The on-screen water cooler: Effects of televised user-generated comments on cognitive processing, social presence, and viewing experience.

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Dedication

Doctoral students are told that PhD programs are individual, independent, autonomous endeavors. They are self-paced, self-initiated, self-motivated, and self-directed. With that in mind, I dedicate this dissertation to me and the sacrifices I made during the four-year journey it took to complete. However, I would be remiss not to also dedicate this dissertation to my father, Ken Cameron, and mother, Karen Cameron, who succeeded in raising two independent, smart, and driven women, both of whom earned Doctorates.

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Abstract

Social television combines traditional television viewing and interactions with social media to create a phenomenon that connects otherwise autonomous viewers through a shared viewing experience. This dissertation explores one type of social television: on-screen user-generated comments. Although the practice spans multiple television genres, little is known about its effect on viewers' cognitive processing of the media, perceptions of the social presence of other viewers, or the viewers' experience of the media. Two experimental studies explored the effects of on-screen user-generated comments on cognitive processing of the media message, the effect of manipulating the content of on-screen user-generated comments and individual differences on perceptions of social presence, and how the perception of social presence affected both the viewing experience (i.e., enjoyment of and engagement in the television show) and cognitive processing. Results revealed that depending on the television material, on-screen user-generated comments either deter or enhance cognitive processing of the television content. Further, on-screen user-generated comments strengthen perceptions of social presence, while individual differences had little effect on that perception. Lastly, perceptions of social presence had an indirect positive effect on the relationship between on-screen user-generated comments and viewer experiences in one video stimulus, and an indirect negative effect on cognitive processing in the other video stimulus. These findings suggest that, while on-screen user-generated comments bring the 'socialness' back to television watching, they may be beneficial or detrimental based on the producer's intent for the program.

Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

Mass media, considered the intersection of mass communication, culture, and technology, are created for and by large audiences. As ‘one to many’ media, mass communication systems create a shared experience among a wide range of individuals. This is especially true for television. Both at the time of watching and after, television serves a number of social purposes, like promoting feelings of togetherness, easing social interactions, and providing topics for conversations (Lull, 1990). Viewers are naturally drawn to share opinions and experiences about shared events or socially relevant media (Harboe, Massey, Metcalf, Wheatley, & Romano, 2008). Television provides a common point of reference or “social glue” to bond both strangers and acquaintances (Chorianopoulos & Lekakos, 2008, p. 114). This shared and common experience ties individual members to an extended society (Silverstone, 1994).

Before the digital age, watching broadcast television could more easily represent a shared experience. Watching television required viewers to be in front of the screen at scheduled times, ensuring mass screenings by large audiences. Fewer screens on which to watch a limited amount of television programming forced family and friends to gather physically around one device. Interactions between members of the viewing audience were restricted to watching together in shared locations or ‘water-cooler’ moments the day after the broadcast (Lochrie & Coulton, 2012a). As the number of screens, networks, and programs increased, the physical presence of others during media use diminished and viewing became more private. The development of digital technologies (e.g., BetaMax, VCRs, DVRs), online television service providers (e.g., Hulu, AmazonPrime) or network websites (e.g., ABC.com, A&E.com) allowed viewers to develop time-shifted viewing habits (Harrington, Highfield, & Bruns, 2013). Viewers exchanged

television broadcast schedules with user-chosen viewing times, dispersing the large, live audience and further diluting the ‘sharedness’ of the experience.

Television’s mass audience also suffered from cultural shifts in the new media age. Viewers, once limited to one-room, one-screen environments, began using mediated communication and adopting new strategies to share the television experience. People began migrating between multiple platforms to fulfill fundamental needs for entertainment, and interacting in ways distinctly different from the traditional passive viewing experience (Jenkins, 2006). Audiences turned to persons with whom they had relationships as trust of traditional media and the perceived effectiveness of mass communications declined (Qualmann, 2009). Reminiscent of watching television with friends and family gathered around one screen, viewers began connecting with others via second screens (i.e., mobile phones, Internet-connected devices and computers used while watching television (the first screen)).

Watching television with a second screen capitalizes on Internet and mobile technologies to allow a fragmented audience to recreate a shared experience (Highfield, Harrington, & Bruns, 2013; Lim, Hwang, Kim, & Biocca, 2015). Individuals privately or publically offer running commentary on universally shared media events as the event unfolds, indicating that they are part of the distributed audience (Highfield, Harrington, & Bruns, 2013). Opportunities to connect through mediated communication increase the reach of interactions, allowing viewers to interact in public forums or within specific networks outside of geographic borders. Shin (2013) argues that the ability to interact with others in online communities while watching television provides a virtual presence and a “credible immersive feeling” that substitutes for face-to-face interactions (p. 941). Engaging with a second screen to share the experience however, constantly challenges how much a viewer attends to and engages with the first screen.

The trends in device-complemented viewing have inspired new production strategies aimed to amass the fragmented audience and bring the 'socialness' back to television. One promising technique to inspire engagement with the mass medium is the inclusion of social media text on television (Zelenkauskaite & Bucy, 2009). This convergence of broadcasting and short messaging service, popularized by mobile phones and online chat, merges text comments sent during the broadcast with television content (Kassavalis, Batikas, Sabalis, Zamani, & Eustathiou, 2004). Comments made in public spaces are added to the screen to embrace conversations about TV happening over 'backchannels.' The 'backchannel' refers to the communication created by an audience to connect with others within or beyond the audience of the primary activity (e.g., watching television; Atkinson, 2010; Doughty, Rowland, & Lawson, 2011). The goals are to inspire live viewing and recreate the mass shared experience by bringing attention and engagement back to the television screen, with the intent that it will increase enjoyment, satisfaction, entertainment and commitment (Wilson, 2015). Nicolle Yaron, producer of NBC's *The Voice*, summed up the industry's interest in this phenomenon, saying, "We wanted to create a true, real-time co-viewing experience." (Drell, 2011).

Unlike producer-created text, this new practice relies on viewer comments publically posted to online sites. Typically, comments come from social media spaces like Twitter or Facebook and are embedded synchronously with the television content. The process of searching, selecting, and placing comments on screen has developed along with the technology necessary to accomplish this task. One approach is to rely on third-party companies who use software to connect to social media application program interfaces (APIs). For example, Twitter's REST API allows access to core Twitter data and the Search API provides methods for interacting with search and trends data. The software, connected to the API's, constantly scans

user-generated comments in designated spaces or tagged with specific markers, then filters comments from the larger sample to eliminate duplicates (i.e., retweets) and replies. The process further purges comments based on client needs and unwanted content (profanity, for example) (Van Grove, 2013). The remaining filtered comments are put in a queue to await manual approval to go on screen. As the practice has grown, selection and filtering software has become available for purchase. This has allowed networks to internally manage search streams, filters, and desirable content, as well as modify the look, location, and visual format of comments.

User-generated comments are added to a variety of programming in a variety of formats. They commonly appear in first-run broadcasts and prime-time shows, but may also supplement rebroadcasts to create an enriched viewing experience or second viewing opportunity. The strategy spans multiple genres, including live sports, presidential debates, daytime talk shows (e.g., NBC's *TODAY*), reality docu-dramas (e.g., Discovery's *Deadliest Catch*), and reality competition shows (e.g., NBC's *The Voice*, CBS's *Survivor*). There is no standardized graphical format for presenting text on screen. The text may appear in a graphical box or as stand-alone text, be arranged in the lower left or top third of the frame, in a multiple text-column on the side of the frame, take up a part of, or fit the length of the screen, and appear at a set or random pace throughout a program.

Purpose and Rationale

This new production practice merges mass media with social media into a mediated social environment rich with individual information. The mediated presentation of social commentary brings individual virtual viewers of the larger mass audience into the private viewing spaces of every individual watching. This 'cyber-living room' represents to viewers they are not alone – others are watching with them. Unlike the user-controlled experience of using a

second screen, on-screen social media comments create an unavoidable and uncontrollable experience for the at-home viewer. The comments that appear are a selected sample of the population of generated comments, embedded into the frame at controlled intervals, in graphically designed formats. Producers are deciding what, how, where, and when comments appear with the intent of increasing attention, engagement, enjoyment, and other positive viewing outcomes by exploiting device-connected shared experiences and characterizing an environment reminiscent of watching together in the same physical space (Wilson, 2015). However, there has been little research to evaluate the effectiveness of this strategy on intended outcomes.

The purpose of this dissertation is to examine how the producer-controlled decisions of this broadcast strategy affect the viewing experience. Two overarching research questions drive this dissertation: 1.) Do on-screen user-generated comments enhance the viewer's sense that they are watching with others? 2.) Do on-screen user-generated comments affect the way viewers process and experience the television content, through this sense of sharing the experience with others?

The central characteristics of media effects approach are applied in this research. That is, the effect is focused on the audience and there is some expectation of influence. Influence is due to either the form or content of the message system, variables to test causality are offered, and empirically testable hypotheses are explored (McLeod, Kosicki, & Pan, 1991). This research first offers a theoretical explanation using the Limited Capacity Model of Motivated Mediated Message Processing (Lang, 2000) of how audiences attend to and cognitively process media messages. Then, this research expands the 'motivated' aspect of the model, proposing that exposure to social information engages motivational systems related to human social needs that

drive cognitive processing. Next, the research will explore the concept of social presence, or a viewer's perception of watching with others, being variable and being enhanced by characteristics of the media. Through this lens, elements of the content of user-generated comments and individual differences theorized to affect social presence are identified and outcomes related to social presence are discussed. Finally, the relationship between social presence and viewing experiences is explored to theorize how social presence affects enjoyment, engagement, and cognitive processing.

This research will make two major contributions. First, results will inform best industry practices for achieving desired outcomes concerning the viewer experience. The empirical evidence will provide actionable insights on selecting user-generated content to maximize positive viewer experiences. Second, this research contributes to the fields of mass communication and computer-mediated communication. Specifically, it forges and then applies new links between theoretical models and concepts to a new phenomenon, contributing to construct and theoretical development. In addition, it provides insight into new viewing practices, and contributes to knowledge of how mediated communication within a viewing experience affects traditional outcomes. In an increasingly mediated world, understanding how information from others through mediated channels is influential is an important challenge for media and communication researchers. Lastly, this research provides a foundation for future research to inquire how micro-level variables (such as graphical formatting, source credibility or characteristics that relate to a viewer's identity) within user-generated comments may influence or change hypothesized relationships and tested predictions.

Background on Social Media

Social media was born out of Web 2.0, a term first used in 2004 to describe the new way software developers and end-users were using the World Wide Web (Walther & Jang, 2012). Web 2.0 is characterized by social web sites that allow individuals to continuously modify content in a participatory and collaborative fashion. Participatory web sites include content generated by the proprietor, aggregate user representations (i.e., descriptive statistics of user ratings, votes, visits or other user activity) and user-generated content (i.e., messages invited, captured or displayed from nonproprietary visitors) (Walther & Jang, 2012). Web 2.0 encourages collective intelligence through features that present and juxtapose messages generated by different authors, continually update, improve with more people using, consuming, contributing, or remixing information, and allow for the creation of networks through participation (Walther & Jang, 2012).

Social media are the websites and software that function specifically to allow communications, interactions, and connections to develop between users through activities such as posting, sharing or co-producing information (Wang, Tchernev, & Solloway, 2012). Social media's inherent function of social interaction reflects the ideological and technological foundations of Web 2.0. This is different compared to other media like television or radio, which are not inherently or primarily social (Wang, Tchernev, & Solloway, 2012). Communication on social media sites can be one-to-one, as with messaging between individuals within a site, one-to-many, as authors provide content to a public audience, or many-to-many, as connected systems pass information about one's activity broadly to indirectly linked members (McClard & Anderson, 2008).

User-generated content is the sum of all the various forms of media content people

publish on social media. User-generated content is openly available, thematically focused, sharable online information products characterized by degrees of authenticity and voluntary creation (i.e., not published for professional purposes) (Kaplan & Haenlein, 2010). User-generated content is shaped significantly by varying degrees of active participation showing a degree of creative effort, user-control of the content, or engagement and interaction with the content (Organization for Economic Cooperation and Development, 2007). The forms of content range from single to multi-media creations, and may include a combination of textual comments, photos, videos, or audio. In this view, content exchanged in emails, instant messages, through sharing or reposting original content, and commercially created content are excluded as forms of user-generated content (Kaplan & Haenlien, 2010). Social media that rely on user-generated content encompasses several online domains, including personal blogs, discussion boards, content-sharing sites (e.g. YouTube, SoundCloud), and social networking sites (SNS).

Social networking sites are one specific type of social media. They allow users to create public or semi-public profiles of personal information, invite others to access those profiles, and communicate with others through email, instant messaging, or site-specific functions (Kaplan & Haenlien, 2010; Lange, 2007). The ‘network’ is created through profile linking to formally articulate relationships with others deemed important or relevant in some way and enable network members to view profiles and changes (Lange, 2007). Social networks include individuals, organizations and websites, varying degrees of relational ties among members, and the interactions that occur between members (Jiang, Chen, & Liu, 2013; Visser & Mirabile, 2004). Most social network sites encourage the maintenance of existing ties and the formulation of new ones (Ellison, Steinfield, & Lampe, 2007).

Two of the more popular social networking sites in the United States currently are

Facebook and Twitter. As of 2014, 74% of adult Internet users use social media (71% use Facebook and 23% use Twitter), an increase of 825% in the past 10 years (from 8% in 2005) (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). Facebook is characterized by interacting with friends, family, and acquaintances through the application and is focused on fostering social interactions and allowing users to 'get to know each other better' (McClard & Anderson, 2008). Twitter is considered a microblog, characterized by individuals broadcasting thoughts or activity through a stream of short messages (Doughty, Rowland, & Lawson, 2011). As an information-sharing platform primarily, Twitter networks are formed through the shared communication practice (Bruns & Burgess, 2011). Connections are made, maintained, and observed through application features (e.g., 'retweets', 'mentions', or 'followers'; Doughty, Rowland, & Lawson, 2012), and reciprocation in relationships is not required (Kwak, Lee, Park & Moon, 2010). Information is collated along topical dimensions using hashtags (Meraz & Papacharissi, 2013), or words or phrases prefixed with a pound sign (#) (Chang, 2010). Hashtags serve as unifying textual markers (Harrington, Highfield, & Bruns, 2012) and are more readily adopted when supplied or predetermined from authorial sources, rather than created by users ad hoc (Chang, 2010). Hashtags displayed on-screen during television programs encourage 'backchannel' conversations about the show.

Background on Social Television

The use of mediated communication technologies to connect TV viewers, promote remotely shared television experiences, and encourage live viewing to increase participation is the foundation for social television (Mantzari, Lekakos, & Vrechopoulos, 2008). Social TV is the combination of television and social media using the Internet as the medium of communication to allow online social interactions to occur between viewers while watching TV (Shin, 2013).

Social TV is characterized by real-time synchronous or asynchronous interpersonal communication supported by various remote communication modalities (Chorianopoulos & Lekakos, 2008). It also requires parallel, synchronized TV viewing with a larger audience (Highfield, Harrington, & Bruns, 2013).

Social television grew out of "sofalising," or the act of viewing television while interacting with a second screen (Doughty, Rowland, & Lawson, 2012, p. 80). Second screens include Internet-connected devices such as desktop computers, laptops, tablets, or cellular phones that supplement the first screen of the television. The second screen enables viewers to connect through web sites or social media and interact with closely tied or loosely coupled ad hoc transient networks composed of fans and audience members that have no history or future (Highfield, Harrington, & Bruns, 2013). Second screen activity on social networking sites help viewers feel as though they are together (Hwang & Lim, 2015), participating in the "communal experience of group viewing without being physically together" (Wohn & Na, 2011, p. 2).

The real-time communication on social media 'backchannels' provides a shared or co-viewing experience (Doughty, Rowland, & Lawson, 2011; Hwang & Lim, 2015). Co-viewing is the shared experience of live viewing the same television content with small groups of other disconnected viewers, facilitated by social media (Doughty, Rowland, & Lawson, 2011; 2012). Harboe and colleagues (2008) liken it to virtually 'sharing the couch' and replacing 'water-cooler moments' with 'cyber-living-rooms' and 'cyber-bars.' Social TV provides the illusion or "credible immersive feeling," that users are watching together, even though authentic face-to-face interactions are replaced with virtual ones (Shin, 2013, p. 941). Viewing with others within a mediated environment enhances the viewing experience by encouraging more engagement with the content and comments (Hwang & Lim, 2015).

Social TV's ability to support and enhance social interactions is a function of its 'sociability,' or the experience of being in a social situation (Geerts & Grooff, 2009; Kreijns, Kirschner, Jochems, & Van Buuren, 2004; Shin, 2013). To enhance sociability, research suggests providing a common ground for shared interests or experiences, offering a place for building and enabling social interaction through synchronous and asynchronous functions, and giving the user control over engagement with and movement in and out of the audience (Chorianopoulos & Lekakos, 2008; Geerts & Grooff, 2009). Sociability is also enhanced by using different communication modalities or channels, minimizing distractions from the television content and disruptions in the program flow, and creating awareness and presence of the audience (Chorianopoulos & Lekakos, 2008; Geerts & Grooff, 2009).

Displaying user-generated comments over television shows is a form of social television. The practice of airing comments incentivizes live viewing and rewards 'backchannel' activity (Highfield, Harrington, & Bruns, 2013). Incorporating viewer comments into a program is thought to extend the relationship of producers to the audience, the audience's relationship with the program, and increase viewer engagement (Doughty, Rowland, & Lawson, 2011; Lochrie & Couton, 2012a, 2012b). Embedding user-generated comments in the screen is also hypothesized to enhance television's sociability. On-screen prompts encourage second screen activity and sharing, whereas producer-provided hashtags or invites to specific online spaces ensure a sense of group privacy and isolate exchanges between specific groups from other conversations (Chorianopoulos & Lekakos, 2008). The presentation of on-screen user-generated comments in the peripherals of the screen, usually fading on and off the screen at paced intervals minimizes distractions and disruptions to the program flow. Beyond the broadcaster's purpose of engaging viewers, aired comments promote a contextual awareness of other viewers (Harrington,

Highfield, & Bruns, 2013). The status and context of other viewers' experience is provided to the larger viewing audience.

Background Study

In a direct test of this phenomenon, Cameron and Geidner (2014) found that adding user-generated comments to a broadcast resulted in conformity to the majority opinion expressed in the on-screen text. The text comments with generic usernames (i.e., @EricGeorgeNYC, @ThreeSixtyFive) were shown in a static white box that ran across the bottom of the screen in a ticker feed format. The content of the comments was manipulated to create a positive-leaning and a negative-leaning experimental condition. Specifically, in the positive condition, 70% of the comments reflected positive opinions of the content, 15% were neutral, and 15% were negative, whereas the negative condition had 70% negative, 15% neutral, and 15% positive comments. The two experimental manipulations were applied to four short video clips (each about two minutes in length). Two clips were performances from a reality competition show (i.e., *American Idol*) and two were persuasive political speeches on current and salient topics given by elected governmental representatives (i.e., one was a Democrat female representative lobbying for women's rights, the other was a Republican male senator lobbying for gun rights). Two separate samples were used to collect the data, one for the reality competition stimuli, and one for the political speech stimuli.

Participants were randomly assigned to watch an experimental or control (clip without the comments) version of both video clips in the experiment. Then they were asked to give opinions of the performer/speaker and performance after each viewing. Overall, significant differences between the groups were found for eight of the 10 outcomes tested. Participants who viewed the clips with a majority of positive comments made more positive judgments compared

to those who viewed the control and negative-leaning clips, and those who viewed the negative-majority clips had more negative judgments. Interestingly, the results were driven by the negative condition, as little difference was found between the positive and control conditions in most comparisons.

The study provides proof of concept that, 1) viewers can aggregate comments across a program to get a sense of the majority opinion, and 2) viewers do conform to the majority opinion represented in on-screen user-generated comments. The study was not able to confirm the mechanism through which the effect was achieved. This dissertation attempts to provide insight into this effect, by theorizing that viewers' processing of media messages is driven by the presence of social information provided in on-screen user-generated comments. Additionally, this dissertation expands the knowledge of how on-screen user-generated comments affect the overall viewing experience.

Plan of Study

The overarching goal of this research is to understand if social viewing environments affect the way media messages are cognitively processed and enhance the viewing experience. To contribute to this understanding, this dissertation will employ two experimental studies. The first will test if the social context theoretically created from on-screen user-generated comments changes how media messages are attended to and cognitively processed. This social context is formally tested in the second study, which seeks to measure the variability in the perception of watching with others. Specifically, Study 2 will test if individual differences and manipulations of on-screen user-generated comments affect the viewer's sense of social presence. In addition, Study 2 will explore if variability in a viewer's sense of social presence affects the viewing experience. These two studies explain separate aspects of the phenomenon that combined, tell

the story of how viewers think about, and experience television programming in variable social viewing contexts.

Chapter 2

Literature Review

The theoretical argument driving this dissertation is concerned with how individuals cognitively process media messages. This process is partly driven by human motivations, which according to theory, are aroused by media content. It is argued that user-generated comments provide variable degrees of evidence of other viewers, allowing the individual viewer to feel like they are watching with others. Experiencing this perceived social context is theorized to increase attention and cognitive engagement with the message. In addition, the social viewing environment is believed to enhance the individual's viewing experience. Lastly, it is expected that differences in individuals' social needs and desires will affect the perception of a social content and their effects on outcomes are explored.

Cognitive Processing

Before an on-screen user-generated comment can have any effect, it must first be seen. As Lang (1990) poignantly states, "attention to media is generally considered a prerequisite to the effects of media" (p. 276). Cognitive processing refers to the way sensory information from the environment enters the brain and is mentally managed. When the senses are activated and directed towards taking in information, the brain is attending to the information. Seeing, hearing, tasting, smelling, or feeling results from attending to sensory information. The information is perceived once the information is understood. After information enters the brain through sensory inputs, it is subject to varying degrees of subsequent mental attention, affecting its staying power within the current thought process and use in consequential mental processing. For example, during a storm, a flash of light activates the visual system, directs the eyes to attend to the stimulus, which sees the light. Lightening is perceived, but so are several other sights, sounds,

and smells of the storm that produced the lightening. Thus, one strike of lightening during a passing storm will not likely garner additional thought after it strikes and disappears.

The Limited Capacity Model of Motivated Mediated Message Processing (LC4MP). The LC4MP is an information-processing model developed by Annie Lang (2000) that specifies how users cognitively engage in media consumption to process media messages. The model's name reflects the five key assumptions of media viewing experiences (Lang, 2006). 1) People are limited in the number of cognitive resources they have available to perceive, understand, and remember information. 2) Media are composed of variably redundant information streams presented in multiple sensory channels and formats. 3) Automatically activated motivational systems direct processing. 4) Learning and behavior is a dynamic process that occurs over time. 5) Communication is a continuous, interactive, dynamic embodied process.

This model describes the mental management of information as a memory model, where pieces of information move through associative mental networks, resulting in varying levels of information integration into existing mental frameworks. The process includes three subsystems of memory. The most basic process is encoding, or the act of creating mental representations of the stimulus. This involves selecting and processing information from the message to make it recognizable (Lang, 2000, 2006). Encoded information is measured with recognition, or the ability to select correct information from multiple choices, and represents information availability in short-term memory. The second process, storage, occurs by way of linking recently encoded information with previously stored knowledge. This subprocess leaves a lasting remnant of the information that is accessible through cued recall, or the ability to remember information given hints or clues, representing that the information was stored in long-term memory (Lang, 2000, 2006). The third subprocess, retrieval, is the most cognitively taxing

process. Retrieval refers to the spreading of encoded information through stored links to create loosely connected bits of information that can be recalled freely, without prompts, cues, or choices (Lang, 2000, 2006).

The three subprocesses can be, but are not necessarily linear, and only encoding is required for either of the other two processes to convene (Lang, 2006). By default, encoding takes precedence over other processes, since it is time dependent and driven by the plethora of information encountered during a message (Lang, 1995). The availability of information in one's mental Rolodex means that information may be activated in processing future information. Overall, the better the information is embedded (i.e., the more completely it is processed), the more it can influence subsequent, related information processing. The success of any one of the subprocesses relies on the amount of resources allocated to the task.

Based on the LC4MP, cognitive resources are allocated to tasks depending on certain factors assumed by the model. Foremost, the cognitive system does not have an infinite capacity to process incoming information. Mediated messages help users attend to and process information by using audio and visual tactics that automatically engage the sensory system. Characteristically, mediated messages present information in multiple channels, which can enhance or challenge one's ability to process elements depending on the similarity of information carried in each channel. In addition to the automatic activation of sensory systems that direct attention, processing can result from controlled efforts. Specifically, the capacity to attend to and process a message increases if a user is or becomes motivated to allocate resources to the cognitive task. Each of these factors is explained in detail below.

Limited capacity. The human brain is limited in its capacity to deal with all the information in an environment. The model describes this capacity as a limited pool of cognitive

resources to complete mental tasks. The resource pool can be broken down into resources required by the task, resources allocated to the task, and available resources remaining in the system during performance of the task (Lang, Bradley, Park, Shin, & Chung, 2006). Available resources are formally defined as the difference between the amount of resources allocated to taking in and perceiving the message, and the amount of resources required to process the message (Lang & Basil, 1998 as cited in Lang et al., 2006, p. 371). The availability of resources determines how well information can be processed, as resources dedicated to one task are not available to perform other tasks (Lang, 1995, 2000, 2006). When more resources are required to process the message than are available, the result is cognitive overload (Lang, 2006).

Fully processing a television message requires it to "be attended to, encoded into short-term memory, stored in long-term memory, and retrievable from long-term memory" (Lang, 1995, p. 89). The simultaneous and continuous active processing necessary to keep up with the fast pace of television commonly leads to the inability to fully attend to and process all incoming information. However, this does not hinder learning from the message or create difficulty in processing the message. As a change happens in the environment, physical sensory systems are automatically activated and an orienting response occurs. An orienting response is an involuntary reaction to a novel stimulus or a signal that something meaningful occurred that results in automatic allocation of resources to attend to the stimulus (Thorson & Lang, 1992; Lang, 2000). Orienting responses are the mechanisms through which attention varies throughout a message, guiding viewers through the message to reduce overload without compromising comprehension (Lang, 1990). The LC4MP model theorizes that orienting responses elicit automatic allocation of resources to the encoding process (Lang, Kurita, Gao, & Rubenking, 2013). As an involuntary, automatic process, orienting responses are not subject to individual viewer differences (Lang,

2000).

Mediated messages. Media messages are made up of elements of form and content. Features of form refer to the physical production strategies and editing techniques that create the structure of the audio-visual experience. This includes luminance levels, camera changes, zooms, pans, edits, slow motion, animation, video graphics, frequency levels, sound effects, music, rate of presentation, and narrative structure (Lang, 2000). The information included in form channels, such as words, text, narrative, dialogue, characters, settings, action, imagery, sounds, color, expressions, tone, intentions or more, is content. Content provides the subjective meaning of the message (Lang, 2000).

Structural form features within the message guide attention to specific parts to enable comprehension of a complex message without fully processing all the information contained within it (Lang, 1995). Structural features refer to the combination of images and sound in video formats that create the multi-sensory environment of a mediated message. Structural features include edits (changing the camera within the same visual scene), cuts (changing from one scene to another), changing the content (i.e., changing from the program to a commercial), and movement (i.e., something moved into or across the screen) (Lang, 1990). These tactics indicate a change in the message and invoke orienting responses through visual disruptions accomplished with changes in the scene. For example, a camera change from one character to another may signal a change in the speaker, and follows with information about the other character in the interaction. With the orienting response activated, attention is automatically directed towards the information directly following the structural element, decreasing processing of the information that preceded it (Lang, 1990).

Manipulating the structural form features presents different types of change that elicit

orienting responses, based on the difference between the information before and after the production strategy. Lang and colleagues (2013) divided the dimensions of information change into three groups categorized by the psychological aspects believed to be governing the response – novelty, motivational, and cognitive. The novelty group refers to a change in the stimulus that introduces new information. Novelty denotes a change in the immediate environment, but does not necessarily mean it is new or unusual to the user (Lang, Borse, Wise, & David, 2002). Adding new information, like changing the focal object between two scenes, introducing a previously unseen object, or adding an unrelated object that does not correspond to previous information in expected ways fall under this dimension of information change. The motivational group involves changes in the scene that invoke motivational relevance. Objects closer to the camera than preceding objects or an emotional change (referring to a change in arousal or valence) in information are dimensions within this category. Lastly, the cognitive group involves changes that require mental transformation. This includes perspective changes, such as introducing an object at a new angle or performing a function that humans cannot accomplish (changing the perspective from a frontal view to viewing the object from above, for example) and changing features like the color, the motion of objects, or adding text or video graphics to the frame.

The dimensions of information change suggest that user-generated comments appearing on the screen also elicit an orienting response. Each time text appears on screen, it represents a novel or new feature to that part of the message. Across the message, this novelty may not persist, as viewers may become habituated and come to expect the text (Lang, Borse, Wise, & David, 2002). This potential decrease in novelty may vary with the format of comment presentation. For example, the novelty of text appearing in a ticker or sidebar format in which

text is constantly visible may wear off faster than with a format where comments intermittently appear on, then disappear off the screen. However, as Lang, Borse, Wise, and Davis (2002) remit, “in television, it seems to be the occurrence of new content that elicits orienting, not its unexpectedness” (p. 220).

The on-screen user-generated comments may also result in orienting responses based on motivational relevance. The presentation styles of the text graphic, for example, its size in relation to the focal object in the primary visual field of the television program or if it seems closer to the viewer or larger than other objects, may be a signal to the viewer that the information is important. In addition, comments presented in colorful boxes or in colorful text may be perceived as more important than less visually intrusive formats where graphical adornments are minimal or more transparent. Furthermore, it is noteworthy to point out that the inclusion of text has traditionally been reserved for emergency messaging or subtitles. As Thorson and Lang (1992) found, familiarity with message features enhances encoding. Thus, user-generated comments may invoke an orienting response based on TV viewers’ previous knowledge and experience with on-screen text.

The appearance of a user-generated comment on screen disrupts the visual field as a form of movement on screen, representing a cognitive dimension of information change. However, this is dependent on the dual-task nature of the message. Specifically, Lang, Borse, Wise, and David (2002) found no evidence of orienting responses to text on computer screens when the rest of the screen was blank. They did find some evidence of orienting responses to more objectified text (i.e., text placed within a box) and to animated banner advertisements, but recognition and recall was found for only the animated information. They concluded that the orienting response is elicited when the viewer was attracted to something new in the immediate environment in

which they were already engaged. Furthermore, their results suggested that orienting responses are more likely in multi-task environments, where one stimulus appears on top of another. As television viewers engage in the viewing process, cognitive processing of the visual and audio information is already at a moderate to high level (Lang, 1990, 1995). The moderate level of attention already directed towards the message ensures that the viewer is visually attracted to the stimulus. Based on the model, an orienting response would be expected each time a text is introduced on screen simply as a result of changing the features within the frame.

Variably redundant, multiple streams. Whether the information attended to affects the viewer's experience or perception depends largely on how thoroughly that information is processed. The more thoroughly information is processed, the more likely it will be learned and affect behavior, referring to the assumption that learning and behavior is a dynamic process that occurs over time. The complexity of the message structure influences how hard a viewer has to work to cognitively process the message (Lang et al., 2013). Structural complexity refers to the type and number of structural forms and features that make up a media message. This complexity exists on a continuum between a single to multiple channels and a continuum of redundancy between the information presented in each channel (unrelated, or conflicting, to exact semantic information) (Lang, 1995; Lang et al., 2013).

Messages with a single channel require fewer resources to process, whereas messages with multiple channels require additional resources (Lang, 1995). However, this results in a counterintuitive effect on how messages are ultimately processed. Multiple channels require more resources meaning that more resources must be allocated to the task, thus memory improves (Lang, 1995; Lang et al., 2013). Television traditionally presents two screens of variably redundant information, creating audio-visual complexity (Lang, 1995). The additional

media stream of on-screen user-generated comments adds a third channel and layer of visual complexity to the screen, theoretically requiring increased cognitive processing.

Research on subtitles provides evidence for the way text on screen is processed. Using an eye-movement-registration system, d'Ydewalle, Praet, Verfaillie, and Rensbergen (1991) measured viewers' time spent reading subtitles. Their results indicated that viewers could not avoid spending time in the subtitle area while the text was on screen. Time spent in a condition without the accompanying soundtrack of dialogue dubbed in the viewer's native language was marginally higher compared to the condition with a soundtrack. Expectedly, time spent on the subtitle area increased as the text was split from one line into two, especially in the condition without the soundtrack, as reading the text was more imperative, yet difficult.

Perego, Del Missier, Porta, and Mosconi (2010) followed up on the effectiveness of processing subtitles with another eye-tracking study. Their results confirmed the time spent on the subtitled area, but did not support the previous claim that structural changes, like segmenting subtitles, affected processing. More importantly, the study found no evidence of tradeoff between image and text processing, as scene and subtitle recognition were equal. They concluded that viewers cognitively process subtitled media effectively to form a good understanding of the content. While viewers cannot avoid reading subtitles, they are able to process the third channel of text with relative ease.

It is important to note that subtitles present redundant information to the audio-visual scene. Redundancy is conceptualized as the relatedness of the semantic meaning between channels (Lang, 1995). When the channels present the same, similar, or related information (i.e., are redundant), the multiple streams are more easily processed and better remembered than when the streams have different or unrelated information (Lang, 1995; Lang et al., 2013). Redundancy

is also related to synchronicity, as the relatedness of the information within channels relies on timing of the presentation. For example, if the audio track does not sync with the video track, even if the information is the same, redundancy would be lower than if the tracks were synced. Studies of laugh tracks exhibit this claim, as the effect of the laughter on the viewing experience is lower when the laugher is more asynchronous (Furnham, Hutson, & McClelland, 2011; Lawson, Downing, & Cetola, 1998; Platow, Haslam, Both, Chew, Cuddon, Goharpey, Maurer, Rosini, Tsekouras, & Grace, 2005).

