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## ABSTRACT

Dissatisfied with the existing theoretical account of the effects of presence on the mode of information processing (i.e., heuristic vs. systematic processing) and how this leads to persuasion in the context of mediated communication, the current study suggests an alternative framework that could provide an efficient and reasonable way of understanding the underlying psychological mechanism of the presence effects on persuasion. Drawing on presence theory, construal level theory, and the dual process model of persuasion, this study proposes a conceptual model that posits construal level as a key variable that mediates the effects of presence on the mode of information processing.

Specifically, on the basis of the conceptual overlap between psychological distance and presence, which are respectively represented as key constructs in construal level theory and presence theory, this study proposes that a sense of presence has the potential to replace the role of psychological distance in the construal level theory and consequently prime a certain level of construal (i.e., the extent to which people's thinking is abstract or concrete). Additionally, the conceptual similarity between the construal level in the construal level theory and the dual process model is supposed to lead people to apply the primed level of construal in processing information. In this framework, construal level is posited as a key factor that could mediate the relationship between the degree to which people experience a sense of presence and the mode of information processing.

This study also attempts to provide a theoretical understanding of how this framework will serially influence the formation of trust and persuasion (i.e., behavioral intention). Guided by the empirical evidence from earlier studies, heuristic and systematic processing are predicted to respectively increase the degree to which people form affective trust towards brand and

cognitive trust towards advertising product information. Consequently, persuasion is predicted to occur through both cognitive trust towards advertising product information and affective trust towards brand, as affect and cognition are intertwined.

In order to validate this conceptual model, a two (ad presentation mode: video vs. text) x two (ad type: location-based advertising vs. traditional advertising) between-subjects experiment (N = 180) was conducted in a recent advertising context—i.e., location-based advertising. Consistent with the predictions based on this framework, the results showed that construal level plays a significant role in mediating the effects of presence and social presence on the mode of information processing. In addition, the amount of heuristic and systematic processing, determined by the construal level primed by a sense of presence and social presence, was positively associated with the degree to which people form affective trust towards brand and cognitive trust towards advertising product information. Consequently, both affective trust towards brand and cognitive trust towards advertising product information, formed through heuristic and systematic processing, positively influenced participants' behavioral (purchase) intention. Through partial least squares structural equation modeling, this framework was statistically validated. Further theoretical implications of this framework are discussed.

*Key Words:* mediated communication, presence, construal level, dual process model, information processing, persuasion.

Towards an explication of the presence effects on information processing and persuasion:  
A construal level framework

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Special thanks to my parents and Hyeyoung for supporting me during the pursuit of my doctoral degree. I wish there will be no more snow in my life.... It has been great with you, Syracuse and Newhouse.

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## CHAPTER 1. INTRODUCTION

The study on persuasion that occurs through mediated communication has gained significance since a considerable amount of modern communication now takes place in the non-physical world (e.g., online environment). According to Ipsos Open Thinking Exchange (2013), Americans between the ages of 18 and 64 were found to spend an average of 3.2 hours per day using social networking services. In addition, as of October 2015, Statista (2015) reported that U.S. adults spent a total of 720 minutes per day on major media such as laptop and desktop computers, mobile devices, television and radio. Such findings suggest that persuasion nowadays is likely to frequently take place via a form of mediated communication.

As persuasion in our daily lives is increasingly taking place through mediated communication (e.g., online advertising), a sizable body of research has attempted to investigate how persuasion occurs in mediated communication and whether certain structural features of a technology play a role in affecting this persuasion (e.g., Grigorovici, 2003; Guadagno, Blascovich, Bailenson, & MacCall, 2007; Kim & Sundar, 2016; Li, Daugherty, & Biocca, 2002; Skalski & Tamborini, 2004; 2007). Specifically, on the basis of the fact that mediated communication inevitably bears a limited capacity to convey rich cues as compared with face-to-face (FtF) communications (i.e., media richness theory; Daft & Langel, 1986), it has been at the center of scholarly debate whether the degree to which a technology enables a realistic experience that approximates the quality of FtF communications will influence persuasion in mediated communication. Intriguingly, past studies have consistently found that a realistic experience simulated by a technology, namely a sense of *presence* (“a psychological state in which the virtuality of experience is unnoticed”; Lee, 2004a, p. 32), can significantly influence persuasion in mediated communication.

With advances in interactive and immersive technologies for the simulation of realistic experiences, the concept of presence has largely motivated persuasion researchers to investigate its role on persuasion. Basically, a dual process model (i.e., elaboration likelihood model and heuristic-systematic model) has guided previous researchers to predict the relationship between presence and the way people process information (i.e., heuristic vs. systematic processing), and its subsequent effects on persuasion (e.g., Grigorovici, 2003; Kim & Sundar, 2016; Skalski & Tamborini, 2004; 2007). Past scholars have attested that the extent to which technological affordances induce a sense of presence in mediated communication can have positive impacts on persuasion. However, mixed findings, regarding the relationship between a sense of presence and the mode of information processing, have emerged across previous studies, and, yet, the underlying psychological mechanism of presence effects on information processing has remained unclear.

When presence is defined as involvement that could be induced by the capacity of a communication modality to make information more vivid or interactive, presence is found to activate both heuristic and systematic processing (Skalski & Tamborini, 2004; 2007). On the contrary, when presence is conceptualized as an antecedent of “affective involvement” (Grigorovici, 2003) or “heuristic cues” (Kim & Sundar, 2016), a heightened sense of presence was found to activate only heuristic processing. Furthermore, many researchers have often conceptualized presence as “involvement” (e.g., Choi, Miracle, & Biocca, 2001; Skalski & Tamborini, 2007), and this has led them to hypothesize that presence will activate systematic processing. Such mixed findings call into question the validity of the existing theoretical framework.

Perhaps because the existing theoretical framework hinders a clear understanding of the role of presence-provoking media technologies on the mode of information processing and persuasion, Kim and Sundar (2016) have proposed an alternative framework, employing the dual process model, the Modality, Agency, Interactivity, and Navigability (MAIN) model (Sundar, 2008), and the Limited Capacity Model of Motivated Mediated Message Processing (LC4MP; Lang, 2000). Based on this framework, Kim and Sundar argued that the sensory richness and realism (i.e., a sense of being there and realism) brought on by a media technology, all of which have previously been conceptualized as sub-dimensions of presence (Lomabard & Ditton, 1997), are sufficient to promote heuristic processing by making people cognitively unavailable to effortfully process information (i.e., cognitive depletion) and rely on cognitive heuristics (i.e., previous experience and observation). Although this theoretical account was often deemed convincing by numerous scholars, the MAIN model also engages in some limitations by excessively relying on technological determinism, which fails to integrate the notion that presence is a subjective experience (i.e., a cognitive feeling; Schubert, 2009).

Taken together, dissatisfied with the insufficiency of the existing theoretical frameworks to coherently account for the specific relationship between presence and the mode of information processing, this study aims to suggest an alternative framework that could guide the study of presence effects on persuasion, through the theoretical lens of construal level theory (Bar-Anan, Liberman, & Trope, 2006). Specifically, drawing from the conceptual overlap between the presence theory (Lee, 2004), the construal level theory and the dual process model of persuasion, this research proposes a new theoretical framework, in which the construal level is posited as a mediating variable that may address the missing link between presence theory and the dual process model of persuasion, and suggest a new way of understanding the underlying mechanism

of presence effects on information processing and persuasion. In doing so, I expect that the current scholarship on the effects of presence on persuasion will be significantly advanced.

Additionally, based on previous findings in which the way people process information serially influenced the formation of trust and behavioral intention (e.g., Kim & Sundar, 2016), this study also attempts to provide a theoretical understanding of how this framework will extend to the formation of trust and behavioral intention. In keeping with the notion that trust is a multidimensional construct (Koh & Sundar, 2010), this alternative framework predicts that heuristic and systematic processing will have different effects on the formation of affective and cognitive trust. Moreover, extending the previous empirical evidence, this framework specifically provides a theoretical account of whether affective and cognitive trust will be directed towards advertising product information (i.e., a product description: central information) or brand (i.e., a source cue: peripheral information).

Specifically, based on the reasoning, heuristic processing is predicted to increase both affective trust towards brand and cognitive trust towards advertising product information because the affective dimension of human perceptions is found to influence cognitive processing (e.g., Nass & Reeves, 1996). In contrast, systematic processing is predicted to only increase the degree to which people form cognitive trust towards advertising product information, while reducing affective trust towards brand. Finally, as affect and cognition are intertwined (Kret & Bocanegra, 2016), persuasion is predicted to occur through both affective trust towards brand and cognitive trust towards advertising product information.

In order to test the validity of this conceptual framework, I conducted a two (ad presentation mode: video vs. text) x two (ad type: location-based advertising vs. traditional



advertising) between-subjects experiment (N = 180) within the context of advertising (i.e., a primary form of persuasion; Dyer, 1982). This experiment is designed to replicate the results of past studies in which presence influenced the mode of information processing, trust, and purchase intention (Kim & Sundar, 2016), and to extend the examination into the context of location-based advertising (i.e., a recent form of advertising defined as “targeted advertising initiatives delivered to a mobile device from an identified sponsor that is specific to the location of the consumer” through location-based services; Unni & Harmon, 2007, p. 28). Recent studies found that location-services can foster a sense of social presence by making the existence of a target entity more salient (e.g., Shin, Jung, & Yoo, 2015; Jung, Roh, Yang, & Biocca, 2017). Therefore, this research attempts to validate the reliability of the current study’s newly developed framework within the domain of traditional and location-based advertising.

## **CHAPTER 2. A THEORETICAL BACKGROUND**

Whilst numerous theories have been developed to guide the study of the effects and design of media technologies, presence theory (Lee, 2004a) has been frequently employed by scholars. Presence theory postulates that the structural features of a technology, together with individual differences and the design of contents, can affect the perceived quality of a mediated social interaction and the likelihood of technology acceptance—as well as persuasion. Over 30 years of presence research has provided ample empirical evidence to suggest that presence, although an elusive construct, lies somewhere beneath human perceptions. Past literature has consistently demonstrated that the effect of presence in mediated communication is not trivial, and that presence theory may thereby be deemed a meaningful framework in guiding the investigation of how media technologies should be designed and of their effects on human psychology; namely persuasion. However, despite its tremendous use as a theoretical framework

in predicting the relationship between presence and persuasion, it still remains unclear why and how presence influences persuasion.

## **2.1. Presence Theory**

The term (tele)presence was first coined by Marvin Minsky (1980) to explain the phenomenon in which operators felt as though they are being transported to a remote location during the use of teleoperating systems. There have been numerous attempts by scholars to explicate the concept of presence. It once appeared that most scholars agreed on the notion of presence as being a subjective experience of being in a remote location that could be engendered when mediated communication approximates nonmediated communication in a physical world (i.e., transportation to a non-physical world or remote location where people are not actually located) (McLellan, 1995, Reeves, 1991; Sheridan, 1992; Slater & Usoh, 1993; Steuer, 1992; Witmer & Singer, 1998). Simply, Reeves (1991) defined the concept of presence as a sense of “being there.”

However, past conceptualization has been criticized by next generation scholars insofar as it has tended to be too medium-specific to be applied to the study of various domains of technologies; thereby limiting the scope of presence research. Accordingly, Lombard and Ditton (1997) redefined presence as “perceptual illusion of non-mediation”, while Lee (2004a) redefined the presence as “a psychological state in which the virtuality of experience is unnoticed” (p. 65). In a related vein, Schubert (2009) later redefined spatial presence as “a cognitive feeling” to account for the mechanism through which people engage in nonconscious processes in sensing a spatial presence. Lee (2004a) argues that presence is mainly comprised of three sub-dimensions, all of which depend on context: physical, social, and self-presence. Lee (2004a) defines physical presence as “a psychological state in which virtual (para-authentic or

artificial) physical objects are experienced as actual physical objects in either sensory or nonsensory ways” (p. 44); social presence as “a psychological state in which virtual (para-authentic or artificial) social actors are experienced as actual social actors in either sensory or nonsensory ways” (p. 45); and self-presence as “a psychological state in which virtual (para-authentic or artificial) self/selves are experienced as the actual self in either sensory or nonsensory ways” (p. 46). The definition of the three different sub-dimensions of presence is rooted in the explication of presence by Biocca (1997). The conceptualization of spatial presence suggested by Schubert pertains to the dimension of physical presence.

Although examples are limited, some scholars have attempted to determine why presence occurs (Lee, 2004b; Slater & Usoh, 1993). Previously, Slater and Usoh (1993) suggested that the willing suspension of disbelief of technology users might be the cause of a sense of presence. Specifically, it has been argued that people have a tendency to accept incoming information unless they are challenged by strong counterevidence, and this tendency may make people experience a sense of presence. However, later studies (Reeves & Nass, 1996; Nass & Moon, 2000) consistently have found that people rather have a tendency to unconsciously and naturally accept incoming virtual stimuli and concluded that automatic processing lies beneath a sense of presence. Accordingly, the claim—i.e., willing suspension of disbelief—has been rejected by recent scholars because the term “willing suspension” connotes the use of conscious mental effort in having a sense of presence.

Alternatively, Lee (2004b) argued that “modularity of human minds,” which is a concept originally developed under the framework of evolutionary psychology, might be the cause of a sense of presence. According to Lee’s argument, people evolutionarily have innate knowledge about how the physical world works (i.e., folk physics) and how others think, feel, and behave

(i.e., folk psychology or theory of mind)—the causal reasoning module (Cosmides & Tooby, 1992, 1994; Plotkin, 1998). Lee speculated that the causal reasoning module may make people automatically and naturally accept incoming stimuli, and this in turn may result in a sense of presence.

In an attempt to enhance the power and validity of presence theory, researchers have searched for the factors that may affect a sense of presence. Lombard and Ditton (1997) proposed that the factors, in general, can be categorized into three dimensions: media forms (e.g., image size and quality), contents (e.g., physical and social realism), and media users (e.g., age, gender). Similarly, Lee and Nass (2001) offered three factors that may affect a sense of presence: characteristics of technology (i.e., objective quality of technology), individual differences, and social factors.

## **2.2. Presence and Persuasion**

Presence theory has been widely adopted by researchers in order to understand the underlying psychological mechanism of media technology consumption and the way in which a sense of presence moderates the effects of media technologies. For example, presence was found to be significantly associated with a variety of psychological constructs such as parasocial relationships (i.e., imagined intimacy; Jin et al., 2009; Lee & Jang, 2013) and enjoyment (Lombard & Ditton, 1997). While the concept of presence is elusive, previous studies demonstrate that presence has a positive connotation. Accordingly, researchers have predicted that presence will engender positive impacts on persuasion (Choi, Miracle, & Biocca, 2001; Grigorovici, 2003; Jung et al., 2019; Kim & Biocca, 1997; Kim & Sundar, 2016; Li et al., 2002; Skalski & Tamborini, 2004; 2007).

The study of Choi et al. (2001), for example, found that a sense of presence can result in a positive attitude towards an advertisement and a brand, as well as purchase intention.

Following this, Li et al. (2002) have confirmed the reliability of previous findings in terms of the role of presence on persuasion: eliciting a sense of social presence through three-dimensional (3D) advertising positively affected the product knowledge and consumers' purchase intention.

More recently, Jung et al. (2019) found that heightening a sense of presence through spatial augmented reality system may contribute to the formation of affective trust towards smoking cessation message and lead people to engage in cessation.

