. Most of that research has focused on the quality of self-presentation online and has not looked at the effect it has on the self. A smaller body of work has examined changes in the self after CMC, but this work has not compared online and offline effects. A review of this literature is valuable, however, in order to establish a useful context for understanding new work on self-concept change, and is examined below.

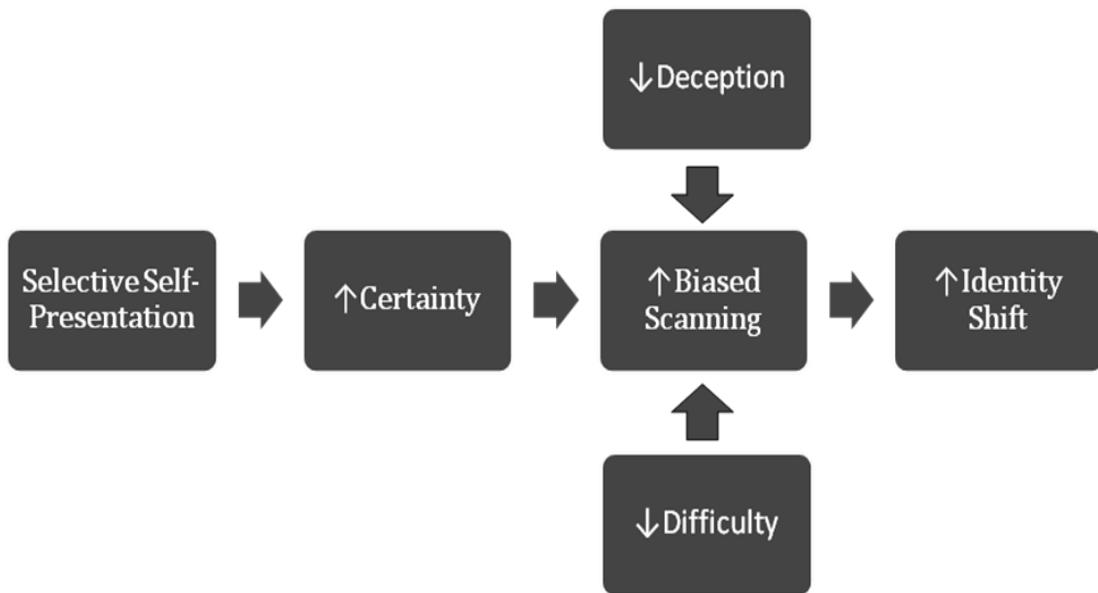


Figure 1. Model of Effect of CMC on Identity Shift via Intensification of Certainty and Biased Scanning

Self-Concept Change Online

Mounting evidence suggests that individuals take advantage of media affordances to engage in identity exploration in computer-mediated communication (CMC). Being anonymous means that self-exploration online often feels safer and reduces social risks (McKenna & Bargh, 2000). Generally, Internet users disclose more (Joinson, 2001), and are better able to access their “true” selves when they are in text (Bargh, McKenna, & Fitzsimmons, 2002). There is evidence of identity construction across many different digital systems, including webpages (Harmon-Jones, Schmeichel, & Harmon-Jones, 2009), online games (Bessière Fleming, & Kiesler, 2007; Hussain & Griffiths, 2008), dating websites (Yurchison, Watchravensringkan, & McCabe, 2005) and blogs (Trammel & Keshelashvili, 2005). Gamers, for example, create avatars that are more like their ideal selves than their actual selves, particularly when the offline self is depressive or has low self-esteem

(Bessière et al., 2007). And scientists' publication rates are inversely related to the number of titles used on web pages, providing further evidence that internet self-presentations can be used to express and affirm desired identity (Harmon-Jones et al., 2009). Young adults are especially invested in identity exploration online, sometimes exploring new identities (e.g. being older, different gender) and sometimes learning how to articulate existing identities (Gross, 2004; Stern, 2004; Subrahmanyam, Greenfield, & Tynes, 2004).

The research on internet self-presentations suggests that people are more expressive, more authentic, and more like their ideal selves in many online contexts. There is also evidence that online self-presentation can be a strategic attempt to enhance identity (Ellison, Gibbs, & Heino, 2006; Harmon-Jones et al., 2009; Toma, Hancock, & Ellison, 2008; Walther, 2007). Though some authors have explicitly hypothesized that online self-enhancement has a measurable effect on subsequent offline self-view (e.g. Bessière et al., 2007), little research has explored this effect directly. The small body of work that has examined this question direction has looked at self-concept change in virtual reality and blogs.

Virtual Reality. Previous work has examined self-concept change online in a limited fashion. Recently there has been interesting work on changing self-concept in video games and virtual reality (VR) (Farrar, Krcmar, & Nowak, 2006; Yee & Bailenson, 2007, 1009; Yee, Bailenson & Ducheneaut, 2009). Yee and Bailenson (2007) have demonstrated evidence of the *Proteus Effect*, which occurs when people adopt behaviors that correspond with their appearance in virtual reality. For example, during social interactions in VR, individuals made to appear tall were more forceful in negotiations than those made to appear short. Individuals made to appear attractive stood closer to other participants and were friendlier than those made to appear unattractive. In other words, participants adopted behaviors associated with the

identities of their virtual characters. This effect also carried over into subsequent face-to-face interactions, suggesting a temporary lasting effect of digital self-presentations on the self-concept (Yee et al., 2009).

The authors describe the Proteus Effect using self-perception theory. In the case of the Proteus Effect, observation of the self as attractive, for example, prompts a shift in attitudes toward the self as attractive. This shift is evidenced behaviorally. According to Bem (1972, p.2), “to the extent that internal cues are weak, ambiguous, or uninterrupted, the individual is functionally in the same position as an outside observer.” This is especially true in virtual reality when the image of self is truly that of a different person.

Blogs. Whereas the Proteus Effect has demonstrated behavioral change as a consequence of self-perception, Gonzales and Hancock (2008) examined self-reported self-concept change in text-based environments. This process was labeled, *identity shift*. Identity shift is the change in internal self-appraisals following digital self-presentations. Based on work in offline environments (Tice, 1992), participants were asked to present themselves in text by answering personal questions from the perspective of an introvert or extrovert. Participants described attitudes about school, fun and family. Participants were told not to lie about their self-presentations, but rather to recall previous experiences that confirm the assigned self-presentation. In that way the experimenters were better able to ensure that biased scanning took place. That study demonstrated that identity shift can take place as a function of text-based self-presentations just as it does following oral self-presentations.

In Gonzales and Hancock (2008), language analysis of the self-presentation texts was performed to examine qualitative differences that may be indicative of identity shift. Participants that reflected a greater degree of certainty in the language of their self-presentations demonstrated greater identity shift. This includes greater use of

words such as, *definitely*, *absolutely*, *sure*, and *know*. The relationship between increased use of certainty words and greater identity shift is consistent with previous work that found that greater confidence in one's presentation and being more comfortable with the performance enhance attitude change (Janis & King, 1954; Steiner & Darroch, 1969). These findings suggest that participants' attitudes about the self-presentation have the same moderating effect on attitudes in text as they do offline.

To date, no research has examined whether text-based self-presentations have a different effect than non-mediated self-presentations on self-concept. More specifically, given the features of text-based communication media that allow people to present enhanced self-presentations, is there an exaggerating effect on biased scanning and identity shift because people have more time and energy to process the self-presentation? To test this, the following study examines the difference between mediated and non-mediated presentations on the self.

CHAPTER 2

STUDY 1: DOES TEXT-BASED COMMUNICATION ENHANCE IDENTITY SHIFT?

To explore media differences on identity shift, the first study compares the effects of self-presentation in a blog to the effects of self-presentation in a video self-presentation. This study is the first to demonstrate whether features of the internet that allow for selective self-presentation enhance identity shift relative to communication environments that do not possess those features. This study is in keeping with a tradition of research in CMC that compares differences in psychological effects of various media (Douglas & McGarty, 2001; Epley & Kruger, 2005; Gonzales, Hancock, & Pennebaker, 2010; Gonzales & Hancock, in press; Hancock & Dunham, 2001; Lea & Spears, 1992; Stewart, Setlock & Fussell, 2004; Toma et al., 2008; Walther, 1996; Weisband & Atwater, 1999). The design follows previous experimental work on self-concept change (Gonzales & Hancock, 2008, Kelly & Rodriguez, 2006; Tice, 1992).

To examine the impact of asynchronous self-presentations on identity shift levels of self-reported extroversion and introversion were compared after individuals presented as extroverted or introverted. Participants were expected to shift their self-concept to match their behavior, or rather display identity shift as a function of their self-presentation. Measurement of change in self-reported extroversion and introversion were used to determine the effect of media on identity shift, and have been used across multiple studies for this purpose (Fazio et al., 1981; Kelly & Rodriguez, 2006; Kunda & Sanitioso, 1989; Sanitioso & Wlordarski, 2004; Tice, 1992).

It is important to note that extroversion and introversion have not been conceptualized as stable personality traits in this line of research (e.g. The Big Five),

but rather as a more malleable aspect of the introverted or extroverted self-concept. Although personality is primarily stable (Eysenck & Eysenck, 1985), there is some small variability in the “periphery of weaker, more situational dependent self-beliefs” (see Kelly & Rodriguez, 2006, p. 185). The long-term impact of subtle changes to these situational self-concepts depends on the ability to reinforce that self-concept over time (Swann & Hill, 1982), something that is possible in many CMC spaces.

In Study 1 participants were asked to present themselves as an extroverted or introverted person while answering four personal questions. This presentation took place in one of two possible conditions described in previous research testing identity shift: in a popular form of CMC, blogging (see Gonzales & Hancock, 2008), or in a simulated face-to-face environment, using a video camera (see Kelly & Rodriguez, 2006). In the blog condition participants created a text-based self-presentation.

Participants in the video condition created a self-presentation by physically constructing their presentation in front of a camera. A camera was used instead of a confederate audience in order to mitigate the idiosyncratic effect of a real audience, and to avoid the effect of feedback, which is an important factor for inducing identity shift but falls outside the discussion of this study (see Walther et al., under revision, for discussion of feedback in CMC). Although a video recorded self-presentation is not a perfect substitute for face-to-face interaction, it maintains the relevant media differences: it does not allow for real-time editing and it requires that participants attend to their visual, non-verbal cues. These factors should take more attention away from the self-presentation than they would in CMC.

CMC presentations give people more time and energy to attend to the self-presentation. Extra time and attention should enhance the bias scanning process, which should in turn intensify identity shift. In comparing the difference in self-concept following CMC and face-to-face simulated self-presentations, it is therefore predicted

that:

H1a: Individuals assigned to portray extroverts will report being more extroverted after a blog self-presentation than after a video self-presentation.

H1b: Individuals assigned to portray introverts will report being more introverted after a blog self-presentation than after a video self-presentation.

As noted above, greater cognitive processing of one's self-presentation leads to greater certainty and strength of an attitude (Barden & Petty, 2008; Petty et al., 1995). If Jessica is more thorough and careful in how she presents herself online compared to face-to-face, she is much more likely to feel confident and certain in the final self-presentation. Moreover, online participants should have more cognitive resources to think about the self-presentation because there is more time to attend to the self, and fewer distracting cues online (Walther, 1996). In other words, it should be easier for Jessica to construct a self-presentation that she is certain of in CMC than in face-to-face. Thus, it is predicted that:

H2: Participants will be more certain of their self-presentations after a blog self-presentation than after a video self-presentation.

Finally, previous studies have found that reactions to one's self-presentation can moderate the effect of self-presentation on attitudes (Girodo & Strickland, 1974; Janis & King, 1954; Steiner & Darroch, 1969). When participants feel comfortable with a given self-presentation, and believe that it was performed successfully, the presentation will have a stronger influence on attitudes (Janis & King, 1954, Steiner &

Darroch, 1969). Therefore, if Jessica is more certain of her self-presentation in CMC than in face-to-face, than she is more likely to shift her self-concept to match the self-presentation that took place in CMC than in face-to-face. The final hypothesis in Study 1 proposes:

H3: Certainty will mediate the effect of media on identity shift.

Method

Participants

Seventy-seven individuals, 40 females and 37 males, from a large Northeastern university participated in this experiment for course credit. The final analysis included 38 participants in a blog self-presentation condition (18 assigned introverts and 20 assigned extroverts) and 39 participants in a video self-presentation condition (19 assigned introverts and 20 assigned extroverts).

Procedure

Participants were brought into the lab and asked to first read over a consent form that described the study as a test of one's ability "to express various traits." After completing the consent form participants were assigned to portray themselves as either extroverted or introverted while answering four different personal questions.

Participants were given brief definitions taken from Tice (1992) of what it means to act extroverted or introverted. This was done to better control for participants' interpretation of each characteristic, and also to emphasize a positive construal of being either introverted or extroverted.

The questions addressed time spent with family, friends, extracurricular activities and things learned in college (Fazio et al., 1981). Participants were asked not to lie in their responses, but instead to "think of times in which you have exhibited this trait in order to make your interview seem as realistic as possible." This prompt

followed a previous protocol by Tice (1992), and was intended to prompt biased scanning.

After completing the consent form and agreeing to present the assigned trait, participants were directed into a small room with a computer and a video camera. In the blog self-presentation condition, participants were asked if they knew what a blog was. Regardless of their answer participants were told that a blog is “often used as an online journal,” but that it was being used in the study to enable remote data collection and analysis. Participants were told that a single person from the experiment would read the responses but that the blog was also open to others online. This was done to increase generalizability to other internet applications. Participants were then given a piece of paper with four interview questions and instructions to begin their post by providing personal information (name, age, major, and hometown).