User-generated comments are variably related to the content of the program. First, comments appear after the event or scene to which it refers and after new information has been presented, reducing the synchronicity of the comment to the content and the redundancy that can exist between the message channels. Theoretically, this presentation feature directs processing to reflect back upon the previous information. This is unique compared to the flow of processing the LC4MP models suggests when orienting responses occur, as the model predicts processing past information is exchanged for encoding new information. However, this process can be disrupted when the viewer is motivated by content or other factors, allowing processing of past information to continue. The referent content, therefore, may enhance processing of both the message and the comment, as the reminder may reinforce or increase the links between the content and message, encouraging storage and retrieval processes. Second, comments are not necessarily redundant to the information in the two other channels. Instead, they may compliment the message or provide an opinion about the message. The time it takes to select comments from the real-time online activity may contribute to both the delay in presentation and selection of content. For example, if a more redundant comment is not found, the tradeoff may be to include a comment that is less specific to particular content (i.e., is more generic; e.g.,

"This show is great!").

Based on these characteristics and the LC4MP model, media messages that show user-generated comments on screen are theoretically more complex than the traditional two-channel format of television, or television with subtitles. The implication of this complexity is that more resources are required to process the three channels of information, especially when the third channel is non-redundant text. In return, viewers who are able to allocate the required resources to process the information are more likely to encode the structural features (i.e., the user-generated comments) and information within the message. Likewise, the reflective nature of comments may increase storage and retrieval if the comments inspire viewers to think back upon previously encoded information from the message as a form of rehearsal.

Motivation. The limited capacity of the cognitive system means there is a trade-off between the ability to attend to structural features that elicit orienting responses and other informational aspects of the message (Thorson & Lang, 1992). During mediated message processing, resources required to attend to all the information in the fast-paced environment are constantly challenged and continuously allocated by both automatic processes and user-controlled efforts (Lang, 2006). To illustrate this claim, one study instructed half of the participants to pay attention to a radio message, while the other half was instructed to just relax and enjoy the same message (Potter, Bolls, Lang, Zhou, Schwartz, Borse, Trout, & Dent, 1997). Levels of cognitive processing were assessed after the message and results showed that orienting responses and recognition (an indicator of encoding) did not differ between the groups. However, storage was higher for those watching to be informed, indicating higher levels of cognitive processing had occurred (Lang, 2000). In essence, viewers allocate resources not bound in automatic processes based on interest, relevance, or motivations to process the content

(Lang, 2006). The resulting changes in automatic and controlled processing throughout a media message relate to the dynamic interactive embodied process the model assumes.

Individuals are generally motivated to take in information, however continued processing beyond the orienting response depends on available resources and the viewer's motivation to selectively attend or process information (Lang, 2000, 2006). As the individual's desire to process the message increases, due to personal relevance, interest or other motivating factors, the viewer is likely to take more control over what and how information is attended to (Lang, 2000; Potter et al., 1997). As a result, the user may focus on specific information, consciously allocating resources towards a task. Content specifically engages viewers' interests or goals related to media uses and gratifications, thus compared to form, is more related to controlled processing (Lang, 2000). Viewers decide what to watch and how hard to concentrate depending on how relevant or meaningful they find the content or how motivated they are to attend (Grabe, Lang, & Zhao, 2003).

The path that information takes from the sensory system to the brain is theorized to be the result of the human motivational system. Traditionally, the model posits that the automatic, instinctual responses to sensory information engages an approach or avoid reaction (Lang, 2000, 2006). The activation of the appetitive (i.e., approach) and aversive (i.e., avoid) motivational systems that automatically direct cognitive processing to assess risk and reward is primarily driven by content that enacts an emotional response (Lang, Park, Sanders-Jackson, Wilson, & Wang, 2007). The emotional experience operates under two dimensions: arousal and valence. Arousal is conceptualized as a force with several distinct dimensions, measured by the level of excitement or activation associated with the emotion, which intensifies motivated behavior (Lang, 1990, 2006; Lang et al., 2007). Operationally, arousal manifests as a physiological (e.g.,

cardiac rhythm), behavioral (e.g., crying) or cognitive (i.e., feelings) response. Valence refers to the positive or negative bias of the emotional content (Lang, 2006; Lang et al., 2007). Valence is responsible for which motivational response is activated, with negative content evoking the aversive system and positive content evoking the appetitive system, whereas arousal relates to the level of activation within that system (Lang et al., 2007).

The two dimensions work together to direct cognitive resources. Positive, pleasing, non-threatening, or neutral message features activate the appetitive system and encourage more approach-behavior, or the desire to continue taking in information (Lang, 2006; Lang et al., 2007; Lang & Yegiyan, 2008; Wang, Lang, & Busemeyer, 2011). When the appetitive system is activated, information will continue to be automatically processed. In neutral conditions, the appetitive system is more active to encourage exploration, but the aversive system is quick to activate to produce a fast response when arousal increases (Lang et al., 2007). Message features that are negative, displeasing, threatening, or present risk activate the aversive system and encourage avoidance-behavior. Activation of this system allocates resources towards relating the information to previous knowledge, assessing risk, and taking steps towards protecting oneself in the future (Lang, 2000; Lang, 2006; Lang et al., 2007; Lang & Yegiyan, 2008; Wang, Lang, & Busemeyer, 2011). Continued attention toward new and other stimuli in the environment is minimized or stopped altogether until the aversive system is deactivated. Together, encoding is higher for positive compared to negative content in calm (low arousal) messages and negative compared to positive content in moderately arousing messages. In highly arousing messages, positive content is encoded, but encoding stops in negative messages as resources are instead directed towards storage and retrieval (Lang et al., 2007).

According to the LC4MP, activation of motivational systems will direct attention and

encourage controlled processing. However, this assumption has only been applied to intrinsic motivations related to needs associated with approach-avoidance (i.e., reward-risk) behaviors, ignoring other motivational factors that drive information processing. As social information in the form of user-generated comments appears on screen, the subsequent processing of the message information is subject to a socio-cognitive interpretation. One such motivational factor found to be associated with more thorough, deliberate, and systematic information processing is rooted in the human need for knowledge, or epistemic motivation (De Dreu, Nijstad, & van Knippenberg, 2008; Van Kleef, De Dreu, & Manstead, 2004).

Individuals have epistemic needs to maintain an accurate understanding of reality and to share a common knowledge of the norms that govern the social world (Higgins, 1992). The thoughts, beliefs, and judgments of others serve as evidence of the social world, providing a "fast and frugal" heuristic for social reality (Shteynberg, 2010, p. 688). Sharing a commonality of inner states with others about the world, or achieving a shared reality, is verified and validated through shared experiences (Echterhoff, Higgins, & Levine, 2009). When individuals are made aware of others attending to a stimulus, the object of that attention takes on more psychological and behavioral importance. The stimulus believed to be experienced by others becomes prioritized as having social significance, inspiring the individual to 'tune in' to the stimulus and the way others experience it (Shteynberg, 2010). Exposure to social information activates the intrinsic need for a shared reality, making the information motivationally relevant.

Developments in new media, such as social TV, attempt to help viewers feel as if they are together in a communal, group-viewing environment (Shin, 2013). Lin, Keegan, Margolin, and Lazer (2014) argue that the shared awareness of experiencing the event with others drives interaction with social media during media events. Research has supported this notion. For

example, one study found social TV use was predicted by viewers' motives to be entertained, to fulfill a need to communicate with others, to gather information from others, and to experience more enjoyment from the television viewing experience (Krämer, Winter, Benninghoff, & Gallus, 2015). Similarly, another study discovered that the need for information, along with a need for excitement, predicted the individual's level of awareness of viewing with others (Hwang & Lim, 2015). A study using focus groups explored the reasons for watching videos on sharing sites using a new feature that embeds content-synchronized comments into the video display (Danmaku videos; Chen, Gao, & Rau, 2015). Results indicated that viewers watched to be entertained, to feel a sense that they were watching in the company of others, to feel a sense of belonging to a group with shared interests, and to seek information about the content. A comparison of individual differences to predict in-person and social media coviewing experiences found social media coviewing was associated with a need to belong, need for solitude (i.e., preference for being alone while viewing; negative relationship), and audience monitoring desires (i.e., tendency to observe others socially during coviewing; Cohen & Lancaster, 2014).

Previous empirical evidence supports the notion that shared experiences affect cognitive processing. In a test of the social tuning hypothesis, Shteynberg (2010) subjected participants to stimuli that were indicated to be viewed by similar or dissimilar others. The results of three studies revealed that recognition time was faster and accuracy was higher when the same stimuli was believed to be experienced by similar others, compared to less similar others. In addition, recognition and accuracy suffered when participants believed that similar others were viewing different stimuli. These findings indicate that cognitive processing was affected by a perceived shared experience, as information was encoded better, making it more cognitively accessible in

recall tasks.

Relatedly, Shteynberg, Hirsh, Galinsky, and Knight (2014) found that shared attention, or the cognizant awareness of perceiving the same stimulus at the same time as another, particularly with a similar other, was related to more cognitive elaboration on the object or stimulus. Participants were led to believe they were viewing the same or different object (e.g., a painting) with similar or different others. In addition, participants' mood was measured or manipulated to determine the effect on attitudes concerning the object. Across three studies, the effect of a participant's mood on object attitudes increased when the participant perceived that the object was being attended to by similar others. These results were replicated and explained in a fourth study, which found that participants who believed they were attending to the same object with similar others demonstrated greater elaborative processing in written descriptions of the object. This heightened elaboration of the object allowed mood, as part of the broad knowledge structure used in processing, to influence attitudes. These findings are provocative in that they indicate that a social context can be experienced even when social others are not present and exert influence without knowledge of others' evaluations, characteristics typical to online and mass media.

This notion that a shared experience influences information processing devoid of explicit knowledge of others' opinions was further tested using a mass media message broadcast in an online environment (Shteynberg, Bramlett, Fles, & Cameron, under review). Participants watched a political video that was labeled either as live or previously recorded, and variations on if and when others viewed the video (currently viewing with participant, previously viewed overall, previously viewed when originally broadcast, and no viewership information). Results suggested that, regardless of if the video was live or previously recorded, simultaneously

viewing with others (i.e., mass shared attention) made a persuasive political speech more persuasive, and a non-persuasive speech less persuasive. The studies further ruled out the possibility that results were a remnant of general positive arousal or perceived attitude agreement with other viewers. Instead, it seems that the information presented in the speeches garnered more, and potentially more critical, cognitive processing, allowing co-attending viewers to make more informed decisions about the content presented.

In a similar study, Skalski and Tambourini (2007) exposed participants to a persuasive message that included a computerized person-figure who appeared in a window within the content frame. They hypothesized that the ability to interact with the computer agent would increase feelings of being with another person, or social presence. Then, depending on the attractiveness of the agent, social presence would affect assessments of the source and message processing, in turn affecting attitudes concerning the content topic. Their model was supported. An individual's sense of being with another (the social agent) increased with interactivity, and inspired more positive judgments about the social agent, even when the agent was unattractive. The authors suggest the reduction in negative thoughts of the unattractive source may be due to a sense of intimacy or closeness resulting from perceptions of social presence. Finally, social presence had a positive effect on message processing, which had a positive effect on attitude. These effects indicate "perceived presence causes greater focus on what the source is saying" (p. 408) and "increases the motivations for message processing" (p. 409), leading to attitude change.

Theoretical contribution. This research explores the idea that on-screen user-generated comments create a social context that engages motivations to consume social information, which directs attention and inspires controlled processing toward the media message. Unlike the LC4MP model which commonly relates controlled processing to content as an a priori effect of

viewers' decision to choose a program, this phenomenon makes content relevant after the comments begin to appear. This proposes a new link between the LC4MP and motivations for attending and processing media messages conceived as a result of the new practice of embedding user-generated comments into broadcast television. Media messages with multiple channels require more cognitive resources to process, resulting in better recall (Lang, 1995; Lang et al., 2013). This suggests that recall overall will be higher for stimuli with a third channel (i.e., text) than without. In addition, the added social context of user-generated comments represents an opportunity for the viewer to gain information about the social reality of the experience. This social information should increase a viewer's motivation to pay attention to the shared stimulus, resulting in better information recall.

The theoretical argument posits that a socially contextualized media message enacts more controlled processing, resulting in more attention and cognitive engagement. Unlike moment-specific cognitive changes that occur when orienting responses engage automatic processing or changes in arousing and valenced content elicit motivational responses, the social context is assumed to be pervasive to the viewing experience. This pervasiveness is assumed because the first user-generated comment that appears on screen makes the implicit audience of the mass medium of television explicit. This suggests the motivation to remain engaged and attentive upon the first appearance of user-generated content should persist during viewing. In addition, programs that employ this practice show multiple comments throughout a show, continually reinforcing the presence of other viewers. As a result, recall for message content should be better overall when a 'socialized' third channel is included, compared to viewing experiences without a contextualized third channel.

H1: Information recall of narrative content will be higher when the message contains

user-generated comments compared to plain text and no text.

Additionally, previous research suggests that shared experiences occur when the individuals are experiencing the same stimulus at the same time. In reality, when viewers record or watch a rebroadcast of a show that includes user-generated comments, the shared experience would be diminished, as the comments would no longer be created and posted in real time. To test this idea within this realm, a sub-hypothesis is proposed.

H1a: Information recall of narrative content will be higher when user-generated comments in the message are live compared to previously recorded.

Social Presence

Building from research on shared attention and shared experiences, I argue that one mechanism responsible for the activation of motivational systems and increased cognitive processing within a social context is the individual's sense of awareness and perception of the presence of other viewers. On-screen user-generated comments may mimic a social viewing experience, like watching together in physical spaces or interacting with a second screen, and serve as evidence that one is watching with others. It is theorized that how the comments appear and elements within the content of the comments contribute to an individual's awareness and sense presence of other viewers. In the next section, I will explain the concept of social presence, describe how the individual's sense of social presence can be fostered by media elements, relate those elements to on-screen user-generated comments, and identify individual differences that may impede or facilitate the effect of media elements on one's sense of social presence.

Theory and conceptualization. Social presence is a multi-dimensional, socio-psychological construct concerned with the perceptual processing of technology-generated stimuli (Lee, 2004). The concept was first used to describe how mediated communication

systems developed and supported interpersonal and social relations devoid of cues inherent in face-to-face communication (Walther, 2011). It requires involvement, or the psychological state created by orienting of one's senses towards, focusing, and directing attention to a coherent stimulus, and immersion, or the perception of being part of the dynamic stream of information (i.e., viewers feel like part of a larger viewing audience) (Witmer & Singer, 1998). The assumption is that once a minimum threshold is met (the viewer is watching the television program), "increased allocation of attention to the information beyond this threshold will increase the sense of presence" (Witmer & Singer, 1998, p. 225).

Short, Williams, and Christie (1976) first conceptualized social presence as the level of salience of another person in a mediated interaction. They theorized that telecommunication systems, like telephones, were unable to transmit the verbal and nonverbal information, such as facial expressions, gaze, posture, or physical distance, which are important for determining how people interact (Gunawardena, 1995). In this regard, social presence was conceived as a characteristic of the media. As a cue-filtered-out theory, its main assertion is "that systematic reductions in the nonverbal cues conveyed by different communication systems lead to impersonal orientations among users" (Walther, 2011, p. 444). Generally, interpersonal interactions and face-to-face communication are believed to have the greatest social presence followed by mediated interactions, like audio plus video (e.g., teleconference) and then audio (e.g., telephone) only, while text media is considered to have the least social presence (Rice, 1992). However, social presence can occur in non-interactive communication exchanges as a perceptual state fostered from an experience devoid of physical involvement (Zelenkauskaite & Bucy, 2009).

The contemporary theoretical perspective of social presence has moved away from a

technology-centric view in favor of understanding the effect of media attributes on the individual's actual perceived salience of others (Skalski & Tambourini, 2007). Under the psychological perspective, social presence is understood as a function of individual perception based on subjective experience, or 'feelings', and not a characteristic of the media (Skalski & Tambourini, 2007). An individual's perception of social presence falls along a single continuum ranging from judgments of 'present' to 'not,' affected by factors or attributes of the communication technology (Shin, 2013). Specifically, researchers consider both how properties of the media affect social presence and how users attribute social presence to mediated representations (Biocca, Harms, & Burgoon, 2003; Zelenkauskaite & Bucy, 2009).

Biocca and Nowak (2001) conceptualized social presence as the level of awareness of the co-presence of another human being or intelligence, with co-presence referring to the basic sensory awareness of another as a necessary pre-condition. Similarly, Zelankauskaite and Bucy (2009) defined social presence as a subjective experience of being aware of another person and the perception of sharing the environment with that other person or persons. This research is concerned with how on-screen user-generated comments foster a sense that the viewer is watching with others. Thus, social presence is conceptualized using these psychological definitions as the level of subjective experience of co-presence of another person or persons.

Under this definition, the construct of social presence comprises six dimensions. One dimension is awareness, or a sense of access to another intelligence (Biocca, Harms, & Burgoon, 2003; Kahn, 2012). Awareness is achieved through incorporating text, images, audio or video channels into media to provide evidence of the other. The information included in those channels can also provide insight into another's intentional, cognitive, or affective state. This insight heightens social presence through the dimension of mutual understanding, or a sense of shared

comprehension, interpretation, or perception about an environment (Biocca, Harms, & Burgoon, 2003). A third dimension is salience of the interpersonal relationship, or the perceived distance between oneself and the other (Biocca, Harms, & Burgoon, 2003). This dimension consists of the concepts of intimacy and immediacy and translates into feelings of affiliation or connectedness with others. Intimacy refers to the interpersonal (as opposed to mediated) nature of the interaction and perceived physical distance between oneself and the other; and immediacy refers to the synchronicity of the interaction and the psychological distance one feels with the other in the interaction (Biocca, Harms, & Burgoon, 2003; Gunawardena & Zittle, 2007). Perceived actuality is a fourth dimension, and relates to the realism or accuracy of the represented objects, events, and people to either the mediated environment or social world (Lombard & Ditton, 2000; Kahn, 2013; Witmer & Singer, 1998). Behavioral engagement, a fifth dimension, relates to the amount of communication or level of interactivity allowed with others in a mediated environment, ranging from observing reactions and nonverbal communication to text chatting or face-to-face talking (Biocca, Harms, & Burgoon, 2003; Zelenkauskaite & Bucy, 2009). The sixth dimension, psychological involvement, involves the individual's level of attention and engagement in a mediated environment (Lee & Nass, 2005; Lombard, Ditton, & Weinstein, 1997). In essence, social presence can only be perceived if the individual's attention and engagement within the mediated environment is at a minimal level (Witmer & Singer, 1998). Increases in engagement and attention beyond this minimum threshold increase the opportunities of feeling as though one is co-attending, achieving feelings of mutual understanding or connectedness with others, deriving perceptions of realism, and/or behaviorally engaging in the mediated environment (Witmer & Singer, 1998).

The concept of social presence falls under an umbrella comprised of copresence,

coattention and coviewing. As defined, social presence, like shared attention, requires a basic awareness of others sharing the same sensory environment (i.e., watching the same stimulus). Social presence expands the dichotomous external condition of shared attention or coviewing (i.e., coviewing or not) to a continuum, conceived as a variable individual experience based on characteristics of the individual and the external environment. As such, social presence and shared attention co-occur. While shared attention and social presence are considered more easily achieved in less mediated interactions (i.e., following one's gaze or through vocal expressions; Higgins, 1992), social presence as an individual perception measured on a continuum can be quantified within any environment (Kaplan & Haenlein, 2010). Shared attention requires that others are perceived as sharing the same object or environment at the same time (Shteynberg et al., 2014), which are characteristics that create variability in perceptions of social presence, not determine it (Kaplan & Haenlein, 2010).

Social presence and media. Across all media, social presence is fostered through form and content. Form features engage the senses and immerse users into the environment. For example, incorporating text, images, audio or video channels that provide evidence of the other creates awareness, or a sense of access to another intelligence (Biocca, Harms, & Burgoon, 2003; Kahn, 2012). Specifically, computer-mediated and virtual environments establish awareness through rich text, images, video, avatars (i.e., customizable cartoon graphic representation of the self; Fong & Mar, 2015), anthropomorphic or animal-like characters, computer agents (e.g., Paperclip in Microsoft Office 97, Lee & Nass, 1999) and robots (Biocca, Harms & Burgoon, 2003). The more realistic or authentic the representation of the objects, events, or people is in the mediated environment or social world, the greater the sense of social presence (Lombard & Ditton, 2000; Kahn, 2013; Witmer & Singer, 1998). In addition, media that are more

interpersonal and less mediated (i.e., intimate) and synchronous versus asynchronous (i.e., immediate) have more social presence (Kaplan & Haenlein, 2010).

Content features of mediated environments that are rich with personal qualities and social cues enhance social presence through transmission of verbal and nonverbal cues (Biocca, Harms, & Burgoon, 2013; Gunawardena & Zittle, 1997). For example, virtual representations of the self in computer-mediated environments, created with avatars, icons, email pseudonyms, and usernames help portray aspects of personality (Fong & Mar, 2015; Graham & Gosling, 2012), demographics (Heisler & Crabill, 2006; Spence, Lachlan, Westerman, & Spates, 2013), homophily (Nowak, Hamilton, & Hammond, 2009), and credibility (Nowak, Hamilton, & Hammond, 2009; Nowak & Rauh, 2008; Park, Xiang, Josiam, & Kim, 2014). Content may also provide insight into another's intentional, cognitive, or affective state, allowing a sense of shared comprehension, interpretation, or perception about an environment (Biocca, Harms, & Burgoon, 2003). In addition, the use of verbal and nonverbal cues to express emotional, behavioral, or cognitive reactions reduce uncertainty about the intent or meaning of the message and require less time and effort to process, positively contributing to social presence (Tang, Wang, & Norman, 2013). Media that provide more social cues generate more social presence (Connell, Medelsohn, Robins, & Canny, 2001; Kaplan & Haenlein, 2010; Rogers & Lea, 2005; Zhang, Lowry, Zhou, & Fu, 2007).

Television. Television has historically implemented audience feedback that capitalizes on such cues to enhance the sense of shared viewing and affect the experience. These techniques include live studio audiences, audience screen shots (i.e., camera shots of the audience), and audio cues (i.e., audience applause or laugh tracks). For example, the addition of laugh tracks in comedic programming provides 'social proof' from others that the content is meant to be funny,

helping viewers understand the humorous intent of programming (Lieberman, Neuendorf, Denny, Skalski, & Wang, 2009; Vraga, Johnson, Carr, Bode, & Bard, 2014). Similarly, cheers, jeers, and applause compliment other types of television content, like talk or game shows (Fein, Goethals, & Kugler, 2007). However, the quality of the characteristics is an important factor in the viewer experience. For example, features of laugh tracks, such as the synchronicity of the laughter to the content, its volume, its length, the perceived audience size or its authenticity (live studio audience versus digitally produced sounds or tracks) can have negative consequences on the viewing experience (Lawson, Downing, & Cetola, 1998). This finding relates to the claim that heightened awareness of the artificiality of the representation detracts from the sense of social presence (Lombard & Ditton, 1997).

In recent years, new forms of audience feedback including the results of viewer voting polls or real-time ratings bring the at-home viewers' perspective to the screen. Audience responses captured in polls or solicited from viewers have appeared as graphical displays, providing viewers with aggregate information about others' reactions to the content (Davis, Bowers, & Memom, 2011; Weaver, Huck, & Brosius, 2009). For example, CNN showed a graph that aggregated the changing assessment of a focus group as they watched the 2004 presidential election (Weaver, Huck, & Brosius, 2009). A&E's *Project Runway:* Season 12 used the same tactic throughout each episode by aggregating votes collected from viewers who responded on Twitter to the on-screen prompts (Konolojy, 2013).

These strategies provide evidence that others are watching the program, which theoretically enhances the individual viewer's sense of social presence. They may allow the viewer to feel like part of the larger audience, whether they watched the originally scheduled broadcast during its first airing, or viewed it on a time-delayed device such as a DVR. However,

the viewer's sense of presence may vary depending on the viewing condition chosen. For instance, viewers who watch the originally scheduled broadcast during its first airing can be confident that other viewers are tuning in, enhancing the sense of watching synchronously with the larger viewing audience. This may especially be the case when the program incorporates viewer polls or reactions, which are dependent on live viewing, and collected and distributed in real-time. Rebroadcasts, where the program is shown again at a later time, would expect to garner a smaller live audience, reducing the viewers' sense of presence. Any viewer polls or reactions integrated into the display are reduced to artifacts of the first live broadcast. In time-delayed viewing conditions, the individually chosen viewing time essentially eliminates the potential that others are watching at that same time.

On-screen user-generated comments. Text-on-screen is not an uncommon phenomenon to television, as news broadcasts, sports shows, or subtitled programs illustrate. However, context must differentiate producer-created text from user-generated comments in order to create a sense of awareness of others. Two main features of on-screen text are commonly used to indicate that it is social commentary. First is the inclusion of social media logos within the overlay to indicate the attached text is from a social media site. This branding tactic gives insight about the source of the text, and may enhance its authenticity as a user-generated comment. A second indicator that contextualizes the information as an expression made by a real person is the inclusion of the text's author. This could include a username (which may or may not be or include a person's proper name, e.g., @jcameron), a real name (e.g., Jackie Cameron), an abbreviated real name (i.e., first name and initial of last name, e.g., Jackie C.), or a username plus the user's real name (e.g., Jackie Cameron @jcameron). In addition to identifying the source author by name, some formats also include a profile picture. While profile pictures vary from

portraits to non-photographic images, the picture provides a representation of the author, further personalizing the text. To test if the textual images of on-screen user-generated comments create an awareness of other viewers watching at the same time and in turn, enhance perceptions of social presence, a hypothesis is proposed.

H2: Perceptions of social presence (particularly the dimension of awareness) will be stronger in viewers who see user-generated comments compared to those who see no comments or plain text.

As personal expressions, user-generated comments offer opinions, reactions, and subjective experiences, making them, by nature, characteristically emotional, arousing, or valenced. Beyond the actual semantic words used in the text, user-generated comments include several features to help express valence, arousal, opinions, vocal tones, or behavioral reactions (Riordan & Kreuz, 2010; Walther, Loh, & Granka, 2005). For example, emoticons (i.e., a sequence of keyboard characteristics arranged in a spatial array; e.g.,☺) are used to show or reinforce positive (e.g., smiling face) or negative (e.g., frowning face) reactions. On Twitter specifically, the use of emojis (i.e., pictorial representations of emoticons) is a practical way to express emotions in the 140-character message limit, and by June 2015, over 14% of TV-related tweets and 20% of reality TV-related tweets contained emojis (Cruse, 2015). Additionally, vocal spelling (e.g., yeeessss), lexical surrogates (e.g., mhmm), and capital letters (e.g., SHOUT) imitate vocal intonation or tone of voice. Grammatical markers like punctuation are used to express attitudes (e.g., !!!) or pauses (e.g., …). Initialisms, such as ‘lol’ (laughing out loud) or ‘smh’ (shaking my head) additionally help express the emotional or physical expressions of arousal and valence (Jones & Schieffelin, 2009). The use of emoticons, humor, introductions, or salutations heightens the sense of social presence (Tu, 2002).

The inclusion of hashtags within the comments may also enhance awareness and social presence. A common convention for television programs is to provide a specific hashtag on screen to encourage 'backchannel' conversations and likewise find those conversations. For example, TLC's show *Little People, Big World* displays the tag #LPBW throughout the program. Hence, comments using this hashtag are indicative of a specific audience of viewers commenting on that show. Hashtags may also change with the content throughout the show, as NBC's *The Island* did in its first season. For example, the show launched hashtags to celebrate participants who departed the show (e.g., #GoodbyeEarnest, #GoodbyeTrey) or when exciting plot points occurred (e.g., #SaveTheTurtle). User-generated comments using the new hashtags as they appear reflect the synchronicity of the viewer watching and commenting. In addition, comments placed closest to the event to which they refer allow the individual to assess the synchronicity of other viewers' experience with the content. The more synchronous the comment is to the content, the more the at-home viewer may perceive the presence of other viewers.

Elements of media form and content affect perceptions of social presence through their ability to create awareness, interpersonal nature, authenticity, and synchronicity. For on-screen user-generated comments, the elements that provide social cues include usernames or branding, verbal and nonverbal content, unifying markers like hashtags, and synchronous timing. Messages with more social cues heighten social presence (Connell et al., 2001; Kaplan & Haenlein, 2010; Rogers & Lea, 2005; Zhang et al., 2007). However, social cues within a media message vary based on the content produced by the creator and the choices content producers make in selecting and presenting comments. Two hypotheses serve to demonstrate that social presence is variable and can vary based on small decisions content producers make about how and which user-generated comments appear on screen.

H3a: Comments with social cues will produce stronger perceptions of social presence than comments that lack social cues.

Related to synchronicity, the redundancy of the content of on-screen user-generated comments can also affect perceptions of social presence. As the redundancy between the information in the comments and the two audio-visual channels increases, the information in the multiple channels becomes easier to process (Lang, 1995; Lang et al., 2013). In addition, redundancy allows the viewer to judge the 'sharedness' of the experience with others, and social presence increases when the multimodal information within an environment is consistent (Lombard & Ditton, 1997; Witmer & Singer, 1998). As comments relate less or are asynchronous to the content of the program, they may seem contrived, inauthentic, or indicate that the author was not actually watching the show, diminishing the shared experience of watching with others (Echterhoff, 2013; Lin et al., 2014). This notion was found in research on laugh tracks, where laughter deemed less authentic, due to being recorded and added during editing, were less likely to increase viewer enjoyment or perceptions of the content's humorous quality (Furnham, Hutson, & McClelland, 2011; Lawson, Downing, & Cetola, 1998; Platow et al., 2005). Overall, more redundancy between the comment and television content will increase perceptions of social presence.

H3b: Redundant content will produce stronger perceptions of social presence than non-redundant content.

Social presence and individual differences. As a psychological experience, both media characteristics and individual differences are believed to affect the experience of social presence (Lombard & Ditton, 1997; Lombard & Ditton, 2000; Witmer & Singer, 1998). The individual differences previously explored range from personal experiences to personality characteristics.

As Neuendorf, Skalski, Denny, Campbell, and Egizii (2012) caution, research examining the impact of individual differences on presence has resulted in contradictory findings difficult to synthesize due to different measures of presence within various environments. Therefore, this research will include the variables most commonly cited in television and social TV environments, or related specifically to social presence as conceptualized for this phenomenon.

Previous research suggests that prior experience and knowledge with a medium eases processing and affects subsequent experiences with the medium (Gunawardena & Zittle, 1997; Lombard & Ditton, 1997; Ogara, Koh, & Prybutok, 2014). Experience and knowledge relate to the familiarity a media user has with the nature of the medium, how it functions, how to use it, and the conventions used within it (Lombard & Ditton, 1997). Specifically, personal relevance and interest in the media message, 'expectancy' about the media content, or exposure to similar content contribute to one's knowledge and affect one's experience of presence (Lombard & Ditton, 1997; Neuendorff et al., 2012). For example, one study found that viewers' past exposure to war films positively predicted presence during a war film, and presence diminished when the viewer's expectation of the film did not coincide with the actual presentation (i.e., footage shown was in color instead of the expected black and white format) (Neuendorff et al., 2012).

Relatedly, experience with a particular type of media or content affects the perception of presence. One study found that users with higher skills and more experience typing on a keyboard or casual shorthand used in mediated communication (i.e., translating emoticons or initialisms) positively correlated to social presence (Tu, 2002). Similarly, another study found that older participants with more prior virtual reality experience reported stronger levels of social presence while participating in a virtual reality world (Siriaraya & Siang Ang, 2012). Likewise, a study using a violent video game found participants who reported more frequent video game play

experienced a stronger sense of social presence (Nowak, Krcmar, & Farrar, 2008). In essence, experience minimizes the distractions or challenges an inexperienced user may face while using the medium, allowing experienced users to be more engaged and immersed in the environment. However, in a study measuring social presence during television viewing, the amount of prior television viewing was not correlated to the levels of social presence experienced (Bracken, 2005).

Prior knowledge and experience with social media and on-screen user-generated comments have important implications for this research. Viewers with at least a minimal knowledge of online social media or the conventions used in online communication can easily recognize elements such as usernames or brand logos and attribute the information to user-generated content from an external source (external to the television message). As the on-screen user-generated comments are perceived as commentary from individual viewers, the viewer can be made aware that other people are watching. However, viewers with no knowledge of social media may have more difficulty understanding these elements as indicators of social information. In addition, a lack of knowledge about textual elements and nonverbal symbols used within comments, such as emoticons or capitalization, may also detract from one's sense of social presence, as understanding the information becomes more difficult. Likewise, viewers who watch more television programs with on-screen user-generated comments (i.e., have more experience) may be less distracted by the on-screen text and experience presence more readily than less experienced viewers. Alternatively, more experienced viewers may have become habituated to the practice, decreasing the novelty of the experience, and resulting in no enhancement on feelings of presence (Lombard & Ditton, 1997).

In a similar regard, a viewer may be characteristically inclined to watch television in a

particular environment. Specifically, a viewer may prefer a more social television viewing experience. This has been described as one's coviewing orientation, formally conceptualized as one's predisposition to share media experiences with others and use television viewing as a social activity (Cohen & Lancaster, 2014). Coviewing orientation consists of three dimensions: the desire to view alone (need for solitude), the preference to view with others (need for company) and the proclivity to monitor others socially while viewing (audience monitoring desires). As Cohen and Lancaster (2014) demonstrated, coviewing orientation significantly predicted the frequency of participating in different types of coviewing behaviors (i.e., watching in the physical presence of others, sending text or instant messages during viewing, sharing content or posting status updates on social networking sites related to the show while watching, and monitoring social networking sites for other's posts about the show while watching). The three dimensions differentially related to the behaviors, however. Specifically, in-person coviewing was negatively associated with a need for solitude and positively associated with a need for company. Interestingly, a need for solitude positively predicted two types of social media coviewing (instant message coviewing and social network site monitoring). Audience monitoring desires positively predicted sending text messages during viewing and monitoring social networking sites and negatively predicted social network site coviewing. While coviewing orientation has not been tested as a predictor of social presence, it seems logical that viewers with a predilection for a social viewing environment would likely experience greater social presence when the environment provides a social context to satisfy their coviewing desires.

In addition to differences in individual experiences, skills and coviewing orientation, one's sense of social presence can also be affected by the individual's personality traits. Personality traits describe an individual's characteristic pattern of thoughts, emotions, or

behaviors. Specifically, individuals have different dispositions related to social environments. Such dispositions result in different levels of 'socialness' and desires to be with or interact with others.

