Aging and Communication Channel Preference, Selection, and Outcome

By

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Abstract

This dissertation addresses two ways of studying ways to communication (communication channels; e.g., telephone, letters, texting, Facebook, etc.). Perspective one considers individual perceptions of the features of different communication channels. Perspective two classifies channels based on the cues (visual, aural, textual) that they carry. Two studies investigate these different perspectives. In study one, college students and internet-using older adults ages 60 and older report on four interpersonal communication scenarios, including the channels that they used. The study showed diverse views on the features of communication channels, demonstrating the importance of considering individual perspectives. Study one also found some support for changing social goals (as outlined by Carstensen's socioemotional selectivity theory) influencing preference for and selection of communication channels. In study two, college student participants reported on their relationships with same-age, parent-age, and grandparent-age partners over the course of one semester. The study found that these relationships involve the use of multiple communication channels, but that the cues the channels carry do not influence the relationships over time. Advantages and disadvantages of both means to study communication channels are discussed, and directions for future study of new communication channels is offered.

Aging and Communication Channel Preference, Selection, and Outcome

General Introduction

We live in an age of ubiquitous mediated communication that extends the bounds of interpersonal relationships in ways both pernicious and beneficial. In communication with those close to us, our communication options are shaped by more than distance and message urgency. While those features still play an important role in deciding how to communicate, other features of communication channels, as well as personal preferences and habits, increasingly matter as well. The study of communication channels in interpersonal relationships thus requires an efficient and effective way to study communication in an environment of channel multiplicity.

This dissertation investigates two ways to understand communication channels. A social approach suggests that differences between channels are driven by user perceptions; for example, individuals may differ in how useful they rate text messaging in situations requiring them to interact with others. An objective approach takes a researcher-centric perspective and suggests that there is variability of features between, but not within, channels. These two perspectives can be used to study preference for and selection of communication channels, as well as the outcomes resulting from their use.

This dissertation is organized into four chapters. In the first chapter, I describe the foundational principles guiding the social and objective perspectives. In the second chapter, I discuss study 1, in which younger and older adults indicate their perceptions of different ways of communicating and their selection of channels in daily, interpersonal communication scenarios. In the third chapter, I describe study 2, in which college students report on relationships with

same-age, parent-age, and grandparent-age communication partners over the course of a semester. In the final chapter, I assess both perspectives and offer directions for future research.

What We Talk About When We Talk About Technology and Communication

As befits an age of rapidly changing technology, terminology has yet to standardize for discussing important aspects of communication channels. There are a range of terms, from broad to specific, that can be used to establish a consistent and coherent shared vocabulary. First, the term "computer-mediated communication" (CMC) is a blanket term used to describe multiple forms of communication that occur over computer-based devices. A single definition of the term has not yet emerged. Media richness theory (Daft & Lengel, 1986; Trevino, Daft, & Lengel, 1990) has been used extensively to predict the selection of communication channels, but the authors never use the term computer-mediated communication. Instead, they discuss communication media, a much broader term that includes all forms of communication, mediated or not. Daft and Lengel (1986) do define technology as "the knowledge, tools, and techniques used to transform inputs into organizational outputs" (p. 563). This use of communication technology rather than the term CMC is echoed throughout research on communication technology in organizations (e.g., Fulk, Schmitz, & Ryu, 1995; Fulk, Schmitz, & Steinfield, 1990; Fulk, Steinfield, Schmitz, & Power, 1987; Poole & DeSanctis, 1990; Swaab, Galinsky, Medvec, & Diermeier, 2012) and interpersonal relationships (e.g., Maguire & Connaughton, 2011).

A widely cited article describing the associations between social psychology and CMC (Kiesler, Siegel, & McGuire, 1984) also does not define CMC. Instead, it offers a variety of

features that CMC offers: The authors link CMC with networked computers and suggest that the networking allows for data sharing, instantaneous message exchange, and collective work (e.g., two remote individuals editing a document at the same time). All this can be done, the authors argue, at a lower cost than existing means of communication. These characteristics suggest that CMC (or "electronic communication"--the authors use the two terms interchangeably) is defined primarily by communication speed and cost, two features the authors regard as inextricably linked with communication occurring over computer networks.

Walther, a foundational figure in the study of computer-mediated communication, defines CMC in his seminal 1992 work: "computer-mediated communication is synchronous or asynchronous electronic mail and computer conferencing, by which senders encode in text messages that are relayed from senders' computers to receivers'" (p. 52). In Walther's (1996) work on the hyperpersonal model, he does not offer a definition, nor does he define the term in his chapter (titled "Computer-Mediated Communication") in *The Handbook of Communication Science* (2010). Instead, Walther (2010) provides a list of communication technologies that are subsumed under the CMC label, a list that is broader than the text messages that were included in his 1992 definition. A meta-analysis of CMC in groups (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002) also lists only a set of features similar to Walther (2010). Given the extensive advances in computing technology, the expansion of the definition to include channels beyond text exchange is important.

More recently, Spitzberg (2006), while describing his model of computer-mediated communication competence, does define CMC: "any human symbolic text-based interaction

conducted or facilitated through digitally-based technologies" (p. 630). This particular definition limits the scope of CMC to text-based communication, while also broadening it to include devices that traditionally have not been considered computers. This definition excludes forms of aural and aural/visual interaction (e.g., video-chatting) that occur over computers and have become popular in recent years. It also allows for the inclusion of mobile telephones capable of sending textual information (e.g., text messages). There is no technical reason to consider the mobile phone as anything less than a computer, but this inclusion is more expansive than the term "computer-mediated" may initially suggest.

Indeed, the most challenging element in defining CMC is providing justification for including "computer" in the term. Definitions that include all aspects of computer-based communication (as Postmes, Spears, and Lea, 1998, note) are too broad; such conceptualizations do not help differentiate computer-based channels from other channels with similar features. Definitions that limit the scope of CMC to text-only messages (e.g., Spitzberg, 2006) impose indefensible restrictions on CMC because they do not provide solid reasoning why text exchanged over a computer is fundamentally different from text exchanged in other ways. It is true that some computer-mediated channels have features that were not present in channels that existed before computer networking (e.g., the ability to synchronously exchange text-based messages), but even these differences have been very nearly found in other, older technologies; for example, the telegraph allowed for near synchronous exchange of text-based messages (Aronson, 1977).

A reasonable conclusion, then, is that using the term CMC is not necessary. With no clear argument for what aspects of a channel make it computer-mediated and no reasoning to suggest that the use of a computer, above and beyond certain features, is fundamentally different from other ways of communicating, then the distinctions in channels that are useful for researchers do not fundamentally depend on a communication channel's association with any particular device. This criticism is echoed in Griffith and Northcraft's (1994) call to study the features of communication channels separate from (or fully crossed with) the channel itself. To do this most effectively, it is best to describe features separately from the channel and not consider the channel holistically. For these reasons, I will not use the term "computer-mediated communication" and instead will focus on individual communication channels.