In the video self-presentation condition participants were told that their responses would be recorded in a video camera and that a graduate student would come in and view the tape to analyze the response after the participant had completed the study (see Kelly & Rodriguez, 2006). As in the blog condition, participants in the video condition were given a piece of paper with four questions and instructions to begin the response by providing personal information (name, age, major, and hometown). In both self-presentation conditions participants were told that the person who would later evaluate the response would be someone other than the experimenter.

In both conditions participants were asked to begin responding to the questions after the experimenter left the room. The participant was instructed to signal to the experimenter using an intercom buzzer when the question responses were completed. At that point the experimenter re-entered the room with follow-up questionnaires. Participants were told that they needed an “actual” measure of extroversion/introversion to verify the presentation. In reality this measure was the

primary dependent variable. After completing the questionnaires the participants signaled the experimenter again and were debriefed.

Measures

Identity shift. After presenting an assigned trait, participants were asked to provide an “actual measure” of introversion/extroversion (see Appendix). The measure of identity shift consisted of 10 bipolar items assessing intro/extroverted self-concept on an 11-point scale (Fazio et al., 1981; Tice, 1992). Items were reverse coded when necessary and summed ($\alpha = .90$). Measures of extroversion identity shift were reflected by high scores on the bipolar scale and measures of introversion identity shift were reflected by low scores on the bipolar scale. Final reports on this measure were used to assess identity shift.

Self-presentation certainty. Three questions were used to measure participants’ certainty following their self-presentation. The questions were taken from previous research on certainty in computer-mediated communication (Tanis & Postmes, 2007). Subjects were asked, “*At this moment I feel [At ease/Not at ease; Uncomfortable/Comfortable; Uncertain/Certain,*” on a 7-point scale. The first item was reverse coded so that a high score reflected greater certainty. The three items were averaged to form an overall rating of certainty ($\alpha = .83$).

Presentation difficulty. Participants were asked about the difficulty of the performance as a manipulation check to assess that they were able to activate bias scanning. Participants must feel that they were able to present as either an introvert or extrovert in order to access bias scanning and thus, participate in any degree of identity shift. A single item 5-pt Likert scale was used to assess, “How difficult was it for you to portray yourself as an [introvert/extrovert]?” (*1=Not At All Difficult; 5=Very Difficult*).

Results

Identity Shift

The first set of hypotheses predicted that trait presentation would interact with medium such that there would be a greater effect of identity shift in the blog condition than in the video conditions (H1a and H1b). To test these hypotheses people assigned to portray extroverts were compared across media and people assigned to portray introverts were compared across media. It was expected that participants in the extroverted condition would report being more extroverted after presenting in the blog than in video, and participants in the introverted condition would report being more introverted after presenting in the blog than in video. Identity shift for assigned extroverts should involve becoming highly extroverted after self-presentation and identity shift for introverts should involve becoming highly introverted.

As shown in Table 1, participants assigned to portray an extrovert experienced higher levels of identity shift in the blog condition than in the video condition, $t(74) = 2.01, p < .05, d = .47$, consistent with H1a. Individuals assigned to portray introverts, however, did not report higher levels of identity shift in the blog, $t(74) = -.12, p < ns$, disconfirming H1b. These data suggest that the enhancement of identity shift in the blog condition was limited to participants in the extroversion self-presentation condition.

To understand why identity shift was not observed for participants assigned to the introvert condition difficulty scores were examined for each trait. A t -test revealed that participants found portraying an introvert more difficult ($M = 3.00, SD = 1.24$) than portraying an extrovert ($M = 2.05, SD = 1.02$), $t(73) = 3.62, p < .001, d = .85$. Furthermore, by reverse scoring the extroversion scores for assigned introverts it is possible to then correlate a single identity shift score with difficulty. Indeed participants that found the task difficult demonstrated less identity shift, ($r = -.51, p < .001$). This observation suggests that the difficulty participants experienced in

Table 1. Extroversion Means in Blog and Video Conditions for Assigned Introverts and Extroverts

	Assigned Extrovert				Assigned Introvert			
	Blog		Video		Blog		Video	
	M	SD	M	SD	M	SD	M	SD
Extroversion Measure	80.5 ^a	9.01	72.3 ^a	15.88	74.24	9.09	74.63	11.35

Note: The Extroversion Measure is a bi-polar measure (*range=11-110*). Introvert refers to those people assigned to portray an introvert and Extrovert refers to those people assigned to portray an extrovert. *M* refers to the condition mean. *SD* refers to the condition standard deviation. ^aMean difference of $p < .05$.

presenting introversion may explain why identity shift took place in the extroversion condition but failed to do so in the introversion condition.

Self-Presentation Certainty

The second set of hypotheses examined the role of self-reported certainty in determining identity shift. First, it was expected that due to increased time for mental processing of the self-presentation in text, participants would be more certain after their presentation in the blog than in the video condition (H2). Consistent with this prediction, a *t*-test demonstrated that participants were more certain in the blog condition ($M = 5.58$, $SD = 1.11$) than they were in the video condition ($M = 4.24$, $SD = 1.39$), $t(74) = 3.15$, $p < .001$, $d = 1.07$. Second, it was expected that certainty would mediate the effect of communication medium on identity shift (H3). The mediation analysis was limited to participants in the extroversion condition, given the lack of identity shift for participants assigned to portray introverts.

Mediation was tested using the four step OLS mediation analysis outlined by Baron and Kenny (1986), as well as a bootstrapping analysis of indirect effects (Preacher & Hayes, 2008). Although Preacher and Hayes (2008) argue that it is unnecessary to perform the Baron and Kenny (1986) analysis if another test of

mediation is performed, I decided to include the Baron and Kenny (1986) analysis because it allows the reader to see the relationship between each pair of variables in the mediation process.

In the Baron and Kenny analysis (1986), the initial step determines the relationship between the independent variable, communication medium, and the dependent variable, self-reported levels of extroversion following self-presentation. Confirming the effect reported above, ($b = .31, p < .05$), participants in the blog condition reported being more extroverted than participants in the video condition.

The second step requires that the independent variable, communication medium, predict changes in the potential mediator, certainty, which was also confirmed ($b = .52, p < .001$). Participants were more certain in the blog condition ($M = 5.58, SD = 1.11$) than they were in the video condition ($M = 4.24, SD = 1.39$).

The third step involved regressing self-reported extroversion scores on both reports of certainty and medium. This step establishes whether the potential mediator, in this case certainty, significantly predicts a change in identity shift while controlling for the independent variable, communication medium. This analysis revealed that when controlling for medium, certainty significantly increased the level of reported extroversion ($b = .57, p < .001$), suggesting that participants demonstrated greater identity shift as they expressed more certainty.

The fourth step tests for complete mediation. To do so the inclusion of the mediation variable (certainty) in the regression model must result in a non-significant effect of the independent variable (medium) on the dependent variable (reported extroversion). This effect was observed in the current model. Self-presentation medium no longer predicted a change in reported extroversion when certainty was included in the model, ($b = .01, p = ns$). This mediation effect was confirmed by a test of indirect effects using bias-corrected and accelerated bootstrapping confidence

intervals. The bootstrap output shows that the indirect effect is different from zero using 95% confidence intervals with a sample size of 5000. This result adds additional support to the notion that certainty has an indirect effect on identity shift.

In sum, findings from both analyses demonstrate that certainty following a self-presentation fully mediated the relationship between medium and extroversion. Participants that expressed certainty following their presentation were more likely to take on the expression of extroversion as part of identity.

Discussion

The purpose of this study was to examine whether CMC presentations exaggerate changes in attitudes about the self relative to offline presentations. A blog was used to represent CMC communication and video was used to represent face-to-face communication. There are a few important contributions from this study. First, although previous work has demonstrated that text-based self-presentations can lead to identity shift (Gonzales & Hancock, 2008), these data are the first to demonstrate that the effects of biased scanning are intensified in CMC relative to face-to-face communication. Second, this study adds to the growing body of research describing the intensification of social processes in CMC. Though previous work describes how and why online self-presentations lead to intensified impressions of others (Boucher et al, 2008; Hancock & Dunham, 2001; Peña et al, 2007), the present study demonstrates that self-presentations online intensify impressions of the self.

Results from Study 1 also supported biased scanning as the mechanism behind self-concept change online. Biased scanning theory suggests that cognitive processing during the formation and articulation of a self-presentation is what prompts the change in attitudes or self-concept (Janis & King, 1954). The degree of identity shift should depend on a person's reactions to his or her self-presentation, with greater confidence, certainty, and ease of presentation increasing the degree of change (Girodo &

Strickland, 1974; Janis & King, 1954; Steiner & Darroch, 1969). In this study greater certainty in the self-presentation was responsible for the intensification of identity shift. This suggests that the features that allow for greater attention to self in CMC also increase certainty in one's self-presentation, as described in Figure 1.

The findings suggest that modern social media (i.e. Facebook, blogs, discussion boards, etc.) may be more important in shaping how we think about ourselves than older, traditional forms of communication. CMC is unique because it is more asynchronous than face-to-face communication and generally permits a greater degree of anonymity. At the same time digital technology is increasingly accessible. Combined, the unique features and pervasive accessibility of digital media underscore the implications of these findings. That is, self-presentation online may be a more efficient way of constructing identity than traditional spaces of self-presentation, including face-to-face communication.

It is important to note that participants assigned to portray an introvert did not evidence identity shift. If it is hard to access past evidence of a self-concept, that self-concept is unlikely to become resituated as a dominant part of the self. Given that the population of participants were undergraduate students in communication, it is possible that introversion was too far outside their "latitude of acceptance" to become part of the existing self-concept (Rhodewalt & Agustsdottir, 1986). This is supported by the finding that participants found it more difficult to portray an introvert than to portray an extrovert, and is consistent with previous work on attitude change that argues that attitudes must be mentally accessible to influence self-concept (Schwarz et al., 1991). In addition, the media itself may lend itself to extroversion, as suggested by research that shy people are more comfortable being extroverted online (Valkenburg & Peter, 2008), and that people in general are more likely to self-disclose in CMC compared to face-to-face encounters (Joinson, 2001). Although the exact reason is

unknown, it is clear that participants found it difficult to act introverted compared to acting extroverted. This suggests that biased scanning was not allowed to operate effectively for people assigned to portray introverts, which reduced identity shift.

CHAPTER 3

STUDY 2: DO PERCEPTIONS OF AUDIENCE ENHANCE IDENTITY SHIFT?

Though Study 1 found important differences across media, the study suffered from the natural confounds present whenever different media are compared. Though common, cross-media comparisons are problematic because they mask some of the individual factors that may drive effects. For example, CMC is verbal, asynchronous, editable, and typically more public than face-to-face communication. Face-to-face communication is multi-modal, extemporaneous and non-editable. Furthermore, one's audience in face-to-face is typically limited to those within physical range and view. These are just a few of the confounds found in media comparisons that are potentially relevant for the present research.

The confound of audience is particularly important. Previous work has found that audience can be an important factor in prompting self-concept change (Gonzales & Hancock, 2008; Kelly & Rodriguez, 2006; Schlenker, Dlugolecki, & Doherty, 1994; Tice, 1992). Using a model of *public commitment*, Study 2 explores how having an audience during self-presentation activates a sense of obligation to behavior (Schlenker et al., 1994). In this way, audience may be another way to enhance biased scanning (Tice, 1992). According to the public commitment model, public self-presentation influences attitudes and self-concept to a larger degree than private self-presentation.

Findings from Study 1 indicate that online self-presentations are especially effective in changing attitudes about the self. The goal of the next study was to systematically examine the potential factors underlying identity shift. This study takes place within the same medium in order to avoid the natural confounds associated with cross-media research. It focuses on two factors that may underlie identity shift in online settings. The first, as described in Study 1, is asynchronicity (e.g., more time to

craft and edit presentations, etc.). The second factor is perceived audience, which is assessed using the framework of the public commitment model.

Public Commitment and Perceptions of Online Audience

Public commitment suggests that people become committed to public self-presentations and it is the implicit obligation to those presentations that enhances self-concept change (Schlenker et al, 1994). Public commitment has explained a variety of effects on attitudes and behaviors (DeYoung, 1993; Jellison & Mills, 1969; Kelly & Rodriguez, 1996; Schlenker et al., 1994). Public commitment to pro-social behaviors increases the behaviors, such as increased likelihood of recycling (see DeYoung, 1993). Public declaration of an opinion on an issue strengthens that opinion (Jellison & Mills, 1969). Even impression formation of others has been shown to be more extreme when an audience is present, suggesting that the presence of others accentuates the effect of behaviors on attitudes more generally (Thomas, Skitka, Christen & Jurgena, 2002).

There are a handful of studies demonstrating that attitudes about the self change according to the perceived *publicness* of the behavior. For example, perceptions of audience determine which of two competing presentations will affect identity (Kelly & Rodriguez, 2006). When people present as both introverted and extroverted and then are told that only one presentation will have an audience, they identify with the public presentation.

Perceptions of having an audience can also contribute to behavioral change associated with the new self-concept (Tice, 1992). After a supposedly public extroverted presentation, participants were more likely to initiate conversation with a stranger and sit closer to a stranger than participants that presented as introverts. There are also instances in which imagining an audience is sufficient to activate public commitment (Schlenker & Wowra, 2003; Schlenker, Wowra, Johnson & Miller,

2008). Across multiple studies, having an audience, real or imagined, during self-presentation causes the presentation to become re-evaluated as a reflection of self.