Extraversion[1] is one personality factor that has been investigated for its impact on social presence. Specifically, one study found that individuals who are more outgoing, personable, sociable, active, enthusiastic, cheerful and enjoy interacting with others (i.e., extraverts) reported stronger social presence in an online group meeting space than those who were more introverted (Tang, Wang, & Norman, 2013). In addition, the study found that social presence mediated the effect of personality on user satisfaction, with extraverts reporting higher user satisfaction than introverts. However, another study found no direct effect of extraversion as a personality trait on social presence, but did find that computerized voices perceived as extraverted elicited stronger reports of social presence, compared to voices deemed introverted (Lee & Nass, 2005). In addition, social presence was stronger when the participant's personality matched the perceived personality of the computerized voice. The interaction showed that introverts reported a stronger sense of social presence when they heard an introverted voice compared to an extraverted voice, and extraverts reported a stronger sense of social presence when they heard an extraverted voice. The results of Lee and Nass's (2005) studies supported their argument that individuals attribute human characteristics to mediated representations, based on factors such as language and voice that give media human-like qualities, which elicit social responses to media as would be expected in interpersonal exchanges.

[1] Although this term is correctly spelled with either an 'a' or an 'o', it was originally spelled with an 'a' when defined by Carl Jung in 1917 (Kaufman, 2015). The spelling also more closely aligns with the conception of the term meaning 'turning outward', as 'extra' in Latin translates to "outside". In technical use, 'extraversion' is still the most widely and accepted spelling (Web of Science search results for 'extraversion' = 6,390, search results for 'extroversion' = 1,755). The chosen spelling here also reflects the spelling used in the majority of references cited in the text.

One's need to form attachments with others may also directly impact one's sense of social presence. This need is described as the need to belong and, although correlated with extraversion, is proven to be a distinctly different construct (Baumeister & Leary, 1995; Leary, Kelly, Cottrell, & Schreindorfer, 2013). Individuals' need to belong drives motivations to feel socially accepted and included, and those with a higher need more vigilantly monitor their social environments to determine how well they fit in (Cohen & Lancaster, 2014). Initial evidence has supported the link between the need to belong and social presence. Research predicting shared viewing experiences found a positive association between the need to belong (Cohen & Lancaster, 2014) and relatedly, the desire to feel a sense of belonging to a group and a sense of watching with others (Chen, Gao, & Rau, 2015). Viewing with others, particularly in mediated environments that connect a viewer to a larger audience, can fulfill desires to feel like part of a larger group and allow a viewer to assess how well they fit within that community (Cohen & Lancaster, 2014).

Overall, the influence of individual differences on social presence in mediated communications requires further inquiry. This research attempts to provide some clarification of the relationship between individual differences and social presence within the television-viewing environment. Prior experience with television and social media is expected to have low variability, thus will serve only as a control variable along with previous knowledge related to content and personal factors of interest and relevance. Individual traits of coviewing orientation, the need to belong, and extraversion will be explored for their direct effects on the perception of social presence.

H4a: Need for solitude will have a negative effect on social presence.

H4b: Need for company will have a positive effect on social presence.

H4c: Audience monitoring will have a positive effect on social presence.

H4d: Extraversion will have a positive effect on social presence.

H4e: Need to belong will have a positive effect on social presence.

Based on previous research that manipulated personalities of mediated representations, it is conceivable that user-generated comments more rich with social cues may also portray a more extraverted personality. Extraverts, compared to introverts, are characteristically more socially present, have louder voices, speak more, occupy more physical space with broader gestures and body postures, and initiate more conversations (Lee & Nass, 2005, p. 35). In previous studies, an extraverted media personality reflected strong, friendly, assertive, confident, commanding, and lengthy (i.e., more text or dialogue) language (Lee & Nass, 2005; Isbister & Nass, 2000; Moon & Nass, 1996). Noticeably, extraverted text also included more punctuation, consistent with the characteristic of extraverts having louder voices (Lee & Nass, 2005). An introverted personality, in contrast, was represented with weaker language, expressing questions or suggestions, and was shorter.

If socially enriched comments are perceived as having a more extraverted personality, previous research suggests that perceptions of social presence will be stronger. More so, this perception of personality will interact with one's own personality, such that perceptions of social presence will be stronger when the perceived personality of the comment matches the viewer's personality. Thus, a hypothesis is offered to expand Hypothesis 3a.

H5: Extraversion will moderate the relationship between social-cue enriched user-generated comments and social presence. Specifically, user-generated comments with social cues will result in stronger perceptions of social presence for extraverted viewers than for introverted viewers.

In addition to the effects individual differences may have on social presence, it is worth exploring these characteristics on cognitive processing as well. Although automatic processing is unaffected by individual differences (Lang, 2000), controlled processing is rooted in individual motivations and interests. If a viewer is more interested, finds the show more relevant, or is more inclined to have social experiences, even when watching television, then they may exert more controlled processing while viewing the show. This may result in viewers paying more or less attention to particular aspects of the media message. As no specific research to predict how these particular characteristics may affect cognitive processing exists, a research question is offered.

RQ1: Do individual differences moderate the relationship between viewing environments and cognitive processing, and if so, how?

Social presence and user experience. Thus far, this dissertation has examined media elements and individual differences as determinants of social presence. However, social presence is considered "one of the key variables that establishes the connection between media and the user experience." (Tang, Wang, & Norman, 2013, p. 1064). Therefore, the next sections of this dissertation focus on the effects of social presence and its mediating role between media characteristics and media outcomes.

A viewer's choice to watch television is related to gratifying needs (Rubin, 2002). Producers attempt to offer products that meet those needs to ensure a more positive viewing outcome. Creating and fostering a sense of social presence is one tactic that can contribute to a more positive viewing experience, as shown in research on other mediated environments. For example, a stronger sense of social presence can increase engagement with the program, provide a more enjoyable experience for the viewer (Cohen, Bowman, & Lancaster, 2016; Skalski & Whitbred, 2010), increase satisfaction with the media (Gunawardena & Zittle, 1997; Ogara, Koh,

& Prybutok, 2014; Siriaraya & Siang Ang, 2012; Tang, Wang & Norman, 2013), and foster commitment, loyalty, and viewership (Hwang & Lim, 2015; Lim, et al., 2015). As this dissertation forces the choice of watching television with or without on-screen user-generated comments on participants, and the phenomenon of study is focused on the viewing experience devoid of the opportunity to participate in the social commentary, it is of primary interest how this viewing environment affects the viewer's engagement in and enjoyment of the experience.

Engagement. Generally, higher engagement is associated with more social presence. However, this association has been primarily tested on viewers who were actively participating and interacting with a second screen (Hill & Benton, 2015; Nee & Dozier, 2015). In addition, different definitions of engagement need to be considered. To some, engagement refers to one's behavioral reaction to the information source (Hwang & Lim, 2015). For television viewing, emotional expression, such as laughing out loud to humorous content or cheering when one's favorite team scores, indicates engagement. In new television environments, engagement extends to participation with second screen activities such as voting in viewer polls or providing text comments directed towards the program or other users. Social television strategies have been associated with higher engagement, as Hill and Benton (2015) found. Specifically, when user-generated comments were shown on screen, those comments were more likely to be discussed by other viewers in online forums than other messages created during the show. In addition, they found that on-screen prompts, like hashtags, kept viewers engaged in online discussions about the show as the program unfolded. Their study provided evidence that viewer engagement, defined as behavioral reactions, during the show increased and was prolonged as a result of the on-screen user-generated comments.

In a non-participatory social television environment, engagement is better conceptualized

as a cognitive state. Specifically, it is defined as "a cognitive state…marked by high levels of involvement and absorption with the content of the TV programming" (Nee & Dozier, 2015, p. 6). In this regard, engagement relates to a viewer's involvement or absorption in and attention paid to a particular stimulus. Similar to Hill and Benton's (2015) evidence of prolonged viewing in a social setting, one's persistence or continued viewing of a program, indicated by the amount of time spent watching and not changing the channel is a popular way to capture this type of engagement (Phalen & Ducey, 2012). Likewise, engagement will wane if viewers become distracted from the content by on-screen commentary, or from the show entirely by other environmental factors (Busselle & Bilandzic, 2009).

This research is the first known to explore how on-screen user-generated comments affect engagement with the program when the viewer is not interacting with a second screen. Including self-reported measures of viewers' perceived engagement with the primary content compliments the first hypothesis, which assesses cognitive engagement with measures of cognitive processing. It also adds nuance to the first hypothesis, in that *H1* measures only cognitive engagement in the main media message (i.e., the content within the audio and video channels). With a self-report measure, a viewer can indicate how engaged they felt with the overall message, allowing the analysis to start to tease apart engagement with the main message compared to engagement with the user-generated comments and message overall. In addition, these measures allow for direct testing of the theorized causal relationships between perceived social presence and the personal experience of engagement theorized in the first hypothesis.

Enjoyment. Enjoyment is a psychological outcome conceptualized as a "pleasurable response to media use" (Zillich, 2014, p. 171). Enjoyment also designates a sense of being entertained or having 'fun' (Lombard & Ditton, 1997). It is associated with social presence, as

"the positive experience of sharing one's experience…may contribute to an overall pleasurable experience, enhancing viewer core enjoyment" (Zillich, 2014, p. 175), yet little empirical research testing this link exists (Lombard & Ditton, 1997). Heeter (1995) directly measured enjoyment in virtual reality experiences and found that enjoyment was higher for those with a stronger sense of 'entering another world' or 'being there.' Heeter (1992) also found that most participants of virtual reality environments strongly desired having other, real people within the virtual world, rating having multiple, real players with which they could interact in live events has highly enjoyable.

Research using television as the medium has found it more difficult to establish a link between the sense of presence and enjoyment. This is partly due to the predominance of previous research that manipulates media characteristics and environments to create varying degrees of social presence, instead of directly measuring users' perceptions. For example, Lombard and colleagues (2000) found that participants enjoyed fast-paced point-of-view movement in the stimuli they used, but found no differences in overall enjoyment of the stimuli based on the screen size manipulations that they hypothesized caused a sense of presence. Likewise, Zillich (2014) found no difference in core (overall) enjoyment of a television show between viewers who viewed in a group setting where participants interacted verbally and nonverbally with each other throughout the viewing and those who viewed the show alone. However, Cohen and Lancaster (2014) tested the effect of coviewing and viewer susceptibility to emotional contagion and found support that the presence of others activates emotional contagion, creating a more emotional experience for the viewer, which led to more enjoyment of the stimulus. Another study, which also did not directly measure social presence, showed that graphs of aggregated real-time positive and negative reactions displayed on screen over music videos increased

enjoyment (Weaver, Huck, & Brosius, 2009). This dissertation contributes to these studies by directly measuring social presence to strengthen their findings.

H6: Social presence will have a positive effect on the viewing experience.

Insomuch as user-generated comments strengthen perceptions of social presence, and those perceptions positively affect the viewing experience, social presence should exhibit an indirect effect on the relationship between user-generated comments and the viewing experience.

H7a: Social presence will mediate the relationship between user-generated comments and the viewer experience.

Furthermore, if a perceived social environment heightens motivations to attend to a stimulus, resulting in more resource allocation or controlled processing towards that stimulus, then stronger perceptions of social presence would be expected to have an indirect effect on the relationship between user-generated comments and cognitive processing.

H7b: Social presence will mediate the relationship between user-generated comments and cognitive processing.

Chapter 3

Methods

This research involved two experimental studies to test the hypothesized relationships between user-generated comments and cognitive processing, social presence, individual differences, and viewer experiences. Study 1 tested the effect of user-generated comments on cognitive processing. It utilized a between-subjects, 4 x 2 design comparing the effect of no text, plain text, on-screen user-generated comments presumed to be live, and on-screen user-generated comments that are known to be previously recorded across two video stimuli. Two levels of cognitive processing (i.e., storage and encoding) were examined as separate dependent variables in the study.

Study 2 tested the effect of user-generated comment characteristics and individual differences on perceptions of social presence. Individual personality variables (i.e., coviewing orientation, extraversion, and need to belong) were tested for their direct effect on perceptions of social presence, and extraversion was additionally tested as a moderator between user-generated comments with and without social cues and perceptions of social presence. Study 2 further tested the effect of social presence perceptions on the viewer experience (i.e., engagement and enjoyment) and cognitive processing (i.e., storage and encoding), to expand on Study 1. Study 2 involved a 4 x 2 with control, between-subjects experiment. The first factor consisted of two levels of social cues (social media comments with and without emotional and arousing non-verbal symbols) combined with two levels of comment redundancy (redundant to the video content versus not redundant). This created five conditions for each video: no comments (control condition), redundant comments with social cues present, redundant comments without social cues, non-redundant comments with social cues present, and non-redundant comments without

social cues. The second factor consisted of two different video stimuli (Food Network versus DIY Network clips).

Study 1 and 2 were administered simultaneously, with all experimental and control conditions for each combined in one large experimental collection procedure. The design employed random assignment[2] to experimental and control conditions. Each participant filled out the same pre-stimulus measures and post-stimulus measures of dependent variables, regardless of whether they were assigned to a condition from Study 1 or Study 2. Data collection was set for approximately two weeks or until the required minimum sample size was obtained. The study was submitted for expedited IRB review on April 6, 2016 and was approved on April 22, 2016. On May 6, 2016, the originally approved IRB was revised to change the sampling group and the revision was approved on May 12, 2016.

Recruitment

Participants were recruited from the online crowdsourcing web service, Amazon Mechanical Turk (Mturk). Mturk is an opt-in system defined as "an online labor market where employees (called workers) are recruited by employers (called requesters) for the execution of tasks (called HITs, acronym for Human Intelligence Tasks) in exchange for a wage (called a reward)" (Paolacci, Chandler, & Ipeirotis, 2010, p. 411- 412). Wages are assigned by the requestor when the HIT is posted, and start at a minimum of $0.01. In exchange for using the online workforce, Amazon retains 20 percent of the amount the requestor pays workers, an additional 20 percent when more than 10 workers are needed, and another 5 percent for using workers with a Master's qualification (i.e., long-term, high-performing workers; Amazon, 2016).

The use of Mturk for academic, and particularly experimental, research has led to much

[2] Participants were evenly divided into conditions, thus assignment was not completely random. For example, if one condition had reached capacity, subsequent participants were randomly assigned to the remaining subset of conditions that had not reached capacity.

scrutiny from social scientists concerning the pool's representativeness to the population. Overall, Mturk is deemed more diverse than other Internet samples (Buhrmester, Kwang, & Gosling, 2011) and university student samples (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Krupnikov & Levine, 2014; Paolacci, Chanler, & Ipeirotis, 2012). However, Mturk is less representative than national probability samples (Berinsky, Huber, & Lenz, 2012), as Mturk samples are younger, more educated, less wealthy (Buhrmester, Kwang, & Gosling, 2011; Krupnikov & Levine, 2014), and more female (Buhrmester, Kwang, & Gosling, 2011). Racially, those who identify as Black are underrepresented and those who identify as Hispanic and Asian are overrepresented in Mturk, compared to the racial distribution of the U.S. (Berinsky, Huber, & Lenz, 2012; Huff & Tingley, 2015; Krupnikov & Levine, 2014). Politically, Mturk workers also tend to be more democratic and liberal (Berinsky, Huber, & Lenz, 2012; Krupnikov & Levine, 2014). Other differences observed by researchers include the Mturk sample being less religious, more likely to rent than own a home, more likely to be single and not married (Berinsky, Huber, & Lenz, 2012), have smaller families (Buhrmester, Kwang, & Gosling, 2011), and live in urban areas (Huff & Tingley, 2015) than the national population or representative sampling techniques. Psychologically, Mturk workers also have lower self-esteem and are less extraverted than more representative samples or student samples (Goodman, Cryder, & Cheema, 2012). However, Berinsky, Huber, and Lenz (2012) conclude that despite these differences, Mturk "does not present a wildly distorted view of the U.S. population" (p. 361). In addition, most researchers agree that the discrepancies only really become a problem and stifle generalizability of results when the differing demographics (i.e., religion, political ideology) moderate predicted effects (Berinsky, Huber, & Lenz, 2012; Krupnikov & Levine, 2014; Mullinix, Leeper, Druckman, & Freese, 2016). Though representativeness of a sample are

desired to obtain unbiased results, this experimental research is focused on making inferences about processes and employed random assignment to reduce bias associated with personal characteristics.

The other common concern of using Mturk samples is the quality of the data. First, Mturk workers may become more savvy as their participation in HITs increases, potentially increasing their experience, knowledge, suspicion or vigilance about experimental procedures (Berinsky, Huber, & Lenz, 2012; Krupnikov & Levine, 2014). However, such 'habitual responders' pose no threat to inferences, according to research by Berinsky, Huber, and Lenz (2012). Several researchers have investigated both the internal and external validity of established, well-tested phenomenon (e.g., The Prisoner's Dilemma, framing and priming) in their fields (e.g., judgment and decision making, political science) using Mturk samples. Whether compared to national population-based samples, university student or staff samples, Internet samples or community samples, causal effects and effects sizes were almost never significantly different (see Casler, Bickel, & Hackett, 2013; Goodman, Cryder, & Cheema, 2012; Mullinix et al., 2016; Paolacci, Chandler & Ipeirotis, 2010). This extends to measurements as well, as reliabilities of established scales taken by Mturk workers passed psychometric scale standards, matched more traditional samples, and maintained high test-retest reliability comparable to traditional samples (Buhrmester, Kwang, & Gosling, 2011). Krupnikov and Levine (2014) did find a few instances where Mturk samples did not match the theoretical expectations obtained from other convenience samples, particularly when tasks required more effort (i.e., reading an article) or trust in the provided information. They concluded that simpler experimental designs produced more generalizable results. In all, there is a growing consensus that Mturk is an adequate sampling pool for making "credible, generalizable experimental inferences with some

confidence" (Levay, Freese, & Druckman, 2016, p. 1).

Researchers have also been concerned about the quality of data in relation to the online system in which it is collected. For example, Mturk workers were found to be more likely to use the Internet to find correct answers even without an incentive to provide correct answers (Goodman, Cryder, & Cheema, 2012). The ability to search the Internet while completing a HIT is an uncontrollable consequence of any online study, compared to laboratory experiments. In addition, much research has focused on the relationship between compensation amounts and data quality. Whereas participation rates and data collection speed are sensitive to compensation amounts, no relationship between financial incentives and data quality have been observed (Buhrmester, Kwang, & Gosling, 2011; Litman, Robinson, & Rosenzweig, 2015). Instead, data quality is associated with worker reputation, as high-reputation workers consistently produce the highest quality of data (Peer, Vosgerau, & Acquisti, 2014). These observations were applied to collect the sample used in this research.

A HIT was created on Amazon Mturk on May 13, 2016. It included the title "Watch a short video, answer questions about video, answer questions about yourself and TV habits," the description "Answer questions about yourself and your television viewing and social media habits, watch a short video clip (about 4 min) and answer questions about the clip and the viewing experience," and keywords of "survey, TV, social television, viewing experience, dissertation study, research." Requirements were set to allow only workers who were located in the U.S., had a HIT approval rate for all requesters' HITs greater than or equal to 95%, and had 100 or more approved HITs. The last two requirements ensured that only workers with high reputations could participate to increase the quality of the data. Mturk workers must be 18 years old to participate in the system, thus fulfilling the requirement of research participants to be 18

years of age.

The HIT was made available for 453 total participants, for a reward of $1.50. The HIT was estimated to take approximately 15 minutes and the reward amount was determined based on the suggested minimum ethical standard pay of $0.10 per minute (Dynamo, 2016). The total sample of 453 participants was collected in just over three hours. Workers spent an average of 20 minutes, 51 seconds on the task, for an hourly rate of $4.32. After a scan of the data for completeness and accuracy (i.e., cases with the same response checked across several items, missing data), all workers were approved.

Sample

A total of 453 participants completed the studies. The sample consisted of adults ages 19 to 76, with an average age of 38 (*M* =37.63, *SD* =12.50). The majority of participants were male (51%), white (78%; 9% Black, 6% Asian, 6% Hispanic, 1.5% other), had earned a Bachelor's degree (39%) or had at least some college or an Associate's degree (38%). In comparison to the U.S. population, the sample obtained was more educated, more White and Asian, slightly more male, and less wealthy (see Table 1). The sample was also younger, more educated, less wealthy, and slightly more male than the viewership demographics of the networks used as stimuli (see Table 2).

Samples sizes for each condition in each study are shown in Table 3. Participants were unique to each condition, however some conditions were not unique to each study. Specifically, participants in the control, plain text, previously recorded and not cued, redundant conditions were used in both Study 1 and Study 2.

Table 1

Demographic Profile of Sample Compared to U.S. Population (2014)

	Sample	U.S. Census (2014)
Highest Education Attained		
Less than High School diploma	1.1%	13.6%
High school diploma or equivalent	11.5%	28.0%
Some college	25.4%	21.2%
Associate's degree	13.1%	7.9%
Bachelor's degree	38.9%	18.3%
Graduate or Professional degree (MD, JD, DDS, DVM, LLB)	9.9%	11.0%
Race		
White	77.7%	62.8%
Black/African American	8.6%	12.2%
Asian	5.8%	4.9%
Hispanic	6.2%	16.9%
Other (includes American Indian and Native Hawaiian/Pacific Islander)	1.5%	1.1%
Gender		
Male	51.2%	49.2%
Female	48.7%	50.8%
Annual Income		
$0 - 24,999	33.3%	23.2%
$25,000 – 49,999	32.0%	23.7%
$50,000 – 74,999	20.7%	17.8%
$75,000 – 99,999	8.4%	12.2%
$100,000 or more	5.6%	23.0%

Note. Source: U.S. Census Bureau, American Fact Finder, 2016

Table 2

Demographic Profile of Sample Compared to Network Viewership (2015)

	Sample	DIY Network	Food Network
Highest Education Attained			
No College	13%	51%	50%
Attended College	87%	49%	50%
Age			
18-34	51%	25%	29%
35-54	36%	36%	36%
55+	13%	39%	35%
Median Age	34 years	50 years	47 years
Gender			
Male	51%	45%	36%
Female	49%	55%	64%
Annual Income			
$0 - 49,999	65%	38%	32%
$50,000 – 74,999	21%	20%	19%
$75,000 or more	14%	42%	46%

Note. Source: National Media Spots, 2015.

Procedure

Data was collected through an online experiment hosted on the University of Tennessee's Qualtrics account through the researcher's individual student account. Participants were able to access the study on any Internet-connected device. Upon accessing the online study, participants were provided with the informed consent documentation and asked to provide their age, in an open response item, to verify they met the minimum age requirement (see Appendix A). As the participants could not fail the age requirement, all continued to the next page where they completed a pre-stimulus questionnaire including control variable measures of knowledge,

Table 3

Sample Sizes for Each Experimental Condition

	Food Network Video	DIY Network Video	Study condition appeared within
Control (no text)	32	27	1 & 2
Plain text	34	29	1 & 2
Previously recorded	34	34	1 & 2
Not cued, redundant	34	32	1 & 2
Not cued, not redundant	35	32	2
Cued, redundant	33	33	2
Cued, not redundant	31	33	2
Total	233	220	

interest, relevance, social television use, social media use, television viewing habits, and personality traits.

The participant was then asked to read a short description of the material they were about to view (see Appendix B). This included a deceptive cover story about the nature of the comments, so that participants would believe they were seeing comments from other individuals.[3] The cover story described the experiment as a live-viewing experience, where other participants could be watching at the same time. After viewing the cover story, participants were asked to answer three true/false statements to assess their understanding of the information in the cover story (e.g., "The comments that I may see are being made by other viewers who are

[3] The decision to use deception to indicate a live-viewing experience was based on a recent experiment testing the effect of on-screen user-generated comments on perceptions of humor. The experiment failed to produce significant differences on perceptions of social presence between clips with user-generated comments, laugh tracks and without laugh tracks as predicted. It is reasonable that this prediction was not supported due to low ecological validity, in which the experimental condition did not adequately replicate the real-world, live nature of the phenomenon. Previous experimental research supports this notion, as shared attention was achieved when viewers believed they were watching concurrently, but not achieved when there were no concurrent viewers, but other viewers had previously watched (Shtyenberg, Bramlett, Fles, & Cameron, under review).

currently watching the same clip"). Incorrect answers prompted a message that provided the participant with the correct answer and a short explanation for that answer. Then they were prompted with the following message:

> *"Thank you for participating. You have been selected for the 'viewer-only' condition. On the next page, the first of two video clips will appear. Please turn up the volume on your device and view the entire clip. Click the forward arrows button at the bottom of the survey page to continue when you are ready."*

When the participant continued to the next page, they were quasi-randomly assigned to one of seven experimental conditions for one of the two videos, which automatically began playing. To encourage viewing, the page was timed to two-thirds of the clip duration, so that participants could not move forward until at least two-thirds of the video had played. The two-thirds timing is an alternative to using a decision rule to eliminate participants from analysis who did not spent at least two-thirds of the video length on the video clip page, as that participant would not have adequately experienced the manipulation. At the two-thirds mark, the button to advance to the next page of the survey appeared at the bottom of the survey page. When the clip ended, the video displayed the message: "Video has ended. Please click the forward arrows at the bottom of the survey page to continue."

After watching the video, participants completed a manipulation check, then post-stimulus measures. All items of each measure, except for the manipulation check, were presented in random order to reduce the likelihood of participants understanding the true objectives of the experiment (Reeves & Thorson, 1986; Thorson, Wicks, & Leshner, 2012). First, participants

completed randomly ordered measures of engagement and enjoyment, followed by the social presence measure. Next, cued recall items were presented to assess storage, followed by multiple-choice recognition items. Collecting items measuring storage prior to items measuring encoding was strategic, as encoding is required for storage, thus information not encoded will not be stored (Lang, 2000). But, measurement of recognition items first could allow participants to further process encoded information to reach an answer during the testing stage that may strengthen cognitive links and enhance storage. In addition, recognition items may provide cues that make associated information more accessible and likely to be used in subsequent processing (Herr, 1989; Lang, 2000).

Following the collection of recall measures, participants answered basic demographic items (gender, race/ethnicity, income, and education; see Appendix G) and continued to the debriefing statement (see Appendix I). Participants then clicked to the final page of the survey, where they were thanked and provided a randomly generated, six-digit numeric code that they were asked to enter into the Mturk system to validate their participation and receive payment.

Stimuli

Reality-based television (RTV) shows were used as stimuli. Reality-based television programming is defined as "programs that film real people as they live out events in their lives, contrived or otherwise, as they occur" (Nabi, Biely, Morgan, & Stitt, 2003, p. 304). The rationale for this choice was based on several factors. First, it is one of the most prevalent genres on television, capturing nearly 50% or more of the primetime audience for a decade (Nielsen, 2011). Second, RTV's appeal gratifies the increasing need for mediated voyeurism, and allows for social comparison and judgment of others (Nabi et al., 2003; Nabi, Stitt, Halford, & Finnerty, 2006; Papachrissi & Mendelson, 2007; Penzhorn & Pitout, 2007), surveillance of behaviors and

relationships among people (Riddle & De Simone, 2013), and social connection or affiliation (Lundy, Ruth, & Park, 2008; Papachrissi & Mendelson, 2007). Third, a characteristic of RTV is audience participation, where viewers are encouraged to vote for participants, make suggestions about the show's direction or activities, and interact with other viewers or reality show participants (Barton, 2009; Heizler & Kimhi, 2012; Penzhorn & Pitout, 2007). Fourth, previous research has found a positive correlation between watching reality television and online behaviors, such as blogging, spending time on social network sites, and sharing photos and videos (Stefanone, Lackaff, & Rosen, 2010). Fifth, on-screen user-generated comments are most prevalent on reality-based programming, presumably due to the participatory characteristics of the genre. Lastly, as considered in research on the LC4MP, this programming is less linear, allowing for short, comprehensive, continuous, stand-alone segments to be extracted and used as stimuli (Lang, Potter, & Bolls, 1999).

Although typologies and identification of subgenres of reality television have been proposed, the growing and changing list of programs and viewer perceptions of such programs makes categorization into meaningful, mutually exclusive and exhaustive categories nearly impossible (Nabi, 2007; Riddle & De Simone, 2013). Therefore, informational reality-based content, consisting of two videos from two different Scripps Networks Interactive cable networks, served as the stimuli for both studies (see Appendix C for links to the videos). The informational reality genre was chosen due to the amount of specific information contained within the narrative content.

One video clip was from the Food Network's show *3 in the Bag*, hosted by Rachel Ray (3:58 minutes in length, season 1, episode 4, originally aired February 9, 2014, captured from FoodNetwork.com, http://www.foodnetwork.com/recipes/rachael-ray/teriyaki-chicken-with-

soba.html; *n* = 233). In the clip, the host describes the ingredients and proportions of the recipe and demonstrates how to make a chicken and noodle dish. The other clip was a tutorial of how to build a bookcase from DIY Network's *Kitchen Impossible* with Marc Bartolomew (3:48 minutes in length, captured from DIY Network YouTube, https://www.youtube.com/user/DIYNetwork, originally posted April 14, 2009; *n* = 220). The clip's host explains the parts and steps necessary to build a bookcase from start to finish. Each clip includes over 15 different pieces of unique information in the form of ingredients, materials, and step-by-step instructions.

These particular clips were pragmatically chosen because they were less than 5 minutes in length (to maximize participants viewing the entire clip and minimize viewing fatigue), were available online as stand-alone videos, and required no additional editing. The use of two clips from the same parent network, with similar branding, editing, and production techniques, maintains a consistency between the clips. Both clips also have one host speaking directly into the camera. The clips differ in that the Food Network video has fewer steps to the finished product and many are simple steps common in cooking (e.g., turn the heat on under the pan and add oil; cut the vegetables). In addition, the host's (Rachel Ray) delivery is conversational and includes her personal opinion and experience. In contrast, the DIY clip has several steps to the finished product, which are summarized in five steps that segment the clip as on-screen text. The steps are complex in that they are unique to building a bookcase and involve tools and procedures of which everyday people may have little prior knowledge. Additionally, some steps are shown but not talked about (e.g., nailing the pieces together) and music is added to the video in the absence of the host talking. Likewise, some steps are talked about but not shown (e.g., fill in nail holes, sand, and paint). The host, while friendly, is also more instructional than conversational in his speech and provides specific details or additional information (i.e.,

measurements, dimensions, sizes, and descriptions like “high-velocity”) rather than opinion or personal experience.

Independent variables

The independent variable for both studies was text on screen. Text was manipulated within the video to create seven experimental conditions to serve both studies: a no-text condition (control), a plain-text condition, and five user-generated comment conditions (described below). The user-generated comment conditions manipulated the inclusion of social cues and redundancy to create four conditions (cued, not redundant; cued, redundant; not cued, not redundant; not cued, redundant) and one condition was further manipulated to represent a previously recorded video.

Content with social cues was operationalized as that which includes nonverbal symbols such as emoticons, capitalization, punctuation and initialisms to express body language, facial expression, vocal tone, or behavior (Riordan & Kreuz, 2010; Walther, Loh, & Granka, 2005). In the social-cue conditions, each comment included at least one element of nonverbal symbolism, whereas the not-cued conditions did not include any symbolism. Comments with social cues were pretested to ensure that participants viewed the social-cued content as more social.[4]

Redundancy was operationalized as the amount of specific information that matches the video or audio channels. The redundant conditions presented comments that included information specifically provided in the audio channel. Comments in the non-redundant condition included information that was unrelated to the actions, characters, or information

[4] User-generated comments with social cues were created and pretested (n = 74) to ensure that social cued comments were perceived as more social than unenriched comments. A total of 32 comments (16 with cues and 16 corresponding text without cues) were rated on 8 pairs of descriptive words used in previous research to indicate ‘socialness’ (Lee & Nass, 2005) using a 4-point scale. The means of 10 comment pairs differed at $p<.05$ and two differed at $p<.10$, indicating that the social cued versions of those 12 comments were perceived as more social than the non-cued comments (see Appendix J).

provided in the clip and lacked any information from the audio channel.

Plain text. The purpose of the plain text condition was to determine if the predicted effects were the result of including social information, and not simply due to the inclusion of a third channel of animated text. The content of the plain text was created to include information that refers to the narrative content, but does not include opinions, reactions, or emotions (e.g., “Kosher salt is easy to pick up and sprinkle due to its grain shape and size”; “Having a helper makes assembly a breeze”; see Appendix D for the full list). The content was matched to the content of the user-generated comment closely as possible and placed at the same time code.

Not cued, redundant. This condition consisted of comments that did not have emoticons, emojis, extra punctuation, or other grammatical lexicons. The comments were redundant, as they referred directly to the video content that appeared right before the comment was shown on screen. It served as the live comment condition in Study 1 and also as a condition in Study 2. Examples include, “She has no idea how to season a chicken, obviously” and “"It can run away from you" is code for "It'll take your hand off"” (see Appendix D).

Previously recorded comments. The comments in this condition were the same comments from the not cued, redundant condition. However, the video was manipulated so that the words “Previously Recorded” in blue text appeared throughout the clip in the upper right-hand corner of the frame. In addition, participants assigned to this condition saw text instructions on the survey page above the embedded video that read, “Due to the lack of current viewers, the following was recorded from a previous viewing.” The purpose of this condition was to determine if live comments differed from non-live comments, while keeping the deception tactic constant across all participants.

Cued, redundant comments. Comments in this condition contained text identical to the not cued, redundant and previously recorded comments, but had social cues added. Examples include, “She has no idea how to season a chicken, obviously🤔😐” and “"It can run away from you" is code for "It'll take your hand off". 😱” (see Appendix D).

Not cued, not redundant comments. Comments in this condition did not include social cues and did not relate back to the video content. This condition was used in Study 2. Examples include, “Rachel Ray & Kelly Clarkson remind me of each other.” and “This video reminds me of elementary school science videos/projects.” (see Appendix D).

Cued, not redundant comments. This condition, used in Study 2, included comments with social cues, but the content of the comments did not relate back to the video content. It used the same text as the not cued, not redundant condition, but had social cues added. Examples include, “Rachel Ray & Kelly Clarkson remind me of each other. HAHA!!! 😄” and “This video reminds me of elementary school science videos/projects 🙄” (see Appendix D).

On-screen text content and format. User-generated comments that appeared in the videos were sampled from comments created by a sample of undergraduate college students in the University of Tennessee’s College of Communication and Information School of Journalism. Students enrolled in the Spring 2016 semester of JREM 250 were asked to watched each video, and while watching, anonymously write their comments about the show on a piece of paper as if they were posting those comments to social media (i.e., Facebook or Twitter). They were told to write in a style that reflected their social media text style, including emoticons, emojis (or descriptions of such images), or grammatical lexicons as they would in a real social television-viewing situation. Nearly 80 students generated an average of two comments for each video. Comments that best fit the experimental conditions were selected. Slight modifications were

made to few comments, and only where necessary.