This decision, in turn, produces another term that needs definition: what term most accurately captures a means of communication (e.g., email, texting, telephone, etc.)? No clear term preference has yet emerged in the literature. I use the term "channel" for four reasons. First, channel is used by some scholars (e.g., Kelly & Keaten, 2007; O'Sullivan, 2000), so the term is not without precedent. Second, channel references a more specific concept than "medium." A medium connotes mass media, in which newspapers, radio, and television are all considered separate media. Including the computer as its own medium makes sense, but this particular grouping, given the array of different types of communication available through the computer, suggests the need to differentiate communication technology from the device that mediates it. Because the television medium has channels, the metaphor may be carried over into communication technologies. Third, the term "channel" has not received widespread use

elsewhere. One particular use of the term is to indicate the type of information (textual, aural, visual) carried by a particular communication technology. But this same concept is more widely described as a "cue" (e.g., "non-verbal cues") in interpersonal communication literature. Finally, channel is used to indicate a route for communication, as in "diplomatic channels." For these reasons, and borrowing from Griffith and Northcraft (1994), I define channel as an objectively- and socially-defined piece communication technology containing a unique constellation of features.

A feature, then, must also be defined. Griffith and Northcraft (1994) define features as "both the objective (e.g., speed of information transmission) and psycho-social (e.g., anonymity of the communicators) characteristics of a medium that result from communication channel selection or media design considerations" (p. 273). This definition can be made more specific and complete by considering the wide variety of additional facets that may affect features, including interactions between the user and the design of the channel, widely noted in work from the late 1980s and early 1990s on the social construction of communication technology (e.g., Fulk et al., 1987; Yates & Orlikowski, 1992). Thus, I define feature as an objectively- and socially-defined characteristic of a channel that determines and is determined by how that channel is used.

I define cues, once again referring to Griffith and Northcraft (1994), as conduits of unique sources of information. Primarily, these cues represent broad means of gaining information. First, there are the words used in communication: verbal, visual (in the case of sign language), and textual cues. Second, there are cues that carry information separate from words

(perhaps most accurately labeled “meaning”; Sitkin, Sutcliffe, & Barrios-Choplin, 1992): visual (e.g., body language, textual annotations) and aural (e.g., tone of voice) cues. Visual cues separate from words can also include the style of textual information; for example, a note with sloppy penmanship may suggest that it was written quickly and convey information separate from the words themselves, perhaps that a "thank you" conveyed in a card is not sincere. Broadly, then, cues can be separated by information and meaning and by their sensory nature (e.g., seen, heard, etc.).

The study of communication channels thus involves multiple areas of study. First, researchers may investigate if and how channels contribute unique information and meaning to the communication process by looking at their component features, the cues they carry, and associated meaning. Researchers may also study the process of channel selection. Beyond selection, research may expand to the communication outcomes associated with channel selection. Finally, researchers may study the combination of these three processes. Let us next consider the nature of channels themselves and how to most effectively study them.

Channels As Objects

Shooting at the wrong target

What is the value in grouping communication channels by their features rather than studying communication channels as entities? The answer has everything to do with the transitory nature of channel popularity. In short, a channel that seems ubiquitous today may not remain widely used. This can result in conclusions from research on a channel as a holistic entity that "can never be applied to any other technology, whether extant or potentially available" (Nass

& Mason, 1990, p. 49). Further, the popularity of a channel among an age group may not translate into a cohort preference for that channel (Ling, 2010). Consider text messaging, a prime example of a popular communication channel and an ideal case for understanding the nature of channel popularity. In December, 2011, several markets in which text messaging had been very popular noted declines in text messages sent during high traffic times (Chen, 2012; Kuittinen, 2011). For example, in Finland, a stalwart of text messaging since the 1990s, two large cell phone service providers logged significant decreases in the number of text messages sent on Christmas Day, one of the most popular text messaging days of the year (Kuittinen, 2011). The same trends were observed in Hong Kong (Kuittinen, 2011) and Australia (Blundell, 2011); the rate of text message growth is also slowing in the United States (Woyke, 2011), a market that adopted text messaging more slowly than other highly connected countries.

To a casual observer, these trends may be very surprising, given the rapid rise of text messaging popularity. The number of teens who texted their friends daily rose from 27% in November 2006 to 63% in July 2011, according to the Pew Internet and American Life Project (Lenhart, 2012; Lenhart, Ling, Campbell, & Purcell, 2010). 97% of American adults ages 18-24 who own cell phones (95%) report using text messaging, and the median number of messages exchanged by this group is 40 per day (Smith, 2011). With high numbers like this, it might seem inconceivable that texting could ever decline in popularity.

Yet a channel comparable to texting has experienced a similar decline: the use of instant messaging (IM) clients like AOL Instant Messenger (AIM). In 2001, the use of instant messaging among teens was so predominant that the Pew Internet and American Life Project labeled this

group the "instant-message generation" (Pew Research Center, 2001). Of teens who used the internet, 74% reported having used IM clients (Lenhart, Rainie, & Lewis, 2001). This popularity, however, did not continue. By 2006, the number had fallen to 68%, a significant decline (Lenhart, Madden, Smith, & Macgill, 2007). In July 2011, among all teens, just 22% reported “IM-ing” daily (Lenhart, 2012). This decline coincides with the rise in the popularity of texting and social networking websites. Though the Pew data does not show that the decline of IM is caused by rise in texting, the trend is striking and troubling for communication channel researchers. If instant messaging can decline in popularity so quickly, what protects text messages from sharing a similar fate?

Herein lies a challenge for researchers of specific communication channels: The channel itself may be captured as just a snapshot in time rather than an enduring trend. How then should researchers produce findings that are not out of date upon publication? Consider, for example, Valkenburg and Peter's (2009) work on the effects of IM use on adolescent friendships. Their results suggest instant messaging fosters self-disclosure which in turn produces stronger friendships. Can the same be said for text messages, if this channel has supplanted IM as the primary form of mediated communication in teens' lives? The inference is risky at best until the study is repeated, identically, with all instances of "instant message" replaced with "text message."

Given the finicky nature of channel popularity, studies measuring use of social networking websites like Facebook may find themselves equally out of date should Facebook use decline; such possibility seems hard to fathom, but some reports indicate that Facebook lost

US membership in May 2011 (Eldon, 2011a; but see Eldon, 2011b for more complex metrics that present a less clear figure) and many reports indicate that Facebook's US growth is slowing rapidly (e.g., eMarketer, 2012), a factor that may be prompting Facebook to explore ways to tap new markets like children under age 13 (D'Arcy, 2012) and buying companies that are growing in popularity (e.g., Instagram, Constine & Cutler, 2012). Additionally, in data collected in December 2012, the Pew Internet and American Life project found a significant decline in social networking website use among three of four age groups, including adults ages 18 to 29 (Duggan & Brenner, 2013). In short, without a better approach to studying communication channels, research in this rapidly changing field is no longer shooting at a moving target; it is shooting at the wrong target altogether.