In previous work on offline public commitment, the ostensible audience consists of one person. Tice (1992) compared the effects of self-presentations that were supposedly heard in real time by a single person (public) to presentations that were recorded and heard later (private). Similar studies have used video recordings that participants were told would or would not be made public (Kelly & Rodriguez, 2006), and in other cases participants were asked to participate in an interview with a confederate or did not interview at all and were instead given a private filler task (Schlenker et al., 1994). In all of these cases, the effect of being public on the self was due to a real or potential, one-person audience

The internet often allows for an audience of one person (e.g. email, chat, SMS), but it frequently allows for many people to view the same self-presentation (e.g. SNSs, multi-party email, discussion boards, blogs, YouTube). In previous work on mediated identity shift the effect of expecting to have a single person audience was compared to the effect of expecting the internet public found in a blog, which could literally be anyone online (Gonzales & Hancock, 2008). In that case having a blog audience compared to a single person induced identity shift, demonstrating that perceptions of having an internet audience induce identity shift. However, Gonzales & Hancock (2008) does not reveal whether identity shift increases directly as the perceived size of the audience increases.

There is little work on the effect of audience size on behavior change or the effect of audience size on identity shift in particular. There is some evidence, however, that social facilitation is impacted by a graded increase in audience size (Knowles, 1983). Performance on basic cognitive tasks has been linked to graded changes in the size of the audience (2, 4, or 8 people). There is also a small body of literature on non-

conscious behavior changes due to audience size that support this idea. For example, people blushed more (Shearn, Bergman, Hill, Abel & Hinds, 1992), and laughed louder and longer during a humorous film as audience increased (Butcher & Whissell, 1984). People also became physically tenser during a performance as a direct effect of audience size (Latané & Harkins, 1976; Jackson & Latané, 1981).

Because the internet is often characterized by sites with audiences of varying size, from one person to many times that, it is useful to understand if differences in perceived audience size correspond to differences in the degree of identity shift. The public commitment model suggests that audience is relevant for self-concept change, but does not address audience size (Schlenker et al., 2004). The research on social facilitation and arousal suggests that basic tasks and non-conscious physical behaviors often increase as audience size increases (Jackson & Latané, 1981; Knowles, 1983). Given this precedent, I propose the following hypothesis:

H1: Perceptions of a larger audience will be positively related to identity shift.

In addition to size, there are a number of other ways that audience can be perceived differently in CMC relative to face-to-face, including how accessible one's self-presentation is online and one's relationship (known versus unknown) with the audience. In a face-to-face conversation, accessibility of someone's self-presentation depends on sensory perceptions of the audience in real time. We see people if vision is unobstructed and hear people if we are in sufficient proximity. In other words, an audience is an audience in non-mediated interaction based on the information in a physical space.

In much of CMC, because content is easily recorded, an audience can develop over time depending on the persistence of the content. A video on YouTube or a post

on a blog may accumulate viewers over the course of many days or even years. Even unintended audiences may gain access to certain information given the ease with which digital information is transferred from one user to the next.

Various factors can influence the likelihood that one's personal information will be accessible on the internet. For example, the algorithm that determines a Google search ranking depends on relevant terms within a webpage, the number of links to and from that webpage, and various other secret factors determined by Google.

Knowledge of a site's privacy settings is another important way to understand its accessibility. Jessica may (or may not) know in advance the settings of her Facebook profile that limit her audience. Finally, understanding of corporate decision making may also inform awareness of audience. How long will a post remain on a webpage before it is removed by a site moderator? Will it show up on the first page of a site, or will the audience have to search through additional pages? Search algorithms, privacy settings and decisions by corporate interests may all determine site accessibility. In all of these cases, perceptions of greater accessibility should translate to having a greater audience, which should result in greater identity shift. To test this, the following hypothesis was posed:

H2: Perceptions of greater accessibility of the self-presentation by an audience will be positively related to identity shift.

Another feature of the internet audience that may influence identity shift is how well people know their audience, or *acquaintance* with the audience. Like offline interactions, internet communication often consists of exchanges between known participants. Email, text messages, and social network communications typically happen between people that already know each other. For example, in

Facebook, certain information can be restricted to sub-groups of friends within a larger network. Email is also often used to communicate with many friends or family at once. Even communication that has an audience of two or more people online often consists entirely of acquaintances.

On the other hand, internet audiences may also be composed of strangers. If Tyrel posts a comment on one of Jessica's Facebook photo, for example, it may be viewed by people within Jessica's network that are strangers to Tyrel. Other sites are populated specifically because they are anonymous, including sites for members of marginalized groups. These sites are populated entirely by strangers who disclose highly personal information that can be central to identity (McKenna & Bargh, 1998; Giles, 2006; Whitlock, Powers, & Eckonrode, 2006). In other words, across the internet, audience ranges from being totally acquainted to totally unacquainted.

The audience in previous work on self-concept change and identity shift consists of strangers. Most of the work involves an experimenter and/or a psychology graduate student as the audience (Fazio et al., 1981; Gonzales & Hancock, 2008; Kelly & Rodriguez, 2006; Tice, 1993). Work on identity shift online used the audience of a public blog, but participants were not asked about their expectations of acquaintance with the audience (Gonzales & Hancock, 2008). More recently, Walther has explored the effects of feedback on identity shift (Walther et al., under revision). In that case, though feedback strengthened the effect of identity shift there was no effect of the source of the feedback.

Although it is not clear how acquaintanceship with an audience affects attitudes about the self, there are studies examining differences in self-presentation as a function of acquaintanceship with one's audience. For example, participants tend to present themselves more modestly when they believe that an audience is known versus unknown (Baumeister & Jones, 1978; Tice, Butler, Muraven & Stillwell, 1995).

Knowing one's audience creates fewer opportunities for new impression formation and instead requires more subtle tactics for continued impression management. People also use face-saving behavior more when they know their audience, or when they expect to meet an unfamiliar audience again (Brown & Garland, 1971). An acquainted audiences' opinion matters more than an unacquainted audience, or an audience that one will never see again.

In the case of public commitment, people adapt attitudes about the self to behaviors out of a sense of obligation to the audience (Schlenker et al., 1994). If acquaintanceship with an audience matters, it is reasonable to assume that a known audience might induce a greater degree of obligation, or public commitment, than an audience of strangers. The opinions of acquaintances may be more valuable and the likelihood of repeated interaction may make consistency between attitudes and behaviors more important. Given this assumption, it is posited that:

H3: Perceptions of acquaintanceship with one's audience will be positively related to identity shift.

Self-Presentation Construction and Time Online

In Study 1 participants were more certain of their self-presentations in a blog than in a video presentation. Increased certainty mediated the effect of media on identity shift, suggesting that the difference in time and attention between CMC and face-to-face allows people to be more certain of self-presentations in CMC. However, it is impossible to know from the previous design if differences in time or reduced cues were responsible for greater certainty, or if it was some other factor altogether.

In the previous study, participants in the blog were both asynchronous and visually anonymous compared to participants in video. They were also led to believe

that they were exposed to a larger audience in the blog than in video. To begin deducing which factor was responsible for increased certainty in Study 1, asynchronicity was operationalized and manipulated in Study 2.

In Study 2, asynchronicity was operationalized as a difference in the time allowed for self-presentation. Asynchronicity refers to the time lapse in digital communication. According to Walther (1996) this time lapse allows people more energy to construct an optimal presentation. If asynchronicity is a component of selective self-presentation that enhances identity shift, the following is expected:

H4: More time for self-presentation will be positively related to identity shift.

Furthermore, if increased certainty online is due to enhanced cognitive processing associated with having more time, then participants that have more time to construct self-presentations should feel more certain than participants that have less time. Based on the findings from Study 1, the following set of hypotheses is proposed:

H5a: Participants that have more time will be more certain in their self-presentations than participants that have less time.

H5b: Certainty in the self-presentation will mediate the effect of time on identity shift.

In order for audience or time to alter the biased scanning process, it is important to first ensure that bias scanning takes place. The previous study found that the difficulty of the presentation interfered with biased scanning. If participants found the presentation task to be too difficult, they were less likely to be affected by the presentation. This finding is also consistent with previous work on biased scanning

and attitude change (Rhodewalt, & Agustsdottir, 1986; Schwarz et al., 1991). If a person can not actually access internal attitudes and memories, or if a presentation falls outside of the overall self-concept, that presentation is unlikely to influence attitudes.

Similarly, previous authors have explicitly stressed that participants be honest during the self-presentation in order to better ensure that biased scanning took place (Gonzales & Hancock, 2008; Tice, 1992). This was made clear so that self-presentation would activate biased scanning. However, if participants are not truthful during the self-presentation the biased scanning processes cannot take effect, and identity shift would be compromised.

In sum, because biased scanning is assumed to be necessary for identity shift to occur, participants that find the presentation to be too difficult, or are deceptive during the presentation, will not be subject to biased scanning and identity shift should not take place. To test these propositions, the following hypotheses were examined:

H6: Greater perceived self-presentation difficulty will be negatively related to identity shift.

H7: Greater reported deception during the self-presentation will be negatively related to identity shift.

Overview

In Study 2 participants were induced to give an extroverted self-presentation and were subsequently assessed for identity shift. To examine the effects of time and perceptions of audience on identity shift the study manipulated how much time participants had to create their self-presentation and varied the kinds of audiences that

participants were told could access the presentation. First, participants either had 2 minutes or 8 minutes to construct the self-presentation. Second, participants were lead to believe that the audience was a single person, a small classroom of people, or a general internet audience.

Although previous research suggests that the general internet audience is perceived to be larger than a single person (Gonzales & Hancock, 2008), it is less clear how participants will construe differences between the entire internet public and a classroom. For instance, will participants view their internet public to be smaller or larger than a class of students? One could imagine that an experienced blogger would expect a class to be much smaller than her internet audience, though a first-time blogger might imagine no one will read his blog but might be convinced that the classroom will see the post. The purpose behind multiple audience conditions was to increase the amount of variability in perceptions of audience and then correlate changes in perceptions of audience with changes in identity shift.

There were a few additional differences between Study 1 and Study 2. In Study 2, participants did not present as introverts. This was because of the difficulty participants generally had portraying an introvert in Study 1. Furthermore, instead of being told explicitly to present as extroverted, participants in Study 2 were asked questions that were designed to naturally evoke biased scanning of extroversion (e.g. *When is the last time you had an interesting conversation with a stranger*). This was intended to contribute to greater identity shift and enhance the generalizability of the manipulation (see Fazio et al., 1981).

To better account for individual differences that might influence the relationship between extroversion and perceptions of audience, several control measures were also included in Study 2. First, to assess baseline levels of state extroversion without using self-report measures, which could bias outcome measures,

confederates that were blind to the manipulation assessed participants' extroverted state upon entering the lab. This involved a brief period of having the participant sit near the confederate, who was posing as a participant, before the start of the manipulation. Confederates rated participants' extroverted state based on verbal and non-verbal behaviors.

Second, self-monitoring was assessed by participants to account for the possibility that participants high in extroversion are inclined to be more sensitive to audience and thus expect a larger audience. The self-monitoring scale captures differences in the degree to which people perceive and respond to their social surroundings (Snyder, 1974; Snyder & Gangestad, 1986). High self-monitors are more likely to be sensitive to an audience, and low self-monitors are less sensitive to an audience. For these reasons, Tice (1992) incorporated the self-monitoring scale in the assessment of an audience's effect on identity shift. The measure was included here to account for variation in sensitivity to audience that might influence the relationship between self-reported extroversion, which is used to assess identity shift, and perceptions of audience size.

Method

Participants

In this study, 29 men and 92 women from a large Northeastern university participated in exchange for class credit. The final analysis included 59 participants in the 2 minute time condition and 62 participants in the 8 minute time condition. In the audience conditions, 41 participants were lead to believe that only one person would read their presentation, 41 were lead to believe that a class would view the presentation, and 39 were lead to believe that anyone on the internet could view the presentation.

Procedure

Study 2 followed the same basic procedure as Study 1, and previous studies on self-concept change (Fazio et al., 1981; Gonzales & Hancock, 2008; Tice, 1992). To better account for baseline extroversion, however, a procedure was borrowed from previous work and added to Study 2 (Fazio et al., 1981). A confederate that was blind to the manipulation was seated in a waiting area at the start of the study. When the participant arrived at the lab, the experimenter excused herself temporarily and asked the participant to take a seat next to the confederate. The confederate was instructed to wait a few minutes and then initiate conversation with the participant by asking the question, “Have you been in a Communication experiment before?” The confederate was instructed to answer any questions from the participant in the same manner each time, and to say as little as possible. After 2 minutes the experimenter returned and escorted the participant into a small computer room. This interaction gave the confederate an opportunity to rate the participant’s extroversion state at the start of the experiment.

Participants were told that the premise of the experiment was to understand how people “present themselves in text.” They were told that the experiment was being done in conjunction with researchers from another university in order to minimize the expectation of a specific audience. They were told that they would be answering four questions: *What is the craziest thing you have ever done? What is your favorite movie? When is the last time you had an interesting conversation with a stranger? What do you usually do to make your friends laugh?* They were asked to answer the questions truthfully, and to begin by including their name, age, hometown and school major at the top of the page across all conditions.

In the 2 minute time condition, participants were told to compose their answers in a stream-of-consciousness fashion. They were told to write as fast as they could, “without editing or stopping,” and not to be concerned about spelling or grammar

errors. In the 8 minute time condition participants were asked to take their time, “editing as you go and thinking carefully about your responses.” This was done to try to increase biased scanning in the latter condition and decrease biased scanning in the former.

The cover stories for the audience manipulations were very similar to those in Study 1. When led to believe that an audience of one person would view the presentation participants were asked to type their answers into a text document. They were asked to save and close the document when they finished typing and were told that only one experimenter would read the text. When led to believe that audience would be a classroom participants were also told to answer their questions by typing in a text document. They were told that one experimenter would read the text and that it would also be read in a class at the other university that was involved with the study. They were told that the professor from that class wanted to give an example of self-presentations to illustrate a lesson on internet experiments. This was conveyed in an offhand manner, as if it was secondary to the main function of the experiment, which was to understand how people present themselves in text. Again, to avoid confounding knowledge of one’s audience with audience size, the class was supposedly from the collaborating university. This was done so that participants did not increase their expectations that friends in the department would see their post.