As such, previous research has consistently demonstrated that a greater sense of presence or social presence can engender positive effects on persuasion. However, the fact that past studies have merely focused on the examination of “what” the effects of presence on persuasion (i.e., “what” question) are, has unfortunately limited our understanding of “why” such a sense of presence positively influences persuasion in mediated communication. In other words, although a plethora of research indicates that forging a sense of presence may considerably contribute to persuasion in mediated communication, they do not seem to provide specific theoretical explanations for how a sense of presence will determine persuasion. Nonetheless, few studies have provided some hints that the dual process (heuristic and systematic processing; Chaiken & Eagly, 1983) may underlie the process in which persuasion occurs through a sense of presence.

### **2.3. Dual Process Model of Persuasion**

In general, the dual process model of persuasion refers to the two popular theories—ELM (Petty & Caccioppo, 1981) and HSM (Chaiken & Eagly, 1983)—that are widely employed by persuasion scholars, in which it is assumed that persuasion is likely to arise via two different ways of information processing: central route (systematic) processing and peripheral route

(heuristic) processing. While the two models are conceptually very similar, HSM is often employed by presence researchers as ELM, in comparison to HSM, is inherently more descriptive and is conceptually too broad to guide persuasion studies. Mainly, the assumption of HSM that the two modes of information processing can concurrently occur led researchers to adopt HSM over ELM.

HSM was originally developed by Chaiken and Eagly (1983) to make up for the conceptual limitations of ELM. Similar to ELM, HSM postulates that persuasion can occur through two different modes of information processing: heuristic processing vs. systematic processing. In HSM, systematic processing is defined as the judgments of the validity of a message based on the scrutiny of the argumentation quality, and heuristic processing is defined as the judgments of the validity of a message in which people rely on simple decision rules (i.e., heuristic decisions). Chaiken and Eagly (1983) articulate that heuristic is the construct which is learned on the basis of past experiences or observations, and they are represented in memory much the same as other knowledge constructs.

HSM demonstrates that the activation of systematic processing (i.e., effortful argument scrutiny) can lead people to focus on central cues (i.e., the argument quality of a message), and the attitudes formed or changed via systematic processing can persist over time; the activation of heuristic processing (i.e., the absence of argument scrutiny) can lead people to focus on peripheral cues (e.g., source characteristics), and the attitude formed via heuristic processing can be ephemeral (Petty and Cacioppo, 1983). Interestingly, HSM predicts that scrutiny of a message can often lead people to reject a message and become resistant to changing their attitudinal positions unless the counterargument of a message is perceived as convincing. In general, heuristic processing is predicted to involve less cognitive effort than systematic processing.

Previously, multiple motivational factors were identified as mediating the likelihood of the activation of heuristic and systematic processing—e.g., prior knowledge, source credibility, task importance, and communication modality. Notably, HSM has merits over ELM as it provides an explanation as to why motivational determinants serve a certain role in activating either systematic or heuristic processing, which was not described in ELM. HSM postulates that the least effort and sufficiency principles can determine the extent to which people engage in systematic scrutiny of a message. The basic assumption of the least effort and sufficiency principles are that while people are inherently cognitive misers (Fiske & Taylor, 1984), people's desire to attain confidence in their judgments can often lead them to effortfully scrutinize a message. Specifically, HSM posits that the failure to meet one's judgmental confidence may make a person engage in systematic processing in an attempt to exceed the judgmental confidence sufficiency threshold (unless one's capacity to process a message is not limited), while sufficient judgmental confidence may make a person cease the systematic scrutiny of the validity of a message's argumentation.

Another merit of HSM pertains to the fact that heuristic and systematic processing are assumed to concurrently occur. In ELM, the two different modes of information processing (i.e., central and peripheral route processing) are conceptually assumed to be mutually exclusive. However, HSM acknowledges the potential that the two modes of processing (i.e., systematic and heuristic processing) may have to independently or interdependently influence judgments. In presence literature, this perspective of HSM has often been accepted as convincing by researchers, thereby leading them to adopt the model in explicating the relationship between presence and persuasion, instead of ELM. Together with this perspective, one of the past studies

conducted by Chaiken and Eagly (1983) has motivated presence researchers to examine the role of presence on the mode of information processing.

#### **2.4. Presence and the Dual Process Model**

In 1983, Chaiken and Eagly found that a communication modality (i.e., video vs. text) could play a role as a source cue to enhance the salience of communicators (i.e., vividness of communicators) and influence persuasion through heuristic processing. This study was deemed significant by presence researchers insofar as it suggested a theoretical linkage between presence and the mode of information processing. On the basis of these findings, a few studies (Grigorovici, 2003; Kim & Sundar, 2016; Skalski & Tamborini, 2004; 2007) have revealed interesting findings in terms of the effects of presence on the mode of information processing and the formation of attitude.

Pertinently, Skalski and Tamborini (2004) extended the work of Chaiken and Eagly by examining whether communication modality (video vs. print) interplays with the size of a screen (i.e., small vs. medium vs. large), in influencing the mode of information processing and attitudes. The results of the study showed that while the communication modality (i.e., vividness) influences a sense of social presence and attitude, the relationship between social presence and attitude is mediated by both heuristic and systematic processing. Later, Skalski and Tamborini (2007) suspected that the concept of media interactivity might better explain the relationship between social presence and persuasion, and tested whether social presence induced by the implementation of interactivity in a media technology would influence the mode of information processing and attitude. However, it was again found that social presence activates both heuristic and systematic processing leading to relatively positive attitudes when people have engaged in positive thoughts towards source or messages. Furthermore, based on the notion that presence is



a feeling of engagement (or involvement or psychological immersion) within a mediated environment, and together with the perspective of dual process model that involvement is predictive of systematic processing, some researchers concluded that a sense of presence is predictive of systematic processing (e.g., Choi et al., 2001).

In contrast, some contradictory findings, in regards to the role of presence on the mode of information processing, have been reported by other scholars. In 2003, Grigorovici attempted to clarify the effects of presence on the mode of information processing and attitude by raising a research question that is very similar to that of the current study—i.e., what might be the role of presence on the mode of information processing and persuasion? Interestingly, this study conceptualized presence as affective engagement and concluded that a sense of presence positively influences heuristic processing, and in turn, leads people to form positive attitudes towards a brand (i.e., peripheral information), but not towards an advertisement (i.e., central information). In a similar vein, Kim and Sundar (2016) replicated the findings of Skalski and Tamborini within the context of mobile advertising. Inconsistent with the findings of Skalski and Tamborini, they found that a greater presence experience, resulted from the large screen size of a mobile phone and the video presentation mode of an advertisement, was positively associated with the amount of heuristic processing, which in turn enhanced the affective trust towards an advertisement and the intention to buy a product promoted in an advertisement.

As such, while past findings suggest that presence is likely to be related to the mode of information processing to some degree, they do not seem to provide a clear account as to which direction presence will influence the mode of information processing. Given that the mode of information processing is predictive of the formation of attitude and behavioral intention, the role of presence on the mode of information processing should be clearly addressed in building a

reliable framework that guides the research on presence effects on information processing. In fact, a number of existing frameworks argue that a heightened sense of presence may promote heuristic processing, but they seem to fail in providing coherent explanations.

## **2.5. Presence and the Mode of Information Processing: Presence and Involvement**

Lombard and Ditton (1997) demonstrated that presence may be an indicator of a feeling of engagement (or involvement) within a mediated environment. This notion has been adopted by some past researchers, and based on the notion that involvement is predictive of systematic processing in the dual process model, some studies speculated that a sense of presence will promote systematic processing (e.g., Choi et al., 2001). Interestingly, a recent study conducted by Oh and Sundar (2015) attempted to explicate the underlying mechanism of how the interactivity of a medium, which is supposed to be an antecedent of presence in other studies (e.g., Lombard & Snyder-Duch, 2001), influences persuasion through cognitive absorption of a message. In this study, interactivity of a medium is expected to enhance user engagement (i.e., involvement), and, in turn, promote the cognitive absorption of a message. It seems reasonable to predict that cognitive absorption will lead to message elaboration (since the term “cognitive” often denotes deliberation). The results of the study, however, showed that the cognitive absorption, enhanced by the interactivity of a medium, paradoxically decreased the amount of message elaboration. This finding leads us to revisit the conceptualization of involvement and its effects on the mode of information processing.

Given the abundance of empirical evidence that presence is positively associated with involvement (e.g., Fortin & Dholakia, 2005), it is likely that presence will indeed enhance user involvement. However, past findings should not be overgeneralized in light of the fact that involvement is comprised of two sub-dimensions, cognitive and affective involvement (Park &

Young, 1986), which are respectively found to have distinctive functional outcomes. Previously, while high cognitive involvement was found to promote the systematic scrutiny of the central cues by activating the left side of the brain, affective involvement was found to lead people to attend to peripheral cues, such as image dimension and the quality of symbols, by activating the right side of the brain (Mittal, 1987).

Although the role of cognitive and affective involvement on the mode of information processing is inherently distinctive, involvement was often considered a unidimensional construct by past presence researchers (e.g., Skalski & Tamborini, 2007). Potentially, this might have led numerous studies to fail in providing a concrete understanding of the role of presence on the mode of information processing. Nevertheless, past studies pointed out that a sense of presence is associated with affect and arousal, which often accompanies affective involvement (e.g., Grigorovici, 2003; Grigorovici & Constantin, 2013). In fact, Oh and Sundar (2015) operationalized the cognitive absorption as a perceptual construct that is correlated with the affective dimension of human perceptions, which seems to make the term “cognitive” absorption a misnomer.

Moreover, while the previous notion, in which presence is predicted to elicit affective (rather than cognitive) responses, may suggest that presence may lead to heuristic processing, it merits note that affect may also instigate systematic processing because affect is intertwined with cognition (Kret & Bocanegra, 2016). Indeed, Pekrun et al. (2002) found that enjoyment, which is often conceptualized as a sub-dimension of affective engagement by education researchers (e.g., Schraw, Flowerday, & Reisetter, 1998), is associated with effortful thoughts as well as cognitive engagement. In this respect, while the role of affective and cognitive involvement is distinctive, positing affective involvement as a psychological consequence of presence may generate mixed

findings as affect is considerably intertwined with cognition. To put it clearly, affective involvement, induced by a sense of presence, may also lead to systematic processing when affective involvement increases cognitive involvement. I suspect that previous findings (Choi et al., 2001; Skalski & Tamborini, 2004; 2007), in which presence instigated systematic processing, are generated by this notion. In conclusion, this “presence as (affective) involvement” framework does not provide a concrete understanding of the potential relationship between a sense of presence and the mode of information processing.

## **2.6. Presence and the Mode of Information Processing: LC4MP Perspective**

In explicating the relationship between presence and the mode of information processing, LC4MP (Lang, 2000) has guided some past researchers (e.g., Kim & Sundar, 2016). LC4MP suggests that the conveyance of rich cues, enabled by presence provoking technologies, may engender cognitive overload amongst users. Further to this, LC4MP posits that the depletion of cognitive resources, resulting from a sense of presence, can lead technology users to engage in heuristic processing (i.e., the reliance on mental shortcuts). Interestingly, this notion was postulated as a theoretical assumption in the study of Kim and Sundar (2016), and served to guide the prediction of whether a sense of presence (i.e., a sense of being there and perceived realism) will influence heuristic processing.

Although the results of Kim and Sundar’s study were consistent with the prediction guided by LC4MP, it contradicts the proposition that a sense of presence can make people decode information easily (Kim & Sundar, 2016). In support of this claim, there have been mixed findings in terms of the effects of presence on memory, which is often operationalized as a sign of dual processing (for a review, see Bailey, Balienson, Won, Flora, & Armel, 2012). In this

regard, this framework fails to provide a clear understanding of the role of presence on the mode of information processing.

## **2.7. Presence and the Mode of Information Processing: The MAIN Model Perspective**

The MAIN model (Sundar, 2008) may perhaps be the most coherent framework in providing a clear, albeit limited (to some degree), explanation of why and how media technologies influence the mode of information processing. In general, the MAIN model posits that the structural features of a technology which enable the conveyance of rich cues (i.e., heightening a sense of presence) can activate heuristic processing by making people readily apply cognitive heuristics and easily decode information using multiple sensory channels. Unlike HSM, in which motivation and involvement are assumed to primarily determine the likelihood of systematic scrutiny, the MAIN model argues that the salience of source cues (i.e., salient structural features) in a media interface is sufficient to trigger cognitive heuristics through a process of hijacking the perception of central cues (e.g., the argumentation quality of a message). This assumption has been directly tested by a sizable body of past research and gained ample support from previous researchers (e.g., Kim & Sundar, 2016).

However, this model also has some limitations as it does not consider that a sense of presence is a subjective experience. The meaning of heuristics may differ across individuals as they are defined as knowledge structures stored in our memory through previous experiences and observations (Higgins, 1989). Nevertheless, the MAIN model postulates that heuristics may have a common meaning among people. Being-there or realism heuristics may not always have a common meaning among people, but the meaning of such heuristics may be subjective and vary upon individuals' dispositions based on previous experiences. In support of this claim, one past study revealed that communication modality (i.e., textual vs. auditory: realism heuristic in the

MAIN model) may have different meanings among people depending on one's prior experiences with a product (i.e., product involvement; Jin, 2009).

In addition, the MAIN model, similar to the "presence as involvement" framework, does not seem to provide a reasonable explanation as to why presence will lead to heuristic processing when presence is defined as involvement (Lombard & Ditton, 1997). The current study suspects that this has led the MAIN model to rely on the concept of realism and being-there heuristics, rather than the previous conceptualization of presence, to get around the potential criticism that may be raised when presence is defined as involvement.

### **CHAPTER 3. A NEW FRAMEWORK BUILDING**

Although previous researchers attempted to establish the relationship between a sense of presence and the mode of information processing, they do not seem to provide a clear account. In this regard, it is imperative that we develop a robust theoretical framework that will underpin previous findings and supplement the limitations of past frameworks. Based on the limitations identified in past frameworks, this chapter begins to propose a new way of understanding the underlying mechanism of presence effects on persuasion, through the theoretical lens of construal level theory (Bar-Anan et al., 2006). Drawing from existing theories and informed by the previous empirical findings reviewed in chapter two, this study attempts to establish the specific relationship between a sense of presence and dual processing. Presence involves the concept of psychological distance and refers to the extent to which other entities are closely perceived in mediated communication. Therefore, the current study suspects that presence might be interrelated with the concept of psychological distance in construal level theory. In addition, both presence and psychological distance can be experienced through people's egocentric

reference frame (or point). As a result, the current study posits that presence will replace the role of psychological distance in CLT.

In construal level theory, construal level is defined as the degree to which a person's thinking is abstract or concrete, while psychological distance is bidirectionally associated with psychological distance. Interestingly, construal level theory demonstrates that a high level of construal is associated with abstract, simple, structured, coherent, decontextualized, primary, core, superordinate, and goal-relevant mind, while a low level of construal (i.e., concrete thinking) is associated with concrete, complex, unstructured, incoherent, contextualized, secondary, surface, subordinate, and goal-irrelevant mind. Similarly, the dual process model posits that systematic processing involves a decontextualized and abstract way of processing information, while heuristic processing involves contextualized and specific ways of processing information. Although construal level and dual processing may be distinctive since construal level can be automatically activated without having cognitive efforts (Fujita, Eyal, Chaiken, Trope, & Liberman, 2008), previous studies have demonstrated that a primed mental state can influence human perceptions and decisions (Merikle, Smilek, & Eastwood, 2001). Therefore, construal level, primed by a sense of presence, is assumed to influence the mode of information processing in the direction of a prevailing primed mental state (i.e., abstract or concrete thinking).