I propose a different approach: a component, ontological approach to studying communication channels, following advice of Griffith and Northcraft (1994) and Nass and Mason (1990), and based around the concept of affordances (Gibson, 1977). In the sections that follow, I will address the concept of affordances in three distinct ways, while also tracing a loose history of scholarly work on the topic. Next, I will describe how each definition could be used to group communication channels. Finally, I will propose a methodology for assessing the features contained within communication channels and the predictive power of the three conceptualizations of affordances.

Conceptualizing Affordances

Gibson coined the term affordances in 1966 and formalized the definition in the late 1970s (1977, 1979). The theory of affordances describes the complex relationship between

animals and the environment, one in which objects in environment offer potential use by the animal, whether an animal made use of such potential or not. Gibson (1977) initially defined affordances as "a specific combination of the properties of [something's] substance and its surfaces taken with reference to an animal" (p. 67). In common examples, a flat, stable surface at the right height affords sitting upon. A series of flat stable platforms increasing in height (e.g., stairs) affords climbing (Warren, 1984). Gibson was unconcerned with the actual perception of the environmental property; that is, an affordance exists whether it is perceived or not. A chair still affords sitting, even if the person cannot see the chair. However, because the affordance is in reference to an animal, a chair that is suitable for a child may not offer the same sitting-upon affordance to an adult. Gibson's conceptualization became more vague in a subsequent revision (1979), leading Jones (2003) to assert that, had Gibson lived to publish more on the topic, the definition would have been clarified. Gibson's conceptualization suggests that the nature of affordances lies primarily in the object itself, relative to the user's ability to manipulate the object but independent of the user's perception of the object.

Gibson's notion of affordances and subsequent additional clarifications, however, have not stood without scrutiny from other scholars. One notable revision to Gibson's definition was proposed by Norman (1988) who sought to bring a design-oriented perspective to the concept. Though Norman (1999) later revised his definition to specify that he is discussing "perceived affordances" (partly to resolve confusion between his definition and Gibson's), the general idea behind the concept is the same. Norman initially defined affordances as "the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing

could possibly be used" (1988, p. 9). The key difference between Gibson and Norman is the debate about where the affordance property exists. For Gibson, it exists in reference to a user, no matter the user's awareness of its existence. For Norman, an affordance exists in the user's own mind and does not exist if the user is not aware of it.

Norman's focus on design is partly at the heart of the differences between his perspective and Gibson's. Norman does not have to reconcile the existence of affordances outside of the user's perspective because, as a designer, an affordance unrecognized by the user is ultimately a failure of design. Norman's position is thus that no designer should discuss affordances without recognizing that user perceptions are reality. In this way, Norman's conception of affordances is rooted in the user. These "perceived affordances" are all that matter because they determine what the user will do with the object.

Norman's definition is not without problem, however, namely in that a user may perceive an affordance that does not exist. For example, a user with little experience with text messaging may suppose the channel to be an ideal way to transmit a high volume of information, perhaps step-by-step directions to get to a location. In practice, the channel's limitations may prevent this from happening. The user's perceived affordances of text messages may not fit the reality. Should text messaging be grouped as a high volume channel because of this misperception? The answer is far from clear.

Several scholars have attempted further refinements of affordances to clarify past ambiguities in the debate. Most notably, Chemero's (2003) reformulation of affordances theory helps address some past problems by making more specific Gibson's initial suggestion of

affordances as existing in the environment independent of an animal's perceptions; regarding this, Chemero notes, "[Gibson's] description makes affordances seem like impossible, ghostly entities […] that no respectable scientist […] could have as part of their ontology" (p. 182). Instead, Chemero suggests that affordances are relationships between aspects of the user and aspects of the object. Thus the affordance exists neither in the object nor in the user and exists only when certain aspects of these two bodies align.

This definition is reinforced in spirit by Stoffregen (2003), who suggests affordances are emergent properties of the system made up of the user and the object; an affordance is an action potential that exists neither in the user nor object but only when the two are combined. Further refining Chemero's conceptualization, Stoffregen also introduces the consequences of intention. Because the possibilities for actions are innumerable in any given relationship between a user and an object (e.g., a cell phone can make calls and send text messages, but also be thrown, chewed on, dropped, etc.), possible behaviors can be refined based on the user's intention. As Stoffregen (2003) explains, "A given behavior […] will occur if and only if (and when) an affordance […] and its complementary intention […] co-occur at the same point in the space-time continuum" (p. 125). This helps clarify affordances as neither the cause nor result of user action.

The formulations of Chemero (2003) and Stoffregen (2003) represent definitions that remove affordances from the object or from the user and instead define them as combinations of the two. Using this idea to classify communication channels requires much more attention be paid to the functions of the channel itself and to the abilities and perceptions of the user. An

affordance for any given communication channel cannot be defined by its own functionality as that affordance does not exist irrespective of the user; similarly, an affordance cannot be based on user perception, as the user's perceptions must align with the device's function in order for an affordance to exist.

A Communication Channel Ontology

With these definitions in mind, we can consider how each may be used to classify communication channels into their component features (Griffith & Northcraft, 1994).

Gibson's Affordances. First, consider Gibson's (1977) formulation of affordances as inherent properties in the object with reference to the user. The key features of communication channels, then, are those present within the channel itself. Consider, for example, the channel of text messaging. Text messages carry certain affordances, including the ability to be sent and received with mobile phones, the ability to transmit messages of 160 characters or less, the ability to be edited and sent asynchronously, and other properties. (For the purposes of this example, I will ignore complications of text messages, including the ability to send a text message to an email address and the ability to send text messages from applications on computers and other devices.)

What about the user? Abilities and other properties of the user must align with the affordances of the text message (Chemero, 2003; Stoffregen, 2003; Turvey, 1992). The user must have a mobile telephone with appropriate configuration to be able to send text messages. But the user's own awareness of text messaging does not change the fact that the user's mobile phone offers the affordance of the communication channel. The user's perceptions matter least in this

definition of affordances. A user's potential for text messaging (indicated, perhaps, by some level of manual dexterity and ability to learn) is all that is needed for a text messaging affordances to exist. That is, if a user can use the mobile phone and can be taught how to send a text message, then this affordance exists separate from the user's own knowledge of it.

This perspective offers a simple way to categorize communication channels because it suggests limited necessity of user-specific data. For example, communication channels that are internet-based (e.g., email, instant messaging, etc.) can all be classified by their functions for all users with access to the internet, because these users' access aligns with the affordances of the channel. It is reasonable to assume that measurement of access is enough to construct a classification scheme for communication channels, as the user's access represents the primary barrier of use of the channel.