Finally, when led to believe that anyone on the internet could read the presentation participants were asked to type their answers into a blog post. As in the previous study, all participants were asked if they knew what a blog was. Regardless of how they answered they were told that “blogs are generally used as an online journal, but we’re using it for data collection because it’s easier to analyze the data from different locations.” The experimenter than told the participant that it was necessary to disclose that in addition to the single experimenter that would be reading

the self-presentation, the blog was publicly accessible to the online community. This was also done to in an offhand manner, as if it was not central to the study.

Participants were told to begin typing after the experimenter left the room. The experimenter returned after the allotted time, and opened an online survey for participants to complete. Participants were told to return to the waiting room upon completion of the survey. When participants returned to the waiting room the experimenter asked the participant to have a seat and she excused herself again. A different confederate was waiting in the adjoining chair this time. The confederate waited about 10 seconds after the experimenter left the room to give the participant an opportunity to initiate conversation. If the participant did not initiate conversation, the confederate would ask the participant, "Did you do the survey?" Again the confederate was instructed to say as little as possible and to keep responses as consistent as possible from one participant to the next. The experimenter returned after 2 minutes and debriefed the participant.

Measures

Baseline ratings of extroversion. To establish baseline measures of extroversion confederates were trained to assess participants' level of extroversion soon after entering the lab. Confederates were asked to rate each participant for *Friendliness*, *Openness*, and, *Extroversion* on a scale of -3 to + 3, ($\alpha = .91$). Ratings on the three items were averaged to create a single score of baseline extroversion.

Self-monitoring. Seventeen items from the 24 item Self-Monitoring Scale (Snyder, 1974) were used to assess participant self-monitoring. Items include questions such as, "At parties and social gatherings, I do not attempt to do or say things that others will like," or, "I have considered being an entertainer." Each of these items is scored with a True or False by the participant. Half of the items were reverse coded so that a high score would indicate a high self-monitor. Scores could range from

0-17, ($\alpha = .60$).

Identity shift. Identity shift was measured using the same 10 item bipolar scale from Study 1 (Appendix). The measure has been used in multiple studies (Fazio et al., 1981; Gonzales & Hancock, 2008; Kelly & Rodriguez, 2006; Tice, 1992), and is consistently internally reliable, ($\alpha = .89$). Because the scale was used this time to measure changes in extroversion only, items 1 and 3-10 were reverse coded so that high scores would reflect identity shift towards a self-perception of extroversion.

Audience size. Participants answered 4 different questions about how big they thought their audience for the text would be, regardless of condition. Questions included: *My answers to the questions will be seen by different people over time; A large number of people will read what I wrote; How many people do you believe will ever read what you wrote;* and an open-ended question in which participants were asked to fill-in an open space in response to the question: *How many people do you think will read what you wrote during this presentation?*

The three Likert questions ranged from 1-7. Participants were asked to indicate their degree of agreement with the first two Likert questions, (*different people, large number of people, 1=Completely Disagree; 7=Completely Agree*). The third question included a range of responses in size (*how many people will read: 0, 1, 2, 3-5, 6-10, 11-50, 50+*). Responses to the open-ended question were positively skewed. To normalize the response curve, the answer was log-transformed. Typically when data is log transformed a 1 is entered in place of a 0. In many cases this is an appropriate adjustment (e.g. income), but in this case the difference between 0 audience and 1 audience is meaningful, therefore participants who had answered 0 were not included in this analysis. This resulted was the removal of 18 participants from this analysis.³

³ The results are identical when performed with this variable without log-transforming the open-ended question.

To create a single measure of perceived audience size a z-score was calculated for each item and then the four standardized responses were averaged together ($\alpha = .81$).

Accessibility. Text accessibility was assessed using three 7-point items ($1=\text{Completely Disagree}; 7=\text{Completely Agree}$): *What I wrote will be accessible for a large number of people to read; This information will be kept private by the researchers and only the experimenter here and at the other university will have access to it; Do you think that you will be able to find the information that you wrote with a google search?* The second item was reverse coded. The items were averaged to compose a single item, (1-7; $\alpha = .73$).

Acquaintanceship. Participants were also asked whether they expected that someone they knew would read their text: *Only strangers will ever see what I wrote; Someone I know personally will probably read this; Eventually someone will permanently delete what I wrote and no one will ever see it again.* The items were assessed using a 7-point scale, ($1=\text{Completely Disagree}; 7=\text{Completely Agree}$). The first and third items were reverse coded and the three items were averaged into a single item so that a high score would reflect the expectation of a known audience, (1-7, $\alpha = .64$).

Self-presentation certainty. Three questions were used to measure participants' certainty following their self-presentation. The questions were also used in Study 1. Subjects were asked, "*At this moment I feel [At ease/Not at ease; Comfortable/Uncomfortable; Certain/Uncertain,*" on a 7-point scale. The three items were reverse coded and averaged to form an overall rating of certainty (1-7, $\alpha = .91$).

Presentation difficulty. Again difficulty was assessed using the same item from the previous study. If self-presentation of a particular attitude is too difficult, it is unlikely that biased scanning will occur (Schwarz et al., 1991). A single item 5-pt Likert scale was used to assess, "How difficult was it for you to portray yourself as an

[introvert/extrovert]?" (1=Not At All Difficult; 5=Very Difficult).

Deception. In this study participants were also asked about deception during the task. Previous studies note that biased scanning requires truthful processing of information about the self (e.g. Tice, 1992). To establish that biased scanning took place it is important to examine whether participants lied during the presentation. To evaluate this, participants were asked the question, "Did you lie about any of your responses?" (1=Not At All; 7=A Lot).

Behavioral evidence of extroversion. At the end of the experiment a different confederate rated participants' consequent extroversion and was intended as a behavioral measure of identity shift. Again, confederates were asked to rate each participant for *Friendliness*, *Openness*, and, *Extroversion* on a scale of -3 to + 3, ($\alpha = .92$). Ratings on the three items were averaged to create a single score of behavioral extroversion.

Finally, the same confederate that rated extroversion after the participant completed the experiment also noted whether or not the participant initiated conversation with the confederate, or whether or not the confederate was forced to initiate conversation with the participant. This was a dichotomous measure (1=No, 2=Yes). Participants high in extroversion were expected to initiation conversation.

Results

Each hypothesis was tested using a separate OLS regression model. The regressions were first performed on self-reported identity shift as the dependent variable, followed by behavioral measures of identity shift, including confederate ratings of behavioral extroversion and a measure of whether or not participants initiated conversation with a confederate.

Each regression model included the following set of control variables: participant sex, experimenter, experimental condition, baseline measures of

extroversion and self-monitoring scores. Before testing the hypotheses, an OLS regression was performed by regressing each of the dependent variables on a model that only consisted of the control variables listed above. See Tables 2-4 for the descriptive data regarding the control variables and their relationships to the dependent variables.

Table 2. Descriptives of Variables in Study 2

	<u>Control Only</u>	
	Mean	SD
Baseline Ratings of Extroversion	0.86	1.15
Self-Monitoring	10.38	2.88
Audience Size	-0.01	0.80
Accessibility	3.06	1.45
Acquaintanceship	3.10	1.27
Self-Presentation Certainty	4.89	1.36
Self-Presentation Difficulty	2.05	1.00
Admitted Deception	0.18	0.24
Self-Reported Extroversion	7.46	1.23
Behavioral Extroversion Ratings	0.80	1.26
Conversation Initiation (No = 0)	0.33	

Note: Experimenter, Sex, Time, Audience and Conversation Initiation are all dichotomous. Baseline ratings of Extroversion and Behavioral Extroversion Ratings range from -3 to +3. Self-monitoring, Accessibility, Acquaintanceship, and Certainty range from 1-17. Audience size and Admitted Deception are standardized to the mean. Difficulty ranges from 1-5.

Table 3. Regression of Dependent Variables on Each of the Control Variables

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	β	β	Exp(B)
Experimenter	.09	.05	1.28
Sex (Male=0)	.17**	.00	2.00
Time (2 min = 0)	-.09	.10	.91
Classroom	.08	.04	1.02
Internet	.09	-.06	.63
Baseline Ratings of Extroversion	.16*	.18**	.78
Self-Monitoring	.25***	.00	.92
R ²	.09	-.01	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

$p \leq .10$ * (two-tailed), $p \leq .05$ ** (two-tailed), $p \leq .01$ *** (two-tailed)

Self-Reported Identity Shift

Audience size. To test the effect of audience size on identity shift self-reported extroversion was regressed on the measure of audience size, which was an average of 4 different measures of perceived audience size (H1). As predicted, participants that

believed that they had a larger audience reported being more extroverted, ($b = .20, p = .05$). This finding supports the hypothesis that increased perceptions of audience size increases the degree of identity shift.

Accessibility. Differences in perceptions of the accessibility of a given self-presentation online might also affect degrees of identity shift (H2). Self-presentations that are more accessible (e.g. *What I wrote will be accessible for a large number of people to read*), will be read by more people. Self-presentations that are perceived as more accessible should therefore induce greater identity shift. However measures of text accessibility did not significantly predict self-reported extroversion ($b = .11, p = .32$).

Acquaintanceship. If participants expected that someone they knew might read the text, they should demonstrate greater identity shift (H3). As hypothesized, participants that believed that there was a chance that an acquaintance would read the text were affected by the text to a greater degree, ($b = .27, p < .01$). This finding supports the hypothesis that increased acquaintanceship with an audience leads to greater commitment to the self-presentation, and thus greater identity shift.

Self-presentation certainty & time. Participants that had more time to construct a self-presentation were also expected to reflect greater identity shift than those participants that had less time (H4). This hypothesis was not supported. There was no relationship between the length of time participants had for self-presentation and their degree of reported extroversion, ($b = -.09, p = .31$). Furthermore, time during self-presentation did not predict differences in certainty, $t(117) = .63, p = .53$, and certainty did not mediate an effect of time on identity shift (H5b) according to a bootstrap analysis of indirect effects using bias-corrected and accelerated bootstrapping confidence intervals at 95% (See Hayes, 2009, for a discussion of how indirect effects can operate without a significant effect of X on Y).

These findings reveal that certainty does not affect identity shift through time. However, given the important role of certainty in determining identity shift in Study 1 it is worth exploring the relationship between certainty and identity shift in Study 2. First, greater reported certainty was positively related to changes in extroversion after controlling for other variables, ($b = .30, p < .01$). This finding demonstrates that certainty is still a critical factor in determining identity shift, though not in relation to time available to construct the presentation. Is it possible, instead, that certainty mediates the effect of either of the other significant predictors of identity shift, audience size or acquaintanceship with audience? If so, this might explain the difference in certainty in Study 1.

To test this question, the Baron & Kenny mediation analysis (1986) was performed for each independent variable as well as the Preacher and Hayes (2008) bootstrapping test for indirect effects. The first step in the Baron and Kenny mediation analysis is to determine the relationship between the primary independent variable of interest and the dependent variable. Confirming the finding reported above, perceptions of audience size predict self-rated extroversion, ($b = .29, p < .01$). In the second step the mediating variable is regressed on the independent variable. This step was not supported. Audience size does not predict differences in audience certainty, ($b = -.08, p = .48$). The lack of a mediation effect was confirmed using bias-corrected and accelerated bootstrapping confidence intervals. The bootstrap output shows that the indirect effect cannot be said to be different from zero using 95% confidence intervals with a sample size of 5000. Certainty does not mediate the effect of perceived audience on identity shift. This suggests that increased certainty in Study 1 is not due to differences in perceptions of audience size.

A mediation analysis was also performed for certainty and audience acquaintanceship. In the first step, reported extroversion is regressed on audience

acquaintanceship, ($b = .27, p < .01$). In the second step, the mediation, certainty, is regressed on the independent variable, acquaintanceship, ($b = -.19, p = .05$). This effect is significant, but in the opposite direction. As expectations of acquaintanceship increase, certainty in one's self-presentation decreases. In the third step, reported extroversion is regressed on certainty, after controlling for acquaintanceship, ($b = .40, p < .01$). However, this does not decrease the effect of acquaintanceship on extroversion but rather increases the effect of acquaintanceship, ($b = .33, p = .01$). The Preacher and Hayes analysis (2008) does not support a significant mediation analysis. The bias-corrected and accelerated bootstrapping confidence intervals demonstrate that the indirect effect cannot be determined to be different from zero with 95% confidence with a sample size of 5000. In other words, the positive effect of acquaintanceship on identity is not due to an indirect effect of certainty.

Taken together, these mediation analyses indicate that the effect of enhanced identity shift in Study 1 was not due solely to perceptions of audience. Audience and certainty have independent effects on identity shift.

Presentation difficulty. It is important to demonstrate that participants were able to activate biased scanning during the experiment. Participants that perceived the task to be difficult were expected to demonstrate less identity shift than participants that perceived the task to be easy (H6). Recall that the task was to have participants talk about their lives by giving real examples of behaviors typical of an extroverted person. This was done to induce bias scanning of extroversion. Indeed, if participants found this task to be difficult they were less likely to report being extroverted upon completion of the task, ($b = -.42, p < .001$)

Deception. A question was added to this study to assess how much participants had lied when writing their responses to the prompt. It was predicted that increased lying would reduce the overall effect of identity shift by interfering with biased

scanning (H7). In support of this hypothesis, regression of extroversion on the log transformed variable for deception revealed that, as expected, participants that admitted to lying to a larger degree also evidenced less identity shift, ($b = -.23, p = .01$). This finding lends further support for biased scanning.

