

ATTRIBUTIONS ONLINE: AN EXAMINATION OF TIME STAMPS, READ RECEIPTS,
AND ELLIPSES IN TEXT-BASED COMMUNICATION

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ABSTRACT

According to social information processing theory (SIPT), humans are actively encoding and decoding information when communicating through technology (Walther, 1992). This study uses SIPT as a theoretical guideline and examines the type of attributions formed when elements such as time stamps, read receipts, and ellipses are present in text-based communication. Malle's (2006) categorization of attribution types was used to analyze attributions from a free response section of an online experiment. Various chi-square tests were used to determine if attributions differed when various chronemic cues were present. Only one hypothesis was supported, but results provide opportunities for future research in this area.

Keywords: social information processing theory, computer-mediated communication, text messaging, read receipt.

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LIST OF ABBREVIATIONS

SIPTSocial information processing theory

CMC.....Computer-mediated communication

INTRODUCTION

Time stamps, read receipts, and ellipses are all functions of text based messaging that have become prevalent in recent years. Time stamps show the date and time in which a message was received and have been used in various mediated forms of communication (Kalman et al., 2006). Read receipts and ellipses are newer additions to the texting scene. Most frequently seen in iMessage, an iPhone text based message service that requires an Internet connection, read receipts let individuals know the status of their message (Apple, 2017; Parkinson, 2015). The words *sent*, *delivered*, or *read* appear next to the time stamp indicating the stage of the message in reference to the receiver. Sent indicates that the message is en route to the receiver, while delivered means that the message has successfully arrived on the receiver's device, but they have yet to read it. Once the receiver has opened the message, the read receipt will then notify the sender that the message has been read (Hunt, 2017; Parkinson, 2015; Whatsapp, 2017).

Ellipses also appear in iMessage (Bennett, 2014). An ellipsis indicates that the other party is in the process of crafting a response (Goldhill, 2014). The ellipsis will only appear when the other party is typing (Bennett, 2014; Stenovec, 2016). Other messaging programs such as Whatsapp, Snapchat, and Facebook Messenger also use different variations of technological cues (read receipts and ellipses) to signal the status of a message. Snapchat for example uses a blue bubble or the face of a user-generated avatar in place of the ellipsis (Snapchat, 2017). The blue bubble or face indicates the other party is in the process of writing a message just as the ellipsis does in iMessage. Over 700 million people worldwide own and use iPhones (Reisinger, 2017), one billion use Whatsapp (Metz, 2016), 1.2 billion use Facebook Messenger (Chaykowski, 2017), and 158 million people use Snapchat (Carson, 2017). People are using these popular applications and have been acclimated to the read receipt and ellipsis-type functions of their respective applications.

Taking a step back from the global technology scene, according to a PEW poll in 2016, approximately 95% of the adult US population owns a cell phone, 77% owning smartphones (PEW, 2017). Another PEW study conducted in 2014 examined technology use in the United States, particularly mobile phone use. Texting is one of the most used features of mobile phones; particularly smart phones, where 97% of users reported texting. 100% of individuals between the ages of 18-29 who participated in the survey sent at least one text during the study period (Smith, 2015). Additionally, 91% of this population used social media on their smart phones. According to the Nielsen International Smartphone Mobility Report (2015), “Americans make or answer 6 phone calls per day, send and receive 32 texts and spend 14 minutes on Chat/VOIP (voice over IP) apps per day” (Nielsen, 2015).

As seen from various survey results, adults use their cell phones frequently. People are sending and receiving messages throughout the day through various applications. While numerous social scientists from different disciplines have studied relationship formation via technology (Baker, 2002; Bonebrake, 2002; Lea & Spears, 1995; McKenna & Bargh, 2000; Merkle & Richardson, 2000; Walther 1992; Walther & Boyd, 2002; Yum & Hara, 2005) and the effect of social media (Davenport et al., 2014; Leung, 2013; Perloff, 2014; Park et al., 2009; Rapp et al., 2013), the impact of time stamps, read receipts, and ellipses on communication-related behaviors has been limited. Time stamps have been available for much longer than read receipts and ellipses, as they are included in email, but are still an understudied element of computer-mediated communication (Kalman et al., 2006). iMessage read receipts and ellipses, and their counterparts in other applications, offer a unique type of communication within text-based messaging offering the users the ability to track the status of their messages. Knowing this information was virtually impossible before these cues were added. Having the ability to track the message status may have

an impact on how individuals make sense of behavior and the type of conversations occurring solely through text.

Due to the overwhelming amount of text-based messaging occurring, and the popularity of the applications that include this technology, it is important to examine how humans make sense of the seemingly constant stream of messages they receive and of the people who send them. This study seeks to understand how people interpret messages and make attributions in text-based conversation. First an understanding of communicative norms must be established. Then past literature on computer-mediated communication and behavior will be examined to identify how people use technology to communicate and the impact this has on their relationships. Lastly, research on attribution formation will be analyzed in order to determine how individuals make sense of behavior.

REVIEW OF NORMS AND BEHAVIOR

Nonverbal Behavior – Defining Norms

Norms have been examined from a number of scholars in varying disciplines. A consistent definition has been hard to attain, but consistent themes appear in norms research. Cialdini specifically has paid attention to how norms manifest in a variety of circumstances. In a prominent study Cialdini et al. (1992) categorized norms into three groups: social, personal, or focal norms. Social norms revolve around what everyone else is doing, personal norms are what an individual believes, thinks, or does, and a focal norm occurs when there is a stimulus present which encourages a certain type of behavior (Cialdini, 2003; Cialdini et al., 1992). Cialdini et al. (1992) conducted a series of studies to examine the impact of perceived norms on recycling behavior. They also examined the impact the three norm types had on individuals when they came across recyclable debris on the ground. They found that all three of these norms could influence an individual's action in regards to recycling behavior. Social norms have also been examined within the field of sociology to understand an individual's behavior when in a group setting.

Lapinski and Rimal (2005), in an explication, attempted to understand how norms are used in research while solidifying a definition and function of norms in behavior. They concluded that norms could be either injunctive or descriptive. Injunctive norms refer to what ought to be done, while descriptive norms refer to what is actually done, often by those within a social group (Cialdini, 2003). These two types of norms can manifest in different ways. Collective norms manifest at the social or institutional level, while perceived norms manifest at the individual level (Borsari & Carey, 2003). Collective and perceived norms can be injunctive or descriptive, depending on the situation (Cialdini, 2003; Miller & Prentice, 1996).

Scholars in sociology have taken a slightly different approach and have identified that norms are determined by the sanctions put in place around expected behavior (Horne & Cutlip, 2002). For example, if the norm is to refill the office copier with paper if it is empty, an employee may receive a social sanction by way of reprimanding, for not refilling it after they used it. Generally sanctioning occurs in a social environment, but can be self-imposed or self-correcting. In this case, an individual believes that their boss will be angry when they do not fill the paper so they will do it to adhere to the norm (Horne, 2001). Horne (2001, 2003, 2004) has paid particular attention to the sanctioning behavior within groups and the impact this has on the behavior of an individual in that group. Horne is also concerned with the impact of sanctioning on deviant behavior (Horne, 2007). Specifically, they are interested in how the punishment (or reward) of a behavior is enforced and the impact sanctioning has on future behavior. Similar to Cialdini's work, Horne examines norms at both the social and individual level. Broadly speaking, norms are a set of expectations one holds due to the perceived or actual expectation of those around them.

Understanding how norms are formed can help identify the type of attributions made by individuals as the attribution formation process relies on an interpretation of another's behavior. Lapinski and Rimal (2005) state that the communication process can be studied in order to understand the formation of norms. In particular, the idea of sanctioning behavior (Horne, 2001) is relevant. If a communicative behavior is deviant or does not adhere to the expectations of a social group, sanctions may occur to curb that behavior. Similarly, injunctive and descriptive norms can be enforced in communicative situations to adhere to conversational norms. The way in which people speak to one another, the words they use, and conversational behavior can be used to identify and categorize normative behaviors in a variety of circumstances. However, in this way communication itself can also be structured by norms.

Nonverbal Behavior – Conversational Norms

Within a conversation, different norms exist which help dictate the flow, content, volume, or even the behavior of the communicators (Burgoon & Jones, 1976). For example, in countries such as the United States, conversational partners are expected to stand approximately 18 inches to 3 feet apart (Burgoon, 1977; Burgoon & Jones, 1976). Any closer or farther away is considered out of the norm and is seen as a violation of space (Burgoon & Le Poire, 1999). Eye contact is generally maintained for 3-second intervals while having a conversation (Argyle & Dean, 1965; Burgoon & Le Poire, 1999). Prolonged eye contact, staring, or wandering is an unwelcome and uncomfortable experience (Argyle & Dean, 1965; Kleck & Nuessle, 1968). Physical and spatial behaviors are not the only conversational behaviors that can be managed by norms. There are numerous conversational behaviors that have been examined under the umbrella of normative behavior (Burgoon & Le Poire, 1999; Schegloff et al., 1977).