Norman's Affordances. Second, let us consider Norman's (1988) formulation of affordances as perceived by the user and not inherent in the object. Norman's notion of affordances, when used to classify communication channels, requires a more complex consideration of user perceptions. Unlike Gibson, for whom access determines affordance, Norman's conceptualization points to the possibility of variability in user perceptions of a given technology. It is entirely possible for one user to view face-to-face communication as an awkward method of communicating, where anything may be said because the user does not feel he has control over his own words and certainly not what his communication partner will say. But for a different, more communicatively competent user, face-to-face may feel like a welcoming environment where the user can control and predict the flow of conversation.

Consider also a communication channel like text messaging. One user may perceive it as an inefficient method of communication, preferring to just call someone; another user, however, may have an entirely opposite position. These differences require that users are surveyed to assess the differences and similarities in their views of communication channels. It also suggests that no one scheme of classification is possible, as variance of perception will occur both between channels and within channels.

Chemero's and Stoffregen's Affordances. Finally, Chemero (2003) and Stoffregen (2003) argue that an affordance is a relationship or emergent property between the user and the object. This suggests a complicated task for the use of affordances in classifying communication channels, but with this perspective in mind, I will offer two possible ways to group channels. First, researchers can measure user perceptions of a channel (e.g., what can be done with it, etc.) and match these with the channel's properties. Perceptions and properties can, of course, be needlessly broad, so it is important to focus on aspects related to the function being studied; for example, all users likely perceive mobile phones as droppable (hence the robust market of phone cases), yet this property can be ignored because it is not communication related. By matching the user's perceptions with the device's capabilities, researchers can group channels into meaningful categories for each user.

This particular classification is more complex than Norman's method of classification because it introduces properties of the object. However, just as Stoffregen (2003) notes, there are innumerable combinations of properties, thus making a full list of affordances impossibly long. The researcher could aim to pair down the list herself, by eliminating functions that she does not

consider communicative. This, however, suggests little difference from Gibson's method. Additionally, it supplants the user's perceptions with the perceptions of the researcher, which may not produce a fully accurate list.

How then can a researcher produce a list that is reasonable in size while also respecting the user's perceptions? The second way to use Chemero's and Stoffregen's thinking to classify channels is by combining them with behavioral intention, as suggested by Stoffregen (2003). Because the possibilities for action are far greater than the actions a user is likely to take, the user's intention can be used to narrow down the list of affordances to a meaningful number. The user can identify features of a communication channel that she is likely to use. For example, on a mobile phone, some users will identify making calls and sending text messages as the primary functions of the device; few users will identify slamming the phone down to make a point to the caller on the other end of the line.

This particular conception offers the most complex way to categorize communication channels: by the affordances that a user intends to use. It is in this way that particularly sticky distinctions can be drawn out. For example, consider the different uses of text messaging between a teenager and his father. The teenager may engage in conversations with friends using text messages, while his father may seldom do this. The use of the device demonstrates that text messaging has the potential of hosting a conversation. Thus Gibson's definition does not distinguish the channel between these two users. Both father and son may also perceive text messages as capable of hosting a conversation, rendering the channel the same for the two user's under Norman's definition. Only when we consider what each user intends to do can we see a

distinction in the channel between generations: for the teenager, the text message is a conversational channel; for the father, it is not.

Conclusion

The complexities of affordances suggest a variety of possible methods for studying communication in a multiple channel environment. The following two studies consider these complexities to study interpersonal communication. Study one uses a socially constructed perspective, in which properties of channels are allowed to vary within and between channels. The intentions of channel use are derived from social goals that have been shown change with age. Study two uses an objectively constructed perspective, in which properties of channels vary only between channels and focus on the type of cues carried by that channel, to investigate differential patterns of communication and outcomes based on the cues channels transmit.

Study One

Recent data from the Pew Internet and American Life project suggests that younger and older adults differ considerably in their preferences for ways of communicating (Zickuhr, 2010; 2011). While younger adults report frequent use of text messaging and social networking websites, older adults are more likely to use email and the telephone. To investigate these differences further, this study uses the principles and logic of socioemotional selectivity theory (SEST; Carstensen, 1991, 1995; Carstensen, Gross, & Fung, 1997) to understand the communication channel preferences (e.g., Bakke, 2010; Kelly & Keaten, 2007; Spitzberg, 2006) and selections (e.g., Daft & Lengel, 1986; Fulk, Steinfield, Schmitz, & Power, 1987; O'Sullivan, 2000) in younger and older adults and to answer the question: Do social goals, as they differ by age, predict communication channel preference and selection?

SEST argues that an individual's social goals are influenced by her future time perspective. Individuals who perceive their future as nearly unlimited tend to seek novel social partners, while individuals who perceive their future as finite focus more on existing partners. This theory has been used to investigate individuals' selection of social partners (Fredrickson & Carstensen, 1990; Fung, Carstensen, & Lutz, 1999), recall of emotional and non-emotional information (Carstensen & Turk-Charles, 1994), preferences for movie content (Mares, Oliver, & Cantor, 2008), and social network size (Carstensen, 1992; Lang & Carstensen, 1994). Unexplored, however, is whether these social goals affect the process of channel selection, choosing a means to communicate with social partners (e.g., choosing to text or call). In the

following sections, I will review the premises of SEST and relate them to the social aspects of communication channels and outline methods to answer the above question.

Socioemotional Selectivity Theory

The central premise of SEST is that an individual's future time perspective, her sense of how much time she has left to live, shapes that individual's motivations for social interaction. With unlimited time, an individual has greater motivation to seek novel social partners (Fredrickson & Carstensen, 1990; Fung, Carstensen, & Lutz, 1999). The development of these relationships offers new sources of information, which are more useful to an individual with time left to use that new knowledge. With limited time, an individual has greater motivation to "live in the moment" and seek a positive emotional state, something that leads to a greater preference for interaction with existing, rather than new, social partners. These partners offer greater likelihood of positive emotional rewards and less risk, given that interaction with novel social partners may not produce a lasting relationship.

Support for this model has been demonstrated in a variety of novel ways. In a set of three studies, Carstensen and Fredrickson (1998) asked participants to sort 18 potential social partners into groups based on how the participant would feel to interact with the person. Analysis of the sorting revealed three dimensions: affective potential (how good or bad it would feel to interact with the person), future contact (likelihood of interacting with that person again in the future), and information seeking (partners who could provide new knowledge to the participant). These three dimensions accounted 82% of the variance in the card sorting task. Between age groups, the researchers found differences in the value placed on interaction with each group. As

participants got older (or in the case of one sample, for those who were HIV positive), they placed greater importance on the affective potential of the interaction and less importance on the information that they might gain from the partner.

To test how emotional aspects of information might be salient to participants, Carstensen and Turk-Charles (1994) investigated the proportion of emotional information recalled after participants read two pages from a novel. As participants got older, the proportion of emotional (compared to non-emotional) information they recalled increased. The researchers argued that older adults attend more to such information and thus remember it at higher rates.