Behavioral Identity Shift

In addition to self-reported identity shift, behavioral measures were taken of identity shift. Participants were rated for extroversion by a confederate following the self-presentation. Also, it was noted if participants initiated conversation with the confederate as an objective measure of extroversion. These measures were used in previous studies examining extroversion as a proxy for identity shift (Fazio et al., 1981; Tice, 1992).

Few variables predicted behavioral identity shift. There was no effect of audience size or time on behavioral extroversion. Perceptions of accessibility of the self-presentation (Odds Ratio: $.58; p = .01$) and acquaintanceship with audience (Odds Ratio: $.56; p = .03$) predicted initiation of conversation in the opposite direction. Greater expectations of accessibility and acquaintanceship meant that participants were less likely to initiate conversation with a confederate. This finding is addressed in the discussion.

Participants' attitudes about their self-presentations resulted in some behavioral evidence of identity shift. For example, self-reported certainty following the self presentation was a significant predictor of both confederate ratings of extroversion, ($b = .19, p = .07$), and initiation of conversation with confederates, (Odds Ratio: $1.63; p = .02$). Perceived task difficulty did not have an effect on either behavioral measure of identity shift.

Finally, self-reported deception negatively predicted both behavioral measures. The more that participants reported lying during the self-presentation the less likely

they were to be rated as extroverted by a confederate, ($b = -.22$, $p = .05$), and the less likely they were to initiate conversation with a participant, (Odds Ratio: $.02$; $p < .01$). This reinforces the notion that a true cognitive scan of behavior is necessary to activate both self-reported and behavioral identity shift.

Discussion

Study 1 suggests that identity shift is intensified in CMC, but it was limited by many of the confounds inherent in cross-media research. For example, asynchronicity, editability, and reduced cues are just a few of the features that are often lumped together in CMC research (eg. Douglas & McGarty, 2001; Epley & Kruger, 2001; Hancock & Dunham, 2001; Walther, 1996; Weisband & Atwater, 1999). Study 2 was designed to isolate some of the specific features associated with identity shift in CMC by having all participants present themselves in text. Asynchronicity was operationalized by manipulating the time participants had to answer questions about extroverted experiences (e.g. *What is the craziest thing you have ever done?*). Different audience conditions were created to increase variability in perceptions of audience size, audience acquaintanceship and accessibility of the text. Audience was manipulated because it is a common feature of CMC, and also previous work has found that having an audience increases *public commitment* to a self-presentation and enhances identity shift (Shlenker et al., 1995; Tice, 1992),

The first analyses explored how participants' perceptions of audience corresponded with degree of identity shift, as measured by self-reported extroversion. Participants that assumed a large audience during the extroverted self-presentation reported being extroverted to a larger degree than participants that assumed a smaller audience. In other words, perceptions of audience size were positively related to identity shift.

The fact that audience size magnified identity shift is consistent with previous

work on social facilitation and arousal (Jackson & Latané, 1981; Knowles, 1983). Previous work has looked at graded increases in audience size and the direct effects that it has on changes in non-conscious behavior. Behaviors like blushing or laughing have been shown to be directly influenced by the size of the audience (Butcher & Whissell, 1984; Shearn et al., 1992). As audience increases, automatic or easily learned behaviors tend to increase in strength. Study 2 suggests that attitudes about the self are subject to the same kind of effect of audience. These findings expand the boundary conditions of the public commitment model by demonstrating that identity shift not only responds to the presence of an audience (Tice, 1992), but also that the size of the audience positively correlates with the degree of identity shift in CMC.

The finding that perceptions of audience size influence identity shift is particularly important for online communication as it is often very public (e.g. discussion boards, social network posts, group email, etc). If having a large audience affects identity shift, the internet may be particularly influential on the self. Previous work on public commitment has examined the effect of a single audience member relative to no audience. This is likely because there are few places in offline environments where one can quickly assemble an audience of many people. On the other hand a person can send an email to many people at once, or know that many people have viewed a Facebook post, blog, or discussion board comment. Of course, not all internet communication is public, but the ease of finding an audience of two or more online suggests that internet communication is an especially effective form of modern communication for influencing the self-concept.

Participants also reported on their perceptions of the accessibility of the text online and the likelihood that the audience would include an acquaintance. It was assumed that if participants perceived the text to be accessible this would mean having a larger audience and thus prompt greater identity shift. The accessibility of the text

did not influence identity shift. This null result must be interpreted cautiously as it may be that these particular questions were insufficient to capture the relationship between perceptions of text accessibility and identity shift. It is also possible that accessibility does not translate to awareness of audience as assumed.

On the other hand, participants that believed that an acquaintance might read the texts demonstrated greater self-reported identity shift than those that believed only strangers would read the text. Although the public commitment model has not addressed acquaintanceship with one's audience it argues that attitude change follows behavior because people feel obligated, or committed, to their audiences (Schlenker et al., 1994). It was therefore predicted that public commitment might be heightened due to a greater sense of obligation to a known audience than an unknown audience. The data support that hypothesis, and further extend the boundary conditions of the public commitment model. In addition to audience size, acquaintanceship with the audience is another feature of audience that increases the degree of identity shift in CMC.

Perceptions of the size and acquaintanceship of the audience had an effect on self-report measures of identity shift, but did not predict changes in behavioral measures of identity shift as expected. The measures were taken from previous studies on self-concept change, and were expected to indicate changes in the extroverted self-concept in the same manner (Fazio et al., 1981; Tice, 1992). On the contrary, perceptions of increased text accessibility and audience acquaintanceship decreased the likelihood that participants would initiate conversation with a confederate. Behavioral measures of identity shift have not previously been used to measure self-presentation accessibility and audience acquaintanceship. It is possible that accessibility and acquaintanceship differ from other factors in how they respond to behavioral measure of identity shit. Research is necessary to better understand the relationship of identity shift, specific audience perceptions and behavioral measures.

In addition to perceptions of audience, certainty following the self-presentation positively predicted change in both self-reported identity shift and behavioral measures of identity shift. This is consistent with previous research that has found that confidence in one's self-presentation makes that self-presentation more likely to influence attitudes (Gonzales & Hancock, 2008; Janis & King, 1954; Steiner & Darroch, 1969), and it is also consistent with the findings from Study 1.

One of the factors thought to be responsible for increased certainty in Study 1 was the availability of extra time in CMC. Study 2 directly tested this possibility by manipulating how much time participants had for their self-presentations. Contrary to expectations, participants with more time did not report feeling more certain about their presentations than those with less time. In fact there was no relationship between time and identity shift.

It is difficult to determine whether time did not influence identity shift because the time manipulation was a poor operationalization of the effect of asynchronicity on biased scanning, or whether asynchronicity is unrelated to biased scanning. Increased certainty in Study 1 may have been unrelated to asynchronicity. If that is true, one possible explanation for why participants were more certain of their presentations in CMC in Study 1 may be that presenting one's self in front of a video is simply less common, and therefore produces more uncertainty than the blog presentations. In other words, the media difference in Study 1 may be a function of norms around media self-presentations (i.e. people are simply more accustomed to writing about themselves online than presenting in a video) instead of specific features of the media. Future research is necessary to determine what increases certainty in CMC.

Another possible explanation for the failed manipulation may be that the time manipulation was a poor operationalization of this difference. One limitation of this manipulation may have been that stream-of-consciousness writing in the shorter time

condition prompted an alternative, but equally effective route to attitude shift. Studies on expressive writing find that people tap into deep and influential emotional experiences by writing in a stream-of-consciousness fashion (Pennebaker & Beal, 1986). If participants in Study 2 responded to the extroversion prompt truthfully and with relative ease, a 2 minute stream-of-consciousness self-presentation may have been just as powerful in evoking identity shift as an elaborated 8 minute presentation. Future research should continue to evaluate operationalizations of asynchronicity before ruling it out as a possible factor in determining identity shift.

Finally, participants' perceptions of task difficulty and degree of deception predicted identity shift. The relationship between task difficulty and identity shift is consistent with findings from Study 1, in which participants found it difficult to present as introverts and therefore did not experience identity shift. If a presentation is too difficult, it may be because it falls beyond the latitude of acceptance, meaning that it is too far outside of the overall self-concept to become part of the working self-concept through self-presentation (Rhodewalt & Agustdottir, 1986). Again, this finding is also consistent with work on attitude change which finds that attitudes that are difficult to access are less likely to influence the self-concept (Schwarz et al., 1991). This pattern was again confirmed in Study 2. Difficult presentations did not influence identity. In addition, a new measure was introduced in Study 2 that is related to difficulty: deceptiveness of the self-presentation. Participants that reported having lied during the self-presentation also demonstrated less identity shift according to both self-report and behavioral measures of identity shift.

Findings of the negative relationship between self-presentation difficulty and identity shift, and deception and identity shift, in conjunction with the positive effect of certainty and identity shift, support the assumption that biased scanning was the mechanism for identity shift in both of these studies. Biased scanning is the cognitive

process of reviewing one's behavior, in this case text-based self-presentation, and re evaluating self-assessments based on that behavior. It is not surprising then that easily articulating a self-presentation, and having it be an honest and complete representation of the self, would induce greater degree of identity shift in Study 2.

CHAPTER 4

GENERAL DISCUSSION

Results from these studies contribute to theoretical work on identity shift in three important ways. First, they reaffirm that biased scanning is a mechanism for identity shift in digital environments. Participants that had a difficult time presenting and participants that were deceptive during their self-presentation exhibited less identity shift. Also participants that were more certain of their self-presentations exhibited more identity shift. These findings support the premise that identity shift requires internal processing of memories and attitudes to support a self-presentation in order for that self-presentation to affect consequent attitudes. If the internal processing is limited, the result of the presentation on attitudes will be limited. These findings support the continued use of the biased scanning model as a framework for research on text-based self-presentation and identity shift. Biased scanning has been used to describe attitude change about political opinions and about the self across multiple studies (Heslin & Amo, 1972; Janis & King, 1954; O'Neill & Levings, 1979; Steiner & Darroch, 1969; Tice, 1992). These studies demonstrate, again, that the boundary conditions of the biased scanning model can be elaborated to include self-concept change in CMC. Moreover, CMC acts on features that enhance biased scanning: certainty and audience perceptions. According to these findings, biased scanning can be intensified in CMC.

Second, this is the first work to demonstrate that identity shift is intensified in CMC. A large body of work has examined the prevalence of self-presentation in CMC (Dominick, 1999; Ellison et al., 2006; Papacharissi, 2002; Toma et al., 2008), and the intensifying effect that self-presentation in CMC has on interpersonal impressions (Douglas & McGarty, 2001; Epley & Kruger, 2001; Hancock & Dunham, 2001). Previous research on self-concept change in digital environments had already

demonstrated that behaviors in new media can affect real-world identity (Gonzales & Hancock, 2008; Yee & Bailenson, 2007, 2009; Yee et al., 2009). Findings from Study 1 demonstrate that self-presentations in CMC also have an intensifying effect on *intrapersonal* impression formation. Participants underwent more identity shift following CMC presentations than they did following face-to-face presentations.

Finally, although previous work has demonstrated that audience can enhance identity shift (Tice, 1992), even in CMC (Gonzales & Hancock, 2008), the third contribution of this work has been to provide a clearer understanding of how characteristics of the perceived audience can influence identity shift. Specifically, perceptions of audience size and perceptions of acquaintanceship with the audience increase the degree of identity shift. As noted above, these findings expand the boundary conditions of the public commitment model, which claims that having an audience during self-presentation is a central factor in inducing identity shift (Schlenker et al., 1994). This work demonstrates that, at least in online contexts, the size and make-up of that audience is also relevant to public commitment. Public commitment theory posits that people have an implicit obligation to their audience conveyed through behavior, which is what prompts attitudes to conform to behavior (Schlenker et al., 1994). These findings suggest that the obligation to audience increases with the size of the audience and acquaintance with audience. If Jeff behaves athletically in front of a small group of strangers that self-presentation is likely to have less of an impact on his overall self-concept than if he behaves athletically for a large group of friends. Being committed to more people and to known people is more meaningful for the self-concept.

In sum, multiple factors that can be found in CMC environments can intensify identity shift via biased scanning (Figure 2). Biased scanning refers to the bias towards a specific attitude or self-concept through the process of self-presentation (Janis &

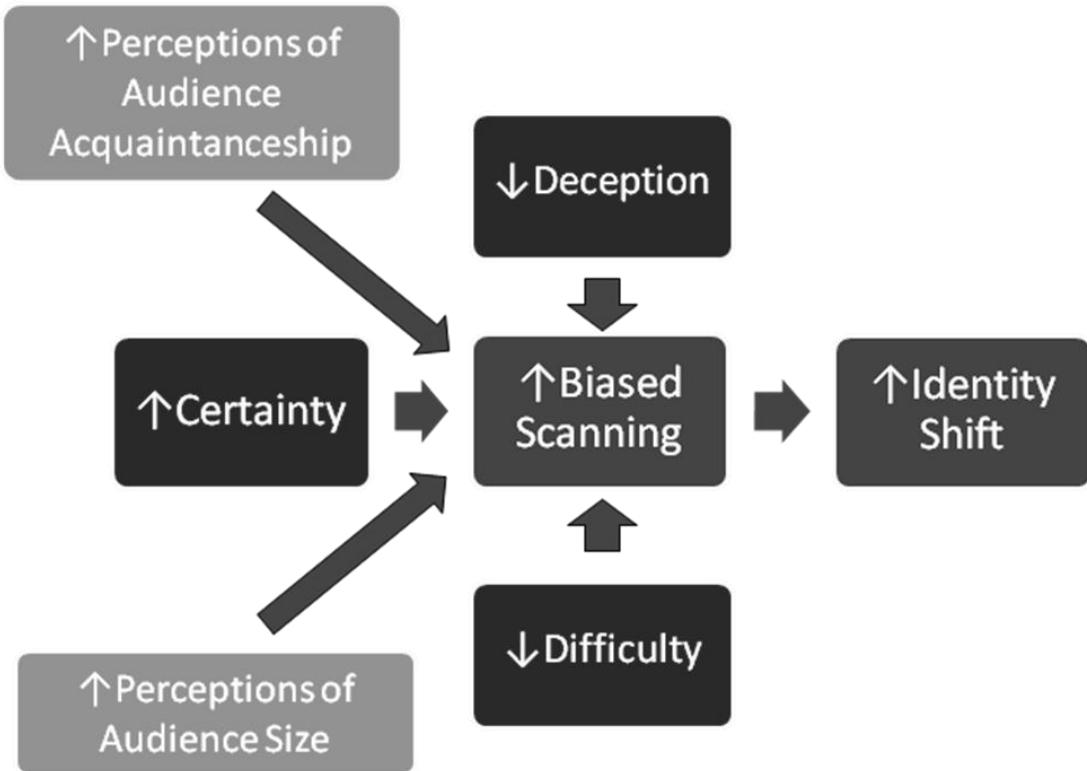


Figure 2. Model of Factors that Influence Identity Shift via Biased Scanning

King, 1954). By articulating an argument or presenting a certain aspect of self we can shift our attitudes about the world and ourselves. In CMC, shifting attitudes about the self has been labeled, *identity shift* (Gonzales & Hancock, 2008), and these studies reaffirm that biased scanning is at the center of identity shift. These studies have demonstrated that various factors can influence the degree of biased scanning, which in turn influences the degree of identity shift. Of course, these factors are not exclusively found online, but they may all be augmented online. Getting on Facebook, for example, allows a person to practically guarantee an audience of more than one person and is almost exclusively known. This is one of many examples of how an internet system may intensify identity shift.