Turn taking is one of the most highly studied aspects of communication norms. These studies have shown that there are pre-established conditions that exist in face-to-face conversation signifying turn taking (Schegloff et al., 1977). Sacks, Schegloff, and Jefferson (1974) established a systematic representation of group conversation. One of their conclusions stated that only one party speaks at a time and if there is an occurrence of two or more parties speaking at the same time, parties will actively work to resolve it. Sacks et al. (1974) also state that conversations are locally managed, meaning turns are foreshadowed thorough the use of questions and answers. It is the responsibility of each party to monitor the conversation in order to contribute when it is their turn to speak. When turn-taking rules are not followed, participants can get frustrated (Schegloff, 2000). Social sanctions may occur when these so-called conversational rules are not followed as Horne (2001, 2003) has illustrated in previous studies. Deviant behavior is discouraged in

conversations in numerous ways but is generally worked through as the conversation progresses by use of social or individual sanctions.

Discourse markers are used in oral communication to determine speaker roles and avoid certain deviant behaviors (Fuller, 2003). Discourse markers are words such as “well,” “you know,” or “like,” that signify where a person is in their story and help anticipate if they are going to continue to speak. These cues help signify turn-taking orally, and help the flow of conversation (Sacks et al., 1974). Each of these oral markers serves a different purpose depending on the type of conversation being held (Schourup, 1999).

Discourse markers are still used in online conversation, but cannot be used in the same manner as the conversation is not completely synchronous. Individuals cannot read each word as they are written, but instead will receive the entire message at once when it is sent (Kalman et al., 2010; Madell & Muncer, 2007). Linguistic scholars have argued that the written form of an ellipsis (not the iMessage generated ellipsis) could be a form of a discourse marker in computer-mediated communication (Raclaw, 2006). The absence of face-to-face synchronous conversation has allowed those who use computer-mediated communication to change their communication style and adapt a new set of norms. Sometimes this means they are adhering to the same norms as in face-to-face conversation, but with different identifying markers as is the case with an ellipsis functioning as a discourse marker. Emotions are also difficult to convey via text-based messaging. Recent work has attempted to identify how the use of emojis in text-based messaging can impact a conversation and the behaviors of individuals by expressing a visualization of emotion (Rodrigues et al., 2017; Thompson & Filik, 2016). Emojis present a new opportunity to showcase emotion when using text-based communication that was previously impossible.

Nonverbal cues can also be used to signify listening and engagement in face-to-face conversations (Cassell et al., 2001). Head nods, smiles, and other facial movements are frequently used to show that the receiver is listening to the speaker (Schulman & Bickmore, 2012). These behaviors are important in signifying turn taking and conversational progression. Listening behaviors are unique to face-to-face communication. Head nods and oral acknowledgements are available synchronously as the other person is speaking. This does not break the rules of turn taking as specified by Sacks, Schegloff, and Jefferson (1974) as they do not interrupt the speaker. These nonverbal behaviors are not available through most computer-mediated communication. As such, it is anticipated that the way in which humans communicate and the behaviors used to signify turn taking may be different online.

Physical and spatial actions, nonverbals, discourse markers, and turn taking have all been thoroughly studied in face-to-face conversation. However, many people are now communicating through technology and using text-based messaging in lieu of face-to-face conversation. As such, scholars have started to examine the differences between face-to-face and computer-mediated communication in a variety of ways.

Theories of Computer-Mediated Communication

The lack of nonverbal communication within a computer-mediated environment is a frequently cited critique of text-based mediums (Daft & Lengel, 1986; Lea & Spears, 1995; Walther, 1992). Various theories have sought to understand the differences between computer-mediated and face-to-face communication. Theories such as media richness (Daft & Lengel, 1984, 1986) and social presence (Short, Williams & Christie, 1976) originally claimed that computer-mediated communication was not as rich (media richness) or was depersonalized (social presence). These two theories in particular claimed that the lack of nonverbal communication was detrimental

to relationship formation. Face-to-face communication research showed the importance of nonverbals in relationship development and maintenance (see Culnan & Markus, 1987; Walther, 2010). Walther however, examined the resourcefulness of humans to find a way to make relationships work through technology.

Social information processing theory (SIPT) has shown that humans will use any available cues to process information when communicating through computer-mediated communication (CMC). Specifically, this information can be used to form relationships with and make decisions about others (Walther, 1992). This theory argues that the impression and relational functions communicators rely on in face-to-face situations can be translated into various forms online. Verbal content, linguistic, stylistic, and chronemic cues may be present in computer-mediated communication (Walther, 1992; Walther & Bunz, 2005; Walther & Parks, 2002). Humans adapt their communication style depending on the channel that is used in order to form these relationships and to encode and decode messages (Valkenburg, Peter, & Walther, 2016).

Social information processing theory gives a framework for understanding how individuals form relationships online through the use of cues. Walther (1992; 1996) states that individuals can form relationships through technology as long as they are given enough time to do so. This process will take longer than a face-to-face interaction due to the time lapses between messages and the lack of nonverbal cues that are available (Walther, 1992; Walther, 1993). Previous studies that have examined the differences between face-to-face and computer-mediated communication gave equal time to both forms of communication (Walther, Anderson, & Park, 1994). This ultimately led to differences in the type and quality of communication these individuals had within the studies. Walther completed various empirical studies to examine the quality of relationship formation online when participants were given unlimited or extended time to communicate (see

Walther 1992; Walther, 1996; Walther & Burgoon, 1992; Walther, Anderson, & Park, 1994). In sum, given enough time, people will use technology effectively and can establish relationships without face-to-face interaction.

Empirical tests of SIPT tested the effect both time and medium in text-based communication. One of the first studies was conducted by Walther and Burgoon (1992) and analyzed the effect of time and medium on relational communication, particularly in small groups. Walther (1993) also examined an interaction of time and the medium on impression development. Both of these studies showed support for SIPT, as those in the computer-mediated conditions needed more time than in the face-to-face conditions to connect with each other, but created relationships that were not statistically different (Walther, 1993, Walther & Burgoon, 1992). More recent works have replicated the original SIPT findings, lending empirical support to the theory (Hian et al., 2004; Wilson et al., 2006). Social information processing assumes that humans will use any cues available to them to interpret information, and this has been shown to lead to relationship formation that parallels face-to-face. The next logical step for this theory was to understand what kinds of information functioned as a SIPT cue in computer-mediated communication, and how individuals made sense of the cues and their communication partners.

There have been numerous studies that have looked at language potency in online discourse as it relates to social information processing. Expressions of irony (Hancock, 2004), instructor immediacy (LaRose & Whitten, 2000), affiliation (O'Sullivan et al., 2004), intimacy (Bazarova, 2012) and online disclosure (Gibbs et al., 2006; Valkenburg & Peter, 2009) have been examined with a SIPT framework. All of these studies found that humans are indeed adapting to the communicative limitations of the technology. Fundamental to SIPT's principles, they are using the

available information to understand their communication partner in an effort to form or maintain a relationship.

Chronemic, or time-based cues, have also been illustrated as a cue that humans use online (Kalman & Rafaeli, 2005; Kalman et al., 2013; Walther & Tidwell, 1995). Time stamps on their own have been shown to be a cue used in email (Walther & Tidwell, 1995). Job candidates who do not adhere to email response norms are less likely to receive job offers (Kalman & Rafaeli, 2011) and the time of day in which a person receives an email can dictate the implied seriousness (Liu et al., 2001). Time stamps give message receivers a cue in which to better understand their communication partner. As such, there may be other cues online that help negotiate turn taking, sanction norms, or encourage people to form decisions about others thus allowing additional information processing to occur.

Turn-taking cues that occur in face-to-face conversation cannot occur in the same manner online. Head nods and oral affirmations are simply not possible. However, previous studies have noted that turn taking cues still exist online (McKinlay et al., 1993). Users may also exploit the system to accomplish turn-taking and other communication tasks more efficiently (Condon and Čech, 2001). Garcia and Jacobs (1999) found that in quasi-synchronous systems (such as instant messaging) individuals found it difficult to manage turn taking because there was not a system in place that let them view “utterances-in-production.” This means they did not know when another person was responding to them, unless they explicitly said so through language. While it is not possible to speak at the same time in the same manner as face-to-face communication, it is possible to inappropriately respond to a message, respond at an inopportune time, or send too many or two few responses in text-based messaging (Anderson, et al., 2010).