### **3.1. Construal Level Theory**

According to construal level theory (CLT), psychological distance is closely related to the extent to which people construe target objects or events as abstract or concrete (Bar-Anan et al., 2006). CLT postulates that our minds form mental construal as a way of representing psychologically distant objects because people can only directly experience here and now (i.e.,

egocentric). Previously, Trope and Liberman (2003) classified the psychological distance into four dimensions: temporal distance, social distance, hypotheticality, and spatial distance.

Temporal distance refers to the concept of how much time (e.g., past or future) separates the perceiver's present time and the target event; social distance is the concept which refers to the perception of difference (i.e., distinctiveness) between the social target and the perceiver's self, such as self versus others, or friend versus others; hypotheticality refers to the concept of whether an event is about to happen or how close the event is to reality, as construed by the perceiver; and spatial distance refers to the distance between the target and the perceiver. Past findings indicate that spatial distance, temporal distance, social distance, and hypotheticality is a subjective experience in which automaticity (i.e., priming) lies beneath the meaning of psychological distance (Trope & Liberman, 2010).

CLT demonstrates that the relationship between psychological distance and level of construal is bidirectional (Trope, Liberman, & Wakslak, 2007), and that the level of construal can prime psychological distance in the same way that psychological distance primes the level of construal. That is, while high psychological distance is associated with a higher level of construal (i.e., abstract thinking), low psychological distance is associated with a lower level of construal (i.e., concrete thinking) of an event or an object. However, Trope and Liberman (2010) argue that psychological distance and construal level should not be considered as the same construct because psychological distance relates to the 'how' question, while construal level relates to the 'what' (i.e., inherent properties of an event) question. Empirically, Bar-Anan et al. (2006) directly tested the association between the psychological distance and the construal level using the Implicit Association Test (IAT); determining that the two constructs are significantly associated.



Notably, CLT demonstrates that the degrees of the abstractness of information also can influence the psychological distance by affecting the level of construal. Previous studies have shown that presenting information through pictures can lead people to perceive an object or an event as psychologically proximate, while presenting information through words can lead people to perceive a target as psychologically distal (Amit, Algom, & Trope, 2009; Amit, Algom, Trope, & Liberman, 2008). Such studies indicate that because pictures can more concretely represent the physical properties of the target objects than words (i.e., abstract representations of the essence of targets), pictures should comprise a lower level of construal, and, in turn, lead people to sense psychological proximity, whereas the opposite should occur through words. Such findings suggest that the degree of the abstractness of experiences in mediated communication may also prime the level of construal such that psychological distance primes construal level, when a medium is defined as a message (McLuhan, 1964).

### **3.2. CLT and Presence Theory**

In communication literature, the concept of physical presence (or telepresence) has frequently been used by researchers to account for the extent to which the existence of a medium is unnoticed. This connotes that a sense of presence occurs when mediated experience is perceived as simulating the physical reality. Interestingly, the definition of physical presence seems to bear significant conceptual overlap with hypotheticality—i.e., the extent to which an event is perceived as close to reality (Armor & Sackett, 2006)—in CLT. Moreover, the definition of social presence, which refers to the extent to which an entity in mediated communication is perceived as psychologically proximate, is conceptually very similar to the definition of spatial distance in CLT, that is, perceived distance between target and self (Fujita et al., 2005). The recent conceptualization of spatial presence (Wirth et al., 2007) postulates that egocentric

reference frame leads to the development of spatial presence, which is similarly posited as underlying the process in which people form psychological distance between self and target in CLT. Such a conceptual overlap between presence and psychological distance suggests that presence might be interrelated with the level of construal, as in CLT. However, it is surprising that none of the past published studies, to the author's knowledge, have empirically investigated whether presence plays a role similar to the psychological distance in CLT and whether it will be accordingly influenced by the level of construal.

Presumably, if presence and psychological distance can be interchangeably used, the abstract experience conveyed by certain structural features of a technology (when a medium is defined as a message) should lower a sense of presence among users, whereas the concrete experience enabled by certain features should heighten a sense of social presence. Moreover, at the same time, a sense of presence (i.e., low psychological distance) should also lead to a low level of construal because concrete information (or experience) is known to make people automatically access concrete thinking in CLT.

Although this proposition has not been directly examined by past researchers using the CLT framework, there is a large body of research which underpins the notion that psychological distance and presence may be interchangeably used (e.g., Kim & Sundar, 2016; Nunez & Blake, 2003). For example, Nunez and Blake (2003) found that presenting graphical information (i.e., concrete information) in a virtual environment induced a higher sense of presence as compared with text-based information (i.e., abstract information; Nunez & Blake, 2003). Similarly, Kim and Sundar (2016) found that the video presentation mode of an advertisement elicited a higher sense of perceived realism (i.e., a sense of presence) as compared with the text presentation

mode. These findings consistently suggest that a greater sense of presence, induced by the concreteness of information or experience, will prime a low level of construal.

### **3.3. CLT and the Dual Process Model**

The definition of construal level in CLT also shares significant conceptual commonality with the constructs of systematic and heuristic processing in the dual process model. Trope and Liberman (2010) noted that when a high level of mental construal is activated, people have a tendency to focus on the central features of information. Conversely, people tend to focus on peripheral information under the activation of low level of mental construal. Interestingly, the dual process model similarly posits that systematic processing is likely to lead people to focus on central cues, whereas heuristic processing is likely to make people focus on peripheral cues.

Although CLT and the dual process model seem to share significant commonalities, it is surprising that there has been little research examining the relationship between construal level and the mode of information processing. One notable study conducted by Fujita et al. (2008) argued that level of construal is conceptually distinct from the dual process because level of construal is a cognitive construct that can be automatically accessed by people without having cognitive efforts. Fujita et al. have mainly focused on the role of temporal distance on persuasion, and through a series of experiments, this study has progressed to conclude that CLT and the dual process model are independent because people were found to be sensitive to argument strength when the attitude object was temporally distant than near. In addition, Ledgerwood et al. (2008) also have found that temporal distance does not affect the number of thoughts, which is operationalized as the evidence of systematic processing in their study.

These studies, however, raised a critical question regarding the validity of the results since 1) Fujita et al. (2008) did not directly measure whether people went through systematic scrutiny when exposed to an attitude object, and 2) the operationalization of systematic processing in Ledgerwood et al.'s study failed to consider the notion of HSM that heuristic and systematic processing are not anchored at the two opposite endpoints on a continuum. These studies do not provide direct evidence to conclude that CLT and the dual process model are independent. Rather, I suspect that construal level, primed by psychological distance, may be an antecedent of dual processing. This speculation is based on the notion that a primed mental state can influence human perceptions and decisions (Merikle et al., 2001). Thus, the priming of construal level through psychological distance could lead people to readily, yet unconsciously, apply their primed state of mind (i.e., abstract or concrete thinking) in processing information. Positing construal level as an antecedent of dual processing does not necessarily contradict the proposition that construal level and dual processing are distinctive concepts because construal level does not require mental efforts.

### **3.4. A New Look at the Mechanism of Presence Effects on Information Processing**

On the basis of the conceptual overlap between presence theory, CLT, and the dual process model, this study proposes a new way of understanding the underlying mechanism of presence effects on the mode of information processing. The theoretical model of this study posits that a sense of presence will replace the role of psychological distance in CLT and will prime a certain level of construal. Considering that a sense of presence connotes psychological proximity, a greater sense of presence is expected to prime a low level of construal and make people focus on peripheral cues. Thus, it is predicted that the attention to peripheral cues (i.e., low level of construal) will potentially accompany heuristic processing as a primed mental state

influences the way people process information in the direction of a prevailing construal level. This is expected to motivate people to use peripheral cues in forming attitudes. In conclusion, this new framework posits construal level as a key factor that mediates the effects of presence on the mode of information processing.

#### **CHAPTER 4. HYPOTHESES**

Based on the framework developed through the theoretical lens of CLT, this study attempts to replicate the results of past studies in which communication modality (video vs. text) was found to influence the mode of information processing (Chaiken & Eagly, 1983), trust, and purchase intention (Kim & Sundar, 2016), within the context of advertising (i.e., a primary form of persuasion; Dyer, 1982). The purpose of this replication is to ascertain whether the current study's framework will generate findings that align with those of previous studies, by which the validity of the framework will eventually be addressed. In this chapter, the relationship between mode of information processing, trust, and behavioral intention (i.e. purchase intention) will further be explicated and hypothesized to provide a specific account of how the effects of presence on persuasion will be sequentially mediated by construal level, mode of information processing, and trust.

Following the replication, the current study seeks to extend the examination into the context of location-based advertising (LBA). LBA is a recent form of advertising defined as “targeted advertising initiatives delivered to a mobile device from an identified sponsor that is specific to the location of the consumer” (Unni & Harmon, 2007, p. 28). Functionally, LBA operates through a location-based services (LBS) technology, which is “information services accessible with mobile devices through the mobile network utilizing the ability to make use of the location of the mobile device” (Virrantaus et al., 2001, p. 68). Interestingly, recent studies

found that LBS can foster a sense of presence by making the existence of a target entity more salient (e.g., Shin, Jung, & Yoo, 2015; Jung, Roh, Yang, & Biocca, 2017). Given these findings, this research attempts to validate the reliability of the current study's newly developed framework within the domain of LBA. This will be performed as part of a validation to confirm whether this framework will withstand the alterations in the domain of presence-provoking technology.

#### **4.1. Technological Features and Presence**

The relationship between the presentation mode of information (i.e., video vs. text) and presence is well established by scholars. Specifically, video mode is known to provide more natural and authentic experiences to users than text mode, and such an experience is found to induce a heightened sense of presence. Given the abundance of empirical evidence which proposes that presenting information through video can elicit a greater feeling of presence as compared to text (e.g., Bente, Rüggenberg, Krämer, Eschenburg, 2008; Kim & Sundar, 2016), the following hypothesis is posited as a first step to validate the current study's framework:

H1: Video mode advertisement will engender a greater sense of presence (as compared to text mode advertisement).

Providing the location information of a target entity in an online communication is found to influence a sense of social presence (Shin et al., 2015; Jung et al., 2017). The conceptualization of social presence (i.e., a sense of being with another; Biocca, Harms, & Burgoon, 2003) connotes that the degree of salience of a target entity in mediated communication can influence a sense of distance. In addition, Kreijns, Kirschner, Jochems, and

van Buuren (2004) proposed that perceiving a target as more “real” rather than “abstract or anonymous” can play a role as a key determinant in inducing a sense of social presence. Given this proposition, it seems reasonable to speculate that providing the location information of a seller (i.e., a store) through LBA may potentially enhance a sense of being with a seller by making people perceive the existence of the store as more real, rather than abstract or unknown (i.e., anonymous). Accordingly, this study posits:

H2: LBA will engender a greater sense of social presence (as compared to traditional advertisement without LBS).

#### **4.2. Presence, Construal Level, and the Mode of Information Processing**

As discussed earlier in chapter three, the conceptual overlap between presence, construal level and the dual process model leads us to speculate that a heightened sense of presence and social presence will lead people to form a low level of construal, and, in turn, promote heuristic processing. By contrast, when a sense of presence and social presence is lowered, it is predicted that people will form a high level of construal and process information in a deliberative way (i.e., systematic processing). In order to validate this claim, these hypotheses are postulated:

H3(a/b): A greater sense of a) presence and b) social presence will lead to a lower level of construal.

H4(a/b): A high level of construal will a) decrease the amount of heuristic processing and b) increase the amount of systematic processing.

### **4.3. The Mode of Information Processing and Trust**

Koh and Sundar (2010) proposed that trust is an important psychological construct that can be influenced by the way in which people process information within the domain of persuasion. In terms of the relationship between the mode of information processing and trust, past studies have shown that heuristic and systematic processing are positively associated with the degree to which people form affective and cognitive trust in the advertisement (e.g., Koh & Sundar, 2010; Kim & Sundar, 2016). While cognitive trust refers to one's confidence about information that is based on the evaluation of the reliability and credibility (Johnson & Grayson, 2005), affective trust refers to one's emotional bond (i.e., a feeling of warmth and openness) with an object (Edell & Burke, 1987; Johnson & Grayson, 2005). The definition of affective trust demonstrates that heuristic processing will likely increase affective trust, as heuristic processing is associated with the affective dimension of engagement (Grigorovici, 2003). On the contrary, systematic processing is likely to increase cognitive trust as people make evaluations on the reliability and credibility of information.

Intriguingly, previous research demonstrates that heuristic and systematic processing can negatively impact cognitive and affective trust respectively (Kim & Sundar, 2016). These findings are based on the proposition that cognitive and affective dimensions are "located at the opposite ends of the attitude continuum" (Kim & Sundar, 2016, p. 49). However, considering that affect is intertwined with cognition (Kret & Bocanegra, 2016), the relationship between heuristic processing and cognitive trust might unfold differently. Specifically, as heuristic processing, promoted by a sense of presence, is inherently affect-based (Grigorovici, 2003), heuristic processing may potentially increase cognitive trust in similar to the way affective engagement (i.e., enjoyment) influences systematic processing. This speculation is in line with



the current study's proposition that affective engagement may not always lead to heuristic processing as it may extend to cognitive engagement. In partial support of this prediction, Kim and Sundar (2016) have found that heuristic processing is predictive of greater behavioral trust, which is defined as willingness to rely on information in making decisions based on conscious and rational thoughts (i.e., systematic processing). On the contrary, systematic processing may decrease affective trust as people tend to be rational when they engage in systematic processing.

While some studies (e.g., Kim & Sundar, 2016) have not made the distinction between the concept of trust and attitudes towards "advertising product information" and "brand," other research suggests that the concept of trust or attitudes towards advertising product information and brand should be distinctively understood in the advertising context. This is because the attitude towards advertising product information (i.e., a product description: central information) is formed through systematic processing, while the attitude towards brand (i.e., a source cue) is formed through heuristic processing (Grigorovici, 2003). Similarly, Koh and Sundar (2010) demonstrate that reliance on central cues (e.g., a product description) is associated with the formation of cognitive trust, whereas reliance on peripheral cues (e.g., a source cue) is associated with the formation of affective trust. In this respect, it might be the case that the affective trust formed through heuristic processing will actually be directed towards brand, rather than advertising product information, as brand is supposed to play a role as a source cue. By contrast, based on the notion that systematic processing makes people attend to central information (e.g., a product description), it is likely that the cognitive trust will be directed towards the advertising product information, rather than the brand promoted in an advertisement. To put it clearly, the formation of cognitive or affective trust may be determined in the direction of the cues people have attended to.

Taken together, this study predicts that while heuristic processing will induce both greater affective trust towards brand and cognitive trust towards advertising product information, systematic processing will only increase cognitive trust towards advertising product information and decrease affective trust towards brand. Accordingly, the following hypotheses are proposed:

H5(a/b): Heuristic processing will lead to greater a) affective trust towards brand and b) cognitive trust towards advertising product information.