Certainty, difficulty and deception all influence the degree to which biased scanning will have an effect on identity shift. Those findings are in keeping with

previous work which has found that attitudes *about* a self-presentation will influence the *effect of* that self-presentation on consequent attitudes (Girodo & Strickland, 1974; Janis & King, 1954; Steiner & Darroch, 1969). If the self-presentation felt difficult or was dishonest, it has less of an effect on identity shift. If one feels certain and comfortable about the presentation, it has a greater effect on identity shift. The contribution of these studies is to provide additional research on factors that moderate biased scanning and demonstrate that the same factors that moderate biased scanning offline also moderate biased scanning online.

Another contribution was to uncover new factors that influence identity shift. Perceptions of audience, including audience size and audience acquaintanceship, also influence the degree of identity shift that takes place following self-presentation. These findings elaborate on the public commitment model, which argues that audience is central to prompting attitude change (Schlenker et al., 1994). Previous work has argued that perceptions of audience “magnify” biased scanning (Tice, 1992). These findings suggest that, like the presence of an audience, the perceived size of that audience and expectation of acquaintanceship with that audience may also magnify identity shift. Unlike the other factors, perceptions of audience depend, at least in part, on the environment, rather than the self-presentation itself. Therefore, audience perceptions have important implications for users and designers of digital technology, which are discussed below.

Future Directions

Having expanded the boundary conditions of the biased scanning and public commitment models by demonstrating their implications for CMC, future research can begin to explore whether or not these same findings (e.g. perceptions of audience size and acquaintanceship) apply to public commitment and biased scanning offline. It is quite possible that these same effects would happen in offline environments, such as in

a public performance or large social gathering of friends and family. Tice (1992) demonstrated that audience was central to effective biased scanning, but this work is the first to point out that specific features of audience influence identity shift. Future research is necessary to demonstrate those effects and continue to elaborate on the features of audience.

Future research is necessary to determine limits on the effect of perceptions of audience and its generalizability to different contexts. Work on social conformity demonstrates that the effect of group size plateaus at a certain point (Latané, 1981). At a certain point, adding additional people to a group will not change the effect that social pressure has on some behaviors. This brings into question whether or not this plateau effect would happen to identity shift, and more specifically whether or not the effect of audience plateaus at all or at the same rate in internet self-presentations. Questions about the rate at which changes in audience alter self-concept will require additional studies. Knowing the boundaries of this effect could also have distinct effects on design choices (e.g. privacy settings, etc.).

Also, in order to know the implications of these findings for public commitment theory in its original form it is necessary to determine whether or not the linear effect of audience on identity shift translates to offline contexts. One could imagine that an audience of 1, 20 or a few 100 might have different effects on the relationship between self-presentation and self-concept in real-world self-presentations, but this has not been tested. This question was less interesting in a pre-internet world in which audiences of various sizes, especially very large audiences, were not readily accessible. However the real-world effect of audience size on self-concept is important to know whether these findings expand public commitment model in its original form or simply inform computer-mediated identity shift processes.

An important question left unanswered by this research is, what causes perceptions of audience size and acquaintanceship? As noted in the results section, there was a relationship between perceptions of audience size and the experimental manipulation of audience. Participants that were told that a classroom of people would see the text on average perceived the audience to be greater than those that were told that the text would be available to the entire internet public. In retrospect this may not be surprising. A classroom is a more concrete entity with an ensured audience. The internet audience is much less uniform and much more amorphous, which makes it an interesting topic to study and a difficult construct to pin down.

Features of a system may implicitly signal size and make-up of audience (e.g. ratings indicators). More explicit indicators of audience may include comment sections, or the list of names on a group email. Also, norms around a particular system determine audience (e.g. Do I know people that may read the Times discussion board). In general, the information that people use to determine their audiences must differ from system to system. The ability to “lurk,” or view a website without being identified further complicates this process. It is possible to have an audience online that never indicates its presence. This possibility is another reason that the internet differs from other communication channels and is another feature of the internet audience that warrants further investigation. In all, what is generally determined offline by physical appearance, is pieced together online by any number of cues and heuristics.

Future research into perceptions of audience size and acquaintanceship would be valuable given the implications of audience factors and the lack of research on the topic to-date. Qualitative interviews with internet users would be one way to begin a thorough investigation of the many unique features that determine perceptions of audience. After understanding the important constructs related to audience

perceptions, it would also be useful to develop a validated scale of audience perceptions for use in quantitative research. Such a scale could be used in future identity shift research, or any other research in which internet audience is a central factor.

All of these efforts could also be better addressed if future work on identity shift used real, public self-presentations. Using public internet-based self-presentations would be a more authentic test of identity shift. It would also enable data collection remotely, which might make self-presentations more natural and would allow for a more diverse sample. This would help disentangle artificial effects from lab manipulations from real-world perceptions of audience.

In addition, a longitudinal test of identity shift would help determine how long identity shift lasts. Even authors that emphasize the fixed nature of self-concepts recognize that repeated cognitive attempts to change the self-concept are possible, but that such changes may take a long time and may not be very great (Swan, Chang-Schneider, & McClarty, 2007). Of course, many aspects of the self are understood to be relatively stable over time (Maracek, & Mettee, 1972; McCrae & Costa, 1995; McFarlin, & Blascovich, 1981; Swann & Hill, 1982; Swann & Read, 1981), however, there may be important implications for subtle changes in malleable aspects of self for increasing positive self-evaluations and even behavior change. There has been some promising research on the long-term benefits of written self-affirmation for scholastic achievement (Cohen, Garcia, Apfel, & Master, 2006). Students that reinforce a positive self-concept see broad lasting effects in the classroom. That research has not examined the question of audience size or how the process could be implemented using digital technology. Additional research is necessary to understand the interaction between audience size, acquaintanceship, specific self-concepts and length of effect before successful implementation of these findings.

Understanding of audience perceptions would also inform research on human-computer interaction and the design of new computer systems that prompt change in the self-concept. Study 2 demonstrated that self-concepts can be elicited unconsciously. Is it possible to enhance attitudes of healthfulness, competence and other ambiguous self-concepts through similar systems? Is it possible to build systems used in the classroom or home to reinforce positive attitudes about the self? Is it possible to motivate behaviors associated with these changes? New identity shift-based systems could be a fun and inexpensive way to channel current internet self-presentation norms to improve mental health. Moreover, if future research reveals that audience has the same effect on other attitudes (e.g. environmentalism, prejudice, work habits), digital systems could be built to reinforce a number of pro-social attitudes and possibly behaviors. The ease with which these systems could be built and implemented is a strong motivator for further exploration between the relationship between specific technological features and psychological states.

Finally, considering implementation leads to a question about the role of conscious awareness in the identity shift process. Recent research on self-affirmation found that awareness of intended affirmation will reduce its effects (Sherman et al., 2009). This is consistent with other attribution theories which suggest that an explanation for the elicited behavior will undermine attitude change (Bem, 1972; Festinger & Carlsmith, 1959). On the other hand, being told to portray a certain characteristic did not completely eliminate the effect of that self-presentation on identity shift in previous research (Gonzales & Hancock, 2008; Tice, 1992). However, if people are going to build and disseminate software that is designed to encourage pro-social self-concepts, it will be important to understand if the intent of such software can be made explicit or must remain ambiguous in order for attitude change to occur.

Caveats & Limitations

Across the two studies one limitation was the inconsistency in the operationalization of asynchronicity. In the first study, the effect of asynchronicity was tested in a cross-media comparison between blog presentations and the video presentations. In the second study, all presentations were made in text, and increased attention was artificially manipulated by controlling time. Although the difference was intentional, the differences in these two operationalizations of asynchronicity detract from our overall understanding about this process, making it harder to infer why the manipulation of time failed in Study 2.

One possible reason that the time manipulation failed to produce an effect on identity shift in Study 2 is that the real reason behind the intensification of identity shift in Study 1 is another feature associated with selective self-presentation, such as the reduction of cues. According to Walther (1996) and others, having a reduced number of cues in CMC is largely responsible for the intensification of interpersonal impression formation (Douglas & McGarty, 2001; Hancock & Dunham, 2001). In Study 1 it was predicted that having reduced cues, such as no visual or audio aspect to the self-presentation, would help a person focus on self-presentation and thus enhance biased scanning. Future research may effectively operationalize a reduction in cues to test its effect on identity shift. Until then the reason behind increased certainty in CMC is still open for future investigation.

Another limitation was the inconsistency between self-reported and behavioral results of identity shift. Previous studies using the same measures have demonstrated both self-reported and behavioral evidence of identity shift (Fazio et al., 1981; Tice, 1992). The findings would be more compelling if behavioral measures identity shift supported the self-report measures of identity shift. The lack of a behavioral effect may be due to poor operationalization and/or the subtlety of this effect. Internal self-

concept is central to the human experience and even temporary changes to this state are noteworthy, however, future work will continue to pursue behavioral effects to compliment the self-report effects found here.

Finally, future work should use experimental manipulations of audience and try to manipulate different self-concepts to avoid the possibility that perceptions of audience and identity shift are spuriously related. Study 2 employed baseline measures of extroversion taken by a confederate as well as measures of self-monitoring to try to account for any spurious effect of audience and extroversion. Future work could avoid this problem altogether, however, by effectively manipulating audience across experimental conditions. Ironically, such a manipulation would only be possible after additional research has been done on the determinants of perceptions of audience across different systems. Eventually replications of these findings using different research designs that account for these limitations will be a valuable contribution to literature on identity shift.

Although I have mentioned some of the positive implications for findings of identity shift, it is also important to note that audience seeking behaviors are not without risk on the internet. Audiences may sometimes be unintended, and the consequences associated with having an unintended audience can vary. For example, predators may take advantage of public information, which can result in serious crimes. Also, corporate interests often use personal information on emails or social networking sites for marketing purposes, which may not be a user's preference. All of these audiences may be included in the public that is used for identity shift, which may result in unintended negative consequences.

There has been a fair amount of research on privacy risks online. Some authors focus on the naiveté of internet users (Barnes, 2006), others posit that norms of privacy are changing, such that information that would have previously been deemed

private is no longer considered worth keeping private by today's standards (Livingstone, 2009). Others have noted that public dialogue is a way to ensure that stakeholders have a say in the social construction of certain identities (e.g. queer community, disabled community), and thus, public self-presentations are simply worth the risks involved (Phillips, 2005).

Given the findings described here, it is possible that people are willing to take risks with privacy because they consciously or unconsciously benefit from the reconstruction of positive self-presentations. Self-presentation is largely motivated by impression management, and that process is made easier online due to features of the media (Baumeister, 1982; Walther, 1996). Thus, if people are actively using the internet to manage impressions by others it is not surprising that they often take risks to simultaneously manage impressions of the self. Future research is necessary to determine whether privacy risks are consciously or unconsciously overlooked for identity shift. Doing so may help designers build systems that better account for the impulses that drive people to take risks with privacy while making those risks less risky and more transparent.

CHAPTER 5

CONCLUSION

Analysis of self-presentation in CMC has covered a variety of formats, including homepages, email, social network sites, dating sites, and more (Dominick, 1999; Duthler, 2006; Ellison, et al., 2006; Papacharissi, 2002; Toma et al., 2008; Trammel & Keshelashvili, 2005; Walther, 2007). Starting with personal web pages, scholars noted that for the first time in history the internet allowed everyday people to disseminate mass communication. As one author writes, “Prior to personal web pages, only the privileged—celebrities, politicians, media magnates, advertisers—had access to the mass audience. Now anybody in the audience with the right hardware and minimal computer skills can become a mass communicator” (Dominick, 1999, p. 647). Early work on internet self-presentation emphasized the performative quality of individuals taking advantage of the new internet stage (Papacharissi, 2002). But performance, as Goffman (1959) and others note, does not come without consequence for identity.