While some measures of preference are unlikely to be strategic (for example, the study on emotional recall), other research suggests that there is a strategic component in optimizing emotional experience within everyday social interaction (Carstensen & Charles, 1998). In a set of studies (Fredrickson & Carstensen, 1990; Fung et al., 1999), participants were asked to imagine they had 30 minutes to spend interacting with someone and were given three potential partners: an immediate family member, the author of a book they had read, and a new acquaintance. Older adults were more likely to choose an immediate family member, as were people asked to imagine they would soon undergo a long move away from their family and friends. An opposite manipulation was also performed in which participants were asked to imagine that their doctor had informed them that a medical breakthrough would add 20 years to their lives; in this case, the preferences of younger adults was unchanged between conditions and the preferences of older adults mirrored that of younger adults--greater preference for new sources of information.

These phenomena have been used to explain differences in social network composition between younger and older adults. Older adults often have been observed to have smaller social networks than younger adults (e.g., Lee & Markides, 1990; Palmore, 1981). Researchers have explained this largely based on the deaths of social network contacts and the limited mobility experienced by some older adults. Some researchers have argued that a smaller network is a symbolic preparation for death (Cumming & Henry, 1961). Socioemotional selectivity and its focus on changing social goals, however, suggests a different reason: The alterations in social networks are strategic and designed to maximize emotional rewards in the present. Interactions with acquaintances and time spent with novel partners are not as likely to produce positive feelings, unlike interaction with close, existing social partners; and thus older adults spend less time making new friends and more time staying close to existing friends and family members. This trend is supported from early to middle adulthood, with middle-aged adults spending significantly less time with acquaintances than young adults (Carstensen, 1992). In a study of adults ranging in age from 69 to 104 (Lang & Carstensen, 1994), age was negatively correlated with the number of peripheral social partners, but no differences were observed in the number of close social partners or members of participants' "inner circles."

The conclusion to draw from these studies is that, as future time perspectives change, individuals change their social goals. Fulfilling these social goals and expressing a preference for novel or established social partners may involve the selection of communication channels, in both long-distance and geographically-close relationships (e.g., Johnson, Haigh, Becker, Craig, & Wigley, 2008). Can the principles of SEST predict these channel choices? Do individuals

perceive some communication channels as better able to fulfill their social goals than others? Do changing social goals predict selection of channels that contain goal-relevant features? These questions have yet to be explored and are addressed in this study.

Social Goals and Preference for Channel Features

Changing social goals and differences between generations in channels preferred and used suggests a third area to consider when investigating interpersonal communication in a multiple channel communication environment: differences in perceptions of communication channels between participants. This study takes a socially oriented perspective on communication channels, in which younger and older adults may view the features of communication channels differently, and this in turn may predict their selection of different channels.

The features identified in the literature are not necessarily the features that predict channel selection differences based on SEST's description of changing social goals. Consider, for example, the feature of editability, the ability to take time to craft and revise a message before sending; this feature is present in channels like email but absent in channels like the telephone. Including measures of editability when studying the effect of changing social goals on channel preference and selection requires demonstration that preference for this feature will differ by age and social goals. In this case, there is little reason to suggest that editability has relevance toward the social goals outline in SEST.

Instead of including all features identified in the past, we must use SEST's premises to suggest which features may offer the most predictive value. Differing social goals (information

gain for those with an extended future time perspective or emotional stability for those who perceive a finite future) and social network size (many or few acquaintances) suggest different utility for communication channels. For those who perceive their time to be unlimited and maintain a larger social network, communication channels that are efficient to use may be more desirable. Maintaining contact with multiple people suggests the need to use channels that allow for faster message construction (because the individual is constructing more messages) and the ability to send messages to multiple people (because the individual needs to communicate with more people). For individuals with a smaller social network, it may be less important to be able to communicate with many people at once. But to receive emotional benefits from communication, immediate connection may be desirable; thus efficient means of communication may be important for older adults as well, seeking to capitalize on the moment and reach out to a partner with little wait.

Communicating for emotional stability suggests a desire to derive emotional benefit from communication (Gable, Reis, Impett, & Asher, 2004; Langston, 1994). This may translate into a preference for channels that foster meaningful interaction and a sense of closeness or social presence. These features may be less important for those seeking new information; indeed, given that communication with acquaintances may involve some relational uncertainty, distance between communication partners may be more desirable (Knobloch, 2006; Knobloch & Carpenter-Theune, 2004; O'Sullivan, 2000). Perception of a finite future may also lead to a preference for channels that enable synchronous communication: attention- and response-demand. Attention-demand is how much a new message gets the attention of its intended

recipient; this feature is present in channels like the telephone (which rings) but less present in channels like a social networking website (which is unlikely to interrupt the recipient). Response-demand is the pressure placed on the recipient to reply to the message; this feature may be more socially determined but is more likely to be high for channels like face to face and the telephone. Without these characteristics, a message is more easily ignored; ignored communication may not produce the positive emotional benefits that the communicator sought. The opposite may be true for those with expansive time perspectives, for whom nonintrusive messages may be key because maintaining multiple relationships requires careful time prioritization.

With these features identified, it is wise to recognize, however, that such features are not inherent in communication channels and that individuals may perceive different channels to have different combinations of features (Fulk et al., 1987). For example, consider relatively subjective category of fostering meaningful interaction. One might reasonably propose that channels higher in social presence (the amount that the channel conveys a communication partner's presence, measured by perceptions of immediacy and intimacy; Short, Williams, & Christie, 1976) offer the most meaningful interactions, because individuals can see and respond to their partner's emotional cues. But some researchers have found high rates of self-disclosure in channels like instant messaging (Valkenburg & Peter, 2009), a channel objectively classified as low in social presence. Thus it is important to consider participants' individual perceptions of what each channel is useful for, as we cannot assume that normative predictions from the past (e.g., that

more complex messages are best transmitted over high cue channels, Daft & Lengel, 1986) account for the complexity of channel use.

Channel Expansion Theory

Another perspective that may play a role here is that of channel expansion theory (Carlson & Zmud, 1999). Channel expansion theory predicts that increased use of a channel will increase perceptions of usefulness of that channel; for example, a person who uses email very frequently may view it as a useful channel for accomplishing a wider array of interpersonal communication tasks than someone who uses email relatively infrequently. Use of channels is thus another important aspect to consider. Combined with age and its associated changing social goals, we can assess the power of social goals and communication channel usage experience in shaping perceptions of channel features and selection.

The Present Study

This study uses a survey to assess differences in channel perceptions, preferences, and selection between a sample of college students and a sample of adults ages 60 and older. Participants first read four interpersonal communication scenarios, describe a time in which a similar scenario happened to them, and then assess their communication channel preferences. The scenarios describe times in which an individual desires to communicate with others and in which features of communication channels described above may predict channel selection. The four scenarios are “Sharing important news with another (or others),” “Maintain connection with another (or others),” “Make social plans with another (or others),” and “Have chit-chat with another (or others).” Once participants complete this task, they complete items assessing their

perceptions of key features described above, their usage patterns of channels, and their future time perspective.