A total of eleven individual pieces of text appeared throughout each clip. Text appeared on screen near the specific information from the narrative content that was used in the recall measurements. There were different time intervals between each text graphic, which mimicked the lulls and swells of the real-life phenomenon (Larsson, 2011; 2013; see Appendix D). Each text appeared on-screen using a 1-second fade-in, remained on screen for 6 seconds, and disappeared using a 1-second fade-out. This buffered format delivered a less jarring, invasive, and distracting strategy per event, which mimics a production strategy used in practice.[5] Text appeared at the same time-code in the video in all conditions.

Both types of text (plain and user-generated comments) appeared within a white graphic box on the right-hand side, just to the left and above of the corner edges of the frame. The rectangular box spanned approximately one-half the length and approximately one-eighth the height of the frame. A smaller, blue-colored text-author box was placed above the white box. For the comment conditions, the author box contained a username (e.g., @oneonine, @Val_Cee), and the author box in the plain text condition contained the name of network (i.e., Food Network, DIY Network). The blue author box spanned approximately one-fourth of the frame, the same height as the white text box, with the left edge aligned to the white text box. The text was centered (top to bottom) in the white box, aligned to the first letter of the author name. Text appeared as 11-point, Arial-font, black text. Author names were in the same font format, but in white-colored text. On-screen comments are typically branded with social media logos (i.e., the Twitter bird or Facebook "F"), however, due to the deception tactic describing a live

[5] This strategy is based on observation of the Discovery Network show *Deadliest Catch*, which was an early forerunner in the use of Tweets on screen. An animated graphic of a crashing ocean wave revealed a Tweet content box on the screen. When the content box fully generated (i.e., the wave subsided), the Tweet text appeared, lasting about 5 seconds. The Tweet text then faded and the comment box was graphically 'washed away' with another animated ocean wave.

experimental setting using a video hosting site, it would not make sense to suggest the interactive participants were posting to real social media sites. Thus, no logo appeared. An example of how plain text and comments looked on screen can be seen in Figures 1 and 2.

Figure 1. Plain text example.

Figure 2. User-generated comment example.

Individual differences. In addition to the text manipulations, five individual characteristics were measured and assessed as variables that could directly affect perceptions of social presence (see Appendix E for complete wording and response options). Correlations

among the variables are available in Table 4.

Extraversion. Extraversion is defined as a sociable, outgoing, personable, active, enthusiastic, interactive, and cheerful disposition. The personality trait of extraversion was measured using a 2-item scale on a 7-point response option ("disagree strongly" to "agree strongly"). The two items were developed as part of a 10-item short version of the well-proven Big Five Inventory. Testing across multiple samples and two languages confirmed that the abbreviated scale adequately represented the full scale (part-whole correlation average = .89), performed well on test-retest reliability (.75 overall stability coefficient), maintained the expected five-factor structure (mean loading on expected factors = .64), evidenced strong discriminant validity (intercorrelation range = .08-13, average = .11), and showed the same pattern of correlations (albeit correlations were slightly lower for the reduced scale) with a similar scale (average correlation across all items = .48) (Rammstedt & John, 2007). The two extraversion items asked respondents to indicate how well the statements "I see myself as someone who is reserved" (reversed coded) and "I see myself as someone who is outgoing, sociable" described his/her personality (Rammstedt & John, 2007). The scale has been successfully used in previous research on social television motives (Krämer et al., 2015). The measure proved reliable in this sample (r = .79, M = 3.93, SD = 1.62).

Need to belong. Participants' need to belong was measured using the 10-item Need to Belong Scale (Leary, Kelly, Cottrell, & Schreindorfer, 2013). Previous research has found the scale reliably tests individuals' motivation to form attachments (α = .78 to .87 across 15 samples, median α = .81), and scores high on construct validity, being conceptually distinct from many other social desires (Leary, et al., 2013, p. 612). The measure has also been used successfully to assess individual differences in social television preferences (Cohen & Lancaster, 2014, α = .85).

Table 4

Correlations among Personality Variables

	Coviewing: Audience Monitoring Subscale	Coviewing: Need for Solitude Subscale	Coviewing: Need for Company Subscale	Extraversion Scale	Need to Belong Scale
Coviewing: Audience Monitoring Subscale	1	-.581**	.696**	.252**	.191**
Coviewing: Need for Solitude Subscale		1	-.597**	-.338**	-.017
Coviewing: Need for Company Subscale			1	.272**	.192**
Extraversion Scale				1	.071
Need to Belong Scale					1

***p* < .01.

The 10 items are measured using a 5-point scale indicating the degree to which each statement is true or characteristic of the individual (1 = not at all; 2 = slightly, 3 = moderately, 4 = very, 5 = extremely) and averaged across. The scale was reliable in this sample (α = .85, *M* = 2.30, *SD* = 0.56).

Coviewing orientation. Coviewing orientation refers to a viewers' preference for attending to others while viewing television (Cohen & Lancaster, 2014). The 11-item measure has three factors: need for company, need for solitude, and audience monitoring desire. The need for company, or the preference for viewing television in the company of others, is measured with 4 items. Need for solitude, or the preference to view television alone is measured with 3 items. One's tendency to monitor others socially while viewing television, or audience monitoring desire, consists of 4 items. The three subscales successfully predicted participation in different types of mediated and non-mediated connected viewing environments. Within the sample, the need for company factor was reliable (α = .82, *M* = 4.76, *SD* = 1.23), along with the need for solitude factor (α = .84, *M* = 3.39, *SD* = 1.36). However, the audience monitoring factor was not measured reliably with the four items, thus the weakest item ("I feel frustrated when people I am watching television with don't seem to enjoy it as much as I do.") was dropped to increase the factor's reliability (α = .82, *M* = 3.99, *SD* = 1.22). All 11 items were measured on a 7-point scale with "disagree strongly" and "agree strongly." Dependent variables

Dependent measures include cognitive processing (Study 1 and Study 2), perceptions of social presence (Study 2), and viewer experiences (Study 2). To assess cognitive processing, outcomes measures of this study were two types of recall. Both storage and encoding were measured across stimuli as indicators of cognitive processing. Perceptions of social presence were measured with a scale developed for this research. Viewer experiences were assessed with

measures of engagement and enjoyment. Appendix F includes wording and response options for all dependent measure items.

Storage. Storage was measured using cued recall items (Lang, 2000). Six items from each video clip asked participants to provide specific content from the audio-video channels. Items had single or multiple part answers. The items chosen reflected the necessities one would need to perform the tasks (i.e., the ingredients or materials needed), or details that were emphasized or repeated during the clip (i.e., how the pieces of the bookcase are attached; what Soba noodles are). For example, participants were asked, "What were the ingredients for the teriyaki sauce? List as many as you remember" (of which there are 8), and "The two pieces of 8 foot plywood will be used for which pieces of the bookcase?" (Answer: sides, top, and shelves).

Identification of correct information indicated the information was stored. Specifically, each participant answered six cued recall items corresponding to the video they were assigned, with a total of 15 possible pieces of correct information in the Food Network clip and 20 possible answers for the DIY Network clip. The total number of correctly recalled pieces of information provided indicated the amount of storage (Grabe, Lang, & Zhao, 2003; $M_{FoodNetwork} = 5.79$, $SD_{Food\ Network} = 3.24$; $M_{DIYNetwork} = 8.09$, $SD_{DIYNetwork} = 3.95$). A review of the histograms of storage for each video revealed normal distributions for the large sample size (for Food Network, skew = 0.13, SE = 0.16 and kurtosis = -0.71, SE = 0.32; for DIY Network, skew = .03, SE = 0.16 and kurtosis = -0.51, SE = 0.33).

Encoding. Encoding was tested using recognition measures based on the LC4MP (Lang, 2000). Recognition items reflected details expressed in the audio track throughout the clip, and were a mix of quantitative and qualitative information. As with the items selected for storage, these items reflected information that would be necessary to complete the tasks as instructed in

the clips (i.e., technique; size and amounts; tools, materials, and ingredients). Specifically, nine pieces of unique information from the content of each clip were selected, and participants were asked to select an answer from a given choice set of four options, presented randomly. For example, “How long should the sauce reduce?” with choices of 15 minutes, 10 minutes, 20 minutes and 5 minutes and “What is the name of the piece that is used to secure the bookcase to the wall?” with choices of cleat, joist, molding, and brace. The average correct answers provided for the Food Network video was 4.63 answers (*SD* = 1.64) and 4.04 (*SD* = 2.04) answers for the DIY Network video. An inspection of the distributions revealed normal distributions for each video (for Food Network, skew = 0.06, SE = 0.16 and kurtosis = -0.37, SE = 0.32; for DIY Network, skew = 0.25, SE = 0.16 and kurtosis = -0.50, SE = 0.33).

Social presence. Participant’s sense of social presence was measured using 16 statements gauging different dimensions the viewer’s perception (see Appendix F). The statements were adapted from several measures used in previous research (e.g., Biocca, Harms, & Gregg, 2001; Hwang & Lim, 2015; Lee & Nass, 2005; Lim, Hwang, Kim, & Biocca, 2015; Lombard, Ditton, & Weinstein, 2009; Xu & Yan, 2011). Most items previously used were specifically developed to measure user’s perception of social presence after participating in a social television experience. For example, one scale used three items, “I feel like many people were watching at the same time.”, “I feel like I was watching the game with friends.”, and “I feel like I was physically communicating with others.”, measured using a 7-point scale ranging from “strongly disagree” to “strongly agree”. The resulting social presence measure had an overall reliability of $\alpha = .79$, with each item loading on to the scale at .56, .87, and .83 respectively and had satisfactory convergent and discriminant validity (Hwang & Lim, 2015, p. 760-761). In addition, the scale successfully predicted channel commitment, defined as “a sense of positive regard for

or attachment to" a particular channel (Hwang & Lim, 2015, p. 758). A 4-item variation of the scale (α= .91) also predicted channel commitment and mediated the effect of engagement in second screen activities on commitment in another study (Hwang & Lim, 2015).

As no standard social presence scale exists, the scale used in this research adapted items from several scales to measure four dimensions of social presence. These included five items to capture the perception of sharing the experience (i.e., awareness or coviewing), five items to measure intimacy or affiliation with other viewers, three items to capture mutual understanding or shared comprehension, and three items to measure engagement or psychological involvement. The 16 items were reworded to reflect the non-interactive viewing experience created from embedding user-generated comments into the program and the reality-based television stimuli used here more accurately (see Table 5 for comparisons and Appendix F). One original item was maintained ("I felt like many people were watching at the same time."). All items were measured on a 7-point Likert scale from "disagree strongly" to "agree strongly."

The items were constructed to measure different dimensions, thus a maximum likelihood factor analysis with Direct Oblimin with Kaiser Normalization rotation (as factors are expected to be correlated) was performed to confirm. The analysis revealed a three-factor structure. Two factors were correlated at r = .52, while the third factor was correlated with the other two factors at r = -.28 and r = -.26. Upon further inspection of the structure and pattern matrices, a simple structure was not obtained. Items that loaded high on one factor also loaded substantially (above .30; Tabachnick & Fidell, 2007) on another factor, and four items loaded similarly on both factors. A third factor included two of the three items constructed to measure engagement or psychological involvement, while all other items loaded on the other two factors. In light of these results, the decision was made to create a 12-item, one-factor scale using all items that loaded

Table 5

Social Presence Scale Items

Dimension	Item used in study	Original Item	Citation
Awareness / Copresence	I felt like I was watching with others.	I feel like I was watching the game with friends.	Hwang & Lim (2015)
	I felt like many people were watching.	I feel like many people were watching at the same time.	Hwang & Lim (2015)
	I felt like others were watching at the same time.	*Cut into two items.	
	I felt like I was watching alone. (reverse coded)	I often felt as if I was all alone.	Biocca, Harms, & Gregg (2001)
	I was aware of other viewers watching the same clip as me.	I was often aware of others in the environment.	Biocca, Harms, & Gregg (2001)
Affiliation / Intimacy	I felt like I was part of a specific audience.	Knowing that millions of others are also watching this show, I feel myself a part of a big family.	Xu & Yan (2011)
	I felt a sense of connection to other people viewing this clip.	(created from conceptual definition)	Xu & Yan (2011)
	I felt like I was watching with friends.	I feel like I was watching the game with friends.	Hwang & Lim (2015)
	While viewing this clip, I had a sense of being ‘in touch with the world’.	Watching this show gives me a stronger sense of being “in touch with the world.”	Xu & Yan (2011)
	I found this to be a sociable experience.	(created from conceptual definition)	(multiple authors)

Table 5 Continued

Social Presence Scale Items

Dimension	Item used in study	Original Item	Citation
Mutual Understanding / Shared Comprehension	I feel like my reactions to the clip were similar to others. I feel like I have similar thoughts or opinions about the clip as other viewers. I feel like I relate to other viewers who have watched this clip.	My opinions were clear to the other.; The opinions of the other were clear to me.; My thoughts were clear to my partner.; The other individual's thoughts were clear to me.; The other understood what I meant.; I understood what the other meant. *Cut into three items	Biocca, Harms, & Gregg (2001)
Engagement / Psychological Involvement	While viewing this clip, I imagined how other viewers were watching the clip or what they were like.	1) Sometimes I imagine a scene of numerous others sitting in front of the television for this show at the same time. 2) While hearing the reviews, how vividly were you able to mentally imagine the source of the voice?	1) Xu & Yan (2011) 2) Lee & Nass (2005)
	I felt mentally immersed in the clip.	To what extent did you feel mentally immersed in the experience?	Lombard, Ditton, & Weinstein (2009)
	I paid close attention to the clip.	How much attention did you pay to what was being said?	Lee & Nass (2005)

high on one factor. This included dropping four items: two attempting to describe mutual understanding, which had low loadings on the factor ("I feel like my reactions to the clip were similar to others", factor loading = .39 and "I feel like I have similar thoughts or opinions about the clip as other viewers, factor loading = .43) and two items that measured engagement or psychological involvement ("I felt mentally immersed in the clip" and "I paid close attention to the clip."). The reliability of the 12-item scale was high ($\alpha = .95$, $M = 3.97$, $SD = 1.47$; $M_{FoodNetwork} = 3.95$, $SD_{FoodNetwork} = 1.46$; $M_{DIYNetwork} = 3.99$, $SD_{DIYNetwork} = 1.48$) and additions of the items chosen for elimination reduced the reliability estimate, validating their elimination.

Viewing experience. Engagement and enjoyment measures measured the viewing experience (see Appendix F for exact wording for each measure).

Engagement. Three items measured perceived engagement in the television content. The original items formed a reliable scale ($\alpha = .88$) and predicted increased engagement in users watching television with a second screen (Nee & Dozier, 2015). In addition, engagement defined in this way fully mediated second screen use and learning (Nee & Dozier, 2015). While upholding the same definition of engagement and maintaining the semantic elements from the original items, the items were reworded to reflect the nature of this study, offer a response set to capture variability in the experience, and measure three dimensions of perceived engagement more accurately (ease, involvement, and engagement; see Table 6). The reworded items are also very similar to items measured to assess mental immersion or engagement on social presence scales (e.g., Lombard, Ditton, & Weinstein, 2009; Witmer & Singer, 1998). Responses were collected on a 6-point scale ranging from 1 = "extremely difficult/uninvolved/unengaged" to 6 = "extremely easy/involved/engaged," without a neutral category. The items were reliable ($\alpha = .80$) and averaged to represent perceived engagement ($M = 4.82$; $SD = 1.11$; $M_{FoodNetwork} = 4.92$,

$SD_{FoodNetwork}$ = 1.11; $M_{DIYNetwork}$ = 4.71, $SD_{DIYNetwork}$ = 1.11).

Enjoyment. Enjoyment was captured using a measure previously used to compare predictors of enjoyment of reality-based and fictional television programming (Nabi, Stitt, Halford, & Finnerty, 2006). Four items asked how enjoyable, pleasurable, entertaining and captivating the clip was were assessed on a 5-point rating scale from "not at all" to "very much" (α = .97; Nabi, Stitt, Halford, & Finnerty, 2006). Although there are numerous operationalizations of enjoyment, this one most closely fits the conceptual definition of enjoyment used in this study (a pleasurable response (Zillich, 2014) or sense of being entertained (Lombard & Ditton, 1997)). The 4 items were reliable (α = .91) and average into an overall enjoyment score (M = 3.57, SD = 1.29; $M_{FoodNetwork}$ = 3.64, $SD_{FoodNetwork}$ = 1.31; $M_{DIYNetwork}$ = 3.49, $SD_{DIYNetwork}$ = 1.27).

Table 6
Engagement Scale Items

Original Item (Nee & Dozier, 2015)	Item rewording for this study	Rationale
I find what's on TV more absorbing this way	How easy was it for you to absorb the content of the TV show?	Reflect the forced viewing condition; capture variability in ease of the experience.
I'm more involved with TV content when watching this way.	How involved were you with the content of the show?	Reflect the forced viewing condition; capture variability in perceived involvement.
I feel more engaged this way with what's on TV.	How engaged with the TV show were you?	Reflect the forced viewing condition; capture variability in perceived engagement.

Control variables

Individuals with knowledge, interest or find relevance in a media message have a tendency to engage in more controlled processing, resulting in more encoding, storage and recall (Grabe, Lang, & Zhao, 2003; Lang, 2000; Lang et al., 2004; Lang et al., 2007) than those with less knowledge, interest or find less relevance in a message. Thus, these factors were measured as control variables to parse out the effects they may have on cognitive processing (see Appendix H for wording and response options for all items). In previous research, these factors have been measured with single items (i.e., "How interesting was …", "How relevant was…") after the stimuli (e.g., Grabe, Lang, & Zhao, 2003; Fox, Lang, Chung, Lee, Schwartz, & Potter, 2004). However, as interest and relevance are theorized to increase due to activating motivational systems and heightened processing, items developed to capture levels of knowledge, interest, and relevance across general to specific aspects of the stimuli were collected prior to seeing the stimuli. In addition, prior experience with a medium may also affect perceptions of social presence (Gunawardena & Zittle, 1997; Ogara, Koh, & Prybutok, 2014) and was added as an additional control measure in this study.

Knowledge. Knowledge is conceptualized as familiarity with the content of the show (Grabe, Lang, & Zhao, 2003). Three items for each video clip were rated on a 5-point scale ranging from "never" to "all the time" and included how often they watch shows on the network associated with the videos; how often they watch shows of the same type; and how often they watch the particular show used as the stimulus. The three items were not highly reliable for the Food Network stimulus ($\alpha = .64$), due to the low correlation of the item "How often do you watch the show ″3 in the Bag″." Removing this item increased the reliability of the remaining two items to $r = .90$. The reliability of the three items for the DIY Network stimulus was

acceptable (α = .82), but increased with the removal of the item "How often do you watch the show ″Kitchen Impossible″." (*r* = .86). Thus, a knowledge score was created by averaging the two reliable items ($M_{FoodNetwork}$ = 2.46, $SD_{FoodNetwork}$ = 1.06; $M_{DIYNetwork}$ = 2.27, $SD_{DIYNetwork}$ = 1.02), and the third item was included as an individual item.

Interest. Interest relates to an individual's personal preference for particular content or topics (Schiefele, 1991, p. 302). To measure interest, participants rated their personal interest in each of the specific genres (cooking shows and home improvement shows), each of the specific networks (Food Network and DIY Network), and each of the specific topics (cooking and building furniture) associated with the video stimuli on a 5-point scale (1 = "not at all interesting" to 5 = "extremely interesting"). The three items formed reliable scales for each video ($\alpha_{FoodNetwork}$ = .94; $\alpha_{DIYNetwork}$ = .88) and averaged into an overall interest score ($M_{FoodNetwork}$ = 2.96, $SD_{FoodNetwork}$ = 1.15; $M_{DIYNetwork}$ = 2.59, $SD_{DIYNetwork}$ = 1.01).

Relevance. Relevance, in this use, refers to the content or topic's significance to the individual (see Petty & Cacioppo, 1984). Three items pertaining to each video clip asked participants to rate the relevance of the general content (cooking and do-it-yourself demonstrations), relevance of the general topics (learning to cook and learning building skills), and relevance of the specific content (Asian food and building furniture), using a 5-point scale (1 = "not at all relevant" to 5 = "extremely relevant"). The three items were reliable ($\alpha_{FoodNetwork}$ = .85; $\alpha_{DIYNetwork}$ = .88) and averaged into an overall relevance score ($M_{FoodNetwork}$ = 2.83, $SD_{FoodNetwork}$ = 1.09; $M_{DIYNetwork}$ = 2.60, $SD_{DIYNetwork}$ = 1.01).

Prior experience. In order to control for previous experience with television and social media, participants were asked individual items concerning general television use (device preference and TV viewing time preference), general social media use, and general social

television use. Individual items for the types of experience were aggregated into four separate experience scores (TV device preference, TV viewing time preference, general social media use, and social TV frequency) to represent prior coviewing experience.

TV device preference. Device preference included two items measured on a 5-point scale ("never", "sometimes", "about half the time", "most of the time", and "always"): the frequency of television viewing on a television and frequency of television viewing on mobile devices. As the two items represent the inverse of each other (watching television on a TV all the time suggests one could not watch television on a device all the time), the device item was recoded into negative values (-1 = never, -5 = all the time). The two items were then summed to create an index that ranged from -4 to 4, with negative scores indicating more television viewing on devices other than a television, 0 indicating half the time watching on both device types, and positive scores indicating more viewing on a television (M = 0.68, SD = 1.95; $M_{FoodNetwork}$ = 0.54, $SD_{FoodNetwork}$ = 1.97; $M_{DIYNetwork}$ = 0.83, $SD_{DIYNetwork}$ = 1.93).

TV viewing time preference. TV viewing time preference included two items measured on a 5-point scale ("never", "sometimes", "about half the time", "most of the time", and "always"): frequency of viewing television live and frequency of viewing television delayed (i.e., rebroadcasts or from a DVR). Like TV device preference, the two items represented the inverse of each other, thus the same inverse coding was applied to the delayed viewing item (-1 = never, -5 = always). The items were summed to create an index ranging from -4 to 4, with negative values indicating a preference for delayed viewing, 0 indicating half delayed and half live viewing preference, and positive values indicating a preference for live viewing (M = -0.77, SD = 1.88; $M_{FoodNetwork}$ = -0.75, $SD_{FoodNetwork}$ = 1.91; $M_{DIYNetwork}$ = -0.79, $SD_{DIYNetwork}$ = 1.86).

Social media use. Frequency of using various social media sites was captured with four social media sites (i.e., Facebook, Twitter, Instagram, and Snapchat) on a 5-point scale ("never", "once in a while", "sometimes", "often", and "all the time"). To obtain a cumulative frequency of all social media use, the items were summed into an index ranging from 4 ("never" uses all four types) to 20 (uses all four types "all the time") (M = 10.12, SD = 3.75; $M_{FoodNetwork}$ = 9.92, $SD_{FoodNetwork}$ = 3.56; $M_{DIYNetwork}$ = 10.33, $SD_{DIYNetwork}$ = 3.94).

Social TV use. Experience with social television was measured using items from Cohen and Lancaster (2014). They included frequency of sending text messages or instant messages during viewing; frequency of sharing content or posting updates to social media during viewing, related to what they were watching; and the frequency of monitoring social media for what other people were posting about the show during viewing. Items used a 5-point scale ranging from "never" to "all of the time," based on previous research (Cohen & Lancaster, 2014). To obtain a cumulative frequency of these activities to represent social TV use, the items were summed into an index ranging from 3 ("never" perform any of the three activities) to 15 (perform all three activities "all of the time") (M = 6.61, SD = 2.96; $M_{FoodNetwork}$ = 6.50, $SD_{FoodNetwork}$ = 2.84; $M_{DIYNetwork}$ = 6.74, $SD_{DIYNetwork}$ = 3.08).

Manipulation checks

Two items were used as manipulation checks. One item determined if participants saw and recognized the user-generated comments, if included. That item asked, "Did viewer comments appear in the video clip you saw?" with response options of 1 = "yes" and 2 = "no." The manipulation worked, as those who did not see comments (M = 1.94, SD = 0.23) differed significantly from those who did see comments (M = 1.12, SD = 0.32), $t(298) = 29.83$, $p < .01$ (equal variances not assumed). Overall, 94% of participants in the control and plain text

conditions for both stimuli correctly answered “no” and 98% of participants in the five user-generated comment conditions for both stimuli correctly answered “yes” to the manipulation check.

To determine if the redundancy manipulation was effective, one question was posed to participants who said they saw comments. The item asked, “How much did the content of the comments align to the content of the show?” with response options of 1 = “not at all” to 5 = “very much.” The manipulation proved effective. Participants in the three redundant comment conditions (i.e., cued, redundant; not cued, redundant; previously recorded (not cued, redundant)) across both stimuli felt the comments were more redundant (M = 3.86, SD = 1.07) than those in the two non-redundant conditions (i.e., cued, not redundant; not cued, not redundant; M = 3.53, SD = 1.0), $t(288) = 2.57$, $p = .01$.

The social-cued conditions did not include a manipulation check, as a sample of comments were pretested for richness and portrayal of extraverted or introverted personalities. Results of the pretest confirmed that the inclusion of social cues did heighten richness, portrayed more extraverted personalities, and were generally more ‘social.’

Analytical strategy

Study 1. Study 1 involved testing two hypotheses and one research question.

The two hypotheses were tested with one, one-way ANOVA. Three planned comparisons served as a priori predictions to test *H1* (recall will be higher when live user-generated comments appear, compared to plain or no text) and *H1a* (recall will be higher when user-generated comments are live, compared to previously recorded). The first two comparisons compared live comments to the control condition (i.e., no on-screen text) and live comments to plain on-screen text to answer *H1*. The third compared live comments to previously recorded comments to

answer *H1a*.

The research question to explore the potential effect of individual differences on cognitive processing was answered by adding individual difference variables to the ANOVA model ran for *H1* and *H1a*. Specifically, prior knowledge, frequency of viewing of the particular show used as the stimulus (1 item), extraversion, need to belong, audience monitoring, need for company, need for solitude (the last three representing subscales of coviewing orientation), and gender were added to the original ANOVA models (resulting in ANCOVAs) and tested as main effects and moderators. Continuous variables were mean centered to simplify the interpretation of significant interactions. The live comment condition was set as the reference group to make easy comparisons between it and all other groups.

The initial research design called for four covariates (knowledge, frequency of watching the particular show used as the stimulus, interest, and relevance) in the analysis of the two hypotheses. The covariates were tested for violations of the assumptions of ANCOVA (correlation with each other, correlation and linearity with the dependent variables, reliability in measurement, and homogeneity of regression slopes between conditions in relation to the dependent variable; Keppel & Wickens, 2004; Miller & Chapman, 2001; Pallant, 2005). These constructs, while considered qualitatively different, were composed of items constructed specifically for this study (due to a lack of standardized measures, but in line with previous research). Knowledge, interest, and relevance were significantly correlated with one another. Specifically for the Food Network clip, knowledge correlated with interest at $r = .77$, with relevance at $r = .62$ and interest correlated with relevance at $r = .78$. The individual item representing frequency of watching the particular show was not correlated with the other three measures (ranged from $r = .07$ to .12). For the DIY clip, knowledge correlated with interest at $r =$

.68, with relevance at $r = .60$, and interest correlated with relevance at $r = .82$. The individual item assessing frequency of watching the particular show was moderately correlated with the other three measures (ranged from $r = .29$ to .56).

Further inspection revealed the measures were not correlated with the outcome variables. Only the individual item had a significant, yet weak correlation with only one dependent variable (storage) for the Food Network clip ($r = -.15$, $p < .05$; all others ranged from $r = .03$ to .09; correlations of the measures on encoding ranged from $r = .00$ to .10). Additionally, only knowledge and interest had a significant, yet weak correlation with only one dependent variable (encoding) for the DIY Network clip (knowledge $r = .16$, $p < .05$; interest $r = .14$, $p < .05$; relevance $r = .11$; particular show $r = -.06$; correlations with storage ranged from $r = .00$ to .10).

Considering the relationship between the measures and their lack of relationship with the outcomes, two potential covariates were retained for further testing (knowledge and watching the particular show). The analysis for the linearity of the covariates to the dependent variables revealed higher R^2 values for cubic and quadratic equations, suggesting a non-linear relationship and violating the ANCOVA assumption. In addition, both of the two covariates violated the homogeneity of regression slopes on at least one of the dependent variables for the Food Network clip (significant interaction between condition and individual item on storage and between condition and prior knowledge on encoding). Due to the small sample size and violations of ANCOVA assumptions (particularly lack of a relationship of the covariates to the dependent variables), the covariates were dropped from the analysis to avoid overinflating the error term, yielding a regular ANOVA. However, the variables left out of the first analysis as control variables were included in the analysis of the research question to allow investigation of their interactions with the conditions (indicated in the violated linearity assumption).

Study 2. Study 2 involved testing twelve hypotheses. One ANCOVA, using the general linear model approach (Gardner, 2007), for each video tested the first eight hypotheses dealing with the direct effect of comments on perceptions of social presence, and individual differences that may affect perceptions of social presence. Specifically:

H2: Perceptions of social presence (particularly the dimension of awareness) will be stronger in viewers who see user-generated comments compared to those who see no comments.

H3a: Comments with social cues will produce stronger perceptions of social presence (particularly the dimensions of mutual understanding, intimacy, and immediacy) than comments that lack social cues.

H3b: Comments that are redundant to the message content will produce stronger perceptions of social presence than non-redundant comments.

H4a: Need for solitude will have a negative effect on social presence.

H4b: Need for company will have a positive effect on social presence.

H4c: Audience monitoring will have a positive effect on social presence.

H4d: Extraversion will have a positive effect on social presence.

H4e: Need to belong will have a positive effect on social presence.

The same four control variables of knowledge, frequency of watching the particular show, interest, and relevance were collected as in Study 1, as these variables may also affect social presence (Lombard & Ditton, 1997; Neuendorff et al., 2012). Four additional covariates were added to represent prior experience. They included social media use, social television use, television device preference, and television viewing time preference (e.g., watching live or from a DVR). Although the planned covariates had weak (although significant) relationships with the

dependent variable social presence (ranged from r = .05 for TV viewing time preference to r = .34 for social TV preference), they were retained in the models for their theoretical importance.

The full linear model resulted in one fixed factor (experimental condition) with five levels (cued and redundant, cued and not redundant, not cued and redundant, not cued and not redundant, and no comments which served as the control variable), five individual difference variables as covariates (audience monitoring, need for company, need for solitude, extraversion, and need to belong), and six control variables (entered as covariates; included the four listed above, prior knowledge and frequency of watching the particular show from Study 1). To test hypotheses 2, 3a and 3b, planned comparison contrast statements were used to compare conditions with comments to the control condition, cued comment conditions to not cued conditions, and redundant comment conditions to not redundant conditions.

To test *H5,* the moderating effect of extraversion on the relationship between cued versus not cued comments and perceptions of social presence, the ANCOVA model described above was re-ran with the experimental conditions grouped to create two categories (cued and not cued). Additionally, the interaction term between the experimental conditions and extraversion was created and added to the model.

The remaining three hypotheses, focused on the direct and mediating effect of social presence on viewing experiences, were analyzed using Andrew Hayes' 2016 PROCESS macro for SPSS (Hayes, 2013, 2016). This technique uses a series of OLS regression equations to calculate the total, direct, and indirect effects of a mediation model. In the case of a multicategorical independent variable, the analysis uses indicator coding to test each category of the IV against the indicator category (e.g., a control condition) to obtain relative total, direct, and indirect effects (Hayes & Preacher, 2014).

To make all the necessary comparisons to test *H6* (social presence has a positive, direct effect on viewing experiences), *H7a* (social presence has a positive, indirect effect on viewing experiences) and *H7b* (social presence has a positive, indirect effect on cognitive processing), an analysis was run for each dependent variable (enjoyment, engagement, storage and encoding) for each video, relative to the control condition (i.e., using the control condition as the indicator category). Additionally, a second set of analyses were run to provide additional context, using the *previously recorded* condition as the indicator category and the control condition was left out to determine if the effects differed between live comments and previously recorded comments.

Variables in the model included the experimental conditions (IVs) and control variables. The experimental conditions from Study 1 and Study 2 that represented live user-generated comment conditions (not cued, redundant; not cued, not redundant; cued, redundant; and not cued, not redundant) were combined into one condition in the models for simplicity and based on the results of the previous hypotheses. Control variables included the covariates and controls from both studies that were significant for either video in any analysis. These were need for company, extraversion, need to belong, social TV use, social media use, and prior knowledge.

Chapter 4

Results

Study 1 examined the effect of on-screen user-generated comments on cognitive processing. Specifically, this study utilized ANOVAs and a 4 (user-generated comments versus prerecorded user-generated comments versus plain text versus no text) x 2 (Food Network versus DIY Network videos) between-subjects design to test if recall of information contained in the narrative content of the show was greater when user-generated comments were embedded within the stimuli (Hypotheses 1 and 1a). Additionally, an ANCOVA was run to investigate the effect of individual differences on cognitive processing (Research Question 1).

Study 2 examined the effects of the content of on-screen user-generated comments and various individual difference variables on viewer's perceptions of social presence and viewing experience. The study used an ANCOVA and a 4 (social-cued, redundant versus social-cued not redundant versus not social-cued, redundant versus not social-cued, not redundant) x 2 (Food Network versus DIY Network videos), with control factor design to examine if the variability of social presence perceptions is affected by manipulations of the media content (Hypotheses 2 - 3b). In addition, the relationship between perceptions of social presence and individual differences (i.e., extraversion, need to belong, and three subscales of coviewing orientation [need for solitude, need for company, and audience monitoring desires]) were assessed (Hypotheses 4a – 4e), and extraversion was tested as a moderator between social-cued comments and perceptions of social presence (Hypothesis 5). Lastly, the mediating effect of perceptions of social presence between experimental conditions and the viewing experience (composed of measures of engagement, enjoyment, and cognitive processing) was examined using PROCESS (Hypotheses 6 – 7b).

Study 1: Results

Study 1 investigated the relationship between on-screen comments and information recall. This study builds from previous research that manipulated listeners' motivation to pay attention to radio messages (Potter et al., 1997). When participants were instructed to pay attention to a sequence of seven radio messages (approximately 12 minutes in length), because they would be asked questions about them later, storage was higher compared to those instructed to relax and enjoy the messages (Lang, 2000). The results suggested that the motivation to take in information resulted in more controlled allocation of resources to the message. This first study tests this phenomenon by replacing the motivation to collect information with social motivations. Two dependent variables were examined for each video clip. The first, storage, was computed as the sum of all correctly provided answers to open-ended prompts (out of a possible 15 answers for the Food Network clip and 20 answers for the DIY Network clip). The second, encoding, was computed as the sum of all correct answers to nine multiple-choice questions.