To this end, it is of interest to this study if time stamps, read receipts, and ellipses function as chronemic cues that humans can use to make sense of the behavior of others and use to enforce the sanctioning or formation of norms, thereby aiding individuals in their communicative goals. It is proposed here that these turn-taking cues allow users to identify when a message has been read (read receipts) and when the other person is responding (ellipsis) which in turn helps individuals encode and decode information about their communicative partners. This has the potential to change how individuals gauge when it is their turn to speak or interpret new information about the other person by giving them the opportunity to see when someone is responding thus impacting how behavior and the flow of communication is interpreted and executed online. Therefore, this study examines how attentive people are to these cues in computer-mediated communication. The following research question was formed:

RQ: Do humans use read receipts and ellipses as cues in text-based communication?

Walther (1996) took SIPT a step further by proposing the hyperpersonal model of communication. This model states that it is possible for people to put their best foot forward when communicating through computer-mediated communication, and this may lead to relationships that are founded on positive communication. When texting or emailing, communicators have the ability to craft their messages very carefully. This allows receivers to form positive perceptions, because they are relying on the text-based messages from others thus forming hyperpersonal relationships. Asynchronous communication lends itself to the hyperpersonal model of communication. When individuals are given enough time to craft their messages, they will self-select the information to distribute.

Texting was traditionally described as an asynchronous method of communication; meaning it there was a lapse between messages. Recently however, texting and instant messaging

has been referred to as near-synchronous (Rettie, 2009) or quasi-synchronous (Garcia & Jacobs, 2010). This form of communication is called near or quasi-synchronous because posted messages are available synchronously, but the process of crafting a message is asynchronous (Garcia & Jacobs, 2010). This means that texting or instant messaging has the benefits of asynchronous communication (participants can edit a response before sending it) and synchronous communication (participants can communicate with one another at any time) (Retti, 2009).

A study by Jaing, Bazarova, and Hancock (2013) found that self-disclosure was perceived as more intimate in computer-mediated conversations than in face-to-face conversations. Individuals were also more likely to reciprocate with self-disclosure statements online, than in person. This has important implications for both SIPT and hyperpersonal research. First, it helps to understand the type of relationships people can form online. Contrary to the original theories like media richness, text-based or asynchronous mediums can and do allow for more personal conversation. Next, this research empirically tested the hyperpersonal model. Lastly, this type of research paves the way for future hyperpersonal studies by illustrating the types of (hyper)personal relationships that can be formed online in varying levels of synchronous media.

It is apparent that humans are forming intense relationships, and are able to maintain these relationships through technology. People are also using computer-mediated communication more than ever before, in almost every aspect of their lives. As this form of communication is changing the way relationships form and maintain it is important to examine how humans explain their own communicative behavior and the behavior of others from the information they are given. Social information processing theory gives a theoretical foundation in which to begin to understand how humans make sense of the world around them.

Humans use what is available to them to make decisions about others by encoding and decoding messages in both face-to-face and computer-mediated communication situations. Humans also use their experiences with others to explain behavior. Attribution theory has been used widely to help social scientists attempt to understand how humans make sense of the world around them. Although less frequently used in computer-mediated communication research, this theory may also help understand how much impact time stamps, read receipts, and ellipses have on the relationships formed and maintained through technology. Manusov (1990) stated that there are two kinds of assumptions about information processing in attribution theory. First, people are actively interpreting events around them, and second that attributions are made using consistent and logical bases to make causal claims. The following section breaks down attribution research in order to examine the attributions formed as a byproduct of text-based computer-mediated communication.

Attribution Theory

Attribution theory attempts to understand how people make sense of behavior. Attributions can be made about one's own actions or the behavior of others (Seibold & Spitzberg, 1982). This theory has been used and improved since the 1950's by a variety of social scientists in communication, anthropology, sociology, and psychology. Attribution research has been conducted in many different circumstances in an attempt to explain and interpret behavior (Malle, 2006). Ruben and Ruben (2001) state various types of researchers "are concerned with how people glean information from the situation during interaction, how attributions shape relationships, and how attributions influence future communication" (p 321).

Attributions are the perceptions of the causes of a behavior (Bazarova & Hancock, 2010; Heider, 1958). Originally, attribution theory was outlined by Heider (1958), but social scientists

from many other disciplines have worked to understand human behavior in a similar fashion. In particular, Kelly (1967), Jones (1976), and Weiner (1972) were influential in making social psychology and attribution theory a popular frame of study. Attribution research has often been focused on the causes of behavior. The actor-observer hypothesis (Jones & Nisbett, 1971), the fundamental attribution error (Ross, 1977), the self-serving bias (Ames, Ames, & Garrison, 1977; Bradley, 1978; Small & Peterson, 1981; Taylor & Koivumaki, 1976; Wells, Petty, Harkins, & Harvey, 1977; Zuckerman, 1979) and the correspondence bias (Gilbert & Malone, 1995; Jones, 1976) are all variations of attribution theory that have been tested. These studies have all placed an emphasis on the causes of behaviors. Many times a simple breakdown of attributions occurred, placing an attribute into one of two categories. Often, these models insinuated humans understand behavior for themselves and for others in different ways, thus biasing their interpretation of behavior.

In 1971 Jones and Nisbett formulated the actor-observer attribution model. This hypothesis stated that actors perceive their own behavior differently from others. More specifically, actors interpret their behavior to situational causes while attributing others behavior as a product of disposition. A frequently cited example from Jones and Nisbett (1971) would be winning a baseball game. An actor would believe that they lost the game because the weather was bad (situational). On the other hand, if the other team lost it was because they were bad at baseball (dispositional). The actor/observer model is still widely used today to attempt to explain attributions of the self and others.

The 1970s also saw the rise of uncertainty reduction theory (Berger, 1979). This theory relied on much of the previous attribution research. Previously, Berger and Calabrese (1975) found that humans want to reduce uncertainty about each other when they first meet. By engaging in

conversation, individuals can ask questions and seek information. This conversation allows them to engage in what Berger and Calabrese (1975) called proactive or retroactive attributions. They make sense of a person's behavior either by using past actions to predict future actions (proactive) or past action to explain present actions (retroactive) (Berger, 1979). These attributions help conversational partners anticipate and explain conversational behavior. This research paved the way for future attribution studies, by highlighting the process by which humans attempt to understand one another.

Research on attributions in the 1980s and 1990s brought to light the importance of intentionality, motive, and causality for behavior (Seibold & Spitzberg, 1982; Silars, 1982). These studies were some of the first to examine communication-related events that led to attributions (Basarova & Hancock, 2010). They relied heavily on the actor/observer bias, insinuating that the self perceives their own behavior as different from the behavior of others. While this introduction of attributions into the field of communication appeared to be a highly explanatory method of study, it has come to light that the actor/observer bias may not be as strong as originally anticipated, particularly in communication related events.

Within the last 20 years attribution research has expanded. As more research has been conducted, the original dichotomous definitions of attributions have been called into question. In particular, a meta-analysis conducted by Malle (2006) found that the actor-observer model has been tested frequently, but the results do not fully support attribution theory. Malle (1999) argues that the attribution model should be expanded beyond simply internal/external or dispositional/situational explanations for behavior. Malle is not the only one to raise issues with the original attribution model. In particular, attributions for communication related events have

been called into question (Sillars, 1982). Communicative events are too complex to be categorized into one of two categories.

Given the questionable support for the theory, and the misuse in communicative situations, a new model was created. The folk-conceptual framework aims to modify traditional modes of studying attribution, to account for the various attributions humans make in a given social situation. Humans make attributions about others through a mental process. The folk-conceptual framework attempts to explain this process, and is one a commonly accepted model for understanding attributions (Malle, 2004).

Folk- Conceptual Framework for Behavior Explanations

The folk-psychology, folk-centered, or folk-conceptual framework (here referred to as the folk-conceptual framework) for behavior explanations enhances the original attribution theory by differentiating between intentional and unintentional behaviors (see Figure 1) (Malle, 1999). This model breaks down intentional behaviors into three smaller types of attributions: reasons, causal history factors, and enabling factors. Reasons can be further analyzed into belief, desire, or valuing judgments. A mental marker may also be present in any of the three reason attributions (Malle 2004; Malle, 2006). To fully understand this complex framework, this section breaks down each individual part of the model.