Hypotheses

From the frameworks discussed above, I propose the following research questions and hypotheses to better understand a socially oriented perspective of communication channels. First, I propose a research question that assess the dynamic nature of perspectives on communication channels based on age group and usage. Variance between and within groups suggests a socially constructed perspective on communication channels may have merit when assessing how perceptions of channels shape use.

RQ1. Will there be differences between ages and users/non-users in ratings of channel features?

Second, I assess how age changes social goals (based on socioemotional selectivity theory) and how these goals may change preference for communication channels perceived to have different features. I propose two hypotheses for features related most directly to the predictions of SEST and one research question for features that may be desirable for all types of social goals.

H1. Younger participants will favor channels that let them communicate with many people at once.

H2. Older participants will favor channels that let them feel connected to their partners and have meaningful interactions.

RQ2. Will younger participants favor quick channels, channels that get their partners attention, and channels that compel a response more than older participants?

Third, using ideas from channel expansion theory, I predict that frequency of use of communication channels will shape perceptions of those channels. This includes shaping perspectives of channel features, another explanation for variance in how individuals view communication channels.

H3. Frequency of channel use will be associated with higher ratings of usefulness for that channel.

H4. Frequency of channel use will be associated with higher ratings of features within that channel.

Finally, I assess if consistency between features that an individual sees as important in an interpersonal interaction can shape selection of a communication channel and overall success of that interaction.

RQ4. Will matches between valued features and features present in a selected channel predict selection and successful interaction?

Study One Method

Participants

Two groups of participants were recruited for this study: 153 college students and 152 internet-using adults ages 60 and older. Upon inspection of the data, one older adult indicated he did not currently use any communication channel and was thus excluded from analysis, resulting in 151 older adult participants. College students enrolled in communications classes at a large, public university in the Midwest had the opportunity to earn extra credit by participating in the study; they enrolled through an online study management system. Older adults were recruited

through a recruitment company (Qualtrics). All participants completed the survey online in a location of their choosing. The college students were most frequently between 20 and 21 years old (Range = 18-42, *M* = 20.46, Median = 20.00, Mode = 20, *SD* = 2.514). The college student participants were overwhelmingly female (73.2%) and reported using the internet for an average of 10.7 years (*SD* = 2.40). Four college students failed to report this information. The older adults averaged 66.5 years of age (Range 60-86, Median = 66.0, Mode = 62, *SD* = 5.36) and reported using the internet for an average of 14.6 years (*SD* = 6.10); due to targeted recruitment, participant sex was nearly split evenly (47.0% Female).

Procedure and Measures

The online survey consisted of 123 items; all items are listed in Appendix A. After giving consent to participate, participants were presented with four situations in which they would need to communicate with someone else. These situations were selected from a pre-test with 19 adults ages 60 and older; the four selected were those that participants indicated happened to them most frequently. The scenarios were "Share some important news with another (or others)"; "Maintain connections (or 'keep up contact') with another person (or multiple other people)"; "Make social plans with another person (or multiple other people) in advance"; "Have chit-chat with another person (or multiple other people)".

For each scenario, participants were asked to think of the last time that situation had happened to them and then to briefly describe the circumstances. Next, participants were asked how much they considered certain features of different ways to communicate (on a scale, 1-I didn't think about this at all; 4-I thought about this some; 7-I thought about this a lot): "How

quickly I could get my message out", "How much I could feel connected with my partner", "How much the channel lets me have a meaningful interaction", "How much this channel gets my partner's attention", "How much the channel compels my partner to respond", and "How much the channel lets me communicate with many people at once". Factor analysis was performed on these features to assess consistent covariance between them and reduce the number of features to consider. No consistent pattern emerged across scenarios or between age groups. Therefore, each feature is analyzed separately.

Participants then indicated the way that they chose to communicate from a list of eight different channels (and an open spot for "other"): Face to face, telephone, paper mail, email, text message, instant messaging, video chat, and social networking website. They assessed how well this channel worked to achieve their communication goal (1-Not well at all; 4-Neither well nor not well; 7-Extremely well). And, using the same scale, they answered how well they thought that each channel could work in the future if a similar situation were to occur. Then, participants ranked channels based on preference for use in a future similar situation.

After completing these items for all four scenarios, participants were asked to assess the eight communication channels (listed above) for the features asked about in each scenario. Participants were asked to assess if each feature was present in the channel on a scale 1-Strongly disagree; 4-Neither agree nor disagree; 7-Strongly agree. They also indicated how often they used each channel (1-Never; 2-A few times per year; 3-A few times per month; 4-A few times per week; 5-A few times per day; 6-Almost constantly). Participants then completed the Future Time Perspectives scale (Carstensen & Lang, 1996) to assess their beliefs about the amount of

time they had left to live. Items included, for example, “Many opportunities await me in the future”, “I expect that I will set many new goals in the future”, “My future seems infinite to me”, “I have a sense that time is running out [reverse coded]”. Three items were reverse-coded. Finally, participants provided some demographic information (age, gender, education, years of internet use, SNS use, and ownership of various electronic devices--cell phone, smart phone, desktop computer, laptop computer, tablet computer, e-reader). Participants also indicated the distance their close family and close friends live from them (1-Same or nearby town; 2-25-50 miles away; 3-50-150 miles; 4-150-500 miles; 5-More than 500 miles) and estimated the number of people they are very close to and the number of people in their general social circle.

Gender was initially entered as a free text variable. After assessing all participant responses, none differed from a sex-based framework. Therefore, all variables were coded as either 0-Male or 1-Female.

For the Future Time Perspectives scale (Carstensen & Lang, 1996), Cronbach's alpha was calculated separately for each group to assess the reliability of the scale. The scale appeared reliable for both groups (college students, $\alpha = .821$; older adults, $\alpha = .890$). An average of the items was taken for use in analysis. A one-way ANOVA was conducted to assess if there were significant differences between the two groups. Younger adults ($M = 5.61$, $SD = .811$) reported significantly greater perceptions of their future time than did older adults ($M = 4.06$, $SD = 1.24$), $F\,(1, 298) = 162.4$, $p < .001$, partial $\eta^2 = .355$.

Study One Results

The results for study one are organized in four sections. First, I assess the value of social categorization of channel features by investigating channel perceptions by age and usage. Second, I investigate differences between young and old, including hypotheses guided by socioemotional selectivity theory. Third, I assess how usage of channels shapes perceptions, using predictions derived from channel expansion theory (Carlson & Zmud, 1999). Finally, I aim to predict satisfaction and selection based on preference for features and ratings of features within selected and preferred channel.