Hypothesis 1. The first hypothesis predicted recall to be higher for the user-generated comment condition compared to the no text and plain text conditions. For the Food Network clip, storage did not differ between experimental groups ($F(3, 130) = .61$, $p = .61$). Those who saw live comments ($M = 6.00$, $SD = 2.59$) stored as much information as those who saw plain text ($M = 5.15$, $SD = 3.25$) or no text ($M = 5.66$, $SD = 3.36$), failing to support *H1*.

For the DIY Network clip, storage did significantly differ between groups ($F(3, 118) = 3.33$, $p = .02$). Planned comparisons using the *Bonferroni* adjustment for alpha (3 contrasts/.05 = .02) revealed a marginally significant difference ($p = .05$), with viewers who saw live comments remembering more information ($M = 8.56$, $SD = 3.40$) than those who saw no text ($M = 6.59$, $SD = 4.14$), supporting *H1*. Storage for those who saw live comments did not significantly differ

from those who saw plain text comments (*M* = 9.66, *SD* = 4.39), against predictions of *H1*. Results of both videos are shown in Figure 3.

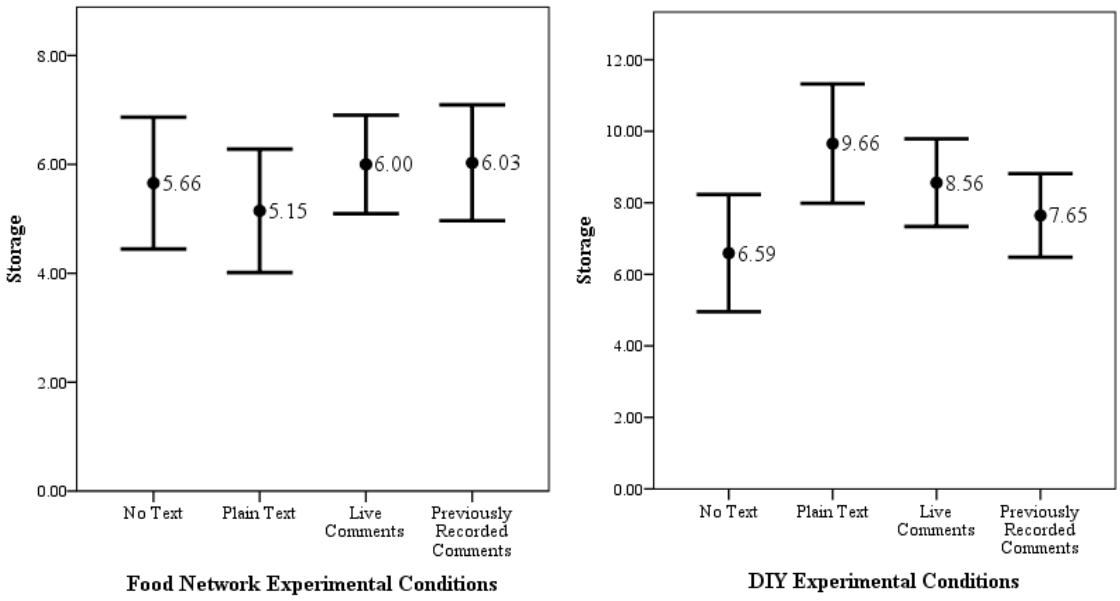

Figure 3. Means and 95% Confidence Intervals of Storage by Condition for Each Video Stimulus.

Encoding (i.e., the number of correctly recalled items) from the Food Network video also did not significantly differ between experimental groups ($F(3, 130) = 1.99$, $p = .12$). Those who saw live comments (*M* = 4.32, *SD* = 1.45) encoded as much information as those who saw plain text (*M* = 4.53, *SD* = 1.62) or no text (*M* = 5.16, *SD* = 1.53), failing to support *H1*. Encoding did differ significantly between groups for the DIY Network video ($F(3, 118) = 3.50$, $p = .02$). The planned comparison analyses revealed that the difference between those who saw live comments (*M* = 4.44, *SD* = 2.34) and those who saw no text on screen (*M* = 3.48, *SD* = 1.93) approached significance ($p = .08$), providing marginal support for *H1*. The comparison between those who saw live comments was not significantly different from those who saw plain text (*M* = 4.76, *SD* = 2.23), failing to support *H1*.Results of both videos are illustrated in Figure 4.

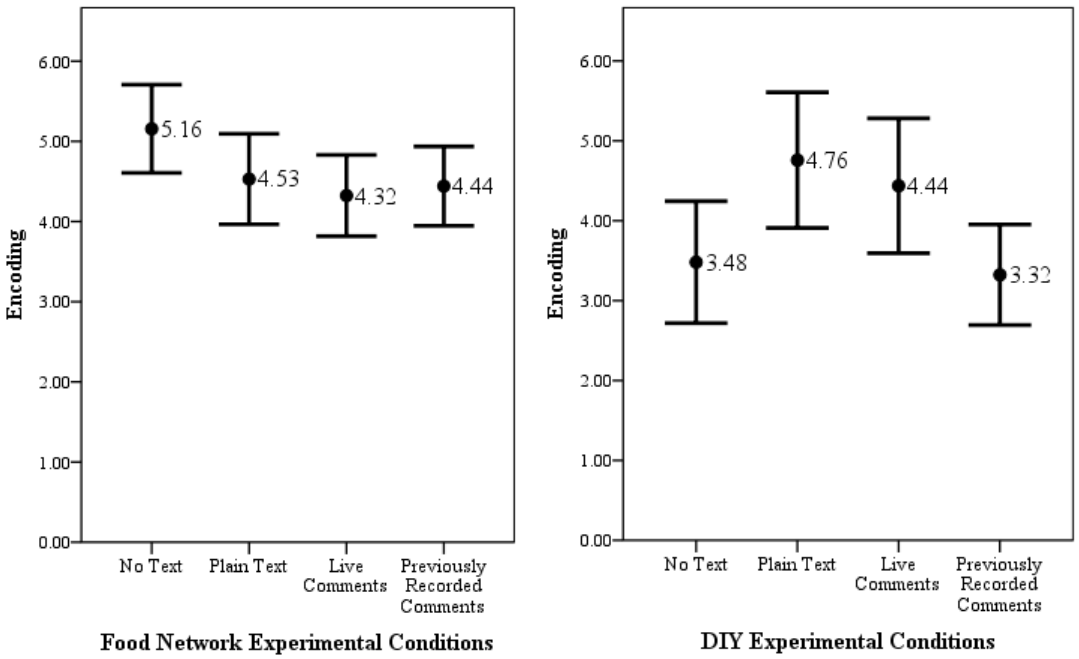

Figure 4. Means and 95% Confidence Intervals of Encoding by Condition for Both Video Stimuli

Overall, Hypothesis 1, predicting recall to be higher in live comment conditions compared to plain text or no text conditions, was partially supported for one video. In the DIY Network video conditions, participants who saw live comments recalled more information than those who saw no text, supporting *H1*. However, recall did not differ between those who saw live comments and those who saw plain text, failing to support *H1*. The next hypothesis explores the relevance of the live nature of comments in producing effects, by comparing live comments to those that were identified as previously recorded.

Hypothesis 1a. This hypothesis predicted recall to be higher when viewers saw live comments compared to previously recorded comments. No differences in storage were observed between conditions for the Food Network video ($F(1, 130) = 0.02$, $p = .96$). Storage for those who saw the live comments ($M = 6.00$, $SD = 2.59$) was the same as for those who saw previously recorded comments ($M = 6.03$, $SD = 3.05$). Storage for participants who saw the DIY video also

did not differ ($F(1, 118) = 0.95$, $p = .33$) between live comments ($M = 8.56$, $SD = 3.40$) and previously recorded comments ($M = 7.64$, $SD = 3.35$, see Figure 3).

Encoding also did not differ ($F(1, 130) = 0.10$, $p = .75$) for those who saw live comments ($M = 4.32$, $SD = 1.45$) and those who saw previously recorded comments ($M = 4.44$, $SD = 1.42$) in the Food Network clip. There was a marginally significant difference ($F(1, 118) = 4.70$, $p = .03$) in the DIY Network clip between those who saw live comments recalling more information ($M = 4.44$, $SD = 2.34$) than those who saw previously recorded comments ($M = 3.32$, $SD = 1.80$, see Figure 4).[6]

Overall, Hypothesis 1a was not supported. Although a marginally significant difference was observed between those who saw live and previously recorded comments in the DIY Network video on encoding, results generally indicated that participants who saw live comments did not recall more information than those who saw previously recorded comments. To continue to test if on-screen user-generated comments socially motivate viewers to pay more attention to the television content, the relationships between cognitive processing and several individual differences are explored next.

Research Question. Automatic processing is unaffected by individual differences, however controlled processing is a product of individual motivations and interests (Lang, 2000). Including user-generated comments within a media message changes the viewing environment, potentially allowing viewers who are more inclined to have a more social viewing experience to process the message differently than those who are less inclined. Thus, a research question was proposed: *Do individual differences explain the relationship between television viewing environments and cognitive processing, and if so, how?* Eight individual difference variables

[6] Pairwise comparisons obtained as part of the ANOVA model revealed only a significant difference ($p = .05$) between the previously recorded condition ($M = 3.32$, $SD = 1.80$) and plain text conditions ($M = 4.76$, $SD = 1.93$).

were included in the models (extraversion, need to belong, audience monitoring, need for company, need for solitude, knowledge, frequency of watching the particular show, and gender).

Storage. The results of the Food Network video ANCOVA for storage with the eight individual difference variables resulted in one significant main effect and no significant interactions. Specifically, one's need for company while watching television had a significant relationship to storage (F (1, 92) = 4.04, p = .05). The relationship was negative (b = -0.61), indicating that as one's need to watch television in the company of others increased, storage decreased. However, this relationship was weak (partial η^2 = .04) and should be considered cautiously due to the model violating Levene's Test for Equality of Error Variances (F (3, 124) = 2.83, p = 04). No significant main or interaction effects were observed for the DIY Network video.

Encoding. The results of the Food Network video ANCOVA for encoding produced only one significant moderator effect. The interaction between gender and the experimental conditions was significant, F (3, 92) = 8.58, p = .01. Investigation of the interaction showed the plain text condition significantly differed from the live comment condition (b = -2.23, p = .01). Specifically, females in the plain text condition correctly identified more information (M = 5.47, SD = 1.51) than males (M = 3.79, SD = 1.32), whereas the opposite was true in the live comment condition (M_{Female} = 4.00, SD_{Female} = 1.41; M_{Male} = 4.52, SD_{Male} = 1.54; see Figure 5).

The analysis for the DIY video revealed a marginally significant main effect of condition and three significant individual difference main effects. Specifically, the experimental conditions approached significance when the variance of individual differences was accounted for (F (3, 79) = 2.33, p = .08), with those in the previously recorded condition encoding significantly less information (b = -2.01, p = .01, M = 3.25, SD = 1.72) than the live comment condition (M = 4.43,

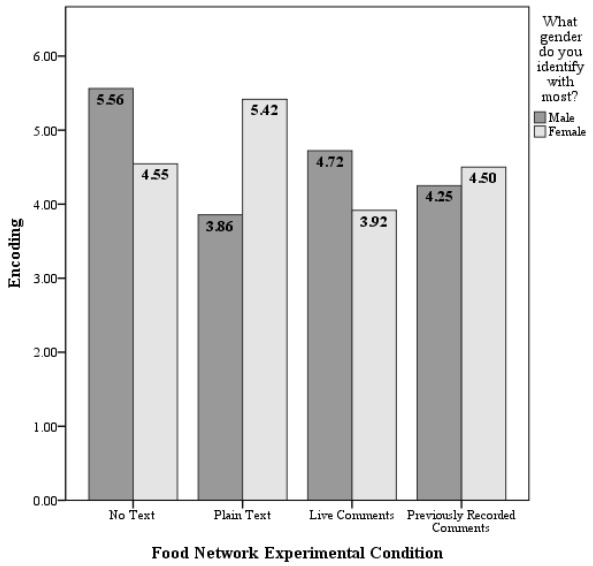

Figure 5. Interaction between Gender and Food Network Experimental Conditions on Encoding

SD = 2.42). The need for solitude while watching television had a moderate negative relationship with encoding (F (1, 79) = 10.59, $p < .01$, b = -0.67), such that the higher one's need for solitude, the less information was encoded. Additionally, extraversion had a weak, negative relationship with encoding (F (1, 79) = 8.14, $p = .01$, b = -0.92), such that more extraverted individuals encoded less information. Lastly, knowledge had a weak, positive relationship with encoding (F (1, 79) = 5.63, $p = .02$, b = 2.08), such that those with more prior knowledge of the genre and network encoded more information. No interactions were significant.

Overall, few individual differences were found to affect cognitive processing. Gender interacted with the experimental conditions to affect encoding in the Food Network video, but had no effect in the DIY Network video. Likewise, the need to watch television in solitude, extraversion, and knowledge of the clip's genre and network were related to encoding for the DIY Network video, but not for the Food Network video. It appears that for the DIY Network video, encoding information was related more to particular individual differences than

experimental condition, which became only marginally significant when individual differences were consider in the analysis.

Study 1: Discussion

In summary, partial support for the claim that information recall of narrative content would be higher when the message contains live user-generated comments compared to plain text, no text, or previously recorded text was found. No support was found in the Food Network video, and partial support was found in the DIY Network video. Specifically, storage and encoding were higher for those who saw live comments compared to those who did not see comments in the DIY Network video, but no differences were found between those who saw live comments and those who saw plain text or previously recorded comments. However, when individual characteristics were included in the analysis, the analysis revealed that those who saw live comments in the DIY Network video encoded more information than those who saw previously recorded comments.

The significance of some individual differences suggests that viewers may be exerting more controlled processing in particular viewing conditions. For the Food Network video, females and those with a higher need to watch television in the company of others recalled more information. The main effect of extraversion and need for solitude on encoding in the DIY Network video suggests that individuals' social characteristics affect attention to the television message regardless of the inclusion of social commentary. In addition, the main effect of prior knowledge on encoding in the DIY Network video clip may indicate that those accustomed to watching this type of show and were 'fans' of this type of programming processed the message differently. To elaborate on how the automatic and controlled processing may be working within these conditions more precisely, post hoc analyses on the dependent variable of encoding were

performed.

Post Hoc Tests. According to the LC4MP, encoding is one measure of automatic orienting responses (Lang, 2000). When an orienting response occurs, attention increases for information presented directly after the stimulus that enacts the response (Lang, 2000). This would suggest that if any type of text on screen elicits an orienting response, then there would be no difference between groups on recognition of information presented after the text. However, when viewers are exerting more controlled processing and willingly directing their attention towards a stimulus, encoding may not occur in predictable ways. For example, if a comment appears on screen and refers back to previous information, a viewer may choose to reflect upon the past information instead of encoding new information. This would allow for information presented directly before a comment appears to be encoded and recognized better for groups who see comments compared to groups who do not. Likewise, research on subtitles suggests that there is no trade-off between image and text presentation (Perego et al., 2010). However, if viewers are choosing to pay attention to the comments or think back upon previous content, then information presented during the comment has the potential to be lost.

To explore these possibilities of how user-generated comments are affecting processing, recognition of information presented *before*, *during*, and *after* the time codes when text was scheduled to appear on screen was compared between experimental and control groups. Of the nine total items used to test encoding, three referred to information that came *before* text was scheduled or appeared, three referred to information that came *during* text was scheduled or appeared, and three referred to information that came *after* text was scheduled or appeared. Two separate one-way ANCOVAs were applied, using the significant individual differences from the research question above as covariates, to investigate these differences between the two clips.

Food Network clip. There were no significant differences in recognition of information *before* text was scheduled or appeared for the Food Network clip ($F(3, 130) = 0.67$, $p = .57$). Recognition of information presented *after* text was scheduled or appeared also did not differ between groups ($F(3, 130) = 0.12$, $p = .95$). Information presenting *during* the appearance or scheduled appearance of text did significantly differ between experimental groups ($F(3, 122) = 3.16$, $p = .03$). Pairwise comparisons (using *Bonferroni* adjustments for multiple comparisons) revealed that those who saw live comments recognized significantly less information ($M_{adjusted} = 1.51$, $SE = 0.16$) than those in the control condition who saw no text on-screen ($M_{adjusted} = 2.13$, $SE = 0.16$; $p = .03$). No differences were observed between those who saw live comments and those who saw plain text ($M_{adjusted} = 1.80$, $SE = 0.15$), or those who saw previously recorded comments ($M_{adjusted} = 1.60$, $SE = 0.16$). The difference in recognition of information *during* scheduled text was not significant between the plain text and control conditions or previously recorded and control conditions.

DIY Network clip. Recognition of information *before* text was scheduled or appeared between groups for the DIY Network clip was not significant (F (3, 113) = 1.73, $p = .16$). Differences in recognition of information presented *during* text was scheduled or appeared were also not significant (F (3, 113) = 1.78, $p = .15$). Differences in recognition of information *after* text was scheduled or appeared did differ significantly (F (3, 115) = 2.76, $p = .05$). However, pairwise comparisons showed no significant differences between groups. Similarly, contrast analyses showed only a marginally significant difference (F (1, 115) = 3.95, $p = .05$) between the live comment condition ($M_{adjusted} = 1.45$, $SE = .17$) and plain text condition ($M_{adjusted} = 0.96$, $SE = .18$).

Importantly, the individual difference variables used as covariates maintained their

significant effect on cognitive processing. Specifically, need for solitude had a significant, weak relationship with encoding *before* text appeared ($F(1, 115) = 4.51$, $p = .04$), *during* the appearance ($F(1, 115) = 14.27$, $p < .01$), and *after* text appeared ($F(1, 115) = 9.37$, $p < .01$). Extraversion was significantly related to encoding *during* ($F(1, 115) = 12.30$, $p < .01$) and *after* text ($F(1, 115) = 7.35$, $p = .01$). Knowledge was significantly related to encoding *during* ($F(1, 115) = 7.58$, $p < .01$) and *after* text ($F(1, 115) = 8.37$, $p = .01$).

Although the results of the post hoc tests suggest different cognitive processing for each video clip, each can be explained with the LC4MP. For the Food Network clip, significantly less recognition of information that came *during* live comments suggests that viewers were paying close attention to the comments and not the audio-visual content. In other words, viewers were directing their cognitive resources towards the comments, leaving few resources to process the audio-visual content. However, the comments were not encouraging viewers to think back upon previously presented information. This conclusion is supported with qualitative evidence that participants provided voluntarily in their responses to the open-ended cued-recall items (listed below). Specifically, 12 participants indicated they were either distracted or paying more attention to comments, making them unable to provide correct answers. Comparatively, there were only four references to the comments for the DIY clip.

> *"Was really very distracted by the comments, they were awful."*
>
> *"i do not remember. i was paying more attention to what sarcastic or funny comment was going to come next"*
>
> *"i was more paying attention to the funny remarks"*
>
> *"I know i saw someone make a comment about it and now i cant remember the correct word."*

"…it was hard to tell because I was reading a comment"

"I remember her saying 6 and then someone on social media commented about that in a sarcastic way."

"That clip was super boring and I was preoccupied with looking for comments to appear..."

"Someone mentioned something about how she said "lilly" no one knew what she was talking about. I hope this experience comes to cable tv, I've never laughed so hard during a cooking show."

"I honestly can't recall, I was distracted by the comments."

"I don't remember! I was paying attention to the comments!"

"I really do not remember specifics. I was paying attention to the comments made by other viewers and was less involved in following step-by-step."

"I don't know! I was reading comments"

For the DIY clip, it appears that the inclusion of live comments enacted more automatic than controlled processing. This was indicated when information that came *after* text appeared was recognized better when text actually did appear, suggesting that the text enacts an orienting response, as found in LC4MP research (Fox et al, 2004; Lang, 2000; Wise, Lee, Lang, Fox, & Grabe, 2008). Any type of on-screen text seemed to not deter processing during the presentation of information as much in this video as in the Food Network clip, as recognition did not differ for information presented *during* the appearance of text. The lack of differing amounts of encoding *before* text appeared suggests that the presence of text does not motivate the viewer to pay more attention to the television message overall, nor engage them in a reflective process of

thinking back on previous information.

The results of Study 1, summarized in Table 7, suggest that the inclusion of user-generated comments appears to create a social viewing experience that may distract or enhance cognitive processing, however it does not motivate viewers to pay more attention to the television message overall. It is still unclear if viewers perceive this as a social viewing environment or how it affects their experience. Thus, the perception of social presence was measured as an outcome of the viewing conditions and tested as one mechanism to explain the relationship between on-screen user-generated comments and the viewing experience.

Study 2: Results

Study 2 examined the effect of social viewing environments on the perception of social presence, how individual differences affected that perception, and how perceptions of social presence affect the viewing experience. Specifically, twelve hypotheses were tested separately for each of the two video stimuli in this study. The first three hypotheses (*H2*, *H3a*, and *H3b*) examine the effect of user-generated comments and manipulation of the comment contents (i.e., inclusion of social cues and the redundancy of the comment content to the message content) on the dependent variable of social presence. The next six hypotheses (*H4a – H4e* and *H5*) explored the relationship of individual differences on perceptions of social presence. The last three hypotheses (*H6*, *H7a*, and *H7b*) examined the mediating role of social presence on the relationship between user-generated comments and the viewing experience, including enjoyment, engagement, and information recall as used in Study 1 (i.e., storage and encoding).

Hypothesis 2. The second hypothesis tested if perceptions of social presence were stronger for messages that contain user-generated comments than messages that did not contain

Table 7

Summary of Study 1 Results

Hypothesis	**Food Network Result**		**DIY Network Result**	
	Storage	**Encoding**	**Storage**	**Encoding**
H1: Information recall of narrative content will be higher when the message contains user-generated comments compared to plain text and no text.	n.d.	n.d.	Live comments > no comments	Live comments > no comments
H1a: Information recall of narrative content will be higher when user-generated comments in the message are live compared to previously recorded.	n.d.	n.d.	n.d.	n.d.
RQ1: Do individual differences moderate the relationship between viewing environments and cognitive processing, and if so, how?	Need for Company (-)	Gender (-)	n.d.	Condition (Live comments > Previously recorded comments) Need for Solitude (-) Extraversion (-) Knowledge (+)
Post Hoc				
Before	-	n.d.	-	n.d.
During	-	Live comments < no comments	-	n.d.
After	-	n.d.	-	Live comments > plain text

Note: ‘n.d.’ indicates no difference.

user-generated comments. The ANCOVA model[7] for the Food Network clip yielded a significant difference between those who did and did not see comments, $F(1, 137) = 21.29$, $p < .01$. Those who saw comments reported significantly stronger perceptions of social presence ($M_{adjusted} = 4.44$, $SE = 0.10$) than those in the control condition ($M_{adjusted} = 2.51$, $SE = 0.21$), supporting *H2*.

The ANCOVA model[8] for the DIY Network clip also yielded significant differences between those who did and did not see comments ($F(1, 129) = 7.24$, $p = .01$). Those who saw comments had significantly stronger perceptions of social presence ($M_{adjusted} = 4.49$, $SE = 0.10$) than the control condition ($M_{adjusted} = 3.10$, $SE = 0.23$), supporting *H2*.

Overall, Hypothesis 2 was supported in both videos, with viewers who saw comments reporting stronger perceptions of social presence than those who did not see comments. To test the variability of perceptions of social presence based on the sociability of the comment content, two hypotheses testing manipulations of content are reported next.

Hypothesis 3a. This hypothesis predicted that perceptions of social presence would be stronger in viewers who saw comments with social cues, compared to those who saw comments without social cues. For the Food Network video, the perception of social presence did not significantly differ between those who saw comments with and without social cues ($F(1, 137) = 1.22$, $p = .27$). The planned comparisons also revealed no significant differences between groups on perceptions of social presence ($F(1, 129) = 1.51$, $p = .29$) for the DIY Network video. Thus, Hypothesis 3a was not supported in either video.

Hypothesis 3b. It was predicted that perceptions of social presence would be stronger in

[7] Covariates in the model included: prior knowledge, frequency of viewing particular show, audience monitoring, need for solitude, need for company, extraversion, need to belong, social TV use, social media use, TV device preference, and TV viewing time preference.
[8] ibid.

viewers who saw comments that were redundant to the audio-visual content compared to those who saw comments that were not redundant to the audio-visual content. For both videos, no differences were observed between redundant and not redundant content ($F_{FoodNetwork}(1, 137) = 0.12$, $p = .73$; $F_{DIYNetwork}(1, 129) = 0.12$, $p = .73$). Thus, *H3b* was not supported.

While *H2* supports the theoretical argument that on-screen user-generated content creates a perceived social viewing environment, *H3a* and *H3b* suggest that this perception is not variable in relation to these manipulations as in other contexts, but may be a dichotomous concept. However, this perception may be subject to individual differences, especially those that predispose viewers to seek out or engage in more social experiences. The individual differences of extraversion, need to belong, need for solitude, need for company, and audience monitoring desires are tested in the next sections.

Hypothesis 4a. One's desire to watch television in solitude was predicted to have a negative effect on perceptions of social presence. The need for solitude was marginally significant ($F(1, 137) = 3.30$, $p = .07$) in the Food Network video, while holding all other variables constant. Those with a stronger need to watch television in solitude had weaker perceptions of social presence ($b = -0.16$, $p = .07$), as predicted. For the DIY Network video, however, the need for solitude was not related to perceptions of social presence (F (1, 129) = 0.89, $p = .35$), failing to support *H4a*.

Hypothesis 4b. One's need for company while watching television was predicted to positively affect perceptions of social presence. This need significantly predicted social presence ($F(1, 137) = 4.08$, $p = .05$) in the Food Network video, such that those with a stronger need to watch television in the company of others had stronger perceptions of social presence ($b = 0.24$, $p = .05$), as predicted. Likewise, the need to watch television in the company of others was

significant ($F(1, 129) = 4.79$, $p = .03$) in the DIY Network video, such that viewers with a stronger need for company had stronger perceptions of social presence ($b = 0.26$, $p = .03$), also supporting *H4b*.

Hypothesis 4c. Audience monitoring was predicted to have a positive effect on perceptions of social presence. This desire to monitor the reactions of other viewers was not significant in the Food Network video (F (1, 137) = 2.15, $p = .15$), but was marginally significant in the DIY Network video (F (1, 129) = 3.28, $p = .07$). Specifically, as one's desire to monitor the audience increased, perceptions of social presence became stronger ($b = 0.21$, $p = .07$), as predicted.

Hypothesis 4d. Extraversion was predicted to have a positive effect on perceptions of social presence in this hypothesis. This prediction was not supported in the Food Network video (F (1, 137) = 0.13, $p = .72$), nor the DIY Network video (F (1, 129) = 0.06, $p = .81$). Extraversion is thus not related to perceptions of social presence.

Hypothesis 4e. Similar to extraversion, the need to belong or fit in with social expectations was also predicted to have a positive effect on social presence. For the Food Network video, this prediction was not supported (F (1, 137) = 0.33, $p = .57$). Unlike in the Food Network analysis, the need to belong was a significant predictor of social presence in the DIY Network video ($F(1, 129) = 9.00$, $p = .003$), although negative. Those with a stronger desire to belong had weaker perceptions of social presence ($b = -0.55$, $p < .01$), the opposite of the prediction made in *H4e*.

Hypothesis 5. The addition of social cues within comments represents a more sociable environment. Thus, it was predicted that extraversion would interact with conditions where social cues were present to have a positive effect on perceptions of social presence. The

interaction term was not significant in the Food Network video ($F(2, 137) = 1.12$, $p = .33$), nor the DIY Network video ($F(2, 129) = 1.12$, $p = .33$). Therefore, *H5* was not supported in either video.

A summary of the results of each hypothesis so far addressed for Study 2 is available in Table 8. Overall, only two hypotheses were supported across both videos. In both videos, social presence was stronger for individuals who saw user-generated comments (*H2*) and for individuals with a stronger desire to watch television in the company of others (*H4b*).

Perceptions of social presence were theorized to explain how on-screen user-generated comments affect the viewing experience. The relationship among the experimental conditions, perceptions of social presence, and outcomes of enjoyment, engagement, and information recall (i.e., storage and encoding) were tested with mediation models (see Table 9 for means and standard deviations for all conditions on all dependent variables).

Hypotheses 6. Hypothesis 6 predicted that social presence would have a positive effect on viewing experiences. For each video, the viewing experiences tested were enjoyment and engagement. For the Food Network video, social presence had a marginally significant, positive effect on enjoyment ($b = 0.15$, $p = .08$), such that stronger perceptions of social presence increased the viewer's enjoyment of the show. In contrast, social presence had no effect on viewer enjoyment for the DIY Network video ($b = 0.11$, $p = .13$).

For engagement, perceptions of social presence had a significant, positive effect in the Food Network video ($b = 0.16$, $p = .02$), and in the DIY Network video ($b = 0.13$, $p = .05$). Specifically, as perceptions of social presence increased, self-reported engagement increased.[9]

[9] An analysis with the previous recorded comment condition as the indicator variable confirmed that perceptions of social presence did not differ between live and previously recorded comments (Food: $b = .02$, $p = .94$; DIY: $b = .17$, $p = .44$). Social presence had a significant direct effect on enjoyment ($b = .18$, $p = .05$) and engagement ($b = .18$, $p = .01$) for the Food video but no effect in the DIY video (engagement: $b = .09$, $p = .28$; enjoyment: $b = .11$, $p = .16$).

Table 8

Summary of Results for Hypotheses 2-5 for Each Stimuli Video

Hypothesis	Food Network	DIY Network
H2: Perceptions of social presence will be stronger for messages that contain user-generated comments than messages that do not contain user-generated comments.	Reject H_0	Reject H_0
H3a: Comments with social cues will produce stronger perceptions of social presence than comments that lack social cues.	Fail to reject H_0	Fail to reject H_0
H3b: Comments that are redundant to the message content will produce stronger perceptions of social presence than non-redundant comments.	Fail to reject H_0	Fail to reject H_0
H4a: Need for solitude will have a negative effect on social presence.	Fail to reject H_0	Fail to reject H_0
H4b: Need for company will have a positive effect on social presence.	Reject H_0	Reject H_0
H4c: Audience monitoring will have a positive effect on social presence.	Fail to reject H_0	Fail to reject H_0
H4d: Extraversion will have a positive effect on social presence.	Fail to reject H_0	Fail to reject H_0
H4e: Need to belong will have a positive effect on social presence.	Fail to reject H_0	Fail to reject H_0 (negative effect)
H5: Extraversion will moderate the relationship between social-cue enriched user-generated comments and social presence. Specifically, user-generated comments with social cues will result in stronger perceptions of social presence for extraverted viewers than for introverted viewers.	Fail to reject H_0	Fail to reject H_0

Table 9

Means and Standard Deviations of Dependent Variables for Each Experimental Condition

Experimental Condition	Enjoyment *M* (*SD*)		Engagement *M* (*SD*)		Storage *M* (*SD*)		Encoding *M* (*SD*)		Social Presence *M* (*SD*)	
	Food	DIY	Food	DIY	Food	DIY	Food	DIY	Food	DIY
Control	3.65	3.51	4.99	4.80	5.66	6.59	5.16	3.48	2.59	3.14
	(1.24)	(1.46)	(1.09)	(1.17)	(3.36)	(4.14)	(1.53)	(1.93)	(1.22)	(1.57)
Plain Text	3.54	3.73	4.77	4.59	5.15	9.66	4.53	4.76	3.04	2.74
	(1.21)	(1.24)	(1.18)	(1.22)	(3.25)	(4.39)	(1.62)	(2.23)	(1.27)	(1.22)
Cued, Redundant	4.00	3.64	5.26	4.51	6.45	7.85	5.03	4.36	4.07	4.49
	(1.25)	(1.20)	(0.87)	(1.04)	(3.60)	(3.55)	(1.90)	(2.07)	(1.24)	(1.40)
Cued, Not Redundant	3.94	3.33	5.23	4.77	5.93	8.18	4.36	4.15	4.52	4.54
	(1.30)	(1.22)	(0.93)	(0.98)	(3.30)	(4.75)	(1.58)	(1.94)	(1.22)	(1.00)
Not Cued, Redundant	3.48	3.26	4.88	4.72	6.00	8.56	4.32	4.44	4.73	4.50
	(1.23)	(1.40)	(1.07)	(1.05)	(2.59)	(3.40)	(1.45)	(2.34)	(1.17)	(1.39)
Not Cued, Not Redundant	3.47	3.52	4.63	4.92	5.37	8.06	4.57	3.75	4.28	4.21
	(1.50)	(1.24)	(1.39)	(0.99)	(3.55)	(3.74)	(1.85)	(1.70)	(1.34)	(1.35)
Previously Recorded	3.47	3.45	4.75	4.65	6.03	7.65	4.44	3.32	4.42	4.07
	(1.40)	(1.19)	(1.06)	(1.32)	(3.05)	(3.35)	(1.42)	(1.80)	(1.39)	(1.44)
Total	3.64	3.49	4.92	4.71	5.79	8.09	4.63	4.04	3.95	3.99
	(1.31)	(1.27)	(1.11)	(1.11)	(3.24)	(3.95)	(1.64)	(2.04)	(1.46)	(1.48)

Overall, Hypothesis 6 was fully supported for engagement in both videos, but not supported for enjoyment (see Tables 10, 11, 12, and 13).

Hypothesis7a. It was predicted that perceptions of social presence would mediate the relationship between user-generated comments and viewing experiences. Table 10 shows the Food Network mediation model results with enjoyment as the dependent variable. The experimental conditions had no indirect effect on enjoyment (as indicated by the presence of zero in the confidence intervals). The same was found for the DIY Network video, as the lack of a direct effect of perceptions of social presence on enjoyment resulted in a lack of significant indirect effects (see Table 11).[10] Overall, perceptions of social presence did not mediate the relationship between user-generated comments and enjoyment. Specifically, though user-generated comments strengthen perceptions of social presence, those perceptions have no impact on enjoyment, thus adding user-generated comments to the television program does not increase enjoyment.