Who we are and how we see ourselves as actors in the world is central to the human experience—especially the modern human experience. In Western cultures today individuation is a critical aspect of social life and is expressed through self-exploration (e.g. religion, self-help, therapy) and corporate consumption, each at two ends of a spectrum of self-definition. It is not surprising then that web based technologies have embraced and perpetuate a culture of self-presentation and personalization. If “you” are the person of the year and iproducts are what “you” use to communicate thoughts, attitudes, preferences and opinions on Twitter, Facebook, LiveJournal, and other applications, it is essential that researchers continue to ask the question: who are “you” becoming as a result of so much “you” on the web?

As noted in the introduction, Turkle explored this question in 1995 and came

to the conclusion that the internet provided an opportunity for playing with identity and developing new aspects of self (Turkle, 1995). At that time Turkle (1995) could not address how self-presentations that are richly detailed and largely accurate also influence identity. The acts of selective self-presentation that take place on today's internet may be even more relevant for identity than the more extreme identity exploration that took place over a decade ago. The subtle enhancements that happen every day in Facebook posts, Twitter updates, restaurant reviews, discussion board comments, webpage bios, and listserve rebuttals may be more powerful determinants of self and identity than previously imagined.

Symbolic interactionists argued that identities are formed as a function of social interaction (Cooley, 1902; Goffman, 1959; Mead, 1934). The fact that identity shift is greater following public CMC self-presentations with a known audience may have broad implications for identity development in the modern world. CMC is now a daily experience in the lives of many. The known audience in a system such as Facebook, for example, is many times greater than most offline, day-to-day interactions. If self-concept undergoes a more intense change following self-presentation in these media it could influence the way millions of people view themselves. Of course it is necessary to temper grand claims of import given the limited amount of research currently on this topic. However, research on the relationship between CMC and the self is growing (Peña, Hancock & Merola, 2009; Walther, Van Der Heide, Tong, Carr, & Atkin, in press), and should continue to grow.

The effect that digital self-presentations have on identity, and the pervasiveness of those presentations, also highlights the responsibility of designers in making design choices. They must ask themselves: What kind of feedback do I give the user about their audience? How easy is it to limit the audience to acquaintances? How public will this system be? How transparent are the design choices throughout the design process

and for the end-user? Debates around these issues have circulated in the media, reaching a new level of fervor in recent months. Concerns about the transparency of Facebook's default privacy settings triggered a firestorm of questions by users and techno-elites about Facebook's abuse of users' trust (boyd, 2010). Debate about privacy settings has always emphasized the risks of letting personal information fall into the wrong hands. Findings from these studies emphasize how those same questions about privacy are also relevant to how the user views the self. Conveying awareness of which people and how many people can view a digital self-presentation should figure into future design decisions.

In addition to decisions about privacy and audience, decisions about interface design are similarly important and may not have previously been recognized for their effects on identity. Study 2 demonstrated that self-presentations that are evoked naturally based on system design can influence the self-concept. How are systems intended for self-presentation designed to evoke certain self-presentations, either because of the technical features of the system or the norms that have culturally evolved around a system? Continued research on the interrelationships between design choices, individual characteristics of the user, and social norms will be imperative for designers that want to account for the effects that their choices have on the self. Meanwhile, researchers would do well to explore the effects of many designs to-date to better understand how trends and assumptions across the design community may have unintended effects for self for the millions of people that use digital systems.

Knowing the implications of design choices for self is not only an important precaution; it is also a valuable tool. Designing systems that rely on social influence to effect internal and perhaps behavioral change could make for powerful applications that would be of interest to corporations, governmental organizations and the public. If it is possible to use a digital technology to help me lose weight, do better in school or

simply feel better about myself, those systems could become exceedingly popular. In fact research has found that text-based self-presentation, both digital and non-digital, has been implicated in behavioral changes in each of those areas already (Cohen et al., 2006; Ellison et al, 2006; Toma, unpublished dissertation). Expanding on this knowledge from the perspective of identity shift could become an incredibly cost-efficient way to reinforce desirable identities and identity related change.

Today cultures that are already self-oriented now have 21st century tools to manifest these tendencies in new ways, and the theory and research is only starting to catch up. Digital technology has capitalized and perpetuated a norm of self-centered communication, in which individual preference and personalization are supreme. These trends are neither bad nor good—they simply are. As social scientists it is our job to be able to point to these trends and recognize their effects as a means of predicting human behaviors and even cultural shifts.

Text-based communications will only become more popular as technology becomes cheaper and more people expect to be connected at all times. Internet self-presentation is still not necessary for survival but that may change in ensuing decades. As those changes occur, understanding of the consequences of these systems for the human experience must struggle to keep up. Future research should continue to observe digital communication in order to understand the effects of our behaviors, and to learn how to manage (or prevent management of) attitudes and behaviors influenced by digital technology.

APPENDIX A

Bipolar Measure of Extroverted Self-Concept

Please put an X on the line at the point that represents the degree to which you actually posses each of the following traits.

1.Talkative _____ Quiet

2.Unsociable _____ Sociable

3.Friendly _____ Unfriendly

4.Poised _____ Awkward

5.Extroverted _____ Introverted

6.Enthusiastic _____ Apathetic

7.Outgoing _____ Shy

8.Energetic _____ Relaxed

9.Warm _____ Cold

10.Confident _____ Unconfident

APPENDIX B

Table 4. Regression of Dependent Variables on Audience Size

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	β	β	Exp(B)
Experimenter	.07	.05	2.23
Sex (Male=0)	.18**	.00	2.20
Time (2 min = 0)	-.08	.10	.50
Classroom	.00	.01	4.06
Internet	.02	-.09	2.90
Baseline Ratings of Extroversion	.12*	.17*	.93
Self-Monitoring	.23***	.00	1.12
Audience Size	.20**	.07	.36*
R ²	.12	.06	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

$p \leq .10$ * (two-tailed), $p \leq .05$ ** (two-tailed), $p \leq .01$ *** (two-tailed)

APPENDIX C

Table 5. Regression of Dependent Variables on Text Accessibility

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	B	β	Exp(B)
Experimenter	.08	.05	2.21
Sex (Male=0)	.17**	.00	2.14
Time (2 min = 0)	-.09	.10	.75
Classroom	.05	.02	1.90
Internet	.01	-.09	1.83
Baseline Ratings of Extroversion	.17*	.18**	.86
Self-Monitoring	.25***	.00	1.00
Text Accessibility	.11	.04	.77
R ²	.12	-.01	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

*p ≤ .10 * (two-tailed), p ≤ .05 ** (two-tailed), p ≤ .01 *** (two-tailed)*

APPENDIX D

Table 6. Regression of Dependent Variables on Acquaintanceship

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	β	β	Exp(B)
Experimenter	.10	.05	2.57
Sex (Male=0)	.14	.01	3.22
Time (2 min = 0)	-.11	.10	.99
Classroom	.06	.04	1.77
Internet	-.02	-.04	2.64
Baseline Ratings of Extroversion	.17**	.18**	.82
Self-Monitoring	.23***	.01	1.01
Acquaintanceship	.27***	-.05	.52**
R ²	.15	-.01	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

$p \leq .10$ * (two-tailed), $p \leq .05$ ** (two-tailed), $p \leq .01$ *** (two-tailed)

APPENDIX E

Table 7. Regression of Dependent Variables on Self-Presentation Certainty

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	β	β	Exp(B)
Experimenter	.09	.05	1.22
Sex (Male=0)	.20**	.02	2.14
Time (2 min = 0)	-.07	.11	.95
Classroom	.09	.04	1.02
Internet	.14	-.03	.69
Baseline Ratings of Extroversion	.15*	.17*	.76
Self-Monitoring	.24***	.00	.91
Certainty	.30***	.19**	1.21
R ²	.18	.03	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

$p \leq .10$ * (two-tailed), $p \leq .05$ ** (two-tailed), $p \leq .01$ *** (two-tailed)

APPENDIX F

Table 8. Regression of Dependent Variables on Self-Presentation Difficulty

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	β	β	Exp(B)
Experimenter	.03	.03	1.12
Sex (Male=0)	.15*	.00	1.91
Time (2 min = 0)	-.15	.08	.85
Classroom	.12	.05	1.07
Internet	.15	-.05	.67
Baseline Ratings of Extroversion	.14*	.17*	.76
Self-Monitoring	.10	-.04	.88
Difficulty	-.42***	-.12	.72
R ²	.23	.00	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

*p ≤ .10 * (two-tailed), p ≤ .05 ** (two-tailed), p ≤ .01 *** (two-tailed)*

APPENDIX G

Table 9. Regression of Dependent Variables on Each of the Control Variables

	Self-Report	Behavioral: Ratings	Behavioral: Talking
	β	β	Exp(B)
Experimenter	.12	.08	1.66
Sex (Male=0)	.15*	-.02	1.55
Time (2 min = 0)	-.08	.11	.98
Classroom	.09	.04	1.65
Internet	.11	-.04	1.16
Baseline Ratings of Extroversion	.19**	.21**	.83
Self-Monitoring	.23***	-.01	.90
Deception	-.23***	-.22**	.01**
R ²	.14	.04	
N	121	121	121

NOTE: Coefficients are standardized. Extroversion is a dichotomous variable. Time is dichotomous, with 0=2 minutes and 1= 8 minutes. Classroom and Blog both =1, with the 1 person audience= 0. Self-Report refers to self-reported extroversion. Behavioral:Ratings refers to ratings of extroversion by confederates. Behavioral:Talking refers to the likelihood that participants initiated conversation with the confederate.

$p \leq .10$ * (two-tailed), $p \leq .05$ ** (two-tailed), $p \leq .01$ *** (two-tailed)

REFERENCES

- Barden, J., & Petty, R.E. (2008). The Mere Perception of Elaboration Creates Certainty: Exploring the Thoughtfulness Heuristic. *Journal of Personality and Social Psychology, 95*, 489-509.
- Bargh, J.A., McKenna, K.Y.A., & Fitzsimons, G.M. (2002). Can you see the real me? Activation and expression of the “true self” on the Internet. *Journal of Social Issues, 58*, 33-48.
- Barnes, S. (2006). A Privacy Paradox: Social Networking in the United States. *First Monday, 11*. Retrieved July 4, 2009, from
<http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1394/1312>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Baumeister, R.F. (1982). A self-presentational view of social phenomena. *Psychological Bulletin, 91*, 3-26.
- Baumeister, R. E., & Jones, E. E. (1978). When self-presentation is constrained by the target's knowledge: Consistency and compensation. *Journal of Personality and Social Psychology, 36*, 608-61.
- Bem, D. J. (1967). Self-Perception: An Alternative Interpretation of Cognitive Dissonance Phenomena. *Psychological Review, 74*, 183-200.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology, 13*, 420–432.
- Bessière, K., Fleming, A.F. & Kiesler, S. (2007). The ideal elf: Identity exploration in world of warcraft. *CyberPsychology & Behavior, 10*, 530-535.

- Boucher, E., Hancock, J.T., Dunham, P. (2008). Interpersonal Sensitivity in Computer-Mediated and Face-to-Face Conversations. *Media Psychology, 11*, 235-258.
- boyd, d. (2010, May). Facebook and “radical transparency” (a rant). Apophenia: Making Connections Where None Existed. Retrieved July 23, 2010, from <http://www.zephoria.org/thoughts/archives/2010/05/14/facebook-and-radical-transparency-a-rant.html>
- Brown, B. R., & Garland, H. (1971). The effects of incompetency, audience acquaintanceship, and anticipated evaluative feedback on face-saving behaviour. *Journal of Experimental Social Psychology, 7*, 490–502.
- Buffardi, L.E. & Campbell, W.K. (2008). Narcissism and social networking web sites. *Personality and Social Psychology Bulletin, 34*, 1301-1315.
- Butcher, J., & Whissell, C. (1984). Laughter as a function of audience size, sex of the audience, and segments of the short film, “Duck Soup.” *Perceptual & Motor Skills, 59*, 949-950.
- Carver, C.S., & Sheier, M.F. (1981). *Attention and self-regulation. A control theory approach to human behavior*. New York: Springer-Verlag.
- Cohen, G.L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the Racial Achievement Gap: A Social-Psychological Intervention. *Science, 313*, 1307-1310.
- Cooley, C. H. (1902). *Human nature and the social order*. New York: Scribner.
- De Young, R. (1993). Changing behavior and making it stick. The conceptualization and management of conservation behavior. *Environment and Behavior, 25*, 185–205.
- Di Blasio, P. & Milani, L. (2008). Computer-mediated communication and persuasion: Peripheral vs. central route to opinion shift. *Computers in Human*

- Behavior*, 24, 798-815.
- Dominick, J.R. (1999). Who do you think you are? Personal home pages and self-presentation. *Journalism and Mass Communication Quarterly*, 76, 646-658.
- Douglas, K.M., & McGarty, C. (2001). Identifiability and self-presentation: Computer-mediated communication and intergroup interaction. *British Journal of Social Psychology*, 40, 399-416.
- Duthler, K. W. (2006). The politeness of requests made via email and voicemail: Support for the hyperpersonal model. *Journal of Computer-Mediated Communication*, 11. Retrieved January 13, 2009, from <http://jcmc.indiana.edu/vol11/issue2/duthler.html>.
- Ellison, N., Heino, R., & Gibbs, J. (2006). Managing impressions online: Self-presentation processes in the online dating environment. *Journal of Computer-Mediated Communication*, 11. Retrieved October, 19, 2007, from <http://jcmc.indiana.edu/vol11/issue2/ellison.html>
- Epley, N., & Kruger, J. (2005). When what you type isn't what they read: The perseverance of stereotypes and expectancies over e-mail. *Journal of Experimental Social Psychology*, 41, 414-422.
- Eysenck, H. J., & Eysenck, M.W. (1985). *Personality and individual differences: A natural science approach*. New York: Plenum.
- Farrar, K. M., Krcmar, M., & Nowak, K. L. (2006). Contextual features of violent video games, mental models, and aggression. *Journal of Communication*, 56, 387-405.
- Fazio, R. H., Effrein, E. A., & Falender, V. J. (1981). Self-perceptions following social interaction. *Journal of Personality and Social Psychology*, 41, 232-242.
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*, 58, 203-211.