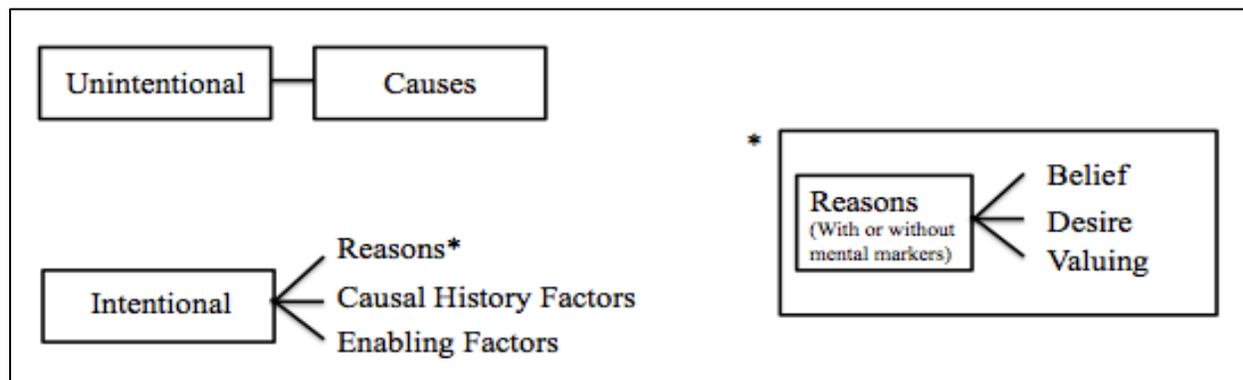


Figure 1. Visual representation of the folk-conceptual theory of behavior explanations

Perceived intent of behavior adds an extremely valuable piece to understanding attributions and is the first step in identifying the type of attribution that has been made. Malle and Knobe (1997) indicated there are five requirements necessary in determining if a behavior is intentional. In order to be intentional, the perceiver must see a behavior satisfy the following requirements: 1) the individual must have a desire for an outcome, 2) the individual must have beliefs about the action leading to that outcome, 3) the individual must have an intention to perform the behavior (which is a decision to act based on beliefs and desires), 4) the individual must be aware they are performing the behavior, and 5) the individual must have the skills to perform the behavior. If all of these requirements are met, the behavior is perceived to be intentional (Malle, 1999; Malle, 2006).

Bazarova and Hancock (2010) provided this example to explain the difference between an unintentional and an intentional behavior: *a man yells to scare away a dog*, versus *a man yells because a dog scared him*. If a man yelled to scare away a dog, that is an intentional act, as he had a desire to get the dog away from him. However, if the man is scared by the dog and yelled in fear, this could be an unintentional act, as he did not mean to make noise. Perceived intentionality of a behavior is central to the argument individuals make in reference to a behavior.

As mentioned previously, ellipses allow the sender to view when the receiver is crafting a response (Stenovic, 2016). It is anticipated when ellipses are present, but there is no response, perceived intent of the nonresponse will be high. If an ellipsis flashes on the screen it means the communicative partner is crafting a response. When the ellipsis disappears and no message is sent, the act may be seen as intentional as it violates the expectancies of the message receiver and the communicative norms that exist in text-based messaging. If individuals are using read receipts and ellipses as a cue within computer mediated communication, a nonresponse should be perceived as

more intentional when the respondent has started to craft a message, but never sends it. This led to the first hypothesis:

H1_a: Perceived intent of a nonresponse will be highest when ellipses are present

On the other hand, if no cues are present, it is anticipated the perceived intent of a nonresponse will be low. Since there are fewer cues to draw upon to help decode information, it is anticipated that the action would be perceived as unintentional. Therefore:

H1_b: Perceived intent of a nonresponse will be lowest when no cues are present

Intentionality is the starting point in identifying attributions in the folk-conceptual framework; however, the model proposed by Malle (1999; 2004) goes deeper to understand the differences between unintentional and intentional perceptions of behavior. The section that follows is a breakdown of the intricate pieces within the folk-conceptual framework of behavior explanations.

Explanations for Behavior

Cause explanations of behavior are the explanations given for an unintentional behavior (Malle, 1999). Previous research has indicated that unintentional behaviors, and thus causes, do not occur as frequently as intentional behaviors when making attributions (Malle, 2004). With this in mind, it is anticipated that a nonresponse when visual cues are not given will be perceived as unintentional; therefore causal attributions will be made. Without the additional cues, it is more likely that individuals will interpret a nonresponse to a causal act (e.g. their cell phone died). With this in mind, the second hypothesis was formed:

H2: Individuals will identify more causes in the no cue condition than in other conditions

Intentional behavior on the other hand, is much more complex and can be explained by three different types of attributions: causal history factors, enabling factors, and reasons. Reasons can be broken down even further as a function of the motive: desire, belief, or valuing (Bazarova

& Walther, 2009; Malle and Knobe, 1997). Causal history factors are the first type of intentional behavior attributions one can make discussed here. DeAndrea and Walther (2011) illustrated causal history factors with this example: Anne studied for the test all last night because she is an overachiever. A causal history explanation describes the origin of why an actor behaved the way they did, without explicitly mentioning the reason why (Bazarova & Hancock, 2010; Malle, 1999). Anne did not actively think to act like an overachiever so she could study all night. Instead, Anne's general disposition as an overachiever acted as a causal force on Anne's reasoning process, which led to the behavior (DeAndrea & Walther, 2011; Malle, 2007).

The next subcategory of intentional behavior attributions includes enabling factor explanations. These explanations are for intentional behaviors that take for granted that the individual had an intention to begin with (Malle, 1999). Specifically, this type of attribution is made when the behavior is seen as difficult. To continue with the same example from DeAndrea and Walther (2011) an enabling factor explanation could be: Anne studied for the test all last night because she drank an entire pot of coffee. Drinking a pot of coffee provides an explanation for Anne's behavior, but it does not serve as a causal factor that influences her thinking (Bazarova & Hancock, 2010; Malle, 1999; Malle & Knobe, 1997). It is anticipated that due to the response function of ellipses, enabling factor explanations will be prevalent. When an ellipsis is shown, but are followed by silence, this could act like an interruption (as seen in face-to-face conversation). In this sense, it is likely that an enabling factor attribution will be made to explain the behavior (e.g. they did not respond because they are always busy) because they know the person potentially tried to respond, but was unable to finish as they are assumed to be busy.

H3: There will be more enabling factor explanations when ellipses are present than in other conditions

Lastly, reasons are the mental states viewed as an explanation for behavior (Bazarova & Hancock, 2010; Malle, 2007). Reasons are historically the most frequent type of intentional attribution accounting for approximately 70% of attributions in previous studies (Bazarova & Hancock, 2010; Malle, 1999). There are two criteria for being considered a reason-based attribution: 1) they must believe that the individuals were aware of the reasons behind their action (subjectivity) and 2) they must believe the agents acted on those particular reasons (rationality) (DeAndreas & Walther, 2011; Malle, 2004). In short, reasons should be perceived as the rationale of the individual by the viewer (Malle, 1999). If for example, Anne studied for the test all night because she wanted to do well, this would be a reason explanation that meets the assumptions that Malle (2007) set in place. The perceiver believes that Anne wanted to do well (subjectivity), and that is why she studied (rationality). Due to the nature of read receipts, and their ability to notify the sender of the status of their message, it is likely that the behavior will be perceived as intentional. Because individuals can see that the message was read, but no response was given, they have an established rationale for the behavior. As such, reasons should be the most frequently cited explanation for a nonresponse when read receipts are present.

H4: There will be more reasons in the read receipt condition than in other conditions

The folk-conceptual framework breaks down reasons into three distinct categories in order to differentiate the type of reasoned attribution. These reasons include beliefs, desires, or valuing judgments. As Malle (2004) stated, “A central assumption of the folk-conceptual theory is that people consider the specific desires, goals, and beliefs that presumably drive one’s own or someone else’s intentional behavior.” This directly applies to the three different categories of reason explanations of behavior (Malle, 1999). Beliefs include knowledge and thinking rationale,

desires involve the wants and needs of the individual, and valuing include the perceived likes and dislikes (Bazarova & Hancock, 2010; DeAndrea & Walther, 2011; Malle, 2004; Malle, 2007).