Channel Perceptions

This first section aims to assess the value of the social perspective of channel categorization. RQ1 asks if there is variability between users and non-users and between older and younger participants. First, I conducted three-way repeated measure ANOVAs, with feature ratings for a channel as the within subjects factor and age group and channel usage (non-user or user, where applicable) as between subjects factors to investigate differences in perception of channel features. These results help to assess if age group or usage have equal effects on determining ratings of communication channel features. Usage was split into a dichotomous variable rather than used as a continuous predictor because the participants in this study are generally tech-savvy; no participant reported not owning their own computer and only 12 older adults reported not owning a mobile phone. Thus, non-users in this study are likely to be volitional non-users; that is, they are actively choosing to not use a channel rather than being restricted in their use of that channel by a lack of access. In a study with a group of similar tech-savvy older adults, Braun (2013) found that the divide between user and non-user was significant

for all attitudinal factors when predicting intention to use social networking websites. I will discuss significant trends in each of the main effects (age and user-status) and then trends in interaction effects.

Significant main effects by age occurred in channels face to face (F [1, 290] = 4.84, p = .029, partial η^2 = .016), email (F [1, 290] = 17.2, p < .001, partial η^2 = .056), texting (F [1, 288] = 5.23, p = .023, partial η^2 = .018), and a marginally significant main effect for telephone (F [1, 293] = 3.75, p = .054, partial η^2 = .013). For face to face and texting, younger adults gave higher ratings for all features on average than older adults. For email and (marginally) telephone, older adults gave higher average ratings.

Significant main effects of user-status (user/non-user) were found for all channels in which this variable could be included: mail (F [1, 286] = 38.0, p < .001, partial η^2 = .117), texting (F [1, 288] = 95.3, p < .001, partial η^2 = .249), IM (F [1, 281] = 41.9, p < .001, partial η^2 = .130), and video chat (F [1, 286] 12.3, p < .001, partial η^2 = .041), and SNS (F [1, 286] = 89.9, p < .001, partial η^2 = .239). Non-users were older adults exclusively for all channels but mail. Users gave consistently higher ratings for all features on average than non-users.

Finally, significant interaction effects were found between features and user and features and age for mail, texting, IM, video chat, and SNS. For mail, post-hoc comparisons using Bonferroni corrections showed older users frequently gave the highest ratings for all features, while younger users were not significantly different from non-users for four features. For texting, older and younger users differed only in their ratings of texting as meaningful and its ability to communicate with multiple people. Younger and older users' ratings were significantly higher

than older non-users' ratings for all features. For IM, as with texting, older and younger users differed only in their ratings of connection (older higher) and communicating with many people (younger higher), and both groups gave significantly higher ratings than older non-users for all features. For video chat, post hoc pairwise comparisons between the four groups show no difference in ratings between younger users, younger nonusers, and older users, but these three groups gave significantly higher ratings for each feature than older non-users, except for communicating with many people. For SNS, older and younger users differed only on their ratings of meaningful interaction (older users gave higher ratings). Both groups gave significantly higher ratings on all features than older non-users. Please see tables 1-8 for all means.

These results suggest that there are differences by both age and usage, but bigger differences form based on usage than age. This suggests that use of a channel is a bigger determinant in shaping how that channel is perceived than a generational divide. The reverse may also be true: Perceptions of a channel may drive use of that channel more than being a part of a certain age group. In either case, this supports the value of considering social perspectives on features present within communication channels.

Further support for that social perspective comes from the broad range of feature ratings. Participants rated how much each of the six features were present in each communication channel. The range of responses, even when separating out younger and older participants and users and non-users of each channel, is most commonly from 1 to 7. There seems to be a wide range of views on the presence of features even among similar age groups and usage patterns.

How do age and usage shape perceptions? The next two sections explore this question--first investigating age differences by assessing how social goals may shape preferences for features and second looking at how usage may shape perceptions of channels.

Age and Future Time Perspective Differences

Differences in feature ratings by channel showed frequent main and interaction effects by age. This section investigates differences by age groups in more detail, starting with overall selection of communication channels. First, I examined channels selected by each scenario and age to assess differences between age groups in preferred channels. The four scenario prompts were sharing important news, keeping up with someone, planning a social activity, and having chit-chat. In raw numbers, the telephone was the most popular channel in all four scenarios for older adults. Younger adults were more varied, preferring the phone when sharing important news, texting when keeping up with someone and arranging an activity, and face to face for chit-chat. Channels of mail, instant messaging, and video chat were selected by less than five percent of participants across all scenarios. Please see table 9 for detailed numbers.

Next, I assessed if there were differences in rates of channel selection between age groups using chi-square tests for the four or five most popular channels per scenario. (Less frequently selected channels were excluded to help meet cell size requirements for the chi-square test.) For scenario 1, there was a significant difference between age groups, χ^2 (n = 269, df = 3) = 28.4, p < .001. The difference comes from younger adults preferring texting over email and older adults preferring the opposite. The telephone was the most selected channel for both groups and face to face was equally popular. For scenario 2, there were again significant differences between age

groups, χ^2 (n = 254, *df* = 4) = 89.3, $p < .001$. The reversal in selection rate between texting and email was again a prominent feature--few younger adults selected email and few older adults selected texting. Rates of selection for instant messaging and SNS were also higher for younger adults compared to older adults.

For scenario 3, there was a significant difference between age groups, χ^2 (n = 270, *df* = 4) = 164.5, $p < .001$. Email was a more popular option for older adults, while SNS was more popular among younger, but the biggest difference was between telephone and texting, with older adults rating the former as their most selected channel and younger adults preferring the latter. For scenario 4, there was again a significant difference between age groups, χ^2 (n = 262, *df* = 3) = 65.3, $p < .001$. Texting was more popular among younger adults than older, while email remained more popular with older adults. The biggest difference was between face to face and the telephone. Younger adults rated face to face as their most elected channel for chit-chat, while older adults used the telephone most.

Next, I tested specific predictions based on socioemotional selectivity theory (SEST). SEST, with its predictions about changing social goals with age, may work to shape preferences for features and for channels, as individuals perceive some channels as better for certain types of social goals. For example, imagine a younger adult who wishes to maintain a large social network, consistent with SEST's predictions about younger adults placing more value on social interactions as providing new sources of information. This person, when thinking about interactions, when expressing preference for a communication channel, and when selecting a

channel, may show higher ratings of features that let her communicate with many people at once than an older adult who finds less value in maintaining many social connections.

Based on these ideas, I made predictions about what features younger and older adults would prefer. H1 predicted that younger adults will favor channels that allow them to communicate with a bigger audience, while H2 predicted that older adults would prefer channels they rated as higher in meaningfulness and feeling connected. RQ2 asks if there are differences in preference for channels based on speed of communication, getting partner's attention, and compelling a response, given that these features might appeal to both the speed conscious and those seeking emotional benefits.