H6(a/b): Systematic processing will lead to (a) greater cognitive trust towards advertising product information and (b) less affective trust towards brand.

#### **4.4. Trust and Purchase Intention**

Previous studies have consistently shown that trust towards brand can directly influence people's intention to buy a product promoted in an advertisement (e.g., Hsin Chang & Wen Chen, 2008; Chang & Thorson, 2004). In a similar vein, the results of Kim and Sundar's work (2016) indicated that affective trust, which is suspected to be directed towards brand, is positively associated with purchase intention. Jung et al. (2019) also found that affective attitude towards a smoking cessation campaign message, induced by a sense of presence, is positively associated with people's intention to engage with the campaign within the domain of a spatial augmented reality technology. These findings consistently suggest that affective trust towards brand will increase purchase intention. Therefore, I posit:

H7: Affective trust towards brand will increase purchase intention.

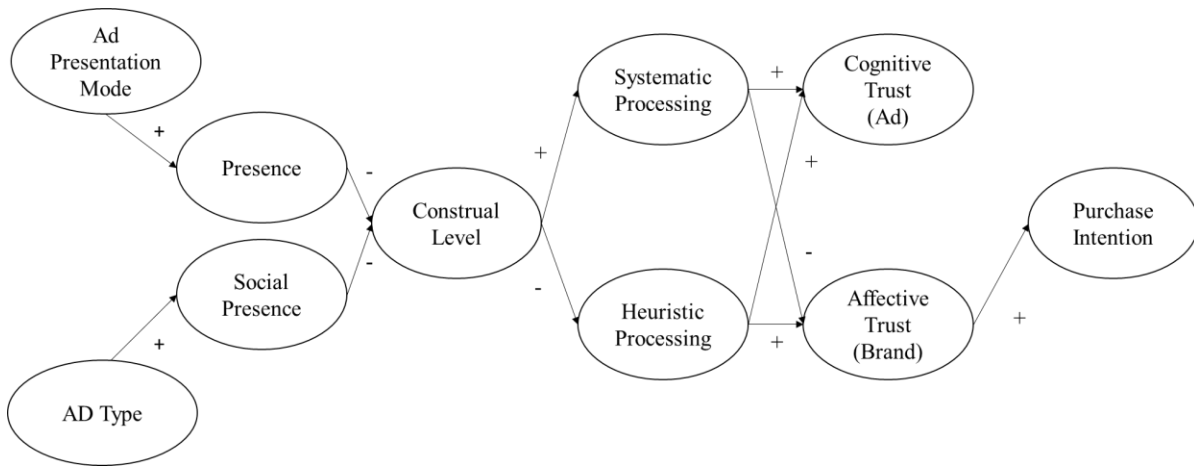
However, Kim and Sundar (2016) found that cognitive trust, which is shaped through systematic processing, is not predictive of purchase intention regardless of the information processing style on which people have relied. Similarly, the study of Jung et al. also indicated that cognitive attitude towards a smoking cessation campaign message, which is assumed to be a psychological outcome of systematic processing, is not predictive of the behavioral intention to engage with the campaign. Nonetheless, given that affect and cognition are intertwined (Kret & Bocanegra, 2016), the previous findings, in which insignificant relationship found between cognitive trust and behavioral intention, do not seem to be theoretically convincing. Indeed, Kim and Sundar (2016) suspect that the non-significant relationship found between cognitive trust and purchase intention might have been generated by a methodological artifact of their experiment. Moreover, although Jung et al. (2019) concluded that affective attitude (or evaluation) may only predict behavioral intention, the results of the study showed that cognitive and affective attitude are significantly correlated ( $r = .31, p < .01$ ). In line with this idea, Lee, Sun, Chen, and Jhu (2015) found that both affective (i.e., emotional) and cognitive trust towards an avatar agent can increase customers' purchase intention in the context of e-commerce. As such, previous studies have yielded mixed results in terms of the relationship between cognitive trust and purchase intention. Therefore, the current study presents the following research question to test the relationship between cognitive trust and purchase intention:

RQ1: Will cognitive trust towards advertising product information increase purchase intention?

#### 4.5. A Theoretical Model

Taking all the theoretical predictions together, the current study proposes a theoretical model that provides a new way of understanding the underlying mechanism of presence effects on persuasion (see Figure 1). This model provides a holistic view of the mechanism of presence effects on persuasion. In order to validate this new framework, the model fit of this framework will be examined using partial least squares structural equation modeling. Accordingly, this study proposes the following research question:

RQ2: Will the theoretical model result in a good model fit?



**Figure 1. A Theoretical Model**

## CHAPTER 5. METHOD

### 5.1. Experiment Design

To validate the hypotheses and the proposed conceptual framework, a two (ad presentation mode: video vs. text) x two (ad type: LBA vs. traditional) between-subjects online experiment was conducted. Participants were recruited through Prolific.ac, which is a

crowdsourcing platform designed for scientific research. Although some researchers call into question the validity of using a nonprobability-based online sample for scientific studies (as online samples tend to be active social media users), recent studies have demonstrated that the quality of the data collected via online platforms (e.g., Amazon MTurk) is sufficiently good when compared with the quality of the data collected via other methods (e.g., Mason & Suri, 2012). In addition, the fact that the purpose of this research is to examine online users' cognition towards online advertising mitigates the potential risks of using online samples.

## **5.2. Participants**

Initially, 200 participants (50 samples per condition) were recruited. Prior to conducting the experiment, the sample size was estimated through the WarPLS 6.0 software (Kock, 2017). Using the minimum absolute significant path coefficient criteria, with the significance level at .05 and the power level at .80, the minimum coefficient in the current study's model was predicted to range from .15 to .25. Results from the power analysis, using the inverse square root method, indicated that the current study may require a sample size ranging from 99 to 275. Considering the gap between the pre-estimated minimum sample sizes, I recruited 200 participants, which was based on the approximate calculation of the median.

Participants were randomly assigned to one of the four conditions to either experience a video-mode or a text-mode advertisement that were either be provided in an LBA or a traditional advertising format. Results from an attention test indicated that 20 participants did not correctly perform the experimental task, and they were thus excluded from the data analysis. As a result, a total of 180 samples were used for the data analysis (45, 46, 44, and 45 participants per each condition). In addition, sex was balanced across conditions to prevent any possible confounding

effects that could be engendered by sex-differences. Results from the Chi-square testing indicated that the distribution of sex is well balanced across the conditions,  $\chi^2(3) = .36$ , n.s.

### **5.3. Stimuli Selection and Development**

Guided by Obermiller and Sangenberg (1998), the current study first searched for 10 product categories that made the highest profits in the United States in 2018 (U.S. Census Bureau, 2018). The aim was to select the product categories that are relevant to the general public.

#### **5.3.1. Control for Product Involvement**

After identifying the top ten product categories, 25 participants were recruited online to select the categories that engendered a moderate level of involvement, as a high or a low level of product involvement is known to influence the way people process information (Petty and Cacioppo, 1983). In order to test the level of involvement, a five seven-point semantic differential scale (i.e., the Personal Involvement Inventory), developed by Zaichkowsky (1985), was employed. Based on the results of the involvement test, three product categories—those which have an involvement score closest to the median value (Mdn = 4.71)—were selected: 1) health products (M = 4.55, SD = .90), 2) sporting goods (M = 4.86, SD = 1.18), and 3) furniture products (M = 4.87, SD = .88).

#### **5.3.2. Control for Product Familiarity**

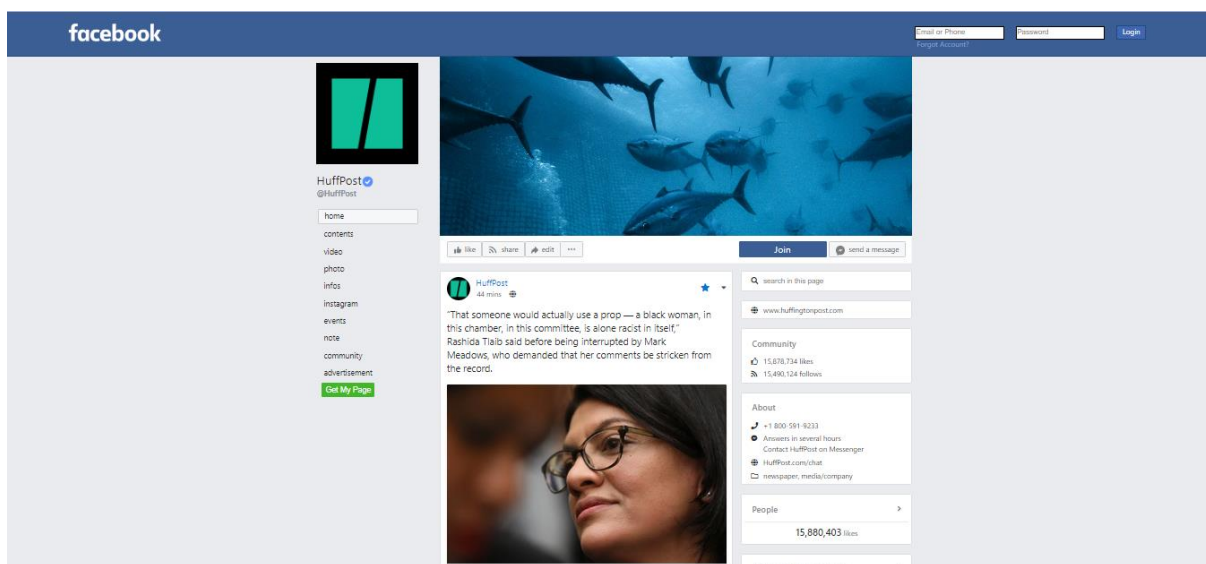
On the basis of the results of the involvement test, three advertisements in a video format per each of the three selected product categories were downloaded from a website which offers compilations of existing advertisements. In order to prevent the confounding effects that could be caused by familiarity with brand or product promoted in the advertisements, the advertisements which promoted relatively unfamiliar brands and products were carefully selected.

### 5.3.3. Control for Ad Induced Arousal and Affect

For the next step, to choose typical advertisements that are less likely to induce a high level of arousal or negative emotion, attitudes towards the advertisements (Soh, Reid, & King, 2009) were measured through another online survey (N = 29, 12 males, 17 females,  $M_{age} = 35.62$ ,  $SD = 12.38$ ). After obtaining the results, three advertisements that engendered a neutral attitude (one per each category) were selected as final stimuli for the experiment.

### 5.3.4. Design of Text-Video Manipulation

For the creation of text mode advertisements, the information included in the selected video mode advertisement (e.g., captions, product descriptions) were transcribed. The font colors, styles, and sizes used in the video advertisements were applied to the text mode advertisements. The advertisements were set to pop up on a mock-up Facebook page of the Huffington Post press organization before accessing to a news article to ensure a naturalistic setting (see Figure 2).



**Figure 2. A mock-up Facebook developed for the experiment.**

### 5.3.5. Design of the LBA Manipulation

In order to add the LBA function to the advertisements, a professional programmer was hired. The advertisements in an LBA format presented the location information of a pseudo store in which participants were told that they can buy the product promoted by the advertisement at the spot placed on a map. The distance between participants and the pseudo store were equally set to two miles for all participants in the LBA conditions. All participants were forced to watch the advertisement, all of which lasted for approximately 30 seconds. The sample advertisements in a text format used for the experiment are presented in Figure 3 and Figure 4.

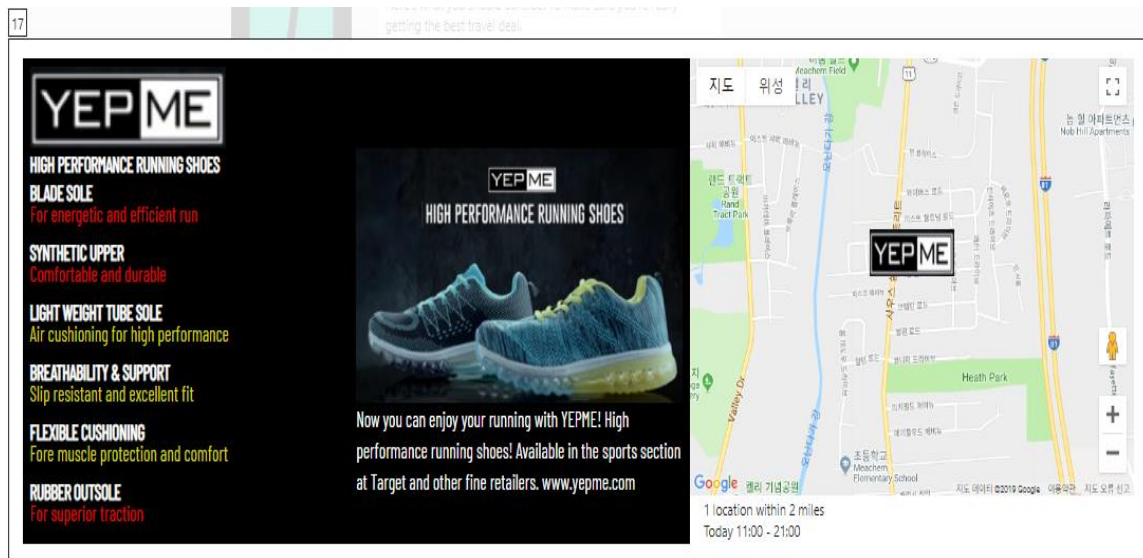
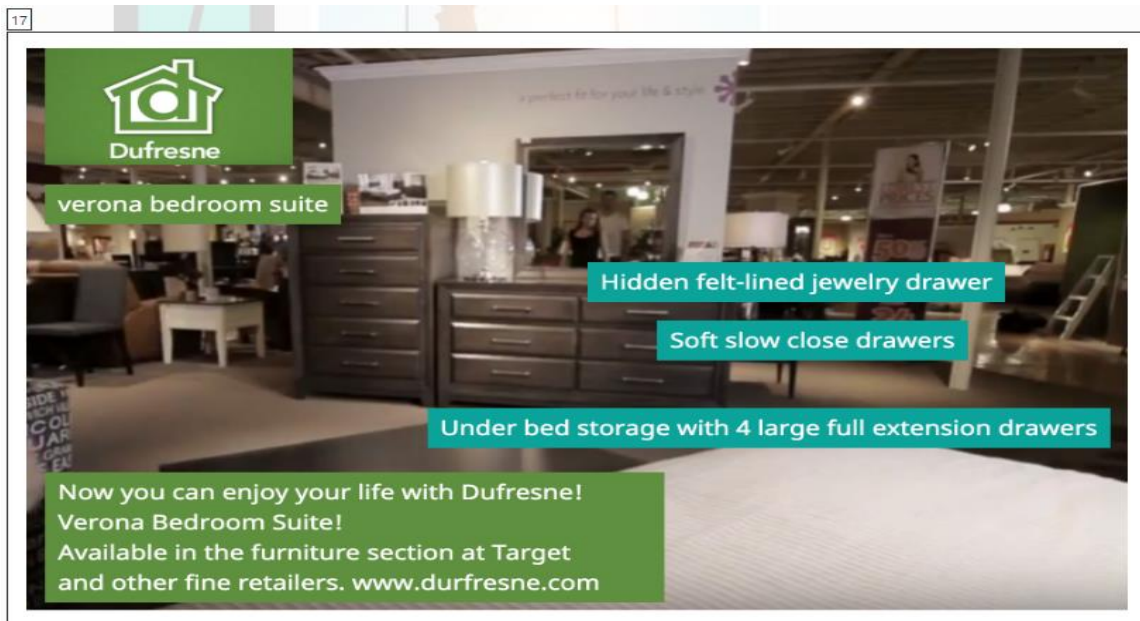


Figure 3. Location-based Advertisement in a Text Format





**Figure 4. Traditional Advertisement in a Text Format**

#### **5.4. Procedures**

Participants were recruited online (through Prolific). They were provided with a task: “Search for a news article on a Huffington Post Facebook page.” The purpose of the experiment was masked to prevent the potential effects of demand characteristics. Instead, participants were informed that the objective of the study is to investigate the habits of users in navigating an SNS webpage.