Individuals do not often actively choose to use beliefs, wants, or desires when making attributions. They are often a subconscious addition. For example, one may interpret an interruption as someone not liking what was said (valuing) or they may interpret the interruption as a need for clarification (desire) (Bazarova & Hancock, 2010). This distinction is important to understand, as reasoning behavior is subjective and relies on the perceiver's judgments. To illustrate this, another example will be used: Ian works long hours. When asked why Ian works long hours, Ian's coworkers may perceive beliefs, desires, or valuing as an explanation of Ian's behavior. They may reason that Ian worked long hours because:

- a. he thought he would lose his job (belief)
- b. he did not want to lose his job (desire)
- c. he liked his job so much (valuing)

In conclusion, the type of reason-based attribution given to explain behavior is dependent on the how the perceiver views the behavior. In hypothesis four, it was predicted in the read receipt condition, there would be more reasoned attributions than in any other condition. More specifically the following hypothesis predicts what type of reasoned attribution will be made:

H5: There will be more desire based reason attributions than any other type of attribution in the read receipt condition.

It is expected that the cue-like function of read receipts will lead individuals to believe assume the reason behind the nonresponse behavior was due to a desire or lack thereof (e.g. they do not want to go to dinner).

In the last portion of the folk-conceptual framework, the three types of reasons can be evaluated according to the presence or absence of a mental marker. Mental state markers are verbs such as “think,” “believe,” “want,” “need,” or “like” given as part of the explanation for behavior (Basarova & Hancock, 2010; Malle 1999; Malle et al., 2000). Compare the following two attributions

- 1) Steve went to the party because he was invited
- 2) Steve went to the party because he thought he was invited

In the first sentence, it is apparent that Steve has a reason for going to the party (because he was invited). On the other hand, the second sentence includes the mental marker “he thought.” This implies that whomever made this attribution believes that Steve was not invited to the party. The mental marker casts doubt onto Steve’s attendance at the party. Mental markers allow researchers to analyze an intentional, reasoned attribution one step deeper.

In sum, attribution theory attempts to make sense of the different explanations humans may give about a behavior. The types of language they use within this explanation indicate the type of attribution they have made. Understanding attributions as they occur as a result of computer-mediated communication pushes the folk-conceptual framework and challenges how humans understand technology and their computer-mediated communication partners.

Summary

This review of literature first outlined a broad definition of norms and how they are formed. Next, the differences in face-to-face and computer-mediated communication norms, particularly in regards to turn taking behavior, were summarized. Prior research on CMC insinuated that face-to-face was the “gold standard” of communication, and that relationships could not form without the benefits of nonverbal communication. Walther (1992) brought to light

social information processing theory, which illustrated that humans can form relationships online, they just need enough time to do so. Humans will use any cues available to process information and meet their communication goals. This brings up an important question, how do humans use these cues? To answer this, attribution theory, and thus the more modern folk-conceptual framework of behavior explanations was identified as a possible explanatory mechanism for understanding how humans use cues online to explain behavior. Time stamps have been used as a chronemic cue in online spaces, therefore its chronemic counterparts, read receipts and ellipses, may be used in this manner as well. Various hypotheses and a research question were proposed in an effort to test social information processing theory, and to expand the bounds of the folk-conceptual framework into the computer-mediated text-based communication sphere. The following section includes the methods and participant data of this study.

METHOD

Research Design

Four short videos of a text-based conversation were created. The text of the conversation remained constant across all conditions. The conversational partners were named after the color of their text bubbles, Blue and White. The conversation appeared as follows:



Figure 2. Text used in experimental conditions

The four conditions were determined by the cues that are available: no cues, a read receipt that stated *delivered*, a read receipt that stated *read*, and the presence of an ellipsis. White did not respond to Blue's invitation to dinner in any condition. The focus of this study is to identify which attributions people make about why White did not respond to Blue. Modeling the Malle and Knobe (1997) and the Ohtsubo (2007) studies, participants were asked to indicate how intentional they believed the act to be. After viewing the short clip participants were asked the following question: *Was White's lack of response intentional or unintentional?* Participants were then asked to identify why they believed White did not respond to Blue's dinner request via free response. The question appeared as follows: *Why did White not respond to Blue's request to go to dinner? Please write your explanation below.* Participants were then given the opportunity to write out their thoughts. This free response section was used within the final coding analysis.

Next, participants were asked to fill out a demographic questionnaire, which included items such as race, age, and gender. Additionally, they were asked if they have a smart phone. As previously stated, read receipts and ellipses are functions of the iMessage program, which requires an Apple device connected to Wi-Fi (Apple, 2017; Parkinson, 2015). This function is on by default, but can be turned off if desired. Those who state that they have an iPhone, were asked if they have turned their read receipt function on. Participants were also asked if they used applications such as Whatsapp, Snapchat, and Facebook Messenger (see Appendix A5 for all survey questions).

Participants and Procedure

Participants were recruited through the basic course at a Midwest university. Participants who completed the survey as part of the basic course were given course credit for completion. A total of 248 people participated in the study. 16 individuals were excluded from analysis for not completing the study in its entirety. An additional 11 participants were excluded from final data analysis due to a mismatch in responses for the consistency check (measurements for intent). Data from a total of 221 participants were used in the final analysis.

Participants were randomly assigned by the survey software to the following cue conditions: read receipt, ellipsis, delivered notification, or no cue condition. Of the 221 participants 49 watched the no cue video, 50 watched the delivered notifications video, 61 watched the ellipsis video, and 61 watched the read receipt video. The sample consisted of 99 males (44.8%), 119 females (53.8%), and 3 individuals who considered themselves to be non-binary or preferred not to answer (1.4%). Most of the individuals who participated in the experiment were white (92.3%), followed by Asian (4.1%), black or African American (1.4%), or identified as other races (2.3%). Many of the participants stated they had smartphones (98.6%); most owned iPhones (76.5.6%),

followed by Android devices (20.4%), Microsoft (1.8%), or used other phone brands (1.4%). 49.7% of iPhone users had their read receipts turned on, 42.6% had them turned off, and 7.7% were unsure if their read receipts were on or off. Participants were also asked to identify the text-based messaging applications or services they used. Texting had the highest frequency of users (98.6%), followed by Snapchat (93.2%), Facebook Messenger (51.6%), and Whatsapp (10.4%). These results resemble the data found in previous PEW and Nielsen studies on text-based messaging (PEW, 2017; Nielsen, 2015)

Two coders, blind to the experiment, were asked to use a codebook to determine the type of attribution made in the free response section. They were trained on the codebook terminology (adapted from Bazarova & Hancock; and DeAndrea & Walther, 2011; Malle, 1999) and were tested for intercoder reliability. Three practice sessions were held to ensure coders understood the codebook and were coding consistently. Each coder received approximately 30 codes during each practice session. The third set of codes was tested for intercoder reliability and was satisfactory on all measures (attribution $p < .001$, 96.7% agreement, $K=0.944$; reason type $p < 0.001$, 100% agreement $K=1.0$; mental markers $p < 0.001$, 90% agreement; gender $p < 0.001$, 100% agreement). Mental markers and gender pronouns had 100% agreement, but were not used in this study.

RESULTS

A one-way ANOVA was used to examine H1_a and H1_b. H1_a and predicted perceived intent would be highest in the ellipsis condition. No significant difference was found $F(3, 217) = 0.668$, $p = 0.573$. While not significant, a visual check identified perceived intent was more frequent in the read receipt condition than in other conditions. H1_a was not supported. H1_b predicted perceived intent would be lowest when no cues were present. In this case, the delivered condition had the lowest frequency of perceived intent. As no significant difference was found between the groups in the one-way ANOVA, H1_b was not supported.

Table 1

One-way ANOVA for H1_a and H1_b of Perceived Intent by Video Condition

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between Groups	3	4.030	1.343	0.668	0.573
Within Groups	217	436.423	2.011		
Total	220	440.452			

A one-way chi-square (Table 2.) test revealed no significant differences in number of causes amongst the four video conditions; $\chi^2(3, N=51) = 0.686$ $p=0.876$. H2 predicted more cause-based attributions in the no cue video condition than in other condition. H2 was not supported.

Table 2

One-way Chi-Square for H2 Causes in all Video Conditions

	Read Receipt	Ellipsis	Delivered	No Cue
Causes	12	15	13	11
	(-0.8)	(2.3)	(0.3)	(-1.8)

The third hypothesis predicted there would be more enabling factor explanations in the ellipsis condition than in other conditions. While this was true within the model, very few enabling factors were coded. Across the four video conditions only four enabling factor explanations were found, three of these were in the ellipsis condition. Due to the small sample sizes for enabling factors and a non-significant model, H3 was not supported.