Self-reported measures of engagement in the stimulus served as a second factor of the viewer experience. The results of the Food Network stimulus (shown in Table 12) revealed a significant indirect effect of experimental condition on engagement for both comment conditions. Specifically, engagement increased 0.16 (CI [0.07, 0.58]) of a point in the live comment conditions and 0.15 (CI [0.07, 0.62]) of a point in the previously recorded condition as a result of the positive relationship between experimental conditions and perceptions of social presence. The DIY Network resulted similarly, with a significant indirect effect of both comment conditions. Engagement increased 0.19 (CI [0.01, 0.43]) of a point in the live comment condition

[10] Results of the analysis using the previously recorded condition as the indicator category, and removing the control condition revealed a significant negative indirect effect of social presence on the relationship between plain text comments and enjoyment (b = -0.27, p < .05, CI [-0.68, -0.03]) for the Food Network video. The indirect effect remained non-significant in the DIY Network video, confirming the results of the initial analysis.

Table 10

Mediation Analysis of Experimental Conditions and Social Presence on Enjoyment for Food Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	0.28 (0.53)	3.04 (0.57)***	2.99 (0.55)**		
Plain Text	0.33 (0.29)	-0.20 (0.32)	-0.25 (0.32)	0.05 (0.06)	[-0.02, 0.21]
Live Comments	1.86 (0.22)***	0.08 (0.25)	-0.20 (0.32)	0.28 (0.16)	[-0.01, 0.60]
Previously Recorded	1.79 (0.31)***	-0.27 (0.34)	-0.54 (0.38)	0.27 (0.16)	[-0.01, 0.61]
Controls					
Need for Company	0.22 (0.08)**	0.07 (0.09)	0.03 (0.08)		
Extraversion	0.05 (0.06)	0.01 (0.06)	0.05 (0.06)		
Need to Belong	0.13 (0.17)	-0.21 (0.18)	-0.23 (0.18)		
Social TV Use	0.08 (0.04)*	0.03 (0.04)	0.01 (0.04)		
Social Media Use	-0.00 (0.03)	0.01 (0.03)	0.01 (0.03)		
Knowledge	0.16 (0.08)*	0.22 (0.08)**	0.20 (0.08)*		
Mediator					
Social Presence			0.15 (0.08)		
Model					
R^2	.37***	.06	.08		
F	16.20***	1.70	1.73		

Note. n = 226. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*p < .05, **p < .01, ***p < .001

Table 11

Mediation Analysis of Experimental Conditions and Social Presence on Enjoyment for DIY Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	1.30 (0.52)*	2.44 (0.53)***	2.30 (0.54)***		
Plain Text	0.11 (0.32)	0.41 (0.34)	0.40 (0.34)	0.01 (0.04)	[-0.04, 0.14]
Live Comments	1.45 (0.27)***	0.04 (0.25)	-0.12 (0.27)	0.16 (0.11)	[-0.03, 0.40]
Previously Recorded	1.29 (0.31)***	0.20 (0.30)	0.06 (0.32)	0.15 (0.10)	[-0.02, 0.40]
Controls					
Need for Company	0.22 (0.08)**	0.18 (0.08)*	0.15 (0.08)*		
Extraversion	-0.01 (0.06)	0.02 (0.05)	0.02 (0.05)		
Need to Belong	-0.27 (0.15)	-0.35 (0.14)*	-0.32 (0.14)*		
Social TV Use	0.14 (0.03)***	0.11 (0.04)**	0.09 (0.04)*		
Social Media Use	0.08 (0.03)**	-0.01 (0.03)	-0.02 (0.03)		
Knowledge	-0.13 (0.08)	0.17 (0.08)*	0.20 (0.08)*		
Mediator					
Social Presence			0.11 (0.08)		
Model					
R^2	.43***	.14***	.15***		
F	25.16***	4.20***	4.22***		

Note. n = 218. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*p < .05, **p < .01, ***p < .001

Table 12

Mediation Analysis of Experimental Conditions and Social Presence on Engagement for Food Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	0.31 (0.53)	4.84 (0.45)***	4.79 (0.43)***		
Plain Text	0.30 (0.32)	-0.28 (0.28)	0.16 (0.07)*	0.01 (0.04)	[-0.02, 0.20]
Live Comments	1.83 (0.22)***	0.04 (0.22)	-0.33 (0.29)	0.16 (0.11)*	[0.07, 0.58]
Previously Recorded	1.76 (0.31)***	-0.30 (0.27)	-0.58 (0.30)*	0.15 (0.10)*	[0.07, 0.62]
Controls					
Need for Company	0.22 (0.08)**	0.00 (0.07)	-0.03 (0.07)		
Extraversion	0.06 (0.06)	0.07 (0.05)	0.06 (0.05)		
Need to Belong	0.13 (0.17)	-0.27 (0.16)	-0.29 (0.16)		
Social TV Use	0.09 (0.04)*	0.02 (0.04)	0.01 (0.03)		
Social Media Use	-0.00 (0.03)	-0.01 (0.03)	-0.01 (0.03)		
Knowledge	0.16 (0.08)	0.18 (0.08)*	0.15 (0.08)*		
Mediator					
Social Presence			0.16 (0.07)*		
Model					
R^2	.37***	.07**	.09**		
F	16.11***	1.56**	2.39**		

Note. n = 227. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*p < .05, **p < .01, ***p < .001

and 0.19 (CI [0.01, 0.40]) of a point in the previously recorded comment condition due to the positive relationship between experimental conditions and perceptions of social presence (see Table 13).[11] Overall, the addition of user-generated comments on screen increased perceptions of social presence, which led to an increase in engagement. Thus, embedding user-generated comments into a television program increases engagement as a function of perceptions of social presence.

Overall, *H7a* was partially supported. While perceptions of social presence did not mediate the relationship between user-generated comments and enjoyment, these perceptions did mediate the relationship between user-generated comments and self-reported engagement. Specifically, viewers who saw both live and previously recorded comments had stronger perceptions of social presence, and in turn, felt more engaged in the video. This result was obtained in both video stimuli.

Hypothesis 7b. For some, engagement refers to the act of 'paying attention' to a stimulus or indicates more cognitive processing. To elaborate on this distinction and expand the findings from Study 1, social presence was tested as a mediator between the experimental conditions and cognitive processing. It was predicted that the experimental conditions would have a positive indirect effect on information recall. The same PROCESS models as before were used, containing the same covariate and control variables, with storage, and encoding entered as dependent variables in separate analyses.

The results showed no significant direct effect of perceptions of social presence on storage for either video (Food Network video: b = -0.15, p = .45; DIY Network video: b = -0.16,

[11] With the previously recorded condition as the comparison group, and without the control condition, the indirect effect of social presence on engagement remained significant for plain text condition in the Food Network video (b = -0.27, p < .05, CI [-0.56, -0.08], but the indirect effect was not significant for both conditions in the DIY Network video.

Table 13

Mediation Analysis of Experimental Conditions and Social Presence on Engagement for DIY Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	1.30 (0.52)*	3.67 (0.57)***	3.50 (0.59)***		
Plain Text	0.11 (0.32)	-0.10 (0.32)	-0.11 (0.32)*	0.01 (0.05)	[-0.07, 0.14]
Live Comments	1.45 (0.27)***	-0.01 (0.23)	-0.20 (0.24)	0.19 (0.10)*	[0.01, 0.43]
Previously Recorded	1.29 (0.31)***	0.03 (0.31)	-0.14 (0.31)	0.17 (0.10)*	[0.01, 0.40]
Controls					
Need for Company	0.22 (0.08)**	0.11 (0.07)	0.08 (0.07)		
Extraversion	-0.01 (0.06)	0.04 (0.05)	0.05 (0.05)		
Need to Belong	-0.27 (0.15)	-0.24 (0.17)	-0.20 (0.17)		
Social TV Use	0.14 (0.03)***	0.03 (0.03)	0.01 (0.03)		
Social Media Use	0.08 (0.03)**	0.03 (0.02)	0.02 (0.02)		
Knowledge	-0.13 (0.08)	0.21 (0.07)*	0.22 (0.08)**		
Mediator					
Social Presence			0.13 (0.08)*		
Model					
R^2	.43***	.12**	.14**		
F	25.16***	2.60**	2.56**		

Note. n = 218. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*$p < .05$, **$p < .01$, ***$p < .001$

p = .49, see Tables 14 and 15, respectively). As a result, there were also no indirect effects to indicate social presence mediates the relationship between experimental conditions and storage.[12] Specifically, perceptions of social presence had no impact on storage, and contributed no explanatory value to the relationship between user-generated comments and storage.

Using encoding (i.e., recognition) as the indicator of cognitive processing, the results of the two videos diverged. There were no direct effects of perceptions of social presence on encoding for the Food Network video (b = -0.07, p = .46), and no significant indirect effects (see Table 16). However, social presence had a significant negative direct effect on encoding in the DIY Network video (b = -0.25, p = .05; see Table 17), and the perception of social presence was a significant mediator for the live and previously recorded comment conditions. Specifically, as social presence increased, those who saw live comments (b = -0.36, p < .05, CI [-0.77, -0.01]) or previously recorded comments (b = -0.32, p < .05, CI [-0.73, -0.03]) encoded less information than those who saw no comments.[13] This difference in conditions was the result of the positive effect of user-generated comments on perceptions of social presence, and the negative effect of perceptions of social presence on encoding. Thus, adding user-generated comments to a television program decreases encoding, as a function of stronger perceptions of social presence.

Overall, *H7b* was not supported for storage, but was supported for encoding in one of the two stimuli. For the DIY Network video, social presence negatively affected encoding and relationship between comments and encoding. The results showed that social presence increased in social viewing environments, resulting in decreased encoding. Therefore, *H7b* was not

[12] The results were replicated in the analysis using the previously recorded condition as the indicator group, such that the direct or indirect effects of social presence on storage were non-significant in both videos.

[13] Results were confirmed in the analysis with the previously recorded condition as the indicator group. No direct or indirect effects were observed in the Food Network video, while social presence remained a marginally significant direct effect (b = -0.26, p = .07) and a positive indirect effect between the plain text condition and encoding (b = 0.31, p < .05, CI [0.01, 0.73]) in the DIY Network video.

Table 14

Mediation Analysis of Experimental Conditions and Social Presence on Storage for Food Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	0.31 (0.53)	8.33 (1.33)***	8.38 (1.34)***		
Plain Text	0.30 (0.32)	-0.45 (0.79)	-0.40 (0.79)	-0.05 (0.10)	[-0.39, 0.05]
Live Comments	1.83 (0.22)***	0.38 (0.63)	0.66 (0.74)	-0.28 (0.38)	[-1.06, 0.45]
Previously Recorded	1.76 (0.31)***	0.49 (0.81)	0.76 (0.86)	-0.27 (0.36)	[-1.03, 0.41]
Controls					
Need for Company	0.22 (0.08)**	-0.15 (0.20)	-0.11 (0.21)		
Extraversion	0.06 (0.06)	0.16 (0.15)	0.17 (0.15)		
Need to Belong	0.13 (0.17)	-0.80 (0.46)	-0.78 (0.46)		
Social TV Use	0.09 (0.04)*	-0.08 (0.10)	-0.07 (0.11)		
Social Media Use	-0.00 (0.03)	-0.13 (0.08)	-0.13 (0.08)		
Knowledge	0.16 (0.08)	0.34 (0.20)	0.36 (0.20)		
Mediator					
Social Presence			-0.15 (0.21)		
Model					
R^2	.37***	.09**	.09**		
F	16.11***	2.94**	2.69**		

Note. n = 227. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*p < .05, **p < .01, ***p < .001

Table 15

Mediation Analysis of Experimental Conditions and Social Presence on Storage for DIY Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	1.30 (0.52)*	7.10 (1.65)***	7.32 (1.74)***		
Plain Text	0.11 (0.32)	2.54 (1.08)*	2.56 (1.08)*	-0.02 (0.09)	[-0.32, 0.08]
Live Comments	1.45 (0.27)***	1.68 (0.84)*	1.91 (0.89)*	-0.24 (0.34)	[-0.92, 0.39]
Previously Recorded	1.29 (0.31)***	0.86 (0.98)	1.07 (1.02)	-0.21 (0.30)	[-0.84, 0.35]
Controls					
Need for Company	0.22 (0.08)**	0.19 (0.23)	0.23 (0.23)		
Extraversion	-0.01 (0.06)	-0.12 (0.16)	-0.12 (0.16)		
Need to Belong	-0.27 (0.15)	0.29 (0.42)	0.25 (0.44)		
Social TV Use	0.14 (0.03)***	-0.21 (0.11)	-0.18 (0.12)		
Social Media Use	0.08 (0.03)**	-0.15 (0.09)	-0.14 (0.09)		
Knowledge	-0.13 (0.08)	0.71 (0.26)*	0.69 (0.27)**		
Mediator					
Social Presence			-0.16 (0.24)		
Model					
R^2	.43***	.14***	.14***		
F	25.16***	3.61***	3.32***		

Note. n = 218. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*$p < .05$, **$p < .01$, ***$p < .001$

Table 16

Mediation Analysis of Experimental Conditions and Social Presence on Encoding for Food Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	0.31 (0.53)	4.74 (0.78)***	4.76 (0.79)***		
Plain Text	0.30 (0.32)	-0.62 (0.41)	-0.60 (0.41)	-0.02 (0.04)	[-0.20, 0.02]
Live Comments	1.83 (0.22)***	-0.51 (0.32)	-0.38 (0.35)	-0.13 (0.17)	[-0.49, 0.19]
Previously Recorded	1.76 (0.31)***	-0.77 (0.38)*	-0.64 (0.41)	-0.12 (0.17)	[-0.50, 0.18]
Controls					
Need for Company	0.22 (0.08)**	-0.01 (0.10)	0.01 (0.11)		
Extraversion	0.06 (0.06)	-0.01 (0.07)	-0.00 (0.07)		
Need to Belong	0.13 (0.17)	0.07 (0.22)	0.08 (0.22)		
Social TV Use	0.09 (0.04)*	-0.06 (0.06)	-0.05 (0.06)		
Social Media Use	-0.00 (0.03)	0.02 (0.05)	0.02 (0.05)		
Knowledge	0.16 (0.08)	0.21 (0.12)	0.22 (0.12)		
Mediator					
Social Presence			-0.07 (0.09)		
Model					
R^2	.37***	.04	.04		
F	16.11***	1.00	0.94		

Note. n = 227. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*p < .05, **p < .01, ***p < .001

Table 17

Mediation Analysis of Experimental Conditions and Social Presence on Encoding for DIY Network Stimulus

	M (a path)	Y (c path)	Y (c', b path)	X-M-Y (a*b path)	
Variables	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	95% CI
Groups					
Control	1.30 (0.52)*	3.87 (0.90)***	4.20 (0.98)***		
Plain Text	0.11 (0.32)	1.17 (0.54)*	1.19 (0.53)*	-0.03 (0.09)	[-0.28, 0.11]
Live Comments	1.45 (0.27)***	0.78 (0.41)	1.14 (0.43)*	-0.36 (0.19)*	[-0.77, -0.01]
Previously Recorded	1.29 (0.31)***	-0.13 (0.48)	0.19 (0.49)	-0.32 (0.17)*	[-0.73, -0.03]
Controls					
Need for Company	0.22 (0.08)**	0.27 (0.12)*	0.33 (0.11)**		
Extraversion	-0.01 (0.06)	-0.08 (0.09)	-0.09 (0.08)		
Need to Belong	-0.27 (0.15)	-0.04 (0.22)	-0.11 (0.23)		
Social TV Use	0.14 (0.03)***	-0.03 (0.22)	0.00 (0.06)		
Social Media Use	0.08 (0.03)**	-0.13 (0.04)**	-0.11 (0.04)*		
Knowledge	-0.13 (0.08)	0.21 (0.14)	0.17 (0.14)		
Mediator					
Social Presence			-0.25 (0.13)*		
Model					
R^2	.43***	.14***	.16***		
F	25.16***	3.93***	4.33***		

Note. n = 218. CI = bias corrected confidence interval based on 1,000 bootstrap samples.
*p < .05, **p < .01, ***p < .001

supported in any of the scenarios, but it was not supported because its result was the opposite of what was expected.

Study 2: Discussion

The purpose of Study 2 was to explain the effects of user-generated comments and individual differences on perceptions of social presence, and the effect of perceptions of social presence on viewing outcomes. Overall, the video clips with user-generated comments positively impacted social presence, regardless of whether they were live or previously recorded. However, adding social cues or manipulating the redundancy of the comment content in relation to the video content did not affect viewers' perception of social presence in any measureable way. Individual differences had little impact on perceptions of social presence, as only the need to watch television in the company of others had a significant positive effect on social presence in both videos as predicted.

The perception of social presence was related to some viewing outcomes. Specifically, social presence was not related to enjoyment, but had a positive direct effect on self-reported engagement. As the perception of social presence got stronger, engagement increased across both videos. In addition, social presence proved to be a viable mediator between the experimental conditions and engagement. In both videos, perceptions of social presence were significantly higher in user-generated comment conditions, which, in turn, increased viewers' self-reported engagement. Furthermore, the perception of social presence had no effect on storage in either video, but the perception of social presence had a negative direct and indirect effect on encoding in the DIY Network video. Specifically, perceptions of social presence were stronger in the live and previously recorded comment conditions, resulting in less encoding.

The results of the mediation analyses both complemented and expanded the results from

Study 1. Although no differences in recall overall were observed between experimental and control groups for the Food Network video, those who saw comments did recognize significantly less information during the time a comment was on screen. Those who saw comments also reported stronger perceptions of social presence, which resulted in them feeling more engaged with the clip. These two findings are complementary and suggest viewers in the comment conditions were directing their cognitive resources towards the comments and experiencing a more social viewing environment. In contrast, the addition of the comments enhanced cognitive processing of the message content in the DIY Network video. However, when the perception of social presence was considered, recognition of information from the clip decreased for all conditions with user-generated comments. This suggests that comments direct attention towards the video, but as the perception of social presence gets stronger, less information from the audio-visual channels is retained. The next section provides a more thorough discussion of the findings in relation to the theoretical arguments driving the analyses, a comparison of the results for Study 1 and Study 2, and general conclusions.

Chapter 5

Conclusion

The purpose of this research was to discover how current production trends of embedding user-generated comments into a television program affects the viewer's cognitive processing and experience of the television content. Two overarching questions drove this research: 1.) Do on-screen user-generated comments enhance the viewer's sense that they are watching with others? 2.) Do on-screen user-generated comments affect the way viewers process and experience the television content, through this sense of sharing the experience with others? Overall, the results of 15 hypotheses across two studies confirmed both overarching questions. On-screen user-generated comments do enhance the viewer's sense that they are watching with others, and this sense affected both the viewer's engagement in and cognitive processing of the television content.

The Limited Capacity Model of Motivated Mediated Message Processing provided the theoretical basis for this research. It assumes that cognitive processing will increase as a reaction to orienting responses that activate the senses and direct attention (i.e., changes such as edits, cuts, or the appearance of text on the screen), or as a result of the viewer's motivation to direct cognitive resources towards a stimulus (i.e., arousing or valenced content that activates fight or flight reactions, or personal interest in the content; Lang, 2000). This research attempted to expand the theoretical understanding of motivationally-driven cognitive processing to include social motivations. Specifically, this research proposed that on-screen user-generated comments create a shared viewing environment, in turn fostering the perception of social presence, or the awareness of viewing the same content at the same time as other viewers (Biocca & Nowak, 2001; Zelenkauskaite & Bucy, 2009). When individuals share the same object of attention and

experience presence, the stimuli becomes socially significant, inspiring the individual to 'tune in' to the stimulus and the way others experience it (Shteynberg, 2010). As a result, motivations for message processing increases and cognitive elaboration on the stimulus increase (Shteynberg, 2010; Shteynberg, et al., 2014; Skalski & Tambourini, 2007). The perception of social presence was considered one mechanism that could invoke viewers' social motivation, leading to a judgment that the show had social relevance. Thus, attention to the television content was expected to increase when social commentary was added.

The results of the two studies suggested that on-screen user-generated comments do not motivate viewers to pay more attention to the television show. The theoretical argument seemed to be supported in the DIY video stimulus, as information recall, an indicator of increased cognitive processing, was higher when user-generated comments were included. However, subsequent analyses revealed that this initial result may be better explained as the result of the on-screen text enacting an orienting response. The increase in encoding in the DIY video stimulus with user-generated comments compared to the stimulus without text was limited to information that came after the appearance of a comment, whereas the amount of information encoded before or during a comment remained the same for all conditions.

Additionally, the lack of difference in the Food Network video suggested that comments did not enhance processing of the television content. This does not mean that cognitive processing in conditions with a third textual channel did not increase, though. Instead, this suggests that viewers were able to process the television content as well as those who did not see comments, despite the addition of the third channel of text, which made the message more complex in structure (i.e., number of channels) and form (i.e., redundancy or synchronicity). According to theory, more complex messages require additional cognitive resources, and overall

message processing increases as more resources are directed towards the message (Fox et al., 2004; Lang, 2000, 2006). However, encoding of the television content significantly decreased during the time a comment appeared on screen, in the Food Network video. This suggests that, while able to overcome the complexity of the three-channel message overall, viewers allocated more resources towards the comments than the television content when comments appeared on screen, leaving fewer resources available to process the television content, indicative of controlled processing. This conclusion is also supported in qualitative information viewers volunteered in their responses to open-ended recall questions. Specifically, they expressed they were distracted by and paying more attention to the comments, thus could not recall the information they were asked to recall.

The second study provided more insight and support for the conclusion that user-generated comments direct attention away from the television content. On-screen user-generated comments do contribute to a sense of sharing the experience with other viewers, as perceptions of social presence were stronger for those who saw user-generated comments compared to those who saw plain text or no text. However, contrary to expectations, perceptions of social presence had a negative effect on cognitive processing of the main television message. This finding was significant for one type of cognitive processing (i.e., encoding) for one video, but was negative (although not significant) for both levels of processing (storage and encoding) for both videos. Specifically, the significant increase in encoding for the DIY video found in the first study was reversed when the perception of social presence was included as a mediator. As social presence increased in the conditions with comments, encoding significantly decreased.

In light of these findings, this research can conclude that on-screen user-generated comments do invoke social motivations that direct cognitive processing, as a result of the

perception of social presence generated by the inclusion of comments. However, this does not increase processing of the message overall or the television content, as theorized based on previous research. Instead, it appears that the comments, not the television content, take on social significance, in turn motivating the viewer to direct attention towards the social information. This is in line with previous research that found perceived presence increased one's focus on the information provided by the source that indicated the presence (i.e., a computer agent, a comment; Skalski & Tambourini, 2007).

The conclusion that viewers seeing comments did not process the television message as well as those who did not see comments does not mean they were not engaged in the experience. Specifically, social presence had a positive effect on self-reported engagement and thus, engagement increased when user-generated comments were included in the video. This finding contributes to the conceptual difference between mental engagement as the cognitive processing of sensory stimuli and one's self-assessment of mental involvement. This suggests that viewers were more engaged in the show overall because of the social viewing environment, and supports previous research that found a positive correlation between perceptions of social presence and engagement with a program (Cohen, Bowman, & Lancaster, 2016; Hill & Benton, 2015; Skalski & Whitbred, 2010). The social experience however, did not affect viewers' enjoyment.

A major practical and theoretical component of this research was to investigate how characteristics of user-generated comments contribute to the variability of perceptions of social presence. Conceptually, social presence refers to one's feeling or sense of an 'other', existing on a continuum ranging from 'present' or 'not'. The strength or weakness of one's sense is affected by the characteristics of the source of the copresence (Biocca, Harms & Burgoon, 2003; Kahn, 2012; Shin, 2013), such as social cues (Connell et al., 2001; Kaplan & Haenlein, 2010; Rogers &

Lea, 2005; Zhang et al., 2007) or consistency of the multimodal information within an environment (Lombard & Ditton, 1997; Witmer & Singer, 1998). This continuum distinguishes social presence from similar concepts such as coviewing or coattention, which refer specifically to the empirical reality of 'present' or 'not' in an environment. Despite manipulating the comment content and attempting to measure multiple aspects of one's perception, social presence did not vary when comments were live or previously recorded, included social cues or not, or were redundant or not to the television content. Instead, perceptions of social presence appeared to exist as a dichotomy. However, this should not be cause to discount the conceptualization and operationalization of social presence as a variable concept that social presence is distinct from coviewing or coattending in this environment.

The lack of variation may be due to a weakness of the manipulations to affect a change. Specifically, the redundancy manipulation was only slightly effective, as the difference between groups who saw redundant or not redundant content (although significant) was small. Likewise, the manipulation of 'socialness' using social cues may not have been as effective as other manipulations of 'socialness' might be. While a pretest confirmed that comments with social cues were perceived as more social than comments without social cues in a direct comparison, the amount of 'socialness' cued comments add does not contribute to perceptions of social presence.

The lack of difference may also reflect a ceiling effect, such that the characteristics of comments had no additive effect on the strength of perceptions, beyond the presence of comments in general. The expected changes in perceptions were based on a definition and measurement of social presence that emphasized the interpersonal nature of relationships, combined with the interactivity allowed between the perceiver and the source of presence. A

social television environment is a shared group environment, consisting of relatively little interpersonal communication. Unlike the types of interpersonal communication studied in previous research (e.g., email, telephone, teleconference), messages are not sent and received between individuals, but are instead posed to the viewing audience at large in a public forum as a one-to-many communication. In addition, this research eliminated one's ability to interact in the backchannel, further reducing the interpersonal nature or connectedness between the individual and other audience members. In such a loosely connected group with no history, future, or ability to interact, insights into the behavioral, cognitive, or emotional dispositions of individual group members, which help individuals derive meaning, engage in appropriate social rules, and develop relationships, would have little relevance and have little effect on perceptions of social presence.

However, both the characteristics of the source of the presence as well as characteristics of the medium within mediated communication environments determine perceptions of social presence. In a non-interactive environment, the elements that create the awareness of copresence are more likely perceived as characteristics of the medium overall, instead of related to characteristics of the social agent. As such, the perception of social presence is better operationalized as perceiving the experience as more social, personable, or friendly, as opposed to perceiving an 'other' in these ways. Social cues that represent individual dispositions in interpersonal environments in turn provide insight into the 'socialness' of the environment. This was indicated in a previous experiment testing the role of social presence as a mediator of the relationship between laugh tracks or user-generated comments and perceptions of humor (Cameron, 2015). Using two measures of social presence, the analysis found no effects of social presence operationalized as perceptions of the source of presence (i.e., laugh tracks and

comments), but effects were observed when social presence was operationalized as perceptions of the mediated experience.

Given these different sources by which perceptions of social presence may vary, some have suggested that both the perception of the source and of the medium should be measured (Biocca, Harms & Burgoon, 2003; Zelenkauskaite & Bucy, 2009). This approach has little theoretical justification and undermines a clear conceptualization of social presence. Though thought of as a universal concept in mediated contexts, social presence is more likely best conceptualized and measured in regards to the specific context in which it is being investigated. In a non-interactive environment, measuring one's perception of the experience may be more appropriate, whereas measuring one's perception of the other may be more appropriate in interactive environments.

The relationship between individual differences and outcomes provided novel theoretical insight on cognitive processing, social presence, and the relationship between them. While not all characteristics had an effect in both videos, there was some indication that those with stronger social needs or desires (i.e., extraverted, desire to watch television in the company of others) did not process the television content as well as those with weaker needs or desires. Similarly, the need to watch television in the company of others, prior knowledge, frequency of social media use, and frequency of social television use exerted a positive effect on social presence. As social presence had a negative effect on cognitive processing and a positive effect on engagement, there is some evidence that individuals with stronger desires for social television experiences are further motivated to direct cognitive processing towards social information and engage in social television when social commentary is included on screen. However, this research did not find relationships between perceptions of social presence and other individual characters (i.e.,

extraversion, need to belong, other dimensions of coviewing orientation) suggested in previous research (Chen, Gao, & Rau, 2015; Cohen & Lancaster, 2014). Although unexpected, research examining the impact of individual differences on presence has resulted in contradictory findings difficult to synthesize due to different measures of presence within various environments (Neuendorf, Skalski, Denny, Campbell, & Egizii, 2012).

Limitations

Several stringent steps were taken to create a sound research design and conduct a controlled experiment; however, this research is subject to many limitations. First, in regards to testing the actual phenomenon, this research limited participants to a non-interactive social viewing environment, and relied on a cover story to promote the belief that the videos were live and comments were composed in real time. The extent to which participants believed this was true is unknown, and may have affected outcomes. In reality, viewers would know if the video was being broadcast live and in real-time, have the choice to use a second screen to supplement the television, the opportunity to check the social media feed from which the comments were being chosen, and the opportunity to participate in that feed. This deviation from the real-life phenomenon may have resulted in an underestimation of effects, as previous research has found stronger perceptions of social presence in viewers who able to participate in the 'backchannel' versus those who were restricted from participating (Zelenkauskaite & Bucy, 2009).

Second, the shows, and the networks in general, from which the clips were chosen, have historically never included user-generated comments. The novelty of the experimental conditions may have affected the way participants familiar with these shows or networks viewed the clips. For example, the unusualness may have increased or decreased their attention to the show compared to viewing the show in a natural setting, or reinforced the experimental nature of the

task. Additionally, both clips were from the ‘informational’ reality television genre. Although user-generated comments are more likely to appear on television shows in the reality genre, they are not common to the ‘informational’ subgenre. With many types of reality subgenres on television, like live sports broadcasts, competition shows, or docu-dramas, results may not generalize to other subgenres. Furthermore, although from the same subgenre, ‘informational’ television shows are not equal in simplicity or relation to personal experience. Specifically, while food is a common topic for all people, building furniture is less common and requires tools, tasks, and materials that are not typical in everyday life. Thus, results may be limited to specific subgenres as well as specific topics. Likewise, the effects in this research may be underestimated in comparison to subgenres in which this practice is more common.

Third, the stimuli differed in subtle, yet distinct ways that may have affected results. The videos had hosts of different genders, and used different approaches in hosting the show. For example, Rachel Ray (Food Network video host) was more conversational and personal in her delivery, while Marc Bartolomew (DIY Network host) was more instructional and direct. Relatedly, the comments that were generated for the Food Network video referred more to the host and the host’s personal characteristics. In contrast, the comments generated for the DIY Network video referred more to the process and tasks appearing in the content. These differences may partly explain why effects found in one video were not found in the other.

Fourth, the two video stimuli were short clips and not full-length episodes. Longer episodes would have offered more information to collect on recall measures, which may have allowed more deviation among groups as well as comparisons of recall between different parts of the clip (i.e., first third, middle third, last third). These comparisons could have offered insight into how processing changes over time (i.e., remains steady, increases or decreases).

Additionally, longer videos would have allowed for more comments or text to appear on-screen, which may have allowed perceptions of social presence, and particularly the perception of different dimensions of social presence, to grow over the duration of the video. Although these may be products of the real-world phenomenon, experimental researchers must be sensitive to participant fatigue, knowledge of being in an experiment, and dropout. Thus, the decision to use shorter videos was made to minimize experimental effects and maximize participation to obtain quality data, potentially resulting in underestimated effects.

Fifth, the experiment was administered online and not in a controlled setting. Viewers may have been distracted by their environments or performing other activities while participating, potentially limiting their focus on the experimental stimuli or materials. In addition, viewers had the ability to watch the video at different volume levels or screen sizes, which may have affected how well they could see or hear the video stimuli. Although the online administration allowed a large overall sample to be collected in a short period of time, some cell sizes were small and cells were unequal. A larger sample size may have strengthened some analyses and uncovered small effects. Furthermore, the use of Mturk provided a sample that does not necessarily represent the average American. First, participants are fairly Internet and computer savvy, as they have opted in to and must navigate various elements and tasks of an online research system. Second, participants had to meet a worker quality criterion such that only those who had adequately completed 100 tasks or more could participate. This limited the sample to participants who were also more savvy research participants. Third, the sample consisted of Americans who were more educated, less wealthy, more White and Asian, and slightly more male than the overall population. While more representative than an undergraduate college student sample, results may be over- or underestimated compared to a more diverse or

representative sample.

Lastly, this research was limited in the measures used. While there are several measures that capture multiple types of or mechanisms involved in cognitive processing (i.e., response latency (Lang et al., 2000), signal detection analysis (Lang et al., 2000), secondary task reaction time (Lang et al., 2000; Lang et al., 2006), eye-tracking (d'Ydewalle et al., 1991; Perego et al., 2010), tonic and phasic heart rate (Lang et al., 1995; Lang et al., 2002), skin conductance (Lang et al., 1999), and free recall (Lang, 2000; Lang et al., 1995)), only two recall measures were used to measure cognitive processing. For experimental control and based on theoretical research, only information from the audio channel was used to construct recall measures. This information was sometimes replicated in the video channel, but not always. Thus, results are limited to audio information only and may benefit from including items that test recall of information from the visual channel as well. Furthermore, the social presence measure was constructed by the researcher due to the lack of established measures valid for this type of environment (i.e., social television viewing). The measure replicated reliable and valid measures as closely as possible to capture perceptions of different dimensions of social presence, but was only able to reliably measure an overall perception of social presence in this sample. A more comprehensive and reliable scale may provide future studies with the ability to better capture perceptions of social presence and how those perceptions relate to the viewing experience. Finally, the overall reliance on self-report measures throughout the studies is always subject to measurement error associated with social desirability, dishonesty, acquiescence (i.e., agreeing with statements regardless of the question's content), or individual interpretation of the question or response options (Dillman, 2000; Lietz, 2010). However, randomized assignment of individuals into experimental conditions was employed to evenly distribute any error that may have resulted from using self-

report measures.

Future Research

This research presents several opportunities for future research to build upon, expand, or clarify findings within this particular viewing environment. First, the experimental design used in this dissertation could be complemented with observational and qualitative methods to provide a more in-depth understanding of how viewers experience on-screen user-generated comments. In addition, these effects should be tested in more naturalistic environments where participants have the ability to interact with the third channel. Cognitive processing outcomes would be of particular interest when participation in the third channel was accomplished using a second screen, and future research should explore how the second screen affects first-screen message processing.

Additionally, much could be learned from applying this design to different stimuli. In terms of the television content, using different types and lengths of programming are necessary to determine if effects can be replicated across genres or benefit from increased exposure. For user-generated comments, future research should consider manipulations of both the form and content. As there is no set standard for embedding user-generated comments in a television program, future studies should investigate if differences in presentation formats affect the way viewers cognitively process information or perceive social presence. This may include the speed at which comments appear, the amount of comments that appear within a given time frame, the placement of comments within the frame, the presentation style (e.g., a scrolling feed of multiple comments, a ticker feed that is constant on screen), and graphical style choices (e.g., color, size, text style). In regards to content, future research should explore if outcomes differ when the content is more personalized (e.g., includes full names, photos or avatars, or indicates identity

characteristics like race or political orientation), is negative or biased (e.g., represents a majority or minority opinion), or includes more social media indicators such as hashtags or branding logos. It would be of particular interest for future research to explore if interactivity and more personalized comments create a more interpersonal interaction in which perceptions of social presence do vary based on the characteristics of the environment.