Upon their agreement to participate in the experiment, participants were specifically given the task of searching for a news article on a Facebook page which is less likely to evoke a specific emotional state or attitude (i.e., “Is January Really the Best Month to Book Cheap Flights?”). Before starting the main experiment, participants were instructed to use desktop computers (this was forced by not providing functions to open the mock-up Facebook page via mobile devices) and to turn on their speakers during the experiment (attention test was conducted to ensure that participants turned on their speakers). This was to control out the potential effects

that could be induced by the excessive differences in the screen size and to ensure that participants experience all the contents (e.g., background music, narration) included in the video mode advertisements. When participants clicked the Facebook posting about the news article, one of following types of advertisements randomly popped up: 1) video-mode LBA, 2) text-mode LBA, 3) video-mode advertisement, and 4) text-mode advertisement. After participants located the information in the article, they were asked to answer two questions regarding the information provided in the article and the advertisement. This was to ensure that they have fully performed the task. After accomplishing of the experimental task, the participants were asked to complete an online questionnaire, as well as a thought-listing task, regarding their experience and their perception towards the advertisement. The experiment lasted for approximately 25 minutes per participant. Participants were rewarded \$3.00 as compensation for their participation.

## **5.5. Measures**

### **5.5.1. Attention Test**

To screen out the participants who fully and validly completed the experimental task, participants were asked to answer the following two questions: 1) “According to the article you read, "July" is the best month to book cheap flights,” and 2) “In the pop-up advertisement, women provided product information with background music.” The first item was given to check whether participants read the article after the exposure to one of the pop-up advertisements, while the second item was given to ensure that all participants have turned on their speaker. The answer option was dichotomous (i.e., True or false).

### 5.5.2. Control Variables

Considering that the three different product categories, randomly presented to participants, may potentially have different levels of impacts on purchase intention, the product category was included as a control variable in the analysis. In addition, although a randomization was applied to the design of the current research, age, gender, and ethnicity of participants were also measured and controlled to ensure that the results are not affected by the individual differences in the participants' basic demographic characteristics. The demographic information of the participants (i.e., age, gender, and ethnicity) is presented in Table 1.

Characteristic	%
Age	
18-19	2.8
20-29	37.2
30-39	27.2
40-49	13.4
50-59	15.5
60-63	3.9
Sex	
Male	45.0
Female	55.5
Ethnicity	
White	75.0
Black or African American	7.8
Asian	7.8
Hispanic or Latino	2.2
Multiracial	7.2

**Table 1. Demographic Information**

### 5.5.3. Dependent Variables

#### 5.5.3.1. Presence

A sense of presence was measured using five 7-point Likert scale items adopted from the Independent Television Commission Sense of Presence Inventory (Lessiter et al., 2001). This measure consisted of items such as “The characters/objects I saw in the pop-up ad were very similar to characters/objects in real life” and “The pop-up ad showed what it is like to use the advertised product in reality.” The composite score was used for the analysis, and higher scores indicate a higher sense of presence ( $\alpha = .82$ )

#### 5.5.3.2. Social Presence

Social Presence was measured by five 7-point Likert scale items adopted from the study of Biocca et al. (2003). The measure is comprised of items such as “While exposed to the pop-up advertisement during the task, I felt like I were close to the seller of the product,” “While exposed to the pop-up advertisement during the task, I felt like the seller of the product was interacting with me.” Higher scores indicate a greater sense of social presence ( $\alpha = .83$ ).

#### 5.5.3.3. Construal Level

The 14-item Behavioral Identification Form (BIF) was used to measure the level of construal primed by the psychological distance induced by the characteristics of the advertisements. This measure is validated by past researchers (Trope & Liberman 2003; Vallacher & Wegener, 1987). Participants were asked to choose one of two statements (e.g., following lines of print vs. gaining knowledge) that represent their idea about an activity (e.g., reading). One statement (i.e., following lines of print) corresponded to the low construal level, and the other statement (i.e., gaining knowledge) corresponded to the high construal level. Low construal level statements were coded as “0,” while high construal level statements were coded

as “1.” Results from a factor analysis, using the maximum likelihood extraction method, indicated that two of the items (i.e., “Traveling by car”: “Following a map” vs. “Seeing countryside” & “Paying the rent”: “Writing a check” vs. “Maintaining a place to live”) has a poor factor loading below .40, and therefore, the items were dropped. The score of each item was summed up and averaged for the analysis. Finally, a score close to one was interpreted as a sign of participants’ engagement with a high level of construal, whereas a score close to zero was interpreted as a sign of participants’ engagement with a low level of construal ( $\alpha = .74$ ).

#### *5.5.3.4. The Amount of Heuristic and Systematic Processing*

Guided by past studies (Chaiken & Maheswaran, 1994; Kim & Sundar, 2016), the amount of heuristic (and systematic) processing is operationalized as the number of nonattribute-related (and attribute-related) thoughts. In order to capture both the qualitative and quantitative aspects of information processing, a thought-listing technique (Cacioppo & Petty, 1981; Skalski & Tamborini, 2007) was used. Using this technique, the participants were asked to list any elements—for a period of three minutes—they recall from the advertisement they viewed. The unit of analysis was comprised of phrases. For the content analysis, two graduate students were hired. The students were trained on the first 20 participants’ responses, and then independently coded the rest of the participants’ responses. The intercoder reliability of the number of heuristic and systematic thoughts (i.e., the amount of heuristic and systematic processing) was validated (Krippendorff’s  $\alpha = .83$ ; Hayes & Krippendorff, 2007).

#### *5.5.3.5. Cognitive Trust and Affective Trust*

Cognitive trust towards advertising product information and affective trust towards brand were measured by the scale developed by Koh and Sundar (2010). Cognitive trust towards advertising product information was measured using eight adjectival items including “credible,”

“well-informed,” and “accurate” ( $\alpha = .92$ ). Affective trust towards brand was measured using 11 adjectival items including “empathetic,” “personal,” “warm,” and “emotionally invested” ( $\alpha = .94$ ). Notably, results from the correlation analysis have shown that cognitive trust towards advertising product information and affective trust towards brand are highly correlated ( $r = .75, p < .01$ ). Therefore, a factor analysis, using the maximum likelihood extraction and varimax rotation method, was conducted to test the discriminant validity of the two constructs. Results from a factor analysis indicated a two-factor solution. Accordingly, two constructs are respectively retained for the analysis.

#### *5.5.5.6. Purchase Intention*

The intention to purchase a product promoted in an advertisement was measured via five seven-point Likert scale items adopted from the study of Kim and Sundar (2016), which was originally developed by Spears and Singh (2004). Items such as “I will probably buy the advertised product” and “I have high purchase interest of the advertised product” were utilized ( $\alpha = .93$ ).

## **CHAPTER 6. RESULTS**

### **6.1. Data Analysis**

All of the dependent variables measured in the current study were calculated by averaging the participants’ responses for all stimuli. For the testing of the hypotheses and research questions (RQ1 & RQ2), partial least squares structural equation modeling (PLS-SEM) was used. PLS-SEM is known to be free from normality assumption and less sensitive to sample size requirements (Kock, 2017; Marcoulides & Saunders, 2006). In addition, PLS-SEM allows an integrative estimation of the nomological network of variables with a complex experimental design (Gupta, 2014; Streukens, Wetzels, Daryanto, & De Ruyter, 2010), as compared to

traditional analytical methods (e.g., the analysis of variance, regression analysis). The model fit, as well as the reliability and validity of measures, were tested using PLS-SEM. The WarpPLS 6.0 software (Kock, 2017) was used for the PLS analysis.

## 6.2. Measurement Validity

A measurement model was tested via PLS-SEM. PLS-SEM allows testing both a measurement and a structural model. In order to ensure the construct validity of the measures, item loadings for each indicator (see Table 2), as well as the internal consistency reliability (Cronbach's Alpha), were evaluated. All of the items' loadings had a desirable reliability for reflective indicators as they were above .40 (Hair, Hult, Ringle, & Sarstedt, 2016) and statistically significant at the level of p-value below .001 (Kock, 2017). In addition, as shown in Section 5.5, the internal consistency reliability for all the constructs was above .70.

Items	Component							
	P	SP	CL	SIP	HIP	CT	AT	PI
P1	.64							
P2	.83							
P3	.88							
P4	.91							
P5	.56							
SP1		.83						
SP2		.59						
SP3		.84						
SP4		.80						
SP5		.83						
CL1			.45					
CL2			.45					
CL3			.43					
CL4			.48					
CL5			.52					
CL7			.54					
CL8			.45					
CL9			.58					
CL11			.64					
CL12			.48					

CL13			.53					
CL14			.57					
SIP				1.00				
HIP					1.00			
CT1						.83		
CT2						.84		
CT3						.75		
CT4						.87		
CT5						.86		
CT6						.80		
CT7						.88		
CT8						.61		
AT1							.75	
AT2							.71	
AT3							.78	
AT4							.84	
AT5							.87	
AT6							.75	
AT7							.82	
AT8							.78	
AT9							.84	
AT10							.90	
AT11							.82	
PI1								.91
PI2								.96
PI3								.92
PI4								.75
PI5								.88

Note. P = Presence; SP = Social Presence; CL = Construal Level; SIP = Systematic Information Processing; HIP = Heuristic Information Processing; CT = Cognitive Trust Towards Advertising Product Information; AT = Affective Trust Towards Brand; PI = Purchase Intention. All item loadings have *p*-values below .001.

**Table 2. Item Loadings of Dependent Variables**

Additionally, because the measurement of all variables in this study were self-reported, I tested whether the data of the current research are subject to common method bias (CMB), which is known to be influenced by social desirability, the motivation for consistency, or the context of measurement (Podsakoff & Organ,1986). This is conducted to ensure the quality of the current study's data. Harman's one-factor test (Cenfetelli et al., 2008; Podsakoff & Organ, 1986), having



all the items included into a factor analysis using the maximum likelihood extraction and varimax rotation methods, was conducted to test whether the data of the current study are subject to CMB. More than one single factor extracted from the data indicates that CMB is not present in a dataset (Podsakoff and Organ, 1986; Cenfetelli et al., 2008; Liang et al., 2007). Results from the Kaiser criterion (i.e., Eigenvalues  $> 1$ ) indicated a 12-factors solution, which demonstrates that the data of the current study are not subject to CMB. The means, standard deviations, and correlations of the measured variables are presented in Table 3. In addition, the descriptive statistics of the measured dependent variables for the three different product categories are presented in Table 4.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. PC	2.03	.82	1													
2. Age	35.77	12.25	-.04	1												
3. Sex	1.56	.50	-.07	.18*	1											
4. Ethn	1.86	1.80	.04	-.26**	-.05	1										
5. Mode	.51	.50	-.07	.05	.02	.06	1									
6. Type	.49	.50	.07	-.03	-.02	-.06	.00	1								
7. P	4.46	1.22	-.15*	.17*	-.03	-.05	.29**	.11	1							
8. SP	3.35	1.30	-.04	.05	-.21**	-.09	.08	.20**	.49**	1						
9. CL	.59	.24	.03	0.1	0.1	.04	-.05	-.03	-.22**	-.24**	1					
10. SIP	2.37	1.69	.10	-.03	.18*	.01	-.30**	.09	-.05	-.05	.06	1				
11. HIP	2.65	2.00	-.07	.06	-.02	-.02	.41**	.02	.28**	.12	-.02	-.36**	1			
12. CT	4.63	1.09	-.17	.10	.02	-.11	.16*	.03	.59**	.49**	-.12	-.02	.14	1		
13. AT	4.12	1.13	-.14	-.01	.03	-.03	.22**	.06	.47**	.49**	-.14	-.06	.10	.75**	1	
14. PI	3.04	1.50	-.06	-.07	-.01	-.03	.05	.04	.43**	.57**	-.12	-.08	.13	.54**	.59**	1

Note. PC = Product Category ( [1] = Vitamin, [2] = Sporting Good, [3] = Furniture); Ethn = Ethnicity; Mode = Advertisement Mode ([0] = Text, [1] = Video); Type = Advertisement Type ([0] = Traditional, [1] = LBA); P = Presence; SP = Social Presence; CL = Construal Level; SIP = Systematic Information Processing; HIP = Heuristic Information Processing; CT = Cognitive Trust Towards Advertising Product Information; AT = Affective Trust Towards Brand; PI = Purchase Intention; \* $p < .05$ , \*\* $p < .01$ .

**Table 3. Mean, Standard Deviation, and Correlation of the Measured Variables**

Dependent Variables	Means and Standard Deviations		
	Product Category		
	Furniture	Vitamins	Sporting Goods
Presence	4.89 (.96)	4.09 (1.25)	4.47 (1.30)
Social Presence	3.47 (1.21)	3.26 (1.44)	3.33 (1.23)
Construal Level	7.60 (2.75)	7.52 (3.03)	7.95 (3.22)
Systematic Processing	2.00 (1.67)	2.58 (1.49)	2.48 (1.88)
Heuristic Processing	3.07 (1.79)	2.27 (1.82)	2.68 (2.30)
Cognitive Trust (Advertising Product Information)	4.96 (.93)	4.49 (1.13)	4.50 (1.12)
Affective Trust (Brand)	4.38 (.93)	4.05 (1.24)	3.97 (1.14)
Purchase Intention	2.99 (1.34)	3.3 (1.74)	2.79 (1.34)

Note. Numbers in the parentheses show the standard deviations

**Table 4. Descriptive Statistics of the Measured Dependent Variables for the Three Product Categories**

### 6.3. Hypothesis Testing

#### 6.3.1. PLS Results

H1 and H2 predicted that advertisement presentation mode ([0] = Text mode, [1] = Video Mode) and advertisement type ([0] = Traditional, [1] = LBA) will be positively associated with 1) a sense of presence and 2) social presence, respectively. Results of the path analysis showed that advertisement presentation mode is a significant predictor for a sense of presence ( $\beta = .28, p < .001$ ). Similarly, advertisement type was also found to be significantly associated with the degree to which participants experienced a sense of social presence,  $\beta = .16, p < .01$ . Therefore, H1 and H2 were supported.