The fourth hypothesis predicted there would be more reasons in the read receipt condition than in other conditions. Consistent with this prediction, reasons were more frequently given in the read receipt condition ($n=45$) than in the ellipsis ($n=36$), delivered notification ($n=26$), or no cue ($n=26$) conditions. A one-way chi-square was used to examine the proportion of reasons within all four video conditions (Table 3.). However, no significant difference between the groups was found, $\chi^2(3, N=133) = 7.541, p=0.057$. H4 was not supported.

Table 3

One-way chi-square for H4 Reasons in All Video Conditions

	Read Receipt	Ellipsis	Delivered	No Cue
Reasons	45	36	26	26
	(11.8)	(2.8)	(-7.3)	(-7.3)

The final hypothesis predicted there would be more desire-based reason attributions than any other type of attribution in the read receipt condition. A one-way chi-square test was run to examine the types of reasons (belief, desire, or valuing) and attributions in the read receipt condition (Table 4.). This test showed significant differences in proportions, $\chi^2(4, N=61) = 79.246$, $p < 0.001$. Desire-based reasons were the most frequently coded response in the read receipt condition.

Table 4

One-way chi-square for H5 Attributions in Read Receipt Condition

	Cause	Causal History	Enabling Factor	Reason (Belief)	Reason (Desire)	Reason (Valuing)
Attribution	12	3	1	0	39	6
	(-0.2)	(-9.2)	(-11.2)	(0)	(26.8)	(-6.2)

To answer the research question, a qualitative thematic analysis by the researcher of the free response section, combined with the analysis of the quantitative data presented previously was used to present support for social information processing theory. A discussion of these findings follows.

DISCUSSION

Research Question

As stated by social information processing theory (SIPT), people are using cues online to encode and decode information about other people when communicating online (Walther, 1992). This is evidenced by the responses of the participants in the present study. For ease of reading, quoted participants were given gender specific pseudonyms. The design of this study presented both quantitative and qualitative data. This allowed for a deeper understanding of the types of attributions individuals were making when the various chronemic cues were present, and both were used to understand the potential support and limitations of SIPT.

Thematic coding was used identify the types of responses given within the study extending beyond the attribution codebook (Saldaña, 2009). In this analysis, themes within the types of explanations were examined to determine what kinds of cues individuals were using to make sense of the given conversation (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006). Two major groups emerged, those who used the cues and those who used other information to make sense of White's nonresponse behavior.

The first theme identified participants who directly and indirectly mentioned read receipts and the ellipsis within their behavior explanation. Dylan, who viewed the ellipsis condition stated that White, "Accidentally typed, probably had to look at his calendar." Knowing the ellipsis indicates the other party is typing, Dylan made the assumption White did not mean to start typing and that was the cause of the ellipsis. On the other hand, Erica, who viewed the delivered notification video explained, "Maybe they haven't seen [t]he message yet." Realizing that the delivered notification means the receiver has not opened the message yet, Erica attributed the lack of response to an unopened message. These two participants illustrate that at least some of the

participants in this study noticed and used the chronemic cues, specifically read receipts and ellipsis, when making attributions about behavior.

Alternatively, other participants used different types of information to make sense of White's nonresponse, leading to the formation of the second theme. This group included individuals who used other information, besides read receipts or ellipsis, to make sense of the conversation between Blue and White. Barb, who did not have any cues in her video stated,

White seemed very uninterested in the conversation. There was no excitement or enthusiasm, and they used a period after 'Yeah I am.' Also, they didn't say something 'Yeah I am, why?' which is what someone would say if they are interested.

Without any chronemic cues to rely on, Barb used the word choices of both Blue and White to make an attribution for their behavior. She also mentioned the use of a period, which to her signified disinterest. Several other participants echoed Barb's comment about the use of punctuation as a factor contributing to White's nonresponse. Other individuals mentioned items such as word choice or messaging style as a predictor of White's behavior. While not the focus of this study, this data provided helpful insight to the types of information people use when engaging in text-based communication. Future sections will discuss the impact of word choice and punctuation in text-based messages.

Quantitative data also helped illustrate the types of information participants were getting from the provided conversation. If individuals were completely unable to make sense of the conversation, they would not have been able to respond to questions pertaining to intent or to the free response section. With few exceptions, everyone gave an answer to the free response section. This means they were using anything they could within the video to make assumptions about White and Blue. Even with this limited information, people were still able to come to conclusions,

and ultimately form attributions, about White's nonresponse behavior. Social information processing theory was anticipated as a likely framework for understanding how people make sense of text-based communication, but individuals who participated in the study frequently provided extensive suggestions for behavior. Even without nonverbal cues or face-to-face interaction, people were still able to provide attributions for behavior from a very short text-based conversation between two unknown individuals. The research here supports the notion that people use whatever is available to them to make decisions and form attributions about others, even when only text is present.

Recent studies on SIPT have indicated other factors influencing how individuals encode and decode information (Croes et al., 2018; Hian et al., 2004; Wilson et al., 2006). Based on this prior research and the information gleaned from this study's participants, several factors are recommended for future studies on text-based communication and SIPT. Factors such as trust, love and attachment style, liking, world-view, and narcissism may have a large impact on the interpretation of behavior. Several of these items could be measured both qualitatively and quantitatively providing for rich and thoughtful data.

The following sections break down the hypotheses and interpret the results for each test. When the test was not significant, a detailed analysis of the proportions or means for each group was conducted to provide insight for future research.

Hypothesis 1_a and 1_b

Hypotheses H1_a and H1_b were not significant, and the proportions were not in line with predictions. Overall, the majority of individuals believed White's nonresponse was intentional, but offered a variety of explanations for their behavior. The results of this ANOVA show that read

receipts have the highest average score for perceived intent ($M=5.2131$) while delivered notifications had the lowest score ($M=4.84$).

Read receipts and delivered notifications typically function together in text-based messaging. This means that once a message is sent, the sender is notified that the message is delivered, and once it is read, they are notified the message has been read (Parkinson, 2015). It is interesting that read receipts and delivered notifications were perceived somewhat differently in this study. The perception of the nonresponse could be predicated on the perceived intent of the recipient, particularly when delivered notifications and read receipts are available. If a message has been delivered, but has not been read as far as the individual can tell (from the technological cues), it is likely they will consider a non-response as unintentional. Knowing only that the message has been delivered may lead individuals to assume their message has not been read. On the other hand, if the message shows a read receipt notifying the sender that the receiver has read their message, it is likely to indicate the nonresponse is intentional. One participant, Erica, who viewed the delivered notification video, believed that White had not seen the message yet and believed the nonresponse was unintentional. She stated, “Maybe they haven't seen he message yet.” Alternatively, participants like Hailey who viewed the read receipt condition were more likely to assume the message was read, and intentionally did not want to respond. Hailey explained the nonresponse by saying, “Maybe they did not want to go to dinner with them, but didn't want to directly say that.”

Future studies should continue to examine both elements of the delivered and read receipts separately and together to determine how they are used in everyday text-based communication. The detailed examination of the interpretation and use of read receipts could be helpful in explaining the effects these cues have on text-based conversations. Additionally, it would be

interesting to see how these cues are managed within the technology itself considering almost half of iPhone users in this study had their read receipts turned off. Anecdotal evidence suggests individuals attempt to manipulate read receipts. They will read the message on their home screen without opening the message, so the read receipt will still state delivered (Minasians, 2016; Parkinson, 2015). Manipulating the status of the read receipt message could have potential consequences, and should be interpreted with caution in future studies. Read receipts present an interesting area of research in regards to perceived intent in the message sending and receiving process. Read receipts have a compelling future for communication research and their use in text-based communication deserves to be recognized.

Hypothesis 2

Hypothesis 2 specifically examined the causes coded within each video condition. The chi-square was not significant. The ellipsis condition contained the highest percentage of causes than any of the other conditions, including the proposed highest no cue condition (H2). This hypothesis is similar to H1_a and H1_b as it indirectly examines intent. Intent is the primary indicator for determining the type of attribution made by an individual using Malle's (2006) coding scheme. Any act perceived as unintentional will be considered a cause-based attribution. Here we can see again the impact perceived intent has on the type of attribution made by an individual when they are exposed to different types of chronemic cues.