- Giles, D. (2006). Constructing identities in cyberspace: The case of eating disorders. *British Journal of Social Psychology*, 45, 463-477.
- Girodo, M., & Strickland, L.H. (1974). A conflict-theory interpretation of attitude change in forced compliance situations. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 6, 385-397.
- Goffman, E. (1959). *The presentation of self in everyday life*. New York: Anchor.
- Gonzales, A. L., & Hancock, J.T. (2008). Identity shift in Computer Mediated Environments. *Media Psychology*, 11, 167-185.
- Gonzales, A.L., & Hancock, J.T. (*in press*). Mirror, mirror on my Facebook wall: Effects of Facebook exposure on self-esteem. *Cyberpsychology, Behavior & Social Networking*.
- Gonzales, A.L., Hancock, J.T., & Pennebaker, J.W. (2010). Language style matching as a predictor of social dynamics in small groups. *Communication Research*, 31, 3-19.
- Greenwald, A.G., & Pratkanis, A.R. (1984). The self. In R.S. Wyer, & T.K. Srull (Eds.), *Handbook of Social Cognition* (pp. 129-178). Hillsdale, NJ: Erlbaum.
- Gross, E. F. (2004). Adolescent Internet use: What I expect, what teens report. *Journal of Applied Developmental Psychology*, 25, 633-649.
- Hancock, J.T., & Dunham, P.J. (2001). Impression formation in computer-mediated communication. *Communication Research*, 28, 325-347.
- Harmon-Jones, C., Schmeichel, B. J., & Harmon-Jones, E. (2009). Symbolic self-completion in academia: Evidence from department web pages and email signature files. *European Journal of Social Psychology*, 39, 311-316.
- Hayes, A.F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408-420.
- Heslin, R., & Amo, M.F. (1972). Detailed test of the reinforcement-dissonance

- controversy in the counterattitudinal advocacy situation. *Journal of Personality and Social Psychology*, 12, 234-242.
- Hussain, Z., & Griffiths, M.D. (2008). Gender swapping and socializing in cyberspace: An exploratory study. *CyberPsychology & Behavior*, 11, 47-53.
- Jackson, J.M., & Latané, B. (1981). All alone in front of all those people: State fright as a function of number and type of co-performers and audience. *Journal of Personality and Social Psychology*, 40, 73-85.
- Janis, I.L., & Gilmore, J.E. (1965). The influence of incentive conditions on the success of role playing in modifying attitudes. *Journal of Personality and Social Psychology*, 1, 17-27.
- Janis, I.L., & King, B.T. (1954). The influence of role playing in opinion change. *Journal of Abnormal and Social Psychology*, 49, 211-218.
- Jellison, J.M., & Mills, J. (1969). Effect of public commitment upon opinions. *Journal of Experimental Social Psychology*, 5, 340-346.
- Jiang, L., Bazarova, N. N., & Hancock, J. T. (*in press*). Disclosure reciprocity in computer-mediated versus face-to-face interactions. *Human Communication Research*.
- Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology*, 31, 177–192.
- Jones, E. E., Rhodewalt, E., Berglas, S., & Skelton, J. A. (1981). Effects of strategic self-presentation on subsequent self-esteem. *Journal of Personality and Social Psychology*, 41, 407-421.
- Kelly, A. E., & Rodriguez, R. R. (2006). Publicly committing oneself to an identity. *Basic and Applied Social Psychology*, 28, 185–191.
- Knowles, E. S. (1983). Social physics and the effects of others: Tests of the effects of

- audience size and distance on social judgments and behavior. *Journal of Personality and Social Psychology*, 45, 1263-1279.
- Kunda, Z., & Sanitioso, R. (1989). Motivated changes in the self-concept. *Journal of Experimental Social Psychology*, 25, 272-285.
- Latané, B. (1981). The psychology of social impact. *American Psychologist*, 36, 343-356.
- Latané, B., & Harkins, S. (1976). Cross-modality matches suggest anticipated stage fright: A multiplicative power function of audience size and status. *Perception and Psychophysics*, 20, 482-488.
- Lea, M., & Spears, R. (1992). Paralanguage and social perception in computer-mediated communication. *Journal of Organizational Computing*, 2, 321-341.
- Livingstone, S. (2008). Taking risky opportunities in youthful content creation: teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, 10, 393-411.
- Maracek, J., & Mettee, D. R. (1972). Avoidance of continued success as a function of self-esteem, level of esteem certainty, and responsibility for success. *Journal of Personality and Social Psychology*, 22, 90-107.
- Markus, H., & Kunda, Z. (1986). Stability and malleability of the self-concept. *Journal of Personality and Social Psychology*, 51, 858-866.
- Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology*, 38, 299-337.
- Martindale, C. (1980). Subselves: The internal representation of situational and personal dispositions. In L. Wheeler (Ed.), *Review of Personality and Social Psychology*, 1, 193-218.
- McCrae, R. R., & Costa, P. T., Jr. (1995). Trait explanations in personality psychology. *European Journal of Personality*, 9, 231-252.

- McFarlin, D. B., & Blascovich, J. (1981). Effects of self-esteem and performance feedback on future affective preferences and cognitive expectations. *Journal of Personality and Social Psychology*, 22, 90–107.
- McKenna, K.Y.A., & Bargh, J.A. (1998). Coming out in the age of the Internet: Identity “demarginzalization” through CMC group participation. *Journal of Personality and Social Psychology*, 75, 681-694.
- McKenna, K.Y.A., & Bargh, J.A. (2000). Plan 9 from cyberspace: The implications of the Internet for personality and social psychology. *Personality and Social Psychology Review*, 4, 57-75.
- Mead, G. H. (1934). *Mind, self, and society*. Chicago: University of Chicago Press.
- O’Neill, P., & Levings, D.E. (1979). Inducing biased scanning in a group setting to change attitudes toward bilingualism and capital punishment. *Journal of Personality and Social Psychology*, 37, 1432-1458.
- Papacharissi, Z. (2002). The presentation of self in CMC life: Characteristics of personal home pages. *Journalism and Mass Communication Quarterly*, 79, 643-660.
- Pelham, B.W. (1991). On Confidence and Consequence: The Certainty and Importance of Self-Knowledge. *Journal of Personality and Social Psychology*, 4, 518-530.
- Peña, J., Walther, J.B., & Hancock, J.T. (2007). Effects of Geographic Distribution on Dominance Perceptions in Computer-Mediated Groups. *Communication Research*, 34, 313-331.
- Peña, J., & Hancock, J. T., & Merola, N. A. (2009). The priming effects of avatars in virtual settings. *Communication Research*, 36, 838-856.
- Pennebaker, J. W., & Beall, S. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology*, 95,

274-281.

- Petty, R. E., Haugvedt, C. P., & Smith, S. M. (1995). Elaboration as a determinant of attitude strength: Creating attitudes that are persistent, resistant, and predictive of behavior. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 93-130). Mahwah, NJ: Lawrence Erlbaum.
- Phillips, D. (2005). From Privacy to Visibility: Context, Identity, and Power in Ubiquitous Computing Environments. *Social Text*, 23, 95-108.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879-891.
- Rhodewalt, F., & Agustsdottir, S. (1986). Effects on self-presentation on the phenomenal self. *Journal of Personality and Social Psychology*, 50, 47-55.
- Sanitioso, R.B., & Włodarski, R. (2004). In search of information that confirms a desired self-perception: Motivated processing of social feedback and choice of social interactions. *Personality and Social Psychology Bulletin*, 30, 412-422.
- Schlenker, B. R., Dlugolecki, D. W., & Doherty, K. (1994). The impact of self-presentations on self-appraisals and behavior: The power of public commitment. *Personality and Social Psychology Bulletin*, 20, 20-33.
- Schlenker, B. R., & Wowra, S. A. (2003). Carryover effects of feeling socially transparent or impenetrable on strategic self-presentation. *Journal of Personality and Social Psychology*, 85, 871-880.
- Schlenker, B. R., Wowra, S. A., Johnson, R. M., & Miller, M. L. (2008). The impact of imagined audiences on self-appraisals. *Personal Relationships*, 15, 247-260.
- Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology*, 61, 195-202.

- Shearn, D., Bergman, E., Hill, K., Abel, A., & Hinds, L. (1992). Blushing as a function of audience size. *Psychophysiology*, 29, 431-436.
- Sherman, D.K., Cohen, G.L., Nelson, L.D., Nussbaum, A.D., Bunyan, D.P., & Garcia, J. (2009). Affirmed yet unaware: Exploring the role of awareness in the process of self-affirmation. *Journal of Personality and Social Psychology*, 97, 745-764.
- Snyder, M. (1974). Self-monitoring of expressive behaviour. *Journal of Personality and Social Psychology*, 30, 526-537.
- Snyder, M., & Gangestad, S. (1986). On the nature of self-monitoring: Matters of assessment, matters of validity. *Journal of Personality and Social Psychology*, 51, 125-139.
- Steiner, I.D., & Darroch, K. (1969). Relationship between the quality of counterattitudinal performance and attitude change. *Journal of Personality and Social Psychology*, 11, 312-320.
- Stern, S.R. (2004). Expressions of identity online: Prominent features and gender differences in adolescents' world wide web home pages. *Journal of Broadcasting & Electronic Media*, 48, 218-243.
- Stewart, C.O., Setlock, L.D., & Fussell, S.R. (2004). Conversational argumentation in decision making: Chinese and U.S. participants in face-to-face and instant-messaging interactions. *Discourse Processes*, 44, 113-139.
- Subrahmanyam, K., Greenfield, P.M., & Tynes, B. (2004). Constructing sexuality and identity in an CMC teen chat room. *Applied Developmental Psychology*, 25, 651-666.
- Swann, W.B., Chang-Schneider, C.S., & McClarty, K.L. (2007). Do our self-views matter? Self-concepts and self-esteem in everyday life. *American Psychologist*, 62, 84-94.

- Swann, W. B., & Hill, C. A. (1982). When our identities are mistaken: Reaffirming self-conceptions through social interaction. *Journal of Personality and Social Psychology*, 43, 59–66.
- Swann, W. B., & Read, S. J. (1981). Acquiring self-knowledge: The search for feedback that fits. *Journal of Personality and Social Psychology*, 41, 1119–1128.
- Tanis, M., & Postmes, T. (2007). Two faces of anonymity: Paradoxical effects of cues to identity in CMC. *Computers in Human Behavior*, 23, 955–970.
- Thomas, D. L., Skitka, L. J., Christen, S. & Jurgena, M. (2002). Social facilitation and impression formation. *Basic and Applied Social Psychology*, 24, 67-70.
- Tice, D. (1992). Self-concept shift and self-presentation: The looking glass self is also a magnifying glass. *Journal of Personality and Social Psychology*, 63, 435–451.
- Tice, D. M., Butler, J. L., Muraven, M., & Stillwell, A. M. (1995). When modesty prevails: Differential favorability of self-presentation to friends and strangers. *Journal of Personality and Social Psychology*, 69, 1120-1138.
- Toma, C. (2010). Affirming the self online: Motives, benefits and costs of Facebook use. Unpublished Dissertation.
- Toma, C., Hancock, J. & Ellison, N. (2008). Separating fact from fiction : An examination of deceptive self-presentation in online dating profiles. *Personality and Social Psychology Bulletin* 34, 1023-1036.
- Trammel, K.D. & Keshelashvili, A. (2005). Examining the new influencers: A self-presentation study of A-list blogs. *Journalism and Mass Communication Quarterly*, 82, 968-982.
- Turkle, Sherry. (1995). *Life on the Screen: Identity in the Age of the Internet*. New York: Simon and Schuster.

- Valkenburg, P. M., & Peter, J. (2008). Adolescents' identity experiments on the Internet: Consequences for social competence and self-concept unity. *Communication Research*, 35, 208-232.
- Walther, J.B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, 23, 3–43.
- Walther, J.B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior*, 23, 2538–2557.
- Walther, J.B., Liang, Y., DeAndrea, D.C., Tom Tong, S., Carr, C.T., Spottswood, E.L., & Amichai-Hamburger, Y. (under revision). The effect of feedback on identity shift in computer-mediated communication. *Media Psychology*.
- Walther, J. B., Van Der Heide, B., Tong, S. T., Carr, C. T., & Atkin, C. K. (in press). The effects of interpersonal goals on inadvertent intrapersonal influence in computer-mediated communication. *Human Communication Research*.
- Weisband, S., & Atwater, L. (1999). Evaluating self and others in electronic and face-to-face groups. *Journal of Applied Psychology*, 84, 632-639.
- Whitlock, J.L., Powers, J.L., & Eckenrode, J. (2006). The virtual cutting edge: The internet and adolescent self-injury. *Development Psychology*, 42, 407-417.
- Yee, N., & Bailenson, J. (2007). The Proteus effect: The effect of transformed self representation on behavior. *Human Communication Research*, 33, 271–290.
- Yee, N. & Bailenson, J.N. (2009). The difference between being and seeing: The relative contribution of self perception and priming to behavioral changes via digital self-representation. *Media Psychology*, 12, 195-209.
- Yee, N., Bailenson, J.N., & Ducheneaut, N. (2009). The Proteus Effect: Implications of Transformed Digital Self-Representation on Online and Offline Behavior. *Communication Research*, 36, 285-312.

Yurchison, J., Watchravesringkan, K., & McCabe, D.B. (2005). An exploration of identity re-creation in the context of internet dating. *Social Behavior and Personality*, 33, 735-750.