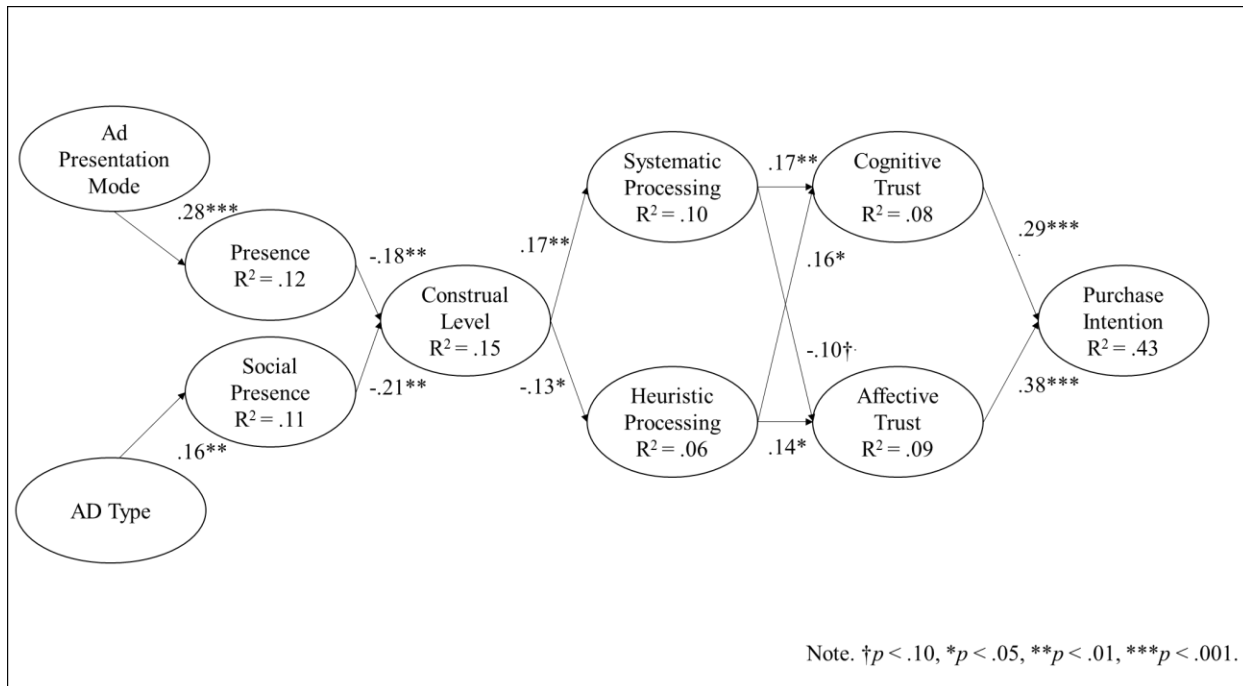
H3 predicted that a) a sense of presence and b) social presence will be negatively associated with construal level. Consistent with the current study's prediction, the results showed that a sense of presence ( $\beta = -.18, p < .01$ ) and social presence ( $\beta = -.21, p < .01$ ) are negatively associated with the construal level. These results were in support of H3(a/b).

H4 predicted that a) construal level will be negatively associated with the amount of heuristic processing, whereas b) it will be positively associated with the amount of systematic processing. In support of the prediction, results indicated that construal level is negatively associated with the amount of heuristic processing ( $\beta = -.13, p < .05$ ), while positively predicting the amount of systematic processing ( $\beta = .17, p < .01$ ). Hence, H4(a/b) was supported.

In H5 and H6, the specific relationship between the mode of information processing and two dimensions of trust was postulated. In detail, while H5 predicted that heuristic processing will lead to greater a) affective trust towards brand and b) cognitive trust towards advertising product information, H6 predicted that systematic processing will lead to a) greater cognitive trust towards advertising product information and b) less affective trust towards brand.

Consistent of the current study's prediction, the results showed that heuristic processing is positively associated with affective trust towards brand ( $\beta = .14, p < .05$ ) and cognitive trust towards advertising product information ( $\beta = .16, p < .05$ ). In addition, it was found that systematic processing is positively associated with cognitive trust towards advertising product information ( $\beta = .17, p < .01$ ). However, systematic processing had a marginal negative impact on affective trust towards brand ( $\beta = -.10, p < .10$ ). In sum, while results were in support of H5(a/b) and H6a, H6b was marginally supported.

Lastly, H7 predicted that affective trust towards brand will positively influence participants' purchase intention. In alignment with the current study's prediction, affective trust towards brand was found to significantly increase purchase intention ( $\beta = .38, p < .001$ ). In addition, cognitive trust towards advertising product information ( $\beta = .29, p < .001$ ) was also found to increase purchase intention significantly. Results showed that H7 is supported. The details of the PLS results are presented in Figure 5.



### Figure 5. PLS model results

#### 6.3.2. Model Fit

In terms of the model fit, we examined the average path coefficient (APC), average R-squared (ARS), average variance inflation factor (AVIF) and average full collinearity VIF (AFVIF) values. AVIF and AFVIF values below 3.3, and the significant APC and ARS indicate a good model fit (Kock, 2017). Overall, the results showed that the proposed model has a good model fit: APC = .14,  $p < .05$ ; ARS = .16,  $p < .05$ ; AVIF = 1.10; and AFVIF = 1.60. The results of the average adjusted R-squared (AARS) score indicated that 14% ( $p < .05$ ) of the variance in the dependent variable was averagely explained by the independent variables in the model.

	Hypotheses	Results
H1	Ad Mode -> Presence (+)	Supported
H2	Ad Type -> Social Presence (+)	Supported
H3a	Presence -> Construal Level (-)	Supported
H3b	Social Presence -> Construal Level (-)	Supported
H4a	Construal Level -> Heuristic Processing (-)	Supported
H4b	Construal Level -> Systematic Processing (+)	Supported
H5a	Heuristic Processing -> Affective Trust (brand) (+)	Supported
H5b	Heuristic Processing -> Cognitive Trust (ad) (+)	Supported
H6a	Systematic Processing -> Cognitive Trust (ad) (+)	Supported
H6b	Systematic Processing -> Affective Trust (brand) (-)	Marginally Supported
H7	Affective Trust (brand)-> Purchase Intention (+)	Supported

**Table 5. Summary of Hypothesis Testing**

## CHAPTER 7. DISCUSSION

In this dissertation, I have extensively reviewed the limitations of existing frameworks that hinder a clear understanding of the effects of a sense of presence on the mode of information processing and persuasion. Given these limitations, this study attempted to build and validate a new way of understanding the underlying mechanism of presence effects on the mode of

information processing and persuasion, through the theoretical lens of CLT. Specifically, on the basis of the conceptual overlap between presence theory and CLT, the current study's theoretical model posited that a sense of presence will replace the role of psychological distance in CLT and prime a certain level of construal. This claim is particularly based on the notion that (spatial) presence is a subjective experience (or feeling) that can be automatically activated through an egocentric reference frame (Wirth et al., 2007). Similarly, CLT posits that the sensitivity to an egocentric reference point underlies the process in which people form psychological distance between self and target. Psychological distance was consistently found to influence people's way of thinking (i.e., construal level; Trope & Liberman, 2010).

Based on this proposition, I predicted that an increased sense of presence, induced by presence-evoking technological affordances (i.e., a video-mode presentation and a location-based service), will lead people to form a low level of construal and make them focus on peripheral cues. By contrast, a lower sense of presence is expected to lead people to form a high level of construal and make them attend to central cues. Subsequently, given the conceptual overlap between the dual process model and CLT, a certain level of construal, primed by a sense of presence, is predicted to influence the way people process information, as people readily apply the activated cognitive state of mind (i.e., construal level) in processing information. To put it clearly, I predicted that heuristic or systematic processing will be influenced in the direction of a primed mental state (i.e., the level of construal), as people utilize the cues (i.e., peripheral or central) they have attended to in processing information.

Consequently, the way people process information, determined by construal level, is expected to sequentially influence the formation of trust and behavioral intention. In detail, I predicted that heuristic processing would be positively associated with affective trust towards

brand as people attend to peripheral information, while systematic processing is predicted to be positively associated with cognitive trust towards advertising product information as people attend to central information (i.e., the quality of product description). Moreover, dissimilar to previous studies, I assumed the positive relationship between heuristic processing and cognitive trust towards advertising product information. This prediction particularly relies upon the proposition that affect can influence the cognitive dimension of human perceptions and that cognitive and affective dimensions are not located at the opposite ends of the attitude continuum. Finally, this framework posited that behavioral intention will be influenced by the degree to which people experience affective trust towards brand.

In sum, this new framework posited construal level as a key factor that accounts for the specific relationship between a sense of presence and the mode of information processing, and its effects on trust and behavioral intention.

### **7.1. Discussion of Findings**

Overall, results from the current study ascertained that video mode and LBS can engender positive effects on a sense of presence and social presence. These findings seem to replicate the previous findings in which video mode and LBS respectively increased a sense of presence (i.e., perceived realism; Kim & Sundar, 2016) and social presence (Shin et al., 2015). Subsequently, in support of the hypotheses built upon the construal level framework, the extent to which people experience a sense of presence and social presence was found to influence the level of construal. This finding underpins the proposition that presence is a construct that is interrelated with the concept of psychological distance in CLT. In addition, construal level, primed by a sense of presence and social presence, positively influenced the amount of systematic processing, while negatively predicting the amount of heuristic processing. These



results indicate that the cues people have attended to (i.e., peripheral or central) may be utilized in processing information, and the style of information processing can be determined in the direction of the construal level primed by a sense of presence and social presence.

Consistent with the prediction of the current research, results have shown that heuristic processing leads people to form greater affective trust towards brand, while systematic processing predicts the formation of greater cognitive trust towards advertising product information. Although the fact that I did not measure cognitive trust towards brand and affective trust towards advertising product information may work as a limitation to make strong comparative arguments, the significant relationships found between the constructs, at least, seem to align well with the previous notion that attitude towards brand can be formed via heuristic processing, while attitude towards advertising product information can be formed via systematic processing (Grigorovici, 2003). In addition, the positive relationship found between heuristic processing and the affective dimension of trust, and systematic processing and the cognitive dimension of trust, also seems to add much to the previous finding (Kim & Sundar, 2016). Although the relationship was marginally significant ( $p = .09$ ), the results showed that systematic processing is negatively associated with the affective dimension of trust, which again supported the previous finding generated by Kim and Sundar.

Additionally, results showed that heuristic processing is positively associated with cognitive trust towards advertising product information. Consistent with the previous notion that affect can influence systematic processing (Pekrun et al., 2002), the current study has found that affect-based information processing (i.e., heuristic processing) can influence the cognitive dimension of human perceptions. Considering that heuristic processing is often assumed to be correlated with the affective dimension of trust, it is not surprising that the affective trust formed

through heuristic processing has subsequently influenced the formation of cognitive trust towards advertising product information. As the amount of heuristic processing increases, people might have formed positive affective trust towards brand. Consequently, this might have extended to the cognitive appraisal of advertising product information. Results from a post-hoc analysis revealed that affective and cognitive trust are significantly correlated, and this seems to provide partial evidence that affect-based information processing is not independent of the cognitive appraisal of advertising product information. The finding, in which both affective trust towards brand and cognitive trust towards advertising product information increased purchase intention, also seems to be indicating that cognitive attitude towards advertising product information is not independent of the affective dimension of human perceptions.

Interestingly, both cognitive trust towards advertising product information and affective trust towards brand were found to significantly increase purchase intention. While the significant relationship found between affective trust and behavioral intention seems to replicate previous studies (e.g., Kim & Sundar, 2016; Jung et al., 2019), the results in which cognitive trust also increased purchase intention call into the validity of the previous findings. Potentially, I suspect that this finding, which is consistent with the theoretical notion that affect and cognition are intertwined (Kret & Bocanegra, 2016), might have been generated by the naturalistic experimental setting through which participants were asked to navigate a familiar social media page (i.e., Huffington post page on Facebook) using their personal computers. In fact, Kim and Sundar (2016) presented advertisements in a pseudo-mobile website of a student organization using a non-personal mobile phone, and this might have worked as an experimental artifact that has generated unexpected findings with respect to the relationship between cognitive trust and

purchase intention. In other words, cognitive trust may also have a positive impact on behavioral intention insofar as naturalistic experiences are ensured.

Nonetheless, the results showed that affective trust towards brand ( $\beta = .38$ ) more reliably predicts purchase intention than cognitive trust towards advertising product information ( $\beta = .28$ ). This finding suggests that the affective way of processing information (i.e., heuristic processing), as compared to systematic processing, may lead to greater persuasion. Similarly, Lee et al. (2015) found that while both cognitive trust and emotional trust towards an avatar agent increased customers' purchase intention in the context of e-commerce, emotional trust was found to have a stronger impact on purchase intention. This demonstrates that forging affective trust towards brand through presence-evoking technologies may be conjugated as a useful means to positively influence consumer behaviors. In sum, these findings provide insights into how interactive and immersive technologies could be utilized in the persuasion context (e.g., advertising).

## **7.2. Theoretical Implications**

There are several benefits of employing the construal level framework in accounting for the underlying mechanism of presence effects on persuasion. Firstly, this framework has merits as it may work as a "best fit" to withstand and exhaust the conceptual variation in the definition of presence. Specifically, the concept of psychological distance aligns well with the previous conceptualizations of presence, which are defined as 1) a cognitive feeling (i.e., nonconscious process) that can be activated through an egocentric reference frame (Schubert, 2009) and 2) an unnoticed psychological state which is based on automatic processing (Lee, 2004). Even when presence is defined as 3) (affective) involvement (Grigorovici, 2003; Lombard & Ditton, 1997), relatively recent research has shown that psychological distance in the framework of CLT is

negatively associated with the degree to which people experience affective engagement (Williams, Stein, & Galguera, 2014) and spatial distance is negatively associated with an emotional attachment to a target (Williams & Bargh, 2008). These facts seem to mitigate the risks of contradicting the previous conceptualizations of presence. Accordingly, this makes the construal level framework robust. To put it clearly, whatsoever the definition of presence is, this framework will generate consistent findings regarding the effects of presence on the mode of information processing.

Furthermore, while previous frameworks attempted to provide a theoretical account of why a greater sense of presence will lead to heuristic processing through LC4MP, the underlying psychological mechanism remained unclear insofar as it contradicted the proposition that a sense of presence can make people easily decode incoming information. However, as CLT postulates that a sense of distance and construal level can be automatically activated without having cognitive efforts, this framework does not necessarily contradict the proposition that presence is predictive of easy decoding of information.

Secondly, as CLT posits that psychological distance is a subjective experience, employing CLT resolves the problem of excessive reliance on technological determinism in which the MAIN model has engaged. The MAIN model assumes that the sensory richness and realism (i.e., a sense of being there and realism) brought on by a media technology, all of which have previously been conceptualized as sub-dimensions of presence (Lombard & Ditton, 1997), can lead people to form positive thoughts through the utilization of being-there and realism heuristics (i.e., if something appears genuine and real, then it must be good). However, as noted earlier, the meaning of heuristics may differ across individuals as they are defined as knowledge structures stored in our memory through previous experiences and observations (Higgins, 1989).

In this regard, being-there or realism heuristics may not always have a common meaning among people, but the meaning of such heuristics may be subjective and vary upon individuals' previous experiences. CLT acknowledges that the degree to which people experience psychological proximity (or a sense of presence) towards a target may differ across individuals and thereby underpins the idea that the meaning of heuristics may be subjective. This also allows us to account for the reason individuals, at times, engage in deliberation, even when salient cues, such as being-there and realism cues, are present in a media interface.