Future research should also consider how outcomes are measured. Different measures of cognitive processing could add nuance or clarity to the findings from this research, as well as provide stronger evidence for instances of controlled processing. Studies should also strive for better conceptualization and measurement of social presence in this particular context to capture the experience more accurately. In addition, future research should investigate how other outcomes of interest to theory or practice, such as satisfaction, show commitment, or television viewing behaviors (e.g., changing the channel, watching live versus delayed) are affected by this practice.

Lastly, tests of this phenomenon should continue to explore audience characteristics as potential influences on outcomes. Specifically, individual differences related to one's proclivity to engage with or enjoy social television experiences, while not highly influential in this research, may be influential given different stimuli. Further, as social media use and expectations differ by generation or age, research should delineate outcomes based on these characteristics to provide both theoretical and practical insights.

General Conclusion

Overall, the two overarching questions driving this research were supported. First, on-screen user-generated comments do enhance the viewer's sense of watching with others, as perceptions of social presence increased when comments were included in the video stimuli.

Second, on-screen user-generated comments do affect the way viewers process and experience television content, through the perception of social presence. When user-generated comments were on screen, cognitive processing decreased and self-reported engagement increased, due to the mediating role of social presence perceptions.

Embedding user-generated comments in to a television program has both theoretical and practical implications (see Appendix K for the white paper on suggestions for practice). Adding the conversations of the 'backchannels' to the screen in the form of user-generated comments does increase the 'socialness' of the experience. The perceived social presence that results changes the way viewers cognitively process elements of the overall message. Unlike the predictions posed by cognitive processing models, the comments motivate viewers to draw their attention away from the television content and as a result, information from the main message is lost. Thus, instead of the television message taking on social significance and resulting in enhanced overall message processing, the comments themselves were more socially significant. This presents a new avenue of theoretical discovery and investigation for cognitive processing in social contexts.

In addition, insights concerning the conceptualization and measurement of social presence in this context were gained from this research. This research seemed to fail to distinguish social presence from conceptually similar to concepts such as coviewing or coattention, despite manipulating characteristics of the media and attempting to measure multiple dimensions of the concept. However, the lack of findings in this research should not discount the conceptualization of social presence as a variable concept, or the investigation of social presence in social television research. Instead, it suggests that social presence be carefully conceptualized and operationalized with consideration of the context of the mediated environment and the

particular source that is contributing to one's perception of social presence. With the prevalence of social television and second screen activity, the lessons learned from this research contribute to the understanding of social presence outside of traditional contexts.

In practice, producer-controlled decisions to add user-generated comments to the screen involve more than just a 'do it' or 'do not' answer. Producers are also faced with what comments to select and how to present them to maximize positive outcomes. This research suggests that there were no differences in engagement or enjoyment when the comments were live or previously recorded. In practice, networks may consider adding social media comments to rebroadcasts to create either an enriched viewing experience or second viewing opportunity. There is some evidence of this in practice already, as the Discovery Channel's *Deadliest Catch: On Deck* replays the previous week's episode with social comments added, prior to airing the new episode. Or, if there were a difference between viewers who watch a first-broadcast and those who watch a later broadcast, this strategy would still be relevant to keeping delayed-viewers engaged. Though comments may keep a viewer engaged while watching, it is not yet known if this practice contributes to viewers' preference for watching live versus recorded broadcasts or increases viewers' commitment to a show (i.e., regularly watching the show).

Additionally, neither the inclusion of social cues nor the redundancy of the comment content to the television content had any additive effect on outcomes. In essence, content producers should not be concerned about whether to select or eliminate comments based on their redundancy or non-verbal symbolism. Comments with social cues (i.e., emoticons, emojis) are perceived as more social and personable environment compared to comments without social cues, thus they should only be ignored if the graphics cannot be reproduced on screen. However, this is not to say that producer-driven decisions about the presentation format, pacing of

comments, or other content characteristics (e.g., negative comments, minority opinions) would also not have an effect on outcomes and more research in this realm and on other preferred outcomes (e.g., satisfaction, viewing commitment) is needed.

When social comments are embedded into the television content, viewers feel more engaged in the viewing experience than when comments are not added. As networks are foremost concerned with selling advertising and keeping viewers' eyes on the screen, increased engagement could contribute to these objectives. One opportunity could be to incorporate advertising into the comment feed, in the form of product mentions or comments sourced from advertisers, brands, sponsors, spokespersons or celebrity endorsers. Likewise, the trends in product placement allows for backchannel conversations about such products, introducing the opportunity to select and air positive comments about products, services, brands, or more, generated by viewers.

Though the practice encourages more viewer engagement with the show as a function of the social environment, it does not generally affect enjoyment. If the goal of the show is to teach or inform the audience, adding user-generated comments would detract from that goal. If the goal of the show is to keep viewers from changing the channel, adding user-generated comments may keep viewers on the channel longer. However, these conclusions may differ in more interactive environments where the viewer is allowed to participate with the content and other viewers. Overall, if producers are attempting to bring the 'socialness' back to television, adding user-generated comments will create the desired shared experience. But, if the hope is to connect individuals within a distributed audience and create a virtual living room, networks need to explore ways to enhance interactivity and interpersonal communication between viewers.

List of References

Amazon Mechanical Turk. (2016). Amazon Mechanical Turk Pricing. Retrieved from https://requester.mturk.com/pricing.

Atkinson, C. (2010). *The Backchannel: How Audiences are Using Twitter and Social Media and Changing Presentations Forever*. Berkeley, CA: New Riders.

Barton, K. M. (2009). Reality television programming and diverging gratifications: The influence of content on gratifications obtained. *Journal of Broadcasting & Electronic Media, 53*(3), 460-476.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497-529.

Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating Online Labor Markets for Experimental Research: Amazon.com's Mechanical Turk. *Political Analysis, 20*(3), 351-368.

Biocca, F. & Nowak, K. (2001). Plugging your body into the telecommunication system: Mediated embodiment, media interfaces, and social virtual environments. In C. Lin and D. Atkin (Eds.), *Communication, Technology and Society* (407-447). Waverly Hill, VI: Hampton Press.

Biocca, F., Harms, C., & Burgoon, J. K. (2003). Towards a more robust theory and measure of social presence: Review and suggested criteria. *Presence: Teleoperators and virtual environments, 12*(5), 456-480.

Biocca, F., Harms, C., & Gregg, J. (2001). *The networked minds measure of social presence: Pilot test of the factor structure and concurrent validity.* Paper presented at the 4th annual International Workshop on Presence, Philadelphia, PA.

Bracken, C. C. (2005). Presence and image quality: The case of high-definition television. *Media Psychology, 7*(2), 191-205.

Bruns, A., & Burgess, J. (2011). *The use of Twitter hashtags in the formation of ad hoc publics.* Paper presented at the 6th European Consortium for Political Research General Conference University of Iceland, Reykjavik.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data? *Perspectives in Psychological Science, 6*(1), 3-5.

Busselle, R., & Bilandzic, H. (2009). Measuring narrative engagement. *Media Psychology, 12*(4), 321-347.

Cameron, J.A. (2015). *The role of social presence on perceptions of humor*. Unpublished manuscript, University of Tennessee, Knoxville, TN.

Cameron, J.A. & Geidner, N. (2014). Something old, something new, something borrowed from something blue: Experiments on dual viewing TV and Twitter. *Journal of Broadcasting & Electronic Media, 58* (3), 400-419.

Capsi, A. & Blau, I. (2008). Social presence in online discussion groups: Testing three conceptions and their relations to perceived learning. *Social Psychology of Education, 11*(3), 323-346.

Casler, K., Bickel, L., & Hackett, E. (2013). Separate but equal? A comparison of participants and data gathered via Amazon's MTurk, social media, and face-to-face behavioral testing. *Computers in Human Behavior, 29*(6), 2156-2160.

Chang, H.-C. (2010). A new perspective on Twitter hashtag use: Diffusion of innovation theory. *Proceedings of the American Society for Information Science and Technology, 47*(1), 1-4.

Chen, Y., Gao, Q., & Rau, P.-L. P. (2015). Understanding gratifications of watching Danmaku videos – Videos with overlaid comments. *9180*, 153-163.

Chorianopoulos, K., & Lekakos, G. (2008). Introduction to social TV: Enhancing the shared experience with interactive TV. *International Journal of Human-Computer Interaction, 24*(2), 113-120.

Cohen, E. L., & Lancaster, A. L. (2014). Individual differences in in-person and social media television coviewing: The role of emotional contagion, need to belong, and coviewing orientation. *Cyberpsychology Behavior and Social Networking, 17*(8), 512-518.

Cohen, E. L., Bowman, N. D., & Lancaster, A. L. (2016). R U with some1? Using text message experience sampling to examine television coviewing as a moderator of emotional contagion effects on enjoyment. *Mass Communication and Society, 19*(2), 149-172.

Connell, J. B., Medelsohn, G. A., Robins, R. W., & Canny, J. (2001, Sept. 30 - Oct. 3). *Effects of communication medium on interpersonal perceptions: Don't hang up on the telephone yet!* Paper presented at the GROUP'01, Boulder, Colorado, USA.

Cruse, J. (2015, Nov. 18). Emoji usage in TV conversation. Retrieved from https://blog.twitter.com/2015/emoji-usage-in-tv-conversation.

d'Ydewalle, G., Praet, C., Verfaillie, K., & Rensbergen, J. V. (1991). Watching subtitled television: Automatic reading behavior. *Communication Research, 18*(5), 650-666.

Davis, C. J., Bowers, J. S., & Memon, A. (2011). Social influence in televised election debates: A potential distortion of democracy. *PLoS ONE, 6*(3), e18154.

De Dreu, C. K., Nijstad, B. A., & van Knippenberg, D. (2008). Motivated information processing in group judgment and decision making. *Personality and Social Psychology Review, 12*(1), 22-49.

Dillman, D. (2000). *Mail and Internet Surveys. The Tailored Design Method*. New York: John Wiley & Sons, Inc.

Doughty, M., Rowland, D., & Lawson, S. (2011). *Co-viewing live TV with digital backchannel streams.* Paper presented at the Proceddings of the 9th international interactive conference on Interactive television, Lisbon, Portugal.

Doughty, M., Rowland, D., & Lawson, S. (2012). *Who is on your sofa?: TV audience communities and second screening social networks.* Paper presented at the Proceedings of the 10th European conference on Interactive TV and video, Berlin, Germany.

Drell, L. (2011, June 15). The Voice: How a TV show became a 24/7 social media conversation. *Mashable.* Retrieved from http://mashable.com/2011/06/15/the-voice-social-media-nbc/

Duggan, M., Ellison, N.B., Lampe, C., Lenhart, A,. and Madden, M. "Social Media Update 2014," Pew Research Center, January 2015. Available at: http://www.pewinternet.org/2015/01/09/social-media-update-2014/.

Dynamo. (2016). *Guidelines for Academic Requesters* [Wiki page]. Retrieved from http://wiki.wearedynamo.org/index.php/Guidelines_for_Academic_Requesters.

Echterhoff, G. (2013). How communication on the Internet affects memory and shared reality: Talking heads online. *Psychological Inquiry, 24*(4), 297-300.

Echterhoff, G., Higgins, E. T., & Levine, J. M. (2009). Shared reality: Experiencing commonality with others' inner states about the world. *Perspectives on Psychological Science, 4*(5), 496-521.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "Friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication, 12*(4), 1143-1168.

Fein, S., Goethals, G. R., & Kugler, M. B. (2007). Social influences on political judgments: The

case of presidential debates. *Political Psychology*, 165-192.

Fong, K., & Mar, R. A. (2015). What does my avatar say about me? Inferring personality from avatars. *Personality and Social Psychology Bulletin, 41*(2), 237-249.

Fox, J. R., Lang, A., Chung, Y., Lee, S., Schwartz, N., & Potter, D. (2004). Picture this: Effects of graphics on the processing of television news. *Journal of Broadcasting & Electronic Media, 48*(4), 646-674.

Furnham, A., Hutson, E., & McClelland, A. (2011). The effect of gender of canned laughter ontelevision programme appreciation. *North American Journal of Psychology, 13*(3), 391-402.

Gardner, R. C. (2007). *Performing analysis of variance with continuous and categorical factors: The easy way.* Unpublished manuscript,Department of Psychology, University of Western Ontario, Ontario, Canada. Retrieved from http://publish.uwo.ca/~gardner/DataAnalysisDotCalm/.

Geerts, D., & Grooff, D. D. (2009). *Supporting the social uses of television: sociability heuristics for social tv.* Paper presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Boston, Massachusettes, USA.

Goodman, J. K., Cryder, C. E., & Cheema, A. (2013). Data collection in a flat world: The strengths and weaknesses of Mechanical Turk samples. *Journal of Behavioral Decision Making, 26*(3), 213-224.

Grabe, M. E., Lang, A., & Zhao, X. (2003). News content and form: Implications for memory and audience evaluations. *Communication Research, 30*(4), 387-413.

Graham, L. T., & Gosling, S. D. (2012). Impressions of World of Warcraft players' personalities based on their usernames: Interobserver consensus but no accuracy. *Journal of Research in Personality, 46*(5), 599-603.

Gunawardena, C. N. (1995). Social Presence Theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational Telecommunications, 1*(2/3), 147-166.

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education, 11*(3), 8-26.

Harboe, G., Massey, N., Metcalf, C., Wheatley, D., & Romano, G. (2008). The uses of social

television. *Computers in Entertainment (CIE), 6*(1), 8.

Harrington, S., Highfield, T., & Bruns, A. (2012). More than a backchannel: Twitter and television. In J.M. Noguera (Ed.), *Audience Interactivity and Participation*. Brussels, Belgium: COST Action Transforming Audiences, Transforming Societies.

Harrington, S., Highfield, T., & Bruns, A. (2013). More than a backchannel: Twitter and television. *Participations: Journal of Audience and Reception Studies, 10*(1), 405-409.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis a regression-based approach*. New York: New York : Guilford Press.

Hayes, A. F. (2016). PROCESS for SAS and SPSS (Version 2.15) [SPSS macro]. Retreived from www.processmacro.org.

Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *Br J Math Stat Psychol, 67*(3), 451-470.

Heeter, C. (1992). Being there: The subjective experience of presence. *Presence: Teleoperators and virtual environments, 1(2),* 262–271.

Heeter, C. (1995). Communication research on consumer VR. *Communication in the age of virtual reality,* 191-218.

Heisler, J. M., & Crabill, S. L. (2006). Who are "stinkybug" and "Packerfan4"? Email Pseudonyms and Participants' Perceptions of Demography, Productivity, and Personality. *Journal of Computer-Mediated Communication, 12*(1), 114-135.

Heizler, O., & Kimhi, A. (2012). Who will be idol? The importance of social networks for winning on reality shows. *The Journal of Socio-Economics, 41*(1), 18-25.

Herr, P. M. (1989). Priming price: Prior knowledge and context effects. . *Journal of Consumer Research, 16*(1), 67-75.

Higgins, E. T. (1992). Achieving 'shared reality' in the communication game: A social action that creates meaning. *Journal of Language & Social Psychology, 11*(3), 107-131.

Highfield, T., Harrington, S., & Bruns, A. (2013). Twitter as a technology for audiencing and fandom. *Information, Communication & Society, 16*(3), 315-339.

Hill, S., & Benton, A. (2012). *Analyzing the Impact of Social TV Strategies on Viewer Engagement*. Paper presented at the ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Beijing, China. http://wan.poly.edu/KDD2012/forms/workshop/SOMA2012/doc/wks_submission_3.pdf.

Hwang, Y., & Lim, J. S. (2015). The impact of engagement motives for social TV on social presence and sports channel commitment. *Telematics and Informatics, 32*(4), 755-765.

Isbister, K. and Nass, C. (2000). Consistency of personality in interactive characters: Verbal cues, non-verbal cues, and user characteristics. *International Journal of Human-Computer Interaction*, *53*(1), 251-267.

Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. NYU press.

Jiang, C., Chen, Y., & Liu, K. (2013). Evolutionary dynamics of information diffusion over social networks. arXiv preprint arXiv:1312.0317.

Jones, G. M., & Schieffelin, B. B. (2009). Talking text and talking back: "My BFF Jill" from boob tube to YouTube. *Journal of Computer-Mediated Communication, 14*(4), 1050-1079.

Kahn, A. S. (2012). *Social presence, re(de)fined.* Paper presented at the International Communication Association Phoenix, Arizona, USA.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons, 53*(1), 59-68.

Kassavalis, P., Batikas M., Sabalis, H., Zamani, Th., & Eustathiou, S. (2004). SMS interactive TV: the convergence of television and mobile networks. Proceedings of International Conference on Information and Communication Technologies: From Theory to Applications, pp.223-224, April 2004.

Kaufman, S. B. (2015, August 31). The difference between extrAversion and extrOversion: What's the correct spelling: extrAversion or extrOversion. [Blog post] Retrieved from http://blogs.scientificamerican.com/beautiful-minds/the-difference-between-extraversion-and-extroversion/.

Keppel, G. & Wickens, T. D. (2005). *Design and Analysis: A Researcher's Handbook.* Upper Saddle River, New Jersey: Pearson Education, Inc.

Konolojy, A. (2013). Project Runway to reveal biggest second-screen interactivity in its history for launch of Season 12. *TV by the Numbers*. http://tvbythenumbers.zap2it.com/2013/07/17/project-runway-to-reveal-biggest-second-screen-interactivity-in-its-history-for-launch-of-season-12/192387/

Krämer, N. C., Winter, S., Benninghoff, B., & Gallus, C. (2015). How "social" is Social TV? The influence of social motives and expected outcomes on the usage of Social TV

applications. *Computers in Human Behavior, 51*, 255-262.

Kreijns, K., Kirschner, P. A., Jochems, W., & Van Buuren, H. (2004). Determining sociability, social space, and social presence in (a)synchronoug collaboraitve groups. *Cyberpsychology & Behavior, 7*(2), 155-172.

Krupnikov, Y., & Levine, A. S. (2014). Cross-Sample Comparisons and External Validity. *Journal of Experimental Political Science, 1*(01), 59-80.

Kwak, H., Lee, C., Park, H., & Moon, S. (2010). *What is Twitter, a social network or a news media?* Paper presented at the Proceedings of the 19th international conference on World wide web, Raleigh, North Carolina, USA.

Lang, A. (1990). Involuntary attention and physiological arousal evoked by structural features and emotional content in TV commercials. *Communication Research, 17*(3), 275-299.

Lang, A. (1995). Defining audio/video redundancy from a limited-capacity information processing perspective. *Communication Research, 22*(1), 86-115.

Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication, 50*(1), 46-70.

Lang, A. (2006). Using the limited capacity model of motivated mediated message processing to design effective cancer communication messages. *Journal of Communication, 56*(s1), S57-S80.

Lang, A., & Basil, M. (1998). What do secondary task reaction times measure anyway? In M. Roloff (Ed.), *Communication yearbook* (Vol. 21, pp. 443–470). Beverly Hills, CA: Sage.

Lang, A., Borse, J., Wise, K., & David, P. (2002). Captured by the World Wide Web - orienting to structural and content features of computer-presented information. *Communication Research, 29*(3), 215-245.

Lang, A., Bradley, S. D., Park, B., Shin, M., & Chung, Y. (2006). Parsing the resource pie: Using STRTs to measure attention to mediated messages. *Media Psychology, 8*(4), 369-394.

Lang, A., Kurita, S., Gao, Y., & Rubenking, B. (2013). Measuring television message complexity as available processing resources: Dimensions of information and cognitive load. *Media Psychology, 16*(2), 129-153.

Lang, A., Park, B., Sanders-Jackson, A. N., Wilson, B. D., & Wang, Z. (2007). Cognition and emotion in TV message processing: How valence, arousing content, structural

complexity, and information density affect the availability of cognitive resources. *Media Psychology, 10*(3), 317-338.

Lang, A., Potter, R. F., & Bolls, P. D. (1999). Something for nothing: Is visual encoding automatic? *Media Psychology, 1*(2), 145-163.

Lang, A., & Yegiyan, N. S. (2008). Understanding the interactive effects of emotional appeal and claim strength in health messages. *Journal of Broadcasting & Electronic Media, 52*(3), 432-447.

Lange, P. G. (2007). Publicly private and privately public: Social networking on YouTube. *Journal of Computer-Mediated Communication, 13*(1), 361-380.

Larsson, A. O. (2011). Interactive to me - interactive to you? A study of use and appreciation of interactivity on Swedish newspaper websites. *New Media & Society, 13*(7), 1180-1197.

Larsson, A. O. (2013). Tweeting the viewer—Use of Twitter in a talk show context. *Journal of Broadcasting & Electronic Media, 57*(2), 135-152.

Lawson, T. J., Downing, B., & Cetola, H. (1998). An attributional explanation for the effect of audience laughter on perceived funniness. *Basic and Applied Social Psychology, 20*(4), 243-249.

Leary, M. R., Kelly, K. M., Cottrell, C. A., & Schreindorfer, L. S. (2013). Construct validity of the need to belong scale: mapping the nomological network. *Journal of Personality Assessment, 95*(6), 610-624.

Lee, E. J., & Nass, C. (1999). *Effects of the form of representation and number of computer agents on conformity*. Paper presented at the CHI'99 Extended Abstracts on Human Factors in Computing Systems.

Lee, K. M. (2004). Presence, explicated. *Communication Theory, 14*(1), 27-50.

Lee, K. M., & Nass, C. (2005). Social-psychological origins of feelings of presence: Creating social presence with machine-generated voices. *Media Psychology, 7*(1), 31-45.

Levay, K. E., Freese, J., & Druckman, J. N. (2016). The demographic and political composition of Mechanical Turk samples. *SAGE Open, 6*(1).

Lieberman, E. A., Neuendorf, K. A., Denny, J., Skalski, P. D., & Wang, J. (2009). The language of laughter: A quantitative/qualitative fusion examining television narrative and humor. *Journal of Broadcasting & Electronic Media, 53*(4), 497-514.

Lietz, P. (2010). Research into questionnaire design: A summary of the literature.*International*

Journal of Market Research, 52(2), 249-272.

Lim, J. S., Hwang, Y., Kim, S., & Biocca, F. A. (2015). How social media engagement leads to sports channel loyalty: Mediating roles of social presence and channel commitment. *Computers in Human Behavior, 46,* 158-167.

Lin, Y. R., Keegan, B., Margolin, D., & Lazer, D. (2014). Rising tides or rising stars?: Dynamics of shared attention on twitter during media events. *PLoS ONE, 9*(5).

Litman, L., Robinson, J. & Rosenzweig, C. (2015). The relationship between motivation, monetary compensation, and data quality among US- and India-based workers on Mechanical Turk. *Behavioral Research,* 47, 591-528.

Lochrie, M., & Coulton, P. (2012a). *Sharing the viewing experience through second screens.* Paper presented at the Proceedings of the 10th European conference on Interactive tv and video, Berlin, Germany.

Lochrie, M., & Coulton, P. (2012b). *Tweeting with the telly on!* Paper presented at the IEEE International Workshop on Social Networks and TV.

Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication, 3*(2), 0-0.

Lombard, M., & Ditton, T. B., with Crane, D., Davis, B., Gil-Egui, G., Horvath, K., & Rossman, J. (2000). *Measuring presence: A literature-based approach to the development of a standardized paper-and-pencil instrument.* Paper presented at the Presence 2000: The third international workshop on presence.

Lombard, M., Ditton, T., & Weinstein, L. (2009). *Measuring presence: the Temple Presence Inventory.* Paper presented at the Proceedings of the 12th Annual International Workshop on Presence.

Lull, J. (1990). Families' social uses of television as extensions of the household. In J. Bryant (Ed.), *Television and the American family* (pp. 59-72). Hillsdale, NJ: Lawrence Erlbaum.

Lundy, L. K., Ruth, A. M., & Park, T. D. (2008). Simply Irresistible: Reality TV Consumption Patterns. *Communication Quarterly, 56*(2), 208-225.

Mantzari, E., Lekakos, G., & Vrechopoulos, A. (2008). *Social TV: introducing virtual socialization in the TV experience.* Paper presented at the Proceedings of the 1st international conference on Designing interactive user experiences for TV and video, Silicon Valley, California, USA.

McClard, A., & Anderson, K. (2008). Focus on Facebook: Who are we anyway. *Anthropology News, 49*(3), 10-12.

McLeod, J. M., Kosicki, G. M., & Pan, Z. (1991). On understanding and misunderstanding media effects. *Mass Media and Society*, 235-266.

Miller, G. A. & Chapman, J. P. (2001). Misunderstanding Analysis of Covariance. *Journal of Abnormal Psychology, 110*(1), 40-48.

Meraz, S., & Papacharissi, Z. (2013). Networked gatekeeping and networked framing on #Egypt. *The International Journal of Press/Politics, 18*(2), 138-166.

Moon, Y. & Nass, C. How "real" are computer personalities? Psychological responses to personality types in human-computer interaction. *Communication Research, 23*(6), 651-674.

Mullinix, K. J., Leeper, T. J., Druckman, J. N., & Freese, J. (2016). The generalizability of survey experiments. *Journal of Experimental Political Science, 2*(2), 109-138.

Nabi, R. L. (2007). Determining dimensions of reality: A concept mapping of the reality TV landscape. *Journal of Broadcasting & Electronic Media, 51*(2), 371-390.

Nabi, R. L., Biely, E. N., Morgan, S. J., & Stitt, C. R. (2003). Reality-based television programming and the psychology of its appeal. *Media Psychology, 5*(4), 303-330.

Nabi, R. L., Stitt, C. R., Halford, J., & Finnerty, K. L. (2006). Emotional and cognitive predictors of the enjoyment of reality-based and fictional television programming: An elaboration of the uses and gratifications perspective. *Media Psychology, 8*(4), 421-447.

National Media Spots. (2015). NMS Network Demographics. Retrieved from http://nationalmediaspots.com/index.php/network-demographics.

Nee, R. C., & Dozier, D. M. (2015). Second screen effects: Linking multiscreen media use to television engagement and incidental learning. *Convergence: The International Journal of Research into New Media Technologies*.

Neuendorf, K. A., Skalski, P., Denny, J., Campbell, R., & Egizii, M. L.(2012). *The role of post-production formal features in the prediction of presence.* Paper presented at the Presence Live Conference, Philadelphia, Pennsylvania, USA.

Nielsen. (2011). 10 years of primetime: The rise of reality and sports programming. Retrieved from http://www.nielsen.com/us/en/insights/news/2011/10-years-of-primetime-the-rise-of-reality-and-sports-programming.html.

Nowak, K. L., Hamilton, M. A., & Hammond, C. C. (2009). The effect of image features on judgments of homophily, credibility, and intention to use as avatars in future interactions. *Media Psychology, 12*(1), 50-76.

Nowak, K. L., & Rauh, C. (2008). Choose your "buddy icon" carefully: The influence of avatar androgyny, anthropomorphism and credibility in online interactions. *Computers in Human Behavior, 24*(4), 1473-1493.

Nowak, K. L., Krcmar, M., & Farrar, K. M. (2008). The causes and consequences of presence: Considering the influence of violent video games on presence and aggression. Presence, 17(3), 256-268.

Ogara, S. O., Koh, C. E., & Prybutok, V. R. (2014). Investigating factors affecting social presence and user satisfaction with mobile instant messaging. *Computers in Human Behavior, 36*, 453-459.

Organization for Economic Cooperation and Development (2007). *Participative web and user-created content: Web 2.0, wikis, and social networking*. Paris: Organization for Economic Cooperation and Development.

Pallant, J. (2005). *SPSS Survival Manual.* New York, New York: Open University Press.

Papacharissi, Z., & Mendelson, A. L. (2007). An exploratory study of reality appeal: Uses and gratifications of reality TV shows. *Journal of Broadcasting & Electronic Media, 51*(2), 355-370.

Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a Participant Pool. *Current Directions in Psychological Science, 23*(3), 184-188.

Park, H., Xiang, Z., Josiam, B., & Kim, H. (2014). Personal profile information as cues of credibility in online travel reviews. *Anatolia, 25*(1), 13-23.

Peer, E., Vosgerau, J., & Acquisti, A. (2014). Reputation as a sufficient condition for data quality on Amazon Mechanical Turk. *Behavioral Research Methods, 46*(4), 1023-1031

Penzhorn, H., & Pitout, M. (2007). A critical-historical genre analysis of reality television. *Communication, 33*(1), 62-76.

Perego, E., Del Missier, F., Porta, M., & Mosconi, M. (2010). The cognitive effectiveness of subtitle processing. *Media Psychology, 13*(3), 243-272.

Petty, R. E., & Cacioppo, J. T. (1984). Source factors and the elaboration likelihood model of persuasion. *Advances in Consumer Research, 11*, 668-672.

Phalen, P. F., & Ducey, R. V. (2012). Audience behavior in the multi-screen "video-verse". *International Journal on Media Management, 14*(2), 141-156.

Platow, M. J., Haslam, S. A., Both, A., Chew, I., Cuddon, M., Goharpey, N., Maurer, J., Rosini, S., Tsekouras, & Grace, D. M. (2005). "It's not funny if they're laughing": Self-categorization, social influence, and responses to canned laughter. *Journal of Experimental Social Psychology, 41*(5), 542-550.

Potter, R. F., Bolls, P., Lang, A., Zhou, S., Schwartz, N., Borse, J., Trout, G., & Dent, D. (1997). *What is it? Orienting to structural features of radio messages.* Paper presented to the Theory and Methodology Division of the Association for Education in Journalism and Mass Communication, Chicago, Illinois, USA.

Qualmann, E. (2009). *Socialnomics: How Social Media Transforms The Way We Live and Do Business.* Wiley.

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*(1), 203-212.

Reeves, B., & Thorson, E. (1986). Watching television: Experiments on the viewing process. *Communication Research, 13*(3), 343-361.

Rice, R. E. (1992). Task analyzability, use of new media, and effectiveness: A multi-site exploration of media richness. *Organization science*, *3*(4), 475-500.

Riddle, K., & De Simone, J. J. (2013). A Snooki effect? An exploration of the surveillance subgenre of reality TV and viewers' beliefs about the "real" real world. *Psychology of Popular Media Culture, 2*(4), 237-250.

Riordan, M. A., & Kreuz, R. J. (2010). Cues in computer-mediated communication: A corpus analysis. *Computers in Human Behavior, 26*(6), 1806-1817.

Rogers, P., & Lea, M. (2005). Social presence in distributed group environments: The role of social identity. *Behaviour & Information Technology, 24*(2), 151-158.

Rubin, A. M. (2002). The uses-and-gratifications perspective of media effects. In J. B. D. Zillmann (Ed.), *Media effects: Advances in theory and research (2nd ed.)* (pp. 525-548). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist, 26*(3 & 4), 299-323.

Shin, D.-H. (2013). Defining sociability and social presence in Social TV. *Computers in Human Behavior*, *29*(3), 939-947.

Short, J., Williams, E., Christie, B., 1976. *The Social Psychology of Telecommunications*. John Wiley & Sons, London.

Shteynberg, G. (2010). A silent emergence of culture: the social tuning effect. *Journal of Personality and Social Psychology, 99*(4), 683-689.

Shteynberg, G., Bramlett, J., Fles, E., and Cameron, J. (in press) Mass shared attention and political persuasion. *Psychological Science.*

Shteynberg, G., Hirsh, J. B., Galinsky, A. D., & Knight, A. P. (2014). Shared attention increases mood infusion. *Journal of Experimental Psychology: General, 143*(1), 123-130.

Silverstone, R. (1994). *Television and everyday life*. Routledge.

Siriaraya, P., & Siang Ang, C. (2012). Age differences in the perception of social presence in the use of 3D virtual world for social interaction. *Interacting with Computers*, *24*(4), 280-291.

Skalski, P., & Tambourini, R. (2007). The role of social presence in interactive agent-based persuasion. *Media Psychology, 10*(3), 385-413.

Skalski, P., & Whitbred, R. (2010). Image versus sound: A comparison of formal feature effects on presence and video game enjoyment. *PsychNology Journal, 8*(1), 67-84.

Spence, P. R., Lachlan, K. A., Westerman, D., & Spates, S. A. (2013). Where the gates matter less: Ethnicity and perceived source credibility in social media health messages. *Howard Journal of Communications, 24*(1), 1-16.

Stefanone, M. A., Lackaff, D., & Rosen, D. (2010). The relationship between traditional mass media and 'social media': Reality television as a model for social network site behavior. *Journal of Broadcasting & Electronic Media, 54*(3), 508-525.

Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks*, *9*(3), 115–136.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics (5th ed.)*. Boston, MA: Allyn & Bacon/Pearson Education.

Tang, F., Wang, X., & Norman, C. S. (2013). An investigation of the impact of media capabilities and extraversion on social presence and user satisfaction. *Behaviour & Information Technology*, *32*(10), 1060-1073.

Thorson, E., & Lang, A. (1992). The effects of television videographics and lecture familiarity on adult cardiac orienting responses and memory. *Communication Research, 19*(3), 346-369.

Thorson, E., Wicks, R., & Leshner, G. (2012). Experimental methodology in journalism and mass communication research. *Journalism & Mass Communication Quarterly, 89*(1), 112-124.

Tu, C. H. (2002). The impacts of text-based CMC on online social presence. *The Journal of Interactive Online Learning, 1*(2).

United States Census Bureau. (2016). *American Fact Finder* [Data file]. Retrieved from http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Van Grove, J. (2013, September 21). The secret company behind Twitter's TV takeover. *CNET*. Retrived from http://www.cnet.com/news/the-secret-company-behind-twitters-tv-takeover/.

Van Kleef, G. A., De Dreu, C. K. W., & Manstead, A. S. R. (2004). The interpersonal effects of emotions in negotiations: A motivated information processing approach. *Journal of Personality and Social Psychology, 87*(4), 510-528.

Vraga, E. K., Johnson, C. N., Carr, D. J., Bode, L., & Bard, M. T. (2014). Filmed in front of a live studio audience: Laughter and aggression in political entertainment programming. *Journal of Broadcasting & Electronic Media, 58*(1), 131-150.

Visser, P. S., & Mirabile, R. R. (2004). Attitudes in the social context: the impact of social network composition on individual-level attitude strength. *Journal of Personality and Social Psychology, 87*(6), 779-795.