As stated previously, there are five requirements for a behavior to be interpreted as intentional (Malle & Knobe, 1997). The individual must have a desire for an outcome, have beliefs about the action leading to that outcome, have an intention to perform the behavior, be aware they are performing the behavior, and have the skills to perform the behavior. If all of these requirements are met, the behavior is perceived to be intentional (Malle, 1999; Malle, 2006). In the

case of the experiment at hand, White never responds to Blue's request for dinner and participants were asked to identify why the nonresponse occurred. The ellipsis serves the function of identifying when the other party is typing. Keeping Malle and Knobe's (1997) restrictions for determining intent in mind, it is difficult to imagine why White would manipulate the cues intentionally to not respond. Under these circumstances, White would have had to intentionally start typing, delete what they were typing, and never respond on purpose. While it is possible to perceive that White was performing this act intentionally to mislead Blue, it does seem unlikely. The previously stated conditions are not necessarily met when determining intent in this case. Even though participants were not likely thinking systematically, they could have been interpreting the cue logically. Dylan, who viewed the ellipsis condition stated, "[White] Accidentally typed, probably had to look at his calendar." This participant also identified the nonresponse was unintentional thus, it was a cause under Malle's coding scheme. Participants such as Dylan illustrate why the ellipsis potentially led to more cause-based attributions in this study.

Considering the results of H2, great care should be taken in future research to have a larger and more refined sample size. It is possible the ellipsis creates more unintentional, thus more causal attributions in CMC, however, this sample did not find statistically significant results. A larger, more representative sample of specifically iPhone users could also provide meaningful insight to how individuals perceive intent of a message when an ellipsis is present.

Hypothesis 3

Hypotheses 3 compared the proportions of enabling factors within all the video conditions. Due to the small number of enabling factors coded within the sample, the chi-square did not meet the $n > 5$ assumption, therefore the test was not run. H3 was rejected.

Enabling factors were expected to appear frequently in the ellipsis condition due to the nature of the chronemic cue (H3). However, enabling factors may be difficult to perceive in the context given in this study. An enabling factor example relevant to this situation is “White did not respond to Blue because White is always busy.” This explanation does not assume White had any intention (to not respond) to begin with. White is simply always busy and their hectic schedule prevented them from responding. It was anticipated that the ellipsis cue would generate the most enabling factor explanations due to the cue’s function. It is necessary for individuals to start typing a message before the ellipsis shows on their partner’s screen. In this way, a nonresponse would likely be seen as either an unintentional act or as an act devoid of conscious intent (an enabling factor). As discussed within H2, it would be unlikely for individuals to intentionally start a message and not finish it to cause a reaction. Instead, it is possible relational information may play into the lack of enabling factors.

Participants were not informed of the relationship status between, or given any information on, the communication styles of White and Blue. It is speculated that since participants were not informed on how White and Blue normally communicate via text-based messaging or the relationship between them, enabling factors were not frequently found in this study. If participants were told Blue was very interested in a romantic relationship with White and wanted to ask them on a date there would be more context to the conversations, and it is likely the attributions would vary. In this example, if White still does not respond to Blue, individuals may make the enabling factor attribution that White did not respond because they do not know Blue has feelings for them. They are not prioritizing their response because they do not realize the value or strength of the relationship.

An examination of specific relationships that utilize text-based CMC as seen in the previous example, should be conducted to determine the impact of time stamps, read receipts, and ellipses under different circumstances. If participants have a foundational understanding of the type of relationship the conversational partners have, they may be more likely to make different types of attributions. If participants were informed that White and Blue were in a romantic relationship, an employee and a supervisor, or a parent and a child, the explanations for White's nonresponse behavior may have been significantly different. The goal of the present study was to determine if the chronemic cues had an impact in a conversation, but it is possible without relational definition, participants were too uninformed to make a concrete attribution of behavior, particularly enabling factor explanations.

Hypothesis 4

Reasons were most frequently found in the read receipt condition ($n=45$), coinciding with H4. While the chi-square test itself was not statistically significant, the proportions follow the predicted distribution. A p -value of 0.057 is close to reaching significance, however, the hypothesis was not supported. Prior research has shown approximately 70% of attributions are reasons (Bazarova & Hancock, 2010; Malle, 1999). An unequal proportion, one-way chi-square was used to determine if this study coincided with research from previous studies, $\chi^2(3, N=221)=61.036, p<0.001$. This study is proportionally similar to previous distributions of attributions. Previous work generally focused on situations occurring face-to-face. It is interesting to note here that in this case, a computer-mediated event generated similar proportions of reasons.

As mentioned previously, it is possible the sample contributed to the non-significant results for H4. A more refined sample of iPhone users who have read receipts turned on could help determine the influence within the population who uses them most. Additionally, it would be

beneficial to examine only the variations in the read receipts (read and delivered status) to determine the effect on text-based communication. Future research would benefit from a detailed analysis of the internal processes within individuals who encounter read receipts. To this end, qualitative research may be beneficial in determining settings in which read receipts provide additional context to forming attributions in computer-mediated text-based communication. For a reason-based attribution to be formed, Malle (1999) states that the individual has to make a subjective assessment and rationalize that assessment. The most frequent reason within this study was a variation on “White did not want to go to dinner with Blue.” In this case, participants were subjectively assessing White’s behavior (nonresponse) as an indication for their future behavior. As they were notified, due to the read receipt, the message was read, this led them to rationalize White’s behavior.

Hypothesis 5

The final hypothesis attempted to examine the differences in reason types within the different conditions. Specifically, this test looked at the distribution of reason types for individuals who were in the read receipt condition. A primary one-way chi-square was used to determine the proportions of causes, causal history, enabling factors, beliefs, desires, and valuing reasons within the sample. This test showed statistical significance. Desire-based reasons were the most frequent when compared to all other attribution types for individuals in the read receipt condition. As previously mentioned, a variant of “White did not want to go to dinner with Blue” was cited as a frequent explanation for White’s nonresponse behavior. This is an example of a desire-based reason. Participants who used this explanation indicated what White wanted (or in this case did not want) to do. As confirmed by H5, desire-based reasons were the most frequent in the read receipt condition out of all other types of attributions.

When individuals see a read receipt marked read, it is assumed the receiver of the message has read the message. If the receiver does not respond to the message, they still may be providing some information to the sender. Many participants rationalized the nonresponse behavior into a desire-based reason. They concluded that the nonresponse was still a form of communication. A lack of response, knowing the receiver has read the message, indicated a lack of interest in dinner. As mentioned previously, people are using SIPT to make decisions about others. In this case, individuals were using contextual cues left by read receipts to infer information about White and Blue's relationship.

The frequency of desire-based reasons in the read receipt condition once again provides insight to the potential opportunities for studying read receipts. Read receipts give information about the status of a message, from which individuals can make assumptions about their communicative partners. Interestingly, many people turn their read receipts off. Research on read receipts should examine why individuals turn this function off. Of particular interest here is the reason behind the use or disuse of read receipts. This study found when read receipts were on, desire-based reasons were present and participants were making the assumption that White did not want to go out with Blue. Considering they had no background knowledge on White or Blue, this is an interesting conclusion. This raises several interesting questions. First, do read receipts provide additional information in text-based communication? Next, what kind of information is gleaned from read receipts? Finally, what aspects of the read receipts lead to the high frequency of desire-based reasons when read receipts are present and how do people come to these conclusions? The future of read receipt research is primed and ready for study. The preceding questions are an excellent place to start to understand the attribution and social information processing that occurs when read receipts are present in text-based communication.

LIMITATIONS AND FUTURE DIRECTIONS

One of the largest limitations for this study was the effect of punctuation and word choice in attribution formation. Instead of using the read receipts or ellipsis, individuals were using other items located within the conversation to try to understand White and Blue's behavior. Many participants stated the use of periods indicated White's lack of interest in going to dinner with Blue. Abby, who viewed the delivered notification video stated,

White didn't respond to Blue's request to go to dinner because white did not want to go to dinner with blue. It was clear by the way white used punctuation like periods throughout the whole conversation that white did not like blue as much as blue liked white. White is trying to avoid responding to the situation.

Without knowing the relationship the two fictitious people had, Abby was able to make an assumption about their behavior mostly based on their punctuation use. For Abby, using punctuation in this way could be out of the norm, and is not expected in her text messages.

While not the focus of this study, it is interesting to note the impact this could have on computer-mediated communication research and SIPT. SIPT states that individuals will use whatever they can to understand the behavior of others. If this assumption is true, it is obvious that the manner in which individuals choose to communicate will impact their attributions. The goal of the present study was to examine the impact chronemic cues such as time stamps, read receipts, or ellipses have on attribution formation. However, results were somewhat limited and may be due in part to the type of cues individuals used from the provided conversation.