Thirdly, the construal level framework provides a clear understanding of why a lower sense of presence is predictive of systematic processing. While previous frameworks (e.g., LC4MP, the MAIN model) postulate that a lower sense of presence will activate systematic processing by making people cognitively available to process information in a deliberative way, it is very unclear if cognitive availability will always lead people to process information in a deliberative way. Given the notion of HSM in which it is posited that the opposite endpoint of heuristic processing on a continuum is not systematic processing, it might be the case that a lower sense of presence will still lead people to engage in heuristic processing, but relatively decreasing its amount. In other words, the past frameworks do not clearly tell if a lower sense of presence will indeed lead to systematic processing. However, CLT provides a clear account of why a lower sense of presence will lead to systematic processing through the proposition that a high level of psychological distance can lead people to apply the abstract way of mind (i.e., attending to central information: a high level of construal) in processing information. In addition, this framework also mitigates the risk of generating mixed findings regarding the effects of presence on the mode of information processing, when presence is defined as involvement.

Fourthly, CLT allows us to take a parsimonious view of how a sense of presence influences the way people process information and persuasion by directly providing the evidence that psychological distance is associated with people's way of thinking. The fact that psychological proximity is associated with construal level seems to clearly address the reason a heightened sense of presence will lead to heuristic processing whereas a lower sense of presence will lead to systematic processing. In other words, having the level of construal as a mediator allows us to build a simple and a concise structure framework since the level of construal accounts for all previous findings that pertain to the relationship between presence and the mode of information processing. The theoretical linkage between psychological distance and people's way of thinking directly allows us to hypothesize that a mental state primed through psychological proximity (i.e., a sense of presence) will extend to the way people process information.

Finally, the construal level framework provides details regarding the relationship between the mode of information processing and trust. Unlike previous studies, this framework is built upon the proposition that affect can influence cognitive processing, and, thus, allows to predict that heuristic processing may also influence the cognitive dimension of human perceptions in the direction of a prevailing affective state (i.e., positive or negative). In presence research, heuristic processing may consistently increase both affective and cognitive trust or attitudes, as a positive connotation is attached to the concept of presence. This way of understanding the relationship between presence and trust dimensions may overcome the limitations of incoherent theoretical accounts generated by previous studies.

### 7.3. Limitations and Future Directions

There are a few limitations in the current research. First, as noted earlier, the fact that the current research did not measure cognitive trust towards brand and affective trust towards advertising product information works as a limitation to argue that cognitive trust and affective trust will indeed be respectively directed towards advertising product information and brand. In this regard, future research should consider measuring both cognitive and affective trust towards advertising product information and brand to ascertain the validity of the current study's theoretical argument.

Second, although the current study did not conduct a mediation analysis to test the mediation paths because we had some non-normal variables (i.e., construal level and the amount of heuristic and systematic processing) in the model, the results might unfold differently when mediation effects are taken into consideration. That is, while each construct introduced in the construal level framework may be directly related to each other, presence may not result in significant effects on purchase intention when construal level, the mode of information processing, and trust come into play in mediating the effects. While the significant direct relationships found between the variables seem to indicate that the presence effects on purchase intention might be fully mediated by construal level, the amount of heuristic and systematic processing, and trust, relatively small path coefficients generated by using non-normal variables (e.g.,  $\beta = .13$ ) suggest that they might play a role in suppressing the significance of mediation paths. In order to confirm the mediating effects, I suggest future researchers increase the sample size to more reliably predict the relationship between the non-normal variables and to develop more reliable and valid measures for the measurement of construal level and the mode of information processing as they engage in some limitations by generating non-parametric data.

Third, while the use of neutral advertisements as stimuli in the current study is guided by previous research to solely focus on the effects of presence on information processing and persuasion, this seems to engage with some limitations insofar as a considerable amount of advertisements in the real world are designed to evoke positive emotional states. In other words, although the validity of the construal level framework was ascertained by the use of neutral advertisements, the results might unfold in a different way when emotion-evoking advertisements are used as experimental stimuli. To confirm whether the construal level framework will withstand the variation in the characteristics of advertisements, future studies should test the effectiveness of this model in other domains of advertisements.

Lastly, as mentioned earlier in the methods section, the fact that the current study used online samples for the validation of the conceptual model may also work as another limitation. Considering that online samples are inclined to more actively engage with social media, this might have potentially affected the results of the current research as participants were asked to navigate a social media page. However, and again, the purpose of this research was to examine people's perceptions of online advertisements that frequently appear on social media. Therefore, it might be more appropriate to have online samples for this line of research.

#### **7.4. Concluding Remarks**

While having a clear understanding of the underlying mechanism of certain phenomena can significantly advance existing scholarship (Lee, 2004b), previous research on the role of presence on persuasion has tended to focus on “what,” rather than “why” and “how,” questions. Unfortunately, this so far has limited a clear understanding of the underlying mechanism of presence effects on the way people process information. In this respect, the current study



attempted to provide a robust theoretical framework that may explicate the mechanism of presence effects on persuasion.

Perhaps, the lack of a consensus over the conceptualization of presence might have led scholars to hesitate in building a robust framework. Although I acknowledge that having a universal definition of presence will add much to the explication of the presence effects on persuasion, this is beyond the scope of the current study. Nonetheless, the new framework introduced in this article, at least, suggests that, whatsoever the definition of presence is, the gap between inconsistent findings revealed in previous studies will be closed. I wish that this framework will work as a headway for future digital persuasion scholars, and contribute to the construction of meaningful knowledge. Further to this, applying this framework to other domains of technologies will also contribute to advancing the practical knowledge of how technological features will affect persuasion in recent advertising contexts.

## **APPENDICES**

## APPENDIX A. Survey Flow

### Consent Form

The current research is approved by the Institutional Review Board at Syracuse University (IRB#: 17-248). Please read the informed consent below and indicate whether you will participate in.

### Informed Consent:

**Notice of informed consent:** Under guidance of Professor Makana Chock, a graduate student at Syracuse University (Mincheol Shin) invites you to participate in a research study. Involvement in the study is voluntary. You may choose to participate or not. This consent form describes the purpose and procedure of this study, along with explanation of your rights as a participant. Please note that you can also save an electronic copy of the consent. In addition, you can print a copy of the consent text for their records.

**Purpose of the study:** The purpose of our study is to test and examine "the habits of people in navigating online websites." You will be asked to complete an online survey based on your experience.

**Procedure:** You are hereby provided with the information to read. Upon your request, researchers of this study will send you a photocopy of the signed document. Please allow us up to 72 hours of processing time after you request a copy.

The experiment will start with having you navigate through an online website and find some information about an experiment. Then, you will be asked to complete a survey based on your experience with the website. Please take your time to answer our questions. The session will take less than 30 minutes.

**Risks:** There is a minimal risk in participating in this study.

We expect that watching advertisements and answering to multiple questions may cause a tiredness. However, we are confident that it will not be excessive.

Please let the researchers know if you experience any discomfort during the experiment via email addresses listed below. You may always withdraw at any time.

**Benefits:** There is no direct benefit to you for participating in this study. However, you are taking part in contribution to the knowledge of communication.

**Confidentiality:** Please note that the current study will ask demographic information that could potentially identify your personal characteristics: age, gender, education, the length of your stay in the United States, and ethnicity. All information gathered from the study will remain confidential. Your identity will not be disclosed to anyone outside of the group of researchers. All data will be analyzed and discussed in aggregate only. The

spreadsheet file that contains data from this study will be encrypted with passwords which will be shared only among the researchers of this study. Whenever one works with e-mail or the internet there is always the risk of compromising privacy, confidentiality and/or anonymity. Your confidentiality will be maintained to the degree permitted by the technology being used. It is important for you to understand that no guarantees can be made regarding the interception of data sent via the internet by third parties.

**Withdrawal:** Participation in this study is voluntary. Withdrawal from the study is without penalty if you feel any uncomforness during the experiment. You will maintain your right to the monetary compensation if you decide to withdraw at any point in time during the study, due to any uncomforness caused by our experiment. You are free to withdraw consent and discontinue participation at any time.

**Compensation:** You are entitled to earn monetary compensation of \$2.5 upon completion of tasks or withdrawal.

**Exclusion Criteria:** You are not eligible for participation if you are under 18 years old or if you have difficulty seeing images or words on a computer screen.

If you have any questions, concerns or complaints about the research please contact: Mincheol Shin (mshin100@syr.edu), a doctoral candidate at Syracuse University  
Dr. Makana Chock (tmchock@syr.edu), Associate Professor at Syracuse University

If you have any questions about your rights as a participant, please contact the Syracuse University Institutional Review Board at (315) 443-3013.

**By Clicking “Yes”, I acknowledge the following statements:**

I am at least 18 years old; I am voluntarily participating in this on-line experiment; and that I have read and understood the "Informed Consent."

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### **Task Information**

This experiment is designed to measure online users' habits and perceptions. In this experiment, **you will be given a task to find a news article on a Facebook page.** During the task, **a pop-up advertisement may appear and please make sure that you attend to all the information as they are part of the experiment.** The next section will instruct you about the requirements and procedures of this experiment.

**Please READ the next section carefully before starting the experiment.**

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### **Procedure**

**1. Please get into the provided link, and *find and read the news article* entitled: “*Is January Really The Best Month To Book Cheap Flights?*” on a**

Facebook page.

2. Before the loading of the article, you may see a **pop-up advertisement**.
3. Please make sure that you **carefully attend to all the information presented during the experiment** as you will be required to answer survey questions based on the information provided during the experimental task.
4. Some of the contents will have **sound or background music**. Therefore, **please make sure that you turn on your speaker and increase the volume**.
5. Please **do not leave your seat while working on the task and make sure that you do not quit this survey link page**.
6. **After completing the task of searching and reading the news article, please come back to this survey link page, and complete the survey**. Once again for your information, please **do not quit this survey link page** while working on the task as you will be required to come back to this page and complete the online survey questionnaires.
7. The survey will ask your thoughts or feelings about the information presented during the experimental task.
8. Please note that **you will not be compensated if our researchers happen to find that you did not go through the given experimental task**.
9. Please make sure that you **do not go back to the link or refresh the Facebook page after you start the survey**. You will be given **only one chance** to go through the experimental task.
10. **Please make sure that you carefully read the procedure**.
11. Please start the experiment by clicking the link provided below:

Website URL: [madgb.github.io/facebook/mv](https://madgb.github.io/facebook/mv)

After you finish the task, please come back to this page and click the arrow button below to start your survey.

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### **Survey Instruction:**

Now, you will be asked to answer the provided questionnaire based on your completed task.

Please read all the instructions and questions carefully, and **CHOOSE** the most **APPROPRIATE** answer that best describes your thoughts or feelings.

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### **Section A (ITC SOPI-Presence)**

Lessiter, J., Freeman, J., Keogh, E., & Davidoff, J. (2001). A cross-media presence questionnaire: The ITC-sense of presence inventory. *Presence: Teleoperators and Virtual Environments*, 10, 282–297.

**Please CHOOSE the most appropriate answer that best describes your experience (A 7-point Likert Scale: Strongly Disagree to Strongly Agree)**

- |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 1. "The characters/objects I saw in the pop-up ad were very similar to characters/objects in real life."          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. "The pop-up ad showed what it is like to use the advertised product in reality."                               | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. "The pop-up ad informed me about what the advertised product is really like."                                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. "By watching the pop-up ad, I could get a realistic sense of what advertised product is like."                 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. "Watching the pop-up ad did not help me learn about the real-life usage of the advertised product." (reversed) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

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### **Section B (Social Presence)**

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

**Please CHOOSE the most appropriate answer that best describes your feelings or thoughts about the pop-up advertisement that appeared before reading the news article. (A 7-point Likert Scale: Strongly Disagree to Strongly Agree)**

1. "While exposed to the pop-up advertisement during the task, I felt like I were close to the seller of the product."

2. "While exposed to the pop-up advertisement during the task, I felt like the seller of the product has responded to my current location."
3. "While exposed to the pop-up advertisement during the task, I felt like the seller of the product was interacting with me."
4. "While exposed to the pop-up advertisement during the task, I felt like the seller of the product was communicating with me."
5. "While exposed to the pop-up advertisement during the task, I felt like the seller of the product was together with me."

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**Section C (Construal Level)**

Trope, Y., & Liberman, N. (2003) Temporal construal. *Psychological Review*, 110(3), 403-421.

Please CHOOSE one of the options that best describes your current thoughts about the statement.

	<b>Low Construal</b>	<b>High Construal</b>
1. Making a list	Writing things down	Getting organized
2. Reading	Following lines of print	Gaining knowledge
3. Measuring a room for carpeting	Using a yardstick	Getting ready to remodel
4. Cleaning the house	Vacuuming the floor	Showing one's cleanliness
5. Painting a room	Applying brush strokes	Making the room look fresh
6. Paying the rent	Writing a check	Maintaining a place to live
7. Locking a door	Putting a key in the lock	Securing the house
8. Climbing a tree	Holding on to branches	Getting a good view
9. Brushing teeth	Moving a brush around in one's mouth	Preventing tooth decay

10. Traveling by car	Following a map	Seeing countryside
11. Washing clothes	Putting clothes into the machine	Removing odors from clothes
12. Resisting temptation	Saying "no"	Showing moral courage
13. Eating	Chewing and swallowing	Getting nutrition

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**Section D (Heuristic & Systematic Processing)**

Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought-listing technique. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive Assessment* (pp. 309–342). New York: Guilford Press.

**You will be given 3 minutes to list all elements or details that you recall from the pop-up advertisement you watched before reading the news article. Please list the elements that you recall from the "Pop-up advertisement."**

( )

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**Section E (Cognitive Trust towards Advertising Product Information and Affective Trust towards Brand)**

Koh, Y. J., & Sundar, S. S. (2010). Heuristic versus systematic processing of specialist versus generalist sources in online media. *Human Communication Research*, 36, 103–124.

**The product information in the pop-up advertisement is... (A 7-point Likert Scale: Strongly Disagree to Strongly Agree)**

**Cognitive Trust towards Advertisement**

1. Credible
2. Well-informed
3. Professional
4. Accurate
5. Qualified



- 6. Experienced
- 7. Trustworthy
- 8. Objective

**The brand in the advertisement is... (A 7-point Likert Scale: Strongly Disagree to Strongly Agree)**

**Affective Trust towards Brand**

- 1. Empathetic
- 2. Indubitable
- 3. Personal
- 4. Warm
- 5. Emotionally invested
- 6. Interested in my well-being
- 7. Willing to listen
- 8. Careful
- 9. Open
- 10. Candid
- 11. Open-minded

**Section F (Purchase Intention)**

Spears, N., & Singh, S. (2004). Measuring attitude toward the brand and purchase intentions. *Journal of Current Issues and Research in Advertising*, 26(2), 53–66.