Walther, J. B. (2011). Theories of computer mediated-communication and interpersonal relations. In M. L. Knapp & J. A. Daly (Eds.), *The Sage handbook of interpersonal communication* (4th ed., pp. 443-479). Thousand Oaks, CA: Sage

Walther, J. B., & Jang, J. (2012). Communication processes in participatory websites. *Journal of Computer-Mediated Communication, 18*(1), 2-15.

Walther, J. B., Loh, T., & Granka, L. (2005). Let me count the ways - The interchange of verbal and nonverbal cues in computer-mediated and face-to-face affinity. *Journal of Language and Social Psychology, 24*(1), 36-65.

Wang, Z., Lang, A., & Busemeyer, J. R. (2011). Motivational processing and choice behavior

during television viewing: An integrative dynamic approach. *Journal of Communication, 61*(1), 71-93.

Wang, Z., Tchernev, J. M., & Solloway, T. (2012). A dynamic longitudinal examination of social media use, needs, and gratifications among college students. *Computers in Human Behavior, 28*(5), 1829-1839.

Weaver, J. B., Huck, I., & Brosius, H.-B. (2009). Biasing public opinion: Computerized continuous response measurement displays impact viewers' perceptions of media messages. *Computers in Human Behavior, 25*(1), 50-55.

Wilson, S. (2015). In the living room: Second screens and TV audiences. *Television & New Media,* 1-18.

Witmer, B. G., & Singer, M. J. (1998). Measuring presence in virtual environments: A presence questionnaire. *Presence, 7*(3), 225-240.

Wise, K., Lee, S., Lang, A., Fox, J. R., & Grabe, M. E. (2008). Responding to change on TV: How viewer-controlled changes in content differ from programmed changes in content. *Journal of Broadcasting & Electronic Media, 52*(2), 182-199.

Wohn, D. Y., & Na, E.-K. (2011). Tweeting about TV: Sharing television viewing experiences via social media message streams. *First Monday,* 16(3). doi:10.5210/fm.v16i3.3368.

Xu, H., & Yan, R.-N. (2011). Feeling connected via television viewing: Exploring the scale and its correlates. *Communication Studies, 62*(2), 186-206.

Zelenkauskaite, A., & Bucy, E. P. (2009). *Presence, participation, and political text-on-television: Testing a converged technology*. Paper presented at the 12th Annual International Workshop on Presence, Los Angeles, CA.

Zhang, D., Lowry, P., Zhou, L., & Fu, X. (2007). The impact of individualism—collectivism, social presence, and group diversity on group decision making under majority influence. *Journal of Management Information Systems, 23*(4), 53-80.

Zillich, A. F. (2014). Watching television with others: The influence of interpersonal communication on entertainment. *Communications, 39(2),* 169-192.

Appendices

Appendix A

Informed Consent

You are invited to participate in a research study about social television viewing. To participate, you must be at least 18 years of age, reside in the U.S., and English is your first language.

The purpose of the research is to examine how viewers experience television with others. Your answers will help inform the development and production of better media strategies.

If you decide to participate, you can complete the study online at your convenience **from any internet-connected device** during the open collection period. It will take approximately 15 minutes and you must complete it in one sitting. It involves viewing a short video clip, filling out brief questionnaires and providing some basic demographic information.

Participation in this study is voluntary. If you decide to participate, you may withdraw from the study at any time. If you withdraw from the study before data collection is completed your data will be destroyed.

The information in the study records will be kept confidential. Data will be stored securely and will be made available only to persons conducting the study. No reference will be made in oral or written reports, which could link you to the study. This study poses no greater risk than that posed by everyday life.

If you have questions, you may ask them now or later; if you have questions after completing the questionnaire you may contact the researcher, Jackie Cameron, at jcamer10@utk.edu (101 Communications Building, Knoxville, TN 37996). If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-7694.

By entering my age and clicking 'Next' below, I am indicating I have read the consent form and am voluntarily agreeing to participate.

Please enter your current age, in years

Appendix B

Cover Story

This research is investigating the strategy of putting social media comments into a television program. In order to test this strategy effectively, the study is set up in the following way:

- You will be randomly selected as either an interactive or a viewer-only participant.
- You will be in a live-viewing environment as soon as the video begins to play. This means other viewers may be watching the same clip as you at that time.
- Interactive viewers will be allowed to make comments on the video they are currently watching, using a fake username.
    - Those comments will be processed through a filtering system, and selected comments will appear within the video clip.
- All viewers who are currently watching the same clip will see those comments in the video.
    - Only comments from viewers who are currently watching that clip will be shown on-screen.
    - Those viewers who start watching after other viewers have made comments will see those comments in the video at the time they were made, as long as the commenter has not finished watching the clip.
    - Comments made by viewers who have watched previously will not appear.

It is important that you understand how the system works in order to accurately evaluate the potential of this technology. To verify this, please answer the following true/false questions:

Cover Story Quiz and After-Quiz Instructions

INSTRUCTIONS: It is important that you understand how the system works in order to accurately evaluate the potential of this technology. To verify this, please answer the following true/false questions:

1) The comments that I may see are being made by other viewers who are currently watching the same clip (True).

2) I will not see comments from viewers who finished watching the clip before I started viewing or from those who have watched the clip previously. (True)

3) As soon as the video begins to play, I will be in a live-viewing environment, where other viewers may be watching the same clip as I am at that time. (True).

INSTRUCTIONS AFTER QUIZ: While the system places you into a group, we would like to know a few things about you and your television viewing habits.

INSTRUCTIONS PRIOR TO FIRST VIDEO CLIP : Thank you for participating. You have been selected for the 'viewer-only' condition. On the next page, the first of two video clips will appear. Please turn up the volume on your device and view the entire clip. Click the forward arrows button at the bottom of the survey page to continue when you are ready.

Appendix C

Video Stimuli

Rachel Ray's 3 in the Bag, Teriyaki Chicken and Soba (Food Network)

Original (Control): https://vimeo.com/162024251

Plain text: https://vimeo.com/162021555

Not cued, redundant (live comments in S1): https://vimeo.com/162016955

Not cued, not redundant: https://vimeo.com/162015579

Cued, redundant: https://vimeo.com/162020803

Cued, not redundant: https://vimeo.com/162017935

Previously recorded: https://vimeo.com/163689311

Kitchen Impossible, DIY Network, tutorial

Original (Control): https://vimeo.com/153178629

Plain text: https://vimeo.com/162014900

Not cued, redundant (live comments in S1): https://vimeo.com/162013582

Not cued, not redundant: https://vimeo.com/162012838

Cued, redundant: https://vimeo.com/162014253

Cued, not redundant: https://vimeo.com/162009573

Previously recorded: https://vimeo.com/163695629

Appendix D

User-Generated Comments

Video Stimulus 1: *Rachel Ray's 3 in the Bag.*

Study 1: Plain Text	**Study 1: UGC** **Study 2: UGC, without social cues, redundant**	**Study 2: UGC with social cues, redundant**	**Study 2: UGC with social cues, not redundant**	**Study 2: UGC without social cues, not redundant**	**Time of appearance**
Easy, healthy, quick meal for four.	Teriaki chicken sounds so good right now. So hungry.	Teriaki chicken sounds so good right now. Sooo HUNGRY!! 😋🍜	Man, now I can't WAIT to have leftover pizza for dinner!! 😋🍕	Man, now I can't wait to have leftover pizza for dinner.	0:09 - 0:14
Kosher salt is easy to pick up and sprinkle due to its grain shape and size.	She has no idea how to season a chicken, obviously	She has no idea how to season a chicken, obviously 🤔😕	Was that a pitbull at the start? I want a dog. 🐶😢	Was that a pitbull at the start? I want a dog.	0:24 – 0:30
High temperature cooking oils include olive and vegetable oils.	That pan is screaming hot. Screaming. Hot.	That pan is screaming hot. SCREAMING. HOT. 🔥	Me: tries to make this Also me: BURNS KITCHEN DOWN 🔥	Me: tries to make this Also me: burns kitchen down	0:32 – 0:38
The original Lea & Perrins Worcestershire sauce has over 15 ingredients.	Worcestershire adds depth of flavor? Physically or philosophically?	Worcestershire adds depth of flavor???? Physically or philosophically? hmmmm… 😖	Rachel Ray is using her products that are sold in Walmart #shamelessplug 😖	Rachel Ray is using her products that are sold in Walmart	0:42 - 0:48

Study 1: Plain Text	**Study 1: UGC** **Study 2: UGC, without social cues, redundant**	**Study 2: UGC with social cues, redundant**	**Study 2: UGC with social cues, not redundant**	**Study 2: UGC without social cues, not redundant**	**Time of appearance**
Substitute with honey or agave nectar if preferred.	She said too too, tutu	She said too too, tutu LOL 	I HATE her voice 	I hate her voice	1:10 - 1:16
Measurements are approximate and can be adjusted to taste.	And counting to six is a way to measure liquids now.	And counting to six is a way to measure liquids now…  	That reminds me of the “2 shots of vodka” video…  	That reminds me of the “2 shots of vodka” video	1:30 - 1:36
Sherry is a fortified wine that comes in several varieties.	It's gilding the lilly? What?	It's gilding the lilly? What??!?!?! 	I don't understand the words she's saying…. 	I don't understand the words she's saying.	1:50 - 1:56
Also get a large pot of water on to boil.	Let it Rip, what does that mean in the kitchen?	Let it Rip, what does THAT mean in the kitchen? 	My kitchen has NEVER been that clean. 	My kitchen has never been that clean.	2:10 - 2:16
Turning the chicken helps it cook more evenly.	Is she pregnant? She looks a little plump too.	Is she pregnant? She looks a little plump too. 	Is this healthy??? Organic is the way to go. 	Is this healthy? Organic is the way to go.	2:40 - 2:46
Soba is in the Asian or Ethnic section in your grocery store.	What is soba? An expensive exotic food from Whole Foods.	What is soba? An expensive exotic food from Whole Foods!!! HAHA! 	Rachel Ray & Kelly Clarkson remind me of each other. HAHA!!! 	Rachel Ray & Kelly Clarkson remind me of each other.	3:17 - 3:23

Study 1: Plain Text	**Study 1: UGC** **Study 2: UGC, without social cues, redundant**	**Study 2: UGC with social cues, redundant**	**Study 2: UGC with social cues, not redundant**	**Study 2: UGC without social cues, not redundant**	**Time of appearance**
Cook soba according to package instructions.	Do I have to serve in a shallow bowl? Will it taste wrong in a deep bowl?	Do I have to serve in a shallow bowl? Will it taste wrong in a deep bowl? 😟	Why do I always feel like an accomplished adult until I watch Rachael Ray? #Icancookcereal 😟	Why do I always feel like an accomplished adult until I watch Rachael Ray?	3:38 - 3:44

Video Stimulus 2: *Kitchen Impossible*

Study 1: Plain Text	**Study 1: UGC** **Study 2: UGC, without social cues, redundant**	**Study 2: UGC with social cues, redundant**	**Study 2: UGC with social cues, not redundant**	**Study 2: UGC without social cues, not redundant**	**Time of appearance**
Build custom bookcases to fit any space.	Scholars don't buy bookcases, they build them.	Scholars don't buy bookcases, they BUILD them 	So many pinterest projects, so little time. & money for that matter. sigh… 	So many pinterest projects, so little time. & money for that matter.	0:22 - 0:28
Saw horses hold long pieces level during cutting.	"measure and cut plywood" I can't even put up a shelf by myself.	"measure and cut plywood" I can't even put up a shelf by myself. LOL! 	Actually, Mateo, I think the first step is to go to Home Depot and buy $6000 in power tools. LOL! 	Actually, I think the first step is to go to Home Depot and buy $6000 in power tools.	0:38 - 0:44
Use a 40- or 80-tooth ATB blade for a clean cut.	I'd cut my fingers off.	I'd cut my fingers off… 	Maybe it's the 5 yr old in me, but I always want to touch those saws… 	Maybe it's the 5 yr old in me, but I always want to touch those saws.	0:47 - 0:53
Having a helper makes assembly a breeze.	The saw looks like the chickens that dip their head in water.	The saw looks like the chickens that dip their head in water. 	Who wants to make a bookshelf when you can buy one at Wallmart for HALF the prices of these tools! #duh 	Who wants to make a bookshelf when you can buy one at Wallmart for half the prices of these tools!	0:58 – 1:04

Study 1: Plain Text	**Study 1: UGC** **Study 2: UGC, without social cues, redundant**	**Study 2: UGC with social cues, redundant**	**Study 2: UGC with social cues, not redundant**	**Study 2: UGC without social cues, not redundant**	**Time of appearance**
Make one router pass instead of two this way.	Whoa dude slow down what is a router?	Whoa dude SLOW DOWN what is a router???? #makeitstop 	I got to get me a carpenter #manlymen  #SWOON	I got to get me a carpenter.	1:17 – 1:23
For a list of tools, materials and instructions, visit DIY.com	Most of these words he is using go straight over my head.	Most of these words he is using go straight over my head. #confused 	What is this accent?? Definitely not Italian…..#Whoisthisguy? 	What is this accent? Definitely not Italian.	1:30 – 1:36
Router bits can spin up to 24,000 revolutions per minute	"It can run away from you" is code for "It'll take your hand off".	"It can run away from you" is code for "It'll take your hand off". 	I need to clean my house. 	I need to clean my house.	1:52 – 1:58
Use a square to keep pieces aligned.	Yeah very do it yourself…because everyone has a nail gun	Yeah very do it yourself…because everyone has a nail gun… 	This video reminds me of elementary school science videos/projects 	This video reminds me of elementary school science videos/projects.	2:11 – 2:17

Study 1: Plain Text	**Study 1: UGC** **Study 2: UGC, without social cues, redundant**	**Study 2: UGC with social cues, redundant**	**Study 2: UGC with social cues, not redundant**	**Study 2: UGC without social cues, not redundant**	**Time of appearance**
Wipe away excess wood glue with a cloth.	gotta give those shelves support!	gotta give those shelves SUPPORT! 	LOL does it come with ikea directions too, or am I supposed to rely on myself to put a bookshelf together backwards? 	does it come with ikea directions too, or am I supposed to rely on myself to put a bookshelf together backwards?	2:28 – 2:34
Make your DIY project look like a professional job.	Are we cooking or building?	Are we cooking or building???? #inchandahalfstrips 	I LOVE watching shows like this because I always watched them with my mommy… 	I love watching shows like this because I always watched them with my mommy.	3:00 – 3:06
Crown molding is optional.	Why wouldn't you paint the shelf before installing? You wouldn't have to worry about getting paint on the walls.	Why wouldn't you paint the shelf BEFORE installing? You wouldn't have to worry about getting paint on the walls. 	RT if you thought about the show Handy Manny or Bob the Builder while watching 	RT if you thought about the show Handy Manny or Bob the Builder while watching	3:36 – 3:42

Appendix E

Personality Traits

1. Coviewing orientation

INSTRUCTIONS: Please select the number on the scale provided that best describes your agreement with each statement. (7-point scale; 1 = disagree strongly to 7 = agree strongly)

Audience monitoring:

1. I enjoy watching other people's reactions when we watch television shows together.

2. I like watching television with people who express their emotions in response to the shows.

3. When I watch television shows, I appreciate the opportunity to talk to other people about what's going on.

4. I feel frustrated when people I am watching television with don't seem to enjoy shows as much as I do.

Need for solitude:

1. Having people around ruins the television viewing experience.

2. It is better to watch television shows alone.

3. It's hard for me to focus on television shows when other people are around.

Need for company:

1. Television is better as a social event.

2. I feel that I get more out of television shows when I watch them with other people.

3. I like to share my television time with other people.

4. I often feel lonely when I watch television shows by myself.

2. Need to belong.

INSTRUCTIONS: Please indicate how true or characteristic each statement is of you. (5-point scale; 1 = not at all; 2 = slightly, 3 = moderately, 4 = very, 5 = extremely)

1. If other people don't seem to accept me, I don't let it bother me. (reverse coded)

2. I try hard not to do things that will make other people avoid or reject me.

3. I seldom worry about whether other people care about me. (reverse coded)

4. I need to feel that there are people I can turn to in times of need.

5. I want other people to accept me.

6. I do not like being alone.

7. Being apart from my friends for long periods of time does not bother me. (reverse coded)

8. I have a strong “need to belong”.

9. It bothers me a great deal when I am not included in other people’s plans.

10. My feelings are easily hurt when I feel that others do not accept me.

3. Extraversion.

INSTRUCTIONS: How well do the following statements describe your personality? (5-point scale; 1 = disagree strongly to 5 = agree strongly)

1. I see myself as someone who is reserved. (reverse coded)

2. I see myself as someone who is outgoing, sociable.

Appendix F

Dependent Measures

Recall:

INSTRUCTIONS: Please select the correct answer from the choices below, based on what you remember.

*Correct answers are in bold.

(*3 in the Bag*)

1. How should the chicken be seasoned?

easy salt, heavy black pepper; heavy salt, easy black pepper; heavy salt, heavy black pepper; easy salt, easy black pepper

2. What are the correct pan temperatures?

medium high heat for chicken, high heat for vegetables; high heat for chicken, medium heat for vegetables; medium low heat for chicken, medium heat for vegetables; high heat for chicken, medium high heat for vegetables

3. Which is her secret teriyaki ingredient?

Worcestershire, sherry, sugar, stock

4. Teriyaki is a ____ and ____ sauce, according to Rachel.

sweet and savory; sweet and sour; sweet and spicy; sweet and salty

5. How long should the teriyaki sauce reduce?

15 minutes; 10 minutes; 20 minutes; 5 minutes

6. How often should the chicken be turned?

a couple of times; once; several times; every minute

7. What is Soba?

Japanese buckwheat noodle; Chinese buckwheat noodle; Japanese whole wheat noodle; Chinese whole wheat noodle

8. If you can't find Soba noodles, what is a good substitute?

whole wheat or whole grain spaghetti or thin spaghetti; regular spaghetti or thin spaghetti; angel hair or fettucine; Japanese udon noodles

9. What is her first step in serving the dish?

Slice the chicken; pile noodles in a shallow bowl; put peppers and onions in a shallow bowl; mix noodles and peppers together.

(*Kitchen Impossible*)

1. How tall is the bookcase?

4 feet; 3 feet; 5 feet; 4 ½ feet

2. One large piece of plywood gets cut into two long strips. One is cut into ____ pieces and the other is cut into _____ pieces?

two/four, two/two, four/four, four/six

3. What type of grooves were cut on the inside for the shelves?

rabbit; tongue and groove; dovetail; regular

4. What was used to guide the router to make the grooves for the shelves?

a level, a t-square, a piece of scrap wood, a guard

5. After the shelves are installed, what is the best way to secure them with nails?

front to back; back to front; sides only; back only

6. What is the name of the piece that is used to secure the bookcase to the wall?

cleat; joist; molding; brace

7. A 1.5 inch strip of popular wood is used to cover what?

inner shelves, **outer unfinished plywood edges**, nail holes, back edges

8. The bookshelf will hold several sizes of books, including which of the following?

binders, legal pads, file folders, photo albums

9. A ¾ inch decorative fluted molding is used to cover what?

inner shelves, outer unfinished plywood edges, nail holes, back edges

Recall Items: Cued Recall

INSTRUCTIONS: Please type your answers to the following items, based on what you remember from the clip. Some items may have multiple answers. Be as specific as you can.

*Answers are below each item.

(*3 in the Bag*)

1. What were the ingredients for the teriyaki sauce? List as many as you remember.

sugar, Miran, Worcestershire, tamari, stock (in a box), sherry, garlic, ginger

2. What types of peppers did she say could be used in this dish?

cubanelle or large frying peppers

3. How long do the vegetables need to cook?

two minutes (or a couple of minutes)

4. Counting to what will produce approximately a third of a cup of liquid?

Six

5. What did she do to the pan after removing the chicken and before adding the vegetables?

Turn the heat up on the pan, add more oil and swirl it around.

6. Before adding the chicken, how many times did Rachel pour oil “around the pan”?

two or twice.

(*Kitchen Impossible*)

1. The two pieces of 8 foot plywood will be used for which pieces of the bookcase?

sides, top, shelves

2. What tools were used in the clip? List as many (power tools and hand tools) as you can remember.

t-square, level, drill, table saw/circular saw, router, nail gun

3. What are the pieces of the bookcase held together with?

nails, glue

4. After the bookshelf is assembled, what steps need to be done to get it ready for paint?

   fill in nail holes, sand

5. What are the steps for making the router groves for the interior shelves on both of the side panels at the same time?

   place the boards side by side, secure them with a piece of scrap wood.

6. The clip was divided into segments using text graphics indicating five general steps. What were those steps?

   Determine the dimensions, measure and cut the plywood, router groves for interior shelves, assembling the unit, finishing touches.

Social Presence

INSTRUCTIONS: Please answer the following regarding the clip you just viewed. (7-point scale; 1 = disagree strongly to 7 = agree strongly)

Shared Experience/Awareness

1. I felt like I was watching with others.
2. I felt like many people were watching.
3. I felt like others were watching at the same time.
4. I felt like I was watching alone. (reverse coded)
5. I was aware of other viewers watching the same clip as me.

Connected with/Affiliation

6. I felt like I was part of a specific audience.
7. I felt a sense of connection to other people viewing this clip.
8. I felt like I was watching with friends.
9. While viewing this clip, I had a sense of being ‘in touch with the world’.
10. I found this to be a sociable experience.

Mutual Understanding/Shared Comprehensive

11. I feel like my reactions to the clip were similar to others.

12. I feel like I have similar thoughts or opinions about the clip as other viewers.

13. I feel like I relate to other viewers who have watched this clip.

Psychological Involvement/Engagement

14. While viewing this clip, I imagined how other viewers were watching the clip or what they were like.

15. I felt mentally immersed in the clip.

16. I paid close attention to the clip.

Engagement

INSTRUCTIONS: Please answer the following regarding the clip you just viewed.

1. How easy was it for you to absorb the content of the TV show clip? (1 = extremely difficult to 6 = extremely easy)

2. How involved were you with the content of the show? (1 = extremely uninvolved to 6 = extremely involved)

3. How engaged with the TV show were you? (1 = extremely unengaged to 6 = extremely engaged)

Enjoyment

INSTRUCTIONS: Please answer the following regarding the clip you just viewed. (7-point scale; 1 = not at all to 7 = very much)

1. How enjoyable was the clip?

2. How pleasurable was the clip?

3. How entertaining was the clip?

4. How captivating was the clip?

Appendix G

Demographics

1. What gender do you identify most with? (Male/Female)

2. What best describes your race?

   ○ White (A person having origins in any of the original peoples of Europe, the Middle East, or North Africa)

   ○ Black/African American (A person having origins in any of the Black racial groups of Africa.)

   ○ Asian (A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.)

   ○ American Indian or Alaska Native (A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment.)

   ○ Hispanic/Latino/Spanish (A person having origins in Mexico, Central America, or South American without maintaining a tribal affiliation).

   ○ Native Hawaiian/Pacific Islander (A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.)

3. What is your current annual income level?

   ○ $0-24,999

   ◉ $25,000 - 49,999

   ○ $50,000 - 74,999

   ○ $75,000 - 99,999

   ○ $100,000 or more

4. What is the highest level of education you have completed?

   ○ Less than high school diploma

   ○ High school diploma or GED

   ○ Some college

- Associate's Degree
- Bachelor's degree
- Master's degree
- Doctorate
- Professional Degree (MD, JD, DDS, DVM, LLB)

Appendix H

Control Measures

Prior experience

General television use: How often do you do the following? (5-point scale; 1 = never, 2 = sometimes, 3 = about half the time, 4 = most of the time, 5 = always)

Watch television shows on a television

Watch television shows on another type of device (phone, tablet, laptop or computer)

Watch television shows during the time they are originally broadcast (live)

Watch television shows after they have originally aired (DVR, On-Demand, Hulu, Netflix, online)

General social media use: How often do you do the following? (5-point scale; 1 = never, 2 = once in awhile, 3 = sometimes, 4 = often, 5 = all the time)

Use Facebook

Use Twitter

Use Instagram

Use Snapchat

Social TV use: How often do you do the following while watching television? (5-point scale; 1 = never to 5 = all the time)

Send text messages or instant messages

Share content or post updates to social media related to what you are watching

Monitor social media for what other people are posting about the show

Prior knowledge

How often do you… (5-point scale; 1 = never, 2 = sometimes, 3 = about half the time, 4 = most of the time, 5 = always)

a. watch shows on the____? (Food Network; DIY Network)

b. watch _____type programming? (cooking; DIY)

c. watch the show _____? (“3 in the Bag”; “Kitchen Impossible”)

Interest

How do you rate the following in regards to your personal interest? (5-point scale; 1 = not at all interesting to 5 = extremely interesting)

a. Cooking shows; Home Improvement shows

b. Food Network; DIY Network

c. Cooking; Building furniture

Relevance

How do you rate the following in terms of its relevance to you personally? (5-point scale; 1 = not at all relevant to 5 = extremely relevant)

a. cooking demonstrations; do-it-yourself demonstrations

b. learning to cook; learning building skills

c. Recipes for Asian food; instructions for how to build furniture

Appendix I

Debriefing Statement

Thank you so much for your participation. I know you are very busy and very much appreciate the time you devoted to participating. Your participation is very valuable to me.

The goal of this experiment was to determine the effect of on-screen user-generated comments on the television viewing experience. Based on previous research, I expect that including comments in a TV program results in feeling like you are watching with other people. The nature of this phenomenon required minor deception. You were told that the video clip was streaming live and that randomly selected participants were generating the comments that may have appeared in the clip you saw. In reality, the clip was pre-produced with and without pre-written comments. This deception was necessary to mimic the real-life experience of seeing social media comments during a live television broadcast. Without it, there was a high chance that you would know that the videos and comments were created expressly for the experiment, and a low chance that you would feel as though the comments were coming from real people who were watching at the same time as you. Thus, the intent of finding out how real-life on-screen social media comments affect the viewing experience could not have been accomplished.

It is very important that you do not discuss this study with anyone else until it is complete. Doing so would greatly compromise my efforts if participants come into this study knowing how it works. If you have any questions or concerns, or want more information about the research on this topic, please contact the Primary Researcher, Jackie Cameron, at jcamer10@utk.edu. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-7694.

TO RECEIVE YOUR SURVEY CODE, YOU MUST CONTINUE TO THE NEXT PAGE.

Appendix J

Pretest

Instructions: Below are 16 statements in boxes (think of them as social media comments), along with 10 pairs of descriptive words. For each pair of words, select the **number between the two words** that you think best describes the statement. For example, if the statement is dull, select 1; somewhat dull, select 2; somewhat lively, select 3; or lively, select 4.

4-point scale

Extraversion[14]**:** introverted/extraverted; shy/outgoing; inward/outward; dull/lively; unenthusiastic/enthusiastic

Richness: Impersonal/Personal, unemotional/emotional, vague/specific, unsocial/social, expressionless/expressive

What in the @#$%??!!					
Introverted	1	2	3	4	Extraverted
Shy	1	2	3	4	Outgoing
Inward	1	2	3	4	Outward
Dull	1	2	3	4	Lively
Unenthusiastic	1	2	3	4	Enthusiastic
Impersonal	1	2	3	4	Personal
Unemotional	1	2	3	4	Emotional
Vague	1	2	3	4	Specific
Unsocial	1	2	3	4	Social
Expressionless	1	2	3	4	Expressive

[14] Original scale: 11-point scale; 1 = describes very poorly to 10 = describes very well; Cheerful, enthusiastic, extraverted, introverted (reverse), inward (reverse), jovial, outgoing, perky, shy (reverse), vivacious. (alpha = .89). Revised into semantic differential: cheerful, perky, vivacious, and jovial combine into one item; outgoing translates into ‘sociable’ and is measured as part of richness.

				t-test for Equality of Means		
Tweet	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
What in the world?	37	2.9754	.58881	-3.705	72	.000
What in the @#$%??!!	37	3.4237	.44179			
This is just crazy.	35	2.7403	.57944	-5.020	70	.000
This is just CRAZY!!!	37	3.3851	.50978			
Who does that?	36	2.3403	.66722	-8.172	71	.000
Who DOES that???	37	3.4918	.53081			
Oh no he didn't.	37	**3.0304**	.64240	-5.728	72	.000
Oh no he didn't!!!!! 😮	37	3.7264	.36543			
That is absolutely disgusting.	36	**3.0779**	.60427	-1.753	71	**.084**
That is absolutely disgusting!! 😩	37	3.3074	.51166			
The things people do.	37	2.3485	.68077	.108	72	**.914**
The things people do…smh	37	2.3311	.69984			
I think I found my new favorite show.	36	2.8194	.65291	-4.134	70	.000
I think I found my new favorite show LOL! 😍😄	36	3.4162	.56890			
Boo, no second date.	37	2.5940	.76040	-5.233	71	.000
Booooo no second date?! 😞	36	3.4861	.69358			
Oh my goodness I can't believe this.	35	2.7714	.70547	-5.739	68	.000
OMG I can't believe this!!!!	35	3.6321	.53802			
What is wrong with this guy?	35	**3.1286**	.60062	-1.918	68	**.059**
What is wrong with this guy?!?!?!	35	3.3786	.48363			
Just watching this makes me anxious	35	2.6041	.71932	.837	70	**.405**
Just watching this makes me anxious 😐	37	2.4696	.64308			
Wow.	35	2.1786	.72208	-5.808	69	.000
Wooooooowwww.	36	3.1910	.74611			
Absolutely dying laughing	34	**3.0870**	.79841	-4.088	68	.000
Absolutely dying laughing 😂😂	36	3.7153	.44882			
That poor woman.	36	2.6076	.60441	-.552	67	**.582**
That poor woman…😢	33	2.6964	.72917			
Uh what the heck?	33	**2.4621**	.55418	-2.292	66	.025
Uh….wth?	35	**2.8179**	.71057			
That looks like a really fun date	33	2.6591	.56533	-1.010	67	**.316**
That looks like a really fun date 😒	36	2.8125	.68433			

Appendix K

White Paper

On-screen User-generated Comments: Suggestions for Practice

The prevalence and growth of social television has many networks considering how to capitalize on viewers' second screen use and backchannel activity. The results of an experimental research study testing the effect of on-screen user-generated comments on the viewer's experience of the television show provides insight as to how networks can utilize this production strategy to maximize goals.

Do expect on-screen comments to enhance the 'socialness' of viewing television. Viewers who saw comments on screen during a television clip had stronger feelings that they were watching with others. Simply implementing this strategy creates a social environment reminiscent of the early days of television when family and friends gathering around one screen and combats television viewing as an individual activity.

Don't expect viewers' to attend to the television content and comments equally. The social environment created when comments were on screen reduced the amount of information viewers retained from the television content. In essence, viewers paid more attention to the comments than the show when comments appeared on screen. If the goal of the program is to educate, inform, or equip viewers with particular knowledge, on-screen comments will detract from this goal.

Do expect on-screen comments to increase viewer engagement. Viewers who saw comments reported higher levels of engagement in the clip. With rising concerns for keeping eyes on the screen and selling advertising, the increased engagement associated with this production strategy creates opportunities that can contribute to these objectives. Increasing viewers' engagement

means viewers are likely to keep viewers on the channel longer. The comments attract more attention than the television content when they appear on screen, presenting opportunities for integrating advertising within the feed. This may include incorporating product mentions or comments from advertisers, sponsors, spokespersons or celebrity endorsers. Likewise, product placement within programs may inspire users to generate comments related to products, services, brands or more, which could be strategically selected for broadcast.

Don't expect on-screen comments to increase enjoyment. Viewers reported the same level of enjoyment of the clip, regardless of whether comments were included or not.

Do consider rebroadcasting comments. Neither the social experience, nor engagement in the show diminished for viewers who watched a clip that included comments generated by previous viewers. Rebroadcasting episodes using comments generated at the time of the original airing to offer an enriched or second viewing opportunity to keep first-broadcast viewers engaged in an episode for a second time. Likewise, adding comments will increase engagement in delayed viewers (e.g., those who watch from DVRs), even though the comments are recorded and no longer live.

Don't agonize over content. Viewers' engagement or social experience did not differ when comments were redundant or not redundant to the television content, nor when comments did or did not include non-verbal symbolism (emoticons, extra punctuation, capital letters). Comments that did include non-verbal symbolism were perceived as more social and personable, thus they should only be eliminated if they cannot be graphically reproduced on screen. Otherwise, such comment characteristics can be eliminated from the comment selection decision process.

Vita

Jaclyn (Jackie) Cameron is from Bushnell, Illinois. She graduated Valedictorian of Bushnell-Prairie City High School in 1997. After enrolling in three prior institutions of higher education, she earned her Bachelor of Arts degree in Psychology with Summa Cum Laude honors in June, 2002 from Saint Xavier University in Chicago, Illinois. Seeking more career-oriented work, she worked as a part-time Program Assistant/Data Analysis for the Office of Institutional Research at Saint Xavier University from 2003-2005.

She returned to school in 2004 and in June, 2007, earned a Master in Science degree in Psychology from DePaul University in Chicago, Illinois. During her time as a Master's student, she also secured employment at DePaul University as a Research Analyst in the Office of Institutional Research. In 2009, she was promoted to Research Associate. By the time she left in 2012, she had presented over a dozen research papers at professional conferences, earned a National Summer Data Policy Institute Fellowship, completed a certificate program in the Fundamentals of Moderating, and was awarded the Institutional Research Leadership in Student Retention Award (2008) for her work.

By 2010, she was also teaching statistics courses as Adjunct faculty, teaching one semester in 2010 at Saint Xavier University, and nearly every quarter at DePaul University from 2010 to 2012. She was also accepted into DePaul University's College of Communication Master's Program to obtain a second Master's degree in 2010. After years as an administrator, faculty member and student in higher education, it was time to pursue her educational goal of earning a PhD.

Jackie moved from Chicago to Knoxville, Tennessee in 2012 to attend the College of Communication and Information at the University of Tennessee. She became a Graduate

Teaching Associate, teaching core courses in the School of Journalism and Electronic Media and producing experimental research in mass media effects. She completed the Best Practice in Teaching Certificate and was awarded a UT Grant Writing Graduate Fellowship in 2013. In 2014, her work received the College's Graduate Student Research Award. In four years, she has co-authored eight research papers accepted to national and international conferences and has had four co-authored papers accepted to publication. In addition to her academic research, Jackie has served as a peer reviewer, poster judge, discussant and moderator for academic conferences, was elected and served as Treasurer and then President for the College's Graduate Student Association, and most recently completed the Women in Cable and Telecommunications Mentorship Program.