This study illustrated the importance of a focused and refined sample. All individuals over the age of 18 were invited to participate in this study. This sample included those who had all brands and types of cell phones from flip phones to the most recent smart phone. While a large

section of the sample population had iPhones, many had the read receipts turned off. Future research must refine the sample to ensure accurate interpretation of results. It is suggested here that a comparison of individuals who have read receipts on and those who have it off, or iPhone, Android, and Microsoft users could be compared. Additionally, studies can directly examine the impact of read receipts on iPhone users who are accustomed to the function. Read receipt and ellipsis-type cues are a function commonly seen in other applications (Hunt, 2017; Parkinson, 2015; Whatsapp, 2017), but a sample of those specific users should be utilized in a thoughtful way to ensure the best results.

Future research should take extreme care to pretest all proposed conversations when possible to account for the differences in communication style. Communication is always changing, and appropriate measures should be taken to ensure the experiments are as close to real life experiences as possible. Specifically, items such as punctuation and word choice should be monitored and heavily regulated. Attempting to use words that have fallen out of favor or are infrequently used may cause discrepancies within the data and cause participants to focus on unanticipated cues instead of the variables of study. Additionally, it would be beneficial to examine the order in which individuals use visual cues to make attributions about others. For example, in text-based communication it is possible to get information from items such as punctuation, word choice, emoji use, and chronemic cues. The question proposed here, is how to people decide which is the most important piece of information when explaining the behavior of others?

Methodologically diverse studies may be beneficial to understanding behaviors and attribution formation in CMC. First, qualitative interviews or open-ended responses could be used to gain a deeper understanding of the processes individuals use when communicating through text-

based means. As very little research has been conducted on read receipts and ellipses specifically in CMC, interviews or other qualitative methods may provide an excellent starting point in researching these cues. Similar to the present study, open-ended questions often require coding by trained individuals, but can provide potentially meaningful understanding of the data. This yields information surveys may not provide naturally. Of course, a small sample of interviews cannot be representative of the entire population, but can certainly provide helpful insight to understanding the text-based communication process. Second, physiological measures such as eye tracking may also help identify unobtrusively what type of information is being used to make decisions about others when engaging in text-based communication without asking participants to identify it themselves. Other physiological measures may also be helpful in identifying arousal when read receipts and ellipses are present, particularly when the messages are time sensitive or a response is anticipated. Psychological measurements used in tandem with physiological measurements could help facilitate a better understanding of the attribution process when combined in a lab setting.

As previously mentioned, the type of relationship held between communicators may also provide different meaning to chronemic cues in text-based communication. To combat these differences, future research may benefit from conducting experiments in a lab setting. By doing this, the researcher will have control of the communication device used, the presentation of cues, and the type of relationship between the communicators. In a lab setting, researchers can also somewhat unobtrusively observe these groups communicating naturally. This type of research will lay the foundation for more detailed analyses of the effects of chronemic cues in text-based messaging. Potential relationships that may work in a lab setting include but are not limited to: romantic partnerships, friendships, roommates, parent and child, employee and supervisor, or even anonymous pairings. It is important to identify how much the pairings or groups communicate with

one another via text-based methods outside of the experiment in order to determine the impact chronemic cues may have on individuals. If phone or chat logs are used, this could be a relatively easy way to determine communicative patterns of the group.

Cultural or demographic differences may also affect the manner in which individuals make sense of behavior. Race, age, gender, geographic location, and education level could potentially influence how and for what reasons individuals choose to make attributions about others when communicating online. Previous work on social networking sites has found demographic information can play a large role in shaping online communication (Sudeshna, 2012; Wells & Link, 2014; Yu et al., 2018). Structural barriers such as access to the Internet, cell phone service, and quality of the device may also influence the type of behaviors exhibited in text-based communication. For example, smart phone users accounted for a large majority of participants in this study (98.6%) however, the remaining participants may have older generation phones or no phone at all. Due to these factors, the manner in which they perceive their communication partner's behavior may be different than someone who has owned a smartphone for several years. Individuals living in areas with limited cell service may be more accustomed to long delays between messages, while city dwellers expect efficient service and fast response times. These demographic and structural differences should be considered when engaging in research in this area.

Conversation topic may also contribute to attribution formation and the understanding of behavior. For example, a couple who have met through an online dating application may be trying to set up a date to meet. In this case, the read receipts and ellipsis may signal interest or disinterest from either party. Without knowing each other beyond their online dating profile, very little is known about the other person. On the contrary, if a parent and child are texting trying to set up a

dinner date, both parties have years of communication tendencies. For example, the child may know their parent usually works from 9-5 Monday through Friday and even if they know their parent read the message, may be more understanding when a response is not immediate. Additionally, a parent may prefer a phone call over a text and is waiting for an opportune time to call. While these situations are specific, so are the relationships each individual brings to their own conversations. It is important to realize no two groups will be the same and generalizations may be difficult. To this end, theories such as SIPT, expectancy violation theory, or interpersonal deception theory may be used contextually within text-based communication. Like SIPT, bringing traditionally face-to-face oriented theories to the online sphere may provide insight to the mental processes that occur when communicating through certain channels when various cues are present.

CONCLUSION

In sum, social information processing theory provides a framework for understanding how individuals are using chronemic cues in text-based conversations to make attributions about others' behavior. Chronemic cues such as time stamps, read receipts, and ellipses may be influencing how people are communicating via text-based messaging. This exploratory study made several predictions that were not supported by the data. The supported hypothesis successfully predicted the largest proportion of desire-based reasons in the read receipt condition. This shows that people are using read receipts most often to make reason-based attributions when read receipts are present. Practical applications of this study emphasize the need for more research examining text-based communication, and read receipts provide the most enticing opportunities for future research endeavors.

While results of this study were often not in the predicted direction, interesting findings still created avenues for exploration. One thing is clear, people are using any available cues in text-based communication to form attributions and make sense of behavior. Without the use of non-verbal cues to guide them, people have started using all the possible information given to them within a conversation, down to the last period...

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APPENDIX A. EXAMPLE OF ELLIPSIS CONDITION



APPENDIX B. EXAMPLE OF DELIVERED CONDITION



APPENDIX C. EXAMPLE OF READ RECEIPT CONDITION

Today, 7:32 PM

Hey! How are you?

Good. What's up?

Not much. Are you around this weekend?

Yeah I am.

Awesome! Wanna grab dinner on Saturday?

Read 7:32 PM

APPENDIX D. EXAMPLE OF NO CUE CONDITION



APPENDIX E. LIST OF SURVEY QUESTIONS

1. The following is a text-based conversation between two people. They will be referred to by the color of their message bubbles: Blue and White. The video was taken from the perspective of Blue, and occurred in real time. Please watch the video and respond to the questions that follow.
2. White never responded to Blue's request for dinner. Was White's lack of response intentional or unintentional?
 - a. Intentional
 - b. Unintentional
3. On a scale from not at all intentional to completely intentional, how intentional was White's lack of response?
 - a. Not at all intentional
 - b. Very unintentional
 - c. Somewhat intentional
 - d. Neither intentional nor unintentional
 - e. Somewhat intentional
 - f. Very intentional
 - g. Completely intentional
4. Why did White not respond to Blue's request to go to dinner? Please write your explanation below.
5. What is your age
 - a. 18-75+
6. Please select the following option that most closely represents you:

- a. White
- b. Black or African American
- c. American Indian or Alaska Native
- d. Asian
- e. Native Hawaiian or Pacific Islander
- f. Other

7. What is your gender

- a. Male
- b. Female
- c. Non-Binary
- d. Prefer not to answer

8. Do you have a smart phone?

- a. Yes
- b. No

9. You previously stated that you have a smart phone. What brand of smart phone do you have?

- a. iPhone
- b. Android
- c. Microsoft
- d. Other, please specify_____

10. You previously stated that you own an iPhone, do you have the read receipt function turned on?

- a. Yes

- b. No
- c. Unsure

11. Do you use your smartphone to text?

- a. Yes
- b. No

12. Please select which of the following applications that you use:

- a. Whatsapp
- b. Snapchat
- c. Facebook Messenger
- d. None of the above

APPENDIX F. CODEBOOK GUIDELINES

A. Participant Number (Imported from Survey Software)

- a. 1-248

B. Intention (Imported from Survey Software)

- a. 1 = intentional
- b. 2 = unintentional

C. Attribution

- a. 1 = cause
- b. 2 = causal history
- c. 3 = enabling factor
- d. 4 = reason

D. REASON type

- a. 1 = belief
- b. 2 = desire
- c. 3 = valuing

E. Mental Marker

- a. 1 = no
- b. 2 = yes

F. Gender Pronouns

- a. 1 = no
- b. 2 = yes he
- c. 3 = yes she
- d. 4 = yes he/she