**Please CHOOSE the option that best describes your idea about the advertised product.**

	Not at all						Extremely
1. I have intention to buy the advertised product.	1	2	3	4	5	6	7

2. I am likely to purchase the advertised product.	1	2	3	4	5	6	7
3. I have high purchase interest of the advertised product.	1	2	3	4	5	6	7
4. I will never buy the advertised product (reversed).	1	2	3	4	5	6	7
5. I will probably buy the advertised product.	1	2	3	4	5	6	7

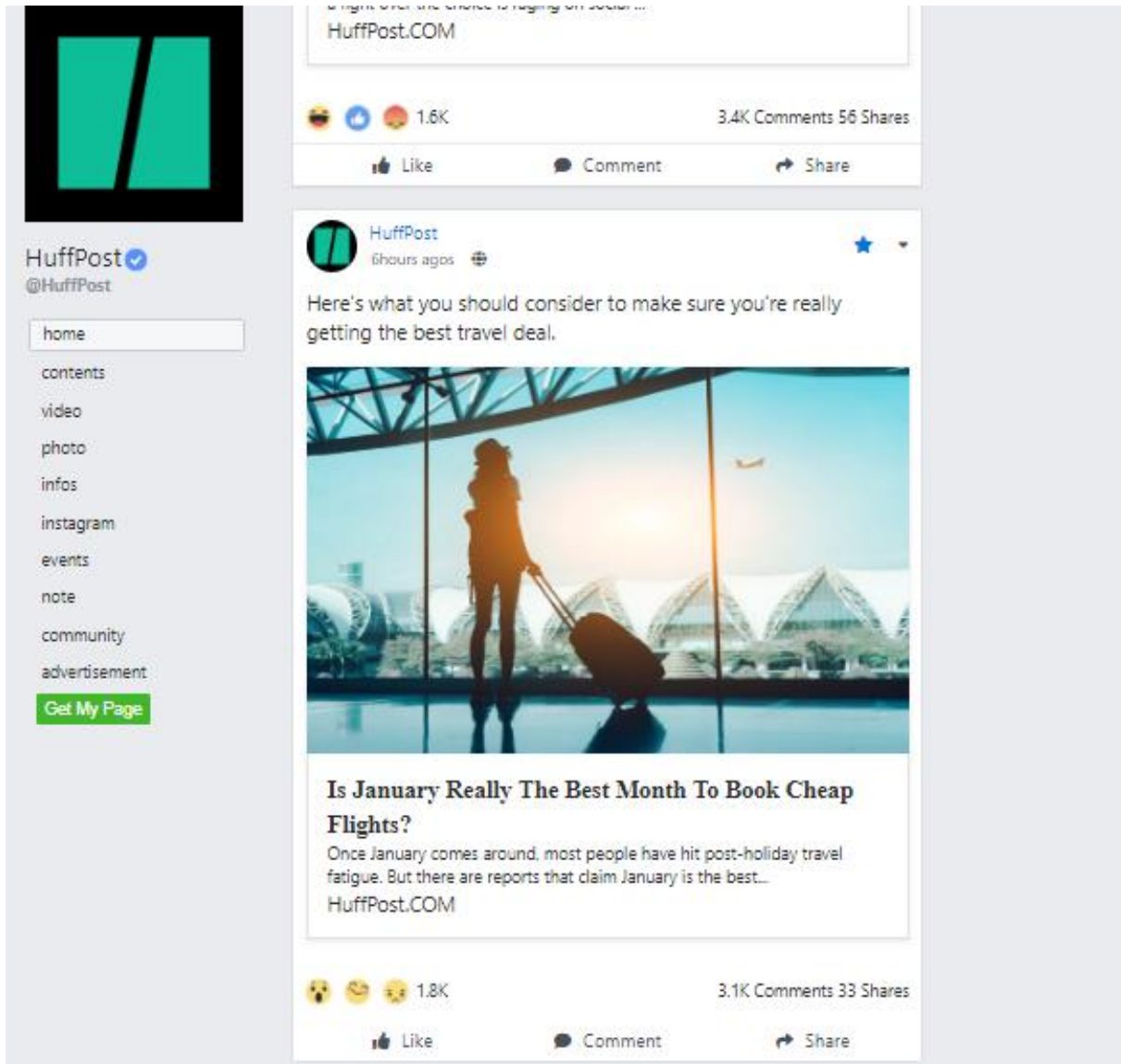
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**Section G (Demographic)**

1. Age: (       )
2. Sex: Male (    ) Female (    )
3. Race/Ethnicity check all that apply:
  - White (1)
  - Hispanic (2)
  - Black/African American (3)
  - Asian (4)
  - Native American/Alaska Native (4)
  - Pacific Islander/Native Hawaiian (5)
  - Multiracial (6)
  - Other (please specify) \_\_\_\_\_

**THANK YOU FOR PARTICIPATING IN THIS STUDY.**

## APPENDIX B. Stimuli



**News Article Placed on the Mock-Up Huffington Post Facebook Page:**

**“Is January Really The Best Month to Book Cheap Flights?”**

**LIFE**

TRAVEL

## Is January Really The Best Month To Book Cheap Flights?

*Here's what you should consider to make sure you're really getting the best travel deal.*

By Taylor Pittman

05/11/2019 12:21pm ET | Updated January 11, 2019



**A News Article Presented After the Exposure to the Pop-Up Advertisement.**

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## VITA

### EDUCATION

---

**Doctor of Philosophy (Mass Communication) | 2019**  
Syracuse University, Syracuse, NY, USA

**Master of Communication Studies | 2016**  
Nanyang Technological University (NTU), Singapore

**Bachelor of Arts (Journalism and Mass Communication & Psychology, Dual Degree) | 2012**  
Sungkyunkwan University (SKKU), Seoul, Korea

### RESEARCH AREAS

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#### **New Media Technologies (Human-computer interaction & Computer-mediated communication)**

- Socio-psychological effects of new media technologies
- Uses and effects of simulation technologies on users' cognition
- Virtual and algorithm-based agents (Avatars & Artificial intelligence)
- Human-centered interaction design (UX & UI design)

#### **Persuasive Communication (Persuasion in mediated-communication)**

- Technological affordances and their effects on information processing, trust, and behaviors
- Social judgments and attitude changes in virtual environments
- Location-based and native advertising
- 

#### **Quantitative Methods & Advanced Statistics**

- Multivariate Statistics (CFA & SEM)
- Nonparametric Regression Models
- Variance-based SEM
- Bayesian Statistics
- Supervised Machine Learning Techniques

### ACADEMIC AND PROFESSIONAL POSITIONS

---

**Research Associate, M.I.N.D. Labs International, Newark, New Jersey | April 2019 - Present**



**Research Assistant, M.I.N.D. Labs International, Syracuse, NY | August 2015–August 2018**

- Digital Human Metrics: Scientific testbed for cross-system support and evaluation (ARPA-E)
- “Trust in Native Advertising” study. Nativo
- Presence Workshop, Amazon, Seattle.

**Research Assistant, Virtual Interaction Science lab, NTU, Singapore | August 2013–May 2015**

- “Social TV for the Elderly: When Passive Co-viewing Leads to a Better TV Watching Experience”
- “Effects of Distance and Movements on Social TV Experiences”

**Research Assistant, Samsung Electronics Co. UX team, South Korea | May 2012–August 2012**

- “Gesture Recognition System and Voice-Agent Usability Testing”

**Data Analyst, KORAIL, Seoul, South Korea | April 2012 – October 2012**

- “Analysis of the railroad incident rate data”

**Research Assistant, Department of Interaction Science, SKKU, South Korea | March 2011–March 2012**

- “Smart TV Interface Design & UX Measurement”
- “Gesture Recognition System UX Measurement”

**Intern, Carat Global (Advertising and Marketing Company), South Korea | October 2010–January 2011**

- “Air Asia Brand Launching and Promotion in South Korea”
- Social Media Manager

**DOCTORAL DISSERTATION**

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“Towards an explication of the presence effects on information processing and persuasion: A construal level framework”

**Doctoral Committee:** Professor Frank Biocca, Co-Chair (Communication); Associate Professor Tamara Makana Chock, Co-Chair (Communication); Professor Dennis Kinsey (Communication); Associate Professor Leonard Newman (Social Psychology); Associate Professor Qiu Wang (Education & Methodology); Professor Jeffrey Stanton (Data Science)

**ACADEMIC PUBLICATIONS**

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**Refereed Journal Articles**

1. International Journal of Human-Computer Studies

***Shin, M.***, Song, S. W., Kim, S., & Biocca, F. (2019). The effects of 3D sound in a 360-degree live concert video on social presence, parasocial interaction, enjoyment, and intent of financial supportive action. *International Journal of Human-Computer Studies*, 126, 81-93.

2. Computers in Human Behavior

***Shin, M.***, Kim, S., & Biocca, F. (2019). The uncanny valley: No need for any further judgments when an avatar looks eerie. *Computers in Human Behavior*, 94, 100-109.

3. Journal of Health Communication

Lee, E. W. J., ***Shin, M.***, Kawaja, A., & Ho, S. (2016). The augmented cognitive mediation model —Examining antecedents of factual and structural breast cancer knowledge among Singaporean women. *Journal of Health Communication*, 21, 583-592.

### Refereed Conference Papers

1. ***Shin, M.*** (May, 2019). *Towards an explication of the presence effects on information processing and persuasion: A construal level framework*. Paper to be presented at the Annual Conference of International Communication Association (ICA), Washington DC, USA

2. ***Shin, M.***, & S. W., Song. (May, 2019). *Your avatar seems too uncanny to accept your friend request: The role of uncanny valley effects on perceived humanness, trustworthiness, and the likelihood of friendship with an unacquainted user in virtual SNS*. Paper to be presented at the Annual Conference of International Communication Association (ICA), Washington DC, USA

3. ***Shin, M.***, & S, Kim. (May, 2018). *No need for any further thoughts when an avatar looks eerie: How the uncanny valley affects the accuracy of thin-slice judgments on the person behind an avatar*. Paper presented at the Annual Conference of International Communication Association (ICA), Prague, Czech Republic

4. ***Shin, M.*** (May, 2018). *How the uncanny valley affects the accuracy of thin-slice judgments on the person behind an avatar*. Paper presented at the international summer school 2018, Münster, Germany (***Best Poster Award, 3<sup>rd</sup> Place***)

5. ***Shin, M.***, Song, S. W., Lee, D., Cho, Y., & Kim, S. (May, 2017). *What makes a virtual concert more realistic: Spatialized 3D sound with head-tracking function in a multimodal virtual reality system*. Paper presented at the Annual Conference of International Communication Association (ICA), San Diego, USA

6. **Shin, M.**, Song, S. W., Biocca, F., Cho, Y., & Yang, H. (June, 2016). *Effects of reverberation and SPL on social presence and parasocial relationships: Why do people prefer live music to recorded music?* Paper presented at the Annual Conference of International Communication Association (ICA), Kyoto, Japan
7. **Shin, M.**, & Jung, Y. B. (May, 2015). *Effects of LBS on psychological distance in CMC*. Paper presented at the Annual Conference of International Communication Association (ICA), Puerto Rico, USA
8. Sng, J., **Shin, M.**, & Jung, Y. B. (May, 2015). *Social TV for the elderly: When passive co-viewing leads to a better TV watching experience*. Paper Presented at the Annual Conference of International Communication Association (ICA), Puerto Rico, USA
9. Lee, E. W. J., **Shin, M.**, & Kawaja, A. (Aug, 2014). *The augmented cognitive mediation model —Examining antecedents of factual and structural breast cancer knowledge among Singaporean women*. Poster presented at the Annual Conference of Association for Education in Journalism and Mass Communication (AEJMC), Montreal, Canada
10. Jung, Y. B., & **Shin, M.** (May, 2014). *Effects of 3D Presentation on Social Presence and Philanthropy*. Paper presented at the Annual Conference of International Communication Association (ICA), Seattle, USA

## PAPERS UNDER REVIEW

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### Submitted and Under Review

**Shin, M.**, Song, S. W., & Chock, T. M. (Under Review). I don't trust your avatar: Uncanny valley effects on friendship decisions in SNS. *Cyberpsychology, Behavior, & Social Networking*.

**Shin, M.**, Jung, Y. B., Biocca, F., & Makana, T. M. (Under Review). A concreteness matters: The effects of LBS on psychological distance, affective intimacy, enjoyment, and perceived irritation in computer-mediated communication. *International Journal of Human-Computer Interaction*.

## WORKING PAPERS

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**Shin, M.** (In preparation for submission). Towards an explication of the presence effects on information processing and persuasion: A construal level framework.

***Shin, M.***, Lee, D., Seo, Y., & Jung, Y.B. (Data Analysis). Artificial Intelligence vs. Human Intelligence: Understanding the credibility and fairness perceptions of AI decisions in the context of social ultimatum game.

Jung, Y. B., & ***Shin, M.*** (Drafting). Effects of 3D presentation on social Presence and philanthropy

Jung, Y. B., Sng, J., & ***Shin, M.*** (Drafting). Social TV for the elderly: When passive co-viewing leads to a better TV watching experience

## **FUNDING AND AWARDS**

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- December 2018      “Artificial Intelligence vs. Human Intelligence: Understanding the credibility and fairness perceptions of AI decisions in the context of social ultimatum game” project (Investigator)
- Research funding from the Coexistence Reality Lab, Kyunghee University, Seoul, South Korea (\$3,000)
- August 2018      Dissertation Research Funding, Syracuse University, Syracuse, NY (\$ 2,000)
- August 2017      “Trust in Native Advertising” Project (Investigator)
- Research grant from Nativo (\$45,000)
- April 2017      “ARPA-E: Faces program” Project (Investigator)
- Research grant of \$1,890,000 (Declined)
- August 2015      Research Fellowship Award, Syracuse University, Syracuse, NY (\$24,310)
- October 2014      “Social TV for Elderly” Project (Research Assistant)
- Research grant from Singapore Tote Board, Gold Cup 2014, Singapore (\$100,000)
- August 2014      3K Research Grant, Nanyang Technological University, Singapore (\$ 3,000)
- February 2012      Outstanding Research Thesis Award, SKKU, Seoul, South Korea (\$200)

## **TEACHING EXPERIENCE (Overall Average Teaching Evaluation Score: 4.4/5)**

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- Fall 2018      “MCJ3045: Persuasive Communication”, Sungkyunkwan University, Seoul, South Korea

- Special lecture on technology and persuasion (“Persuasion in the Digital Era”)

Spring 2018 “DESN 481: Designing of User Experiences”, California State University, Long Beach

- Guest Lecturer
- Lecture on the methods for UX & UI testing

Spring 2018 “COM 107: Communications & Society”, Syracuse University

- Guest Lecturer
- Lecture on communication technology and digital persuasion

Spring 2018 “COM 600: Minds in New and Social Media”, Syracuse University

- Co-Instructor
- Lectures on technologies and persuasion
- Project supervision

Spring 2018 “EDU 888: SEM and Factor Analysis”, Syracuse University

- Teaching Associate
- Leading class discussions and computer lab sessions
- Independent research supervision

Fall 2017 “DESN 483: Data & Tech Human Interaction Design”, California State University, Long Beach

- Guest Lecturer
- Special topic seminar on Interactive prototype

Fall 2017 “COM 600: Human-Computer Interaction”, Syracuse University

- Co-Instructor
- Lectures on the foundation of interaction design and UI prototyping
- Supporting the instructor

Fall 2014 “Foundation of Communication Studies”, Nanyang Technological University

- Teaching Assistant
- Supporting the instructor
- Tutoring students

## **SERVICES**

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### **Reviewer for Conference**

International Communication Association | *2016 - Present*

### **Search Committee**

Graduate Student Representative of John Ben Snow Chair Search Committee, Newhouse School of Public Communications, Syracuse University | *Spring 2017*

## **Community Service**

President of Korean Graduate Student Association at Syracuse University | 2017-2018

## **THESIS SUPERVISION**

---

Yeonhee Cho (Master's Thesis, 2018). How Virtual Reality Activates Spatial Cognition and Presence to Affect Language Learning

Se jung Kim (Master's Thesis, 2019). Extending the Cognitive Mediation Model: How Fake News Leads to Belief