Three measures are useful here. First, there is the degree that the individual thought about the feature in the scenarios, indicating a thoughtful approach to social goals. Second, there are the ratings of the channel that the participant reported using in the social scenario. And finally, there are the ratings of the channel that participants indicated as their most preferred channel. This second distinction is important as the channel a participant actually used may be different from the channel he most prefers. Thus I compare the features participants' thought about in the scenarios, their feature ratings for participants' selected channel, and feature ratings for their most preferred channel using a series of two-way repeated measures ANOVAs; feature was the within subjects factor, while age was used as the between subjects factor. The measures are averaged across all four scenarios.

First, I examined features thought about averaged across the four communication scenarios between younger and older participants. There was no main effect of age (F [1, 298] =

2.915, $p = .089$, partial $\eta^2 = .010$), a significant main effect of feature (F [5, 1490] = 75.67, $p < .001$, partial $\eta^2 = .203$), and a significant interaction effect (F [5, 1490] = 15.40, $p < .001$, partial $\eta^2 = .049$). Post hoc tests using Bonferroni corrections showed younger adults thought more about speed of communication, getting their partner's attention, compelling their partner to respond, and communicating with many people at once; older adults thought more about having a meaningful interaction.

Second, I examined differences in feature ratings of selected channels between younger and older participants. There was no significant main effect of age (F [1, 298] = 2.643, $p = .105$, partial $\eta^2 = .009$), a significant main effect of feature (F [5, 1490] = 119.14, $p < .001$, partial $\eta^2 = .286$), and a significant interaction effect (F [5, 1490] = 27.20, $p < .001$, partial $\eta^2 = .084$). Post hoc tests using Bonferroni corrections showed that older adults rated their selected channels higher in features of feeling connected, having a meaningful interaction, and getting their partner's attention than did younger adults. Younger adults rated their selected channel higher on ability to communicate with many people at once.

Finally, because an individual's selected channel may differ from their preferred channel, I looked at rating differences of preferred channel. Once again, there was no main effect of age (F [1, 298] < 1, $p = .570$, partial $\eta^2 = .001$), a significant main effect of feature (F [5, 1490] = 95.21, $p < .001$, partial $\eta^2 = .242$), and a significant interaction effect (F [5, 1490] = 12.21, $p < .001$, partial $\eta^2 = .039$). Post hoc comparisons using Bonferroni corrections showed that older adults rated their preferred channels as higher in speed and feeling connected to their partner; younger adults rated their preferred channels as higher higher in compelling their partner to

respond and in enabling communication with many people at once. Please see table 10 for all tests.

Because age group is a proxy for changing social goals, the future time perspective scale (Carstensen & Lang, 1996; Lang & Carstensen, 2002) was tested as a possible mediator between age group and ratings in selected channels of features connection, meaningful interaction, and communication with many people. Bootstrap testing (with 1000 resamples) was used to test the mediation effect (Preacher & Hayes, 2004; Preacher & Leonardelli, 2010). There was significant partial mediation for only the feature of connecting with many people (bootstrap estimate = -.534, bias corrected and accelerated 95% CI = -.8418 - -.2679). Features of feeling connected to partner and having a meaningful interaction did not show significant mediation. Please see table 11.

These findings find some consistency with H1 and H2. Older adults thought about and rated both their preferred and selected channels as higher in meaningfulness and connection. Younger adults thought more about and selected channels that enabled communication with many people at once. In answer to RQ3, in features thought about and in preferred channels, younger adults gave higher ratings for compelling partner response. Speed and getting partner's attention showed inconsistent differences between the three outcome measures.

Useful for more purposes

Because of the strong socially-defined differences in perception of channel features, it is important to next assess how experience using a channel may shape ratings of usefulness for that channel and perceptions of channel features. Channel expansion theory (Carlson & Zmud, 1999)

predicts that increased use of a channel will increase perceptions of usefulness of that channel; for example, a person who uses email very frequently may view it as a useful channel for accomplishing a wider array of interpersonal communication tasks than someone who uses email relatively infrequently. H3 and H4 predicted that usage of multiple communication channels would be similarly associated with usefulness and that usage would increase perceptions of the features tested in this study.

To test these hypotheses, participants were asked to consider how well each of eight channels could work in each of the four situations. Average ratings for each channel across scenarios was taken (for example, average usefulness of the telephone for each of the four scenarios). This measure was correlated with frequency of use of that channel. For younger and older adults, usage of a channel was associated with higher ratings of its usefulness in situations for all channels except face to face. With increased use, ratings of usefulness of that channel across all scenarios increased, confirming H3.

Just as users and non-users differed in their perceptions of features within channels, usage may also increase perceptions of features. This may be a possible explanation for the increase in usefulness. To test this, one-tailed Pearson correlations were calculated between perception of features within a channel and use of that channel for age groups separately. For all eight channels, among older participants, usage of the channel was significantly correlated with ratings of all features. The pattern was not as consistent for younger adults, though no correlation was significantly negative. Perceptions of one features were significantly correlated with usage in six of eight channels--Communicating with many people. Quickness was positively correlated with

use in five of eight channels. No other feature was significantly positively correlated with use of more than half the channels. Please see Table 12.

To assess if the relationship between use of a channel and the rating of its usefulness was mediated by ratings of other features, bootstrap testing (with 1000 resamples) was used to test for a mediation effect for each channel. There was significant mediation for all channels except face to face. No single feature was a consistent mediator between use and usefulness, nor was any feature a consistent predictor of usefulness. Please see table 13.

In short, older adults showed consistent patterns with usage and features; usage was related to increased perceptions of usefulness and perceptions of all six features within channels. For younger adults, usage was related to usefulness and several features in some channels. No correlation was negative, even if all were not significant. None of the features consistently predicted usefulness, suggesting that these features may not be the most predictive of perceptions of usefulness, something supported in past research investigating perceptions of usefulness (for review, see Legris, Ingham, & Collerette, 2003). Overall, these patterns provide support for H4 for older adults and partial support for younger adults.

Channels, Features, and Satisfaction with Interaction

Finally, RQ4 asked if ratings of features were related to selection of one channel over another. First, I assessed if feature ratings predicted use of the channel in a series of regressions. Age group, feature ratings, and interaction terms between the two were regressed onto use of the channel in eight separate tests. The results were consistently non-significant. No consistent patterns emerged in the results. Please see Table 14.

Second, I assessed if matches between features that individuals thought about in the situation and the rating of that feature in the selected channel could predict satisfaction. For example, two participants report thinking a lot about speed of communication; one selects a channel she rated as enabling fast communication, while the other selects a channel she rated as slower. Was the first participant more satisfied with her interaction than the second?

To test this, I subtracted the value of that feature from the rating of that feature in the selected channel. This produced a number ranging from -6 to 6, where negative values indicate a feature that was unimportant but was highly present in the selected channel, and positive values indicate the value was very important but not present in the selected channel. This scale was then folded by taking the absolute value of the difference. This value was regressed onto satisfaction for each scenario. No consistent patterns emerged and only two difference scores were significant predictors of satisfaction overall, with no difference score predicting satisfaction in more than one scenario.

Third, I assessed if the difference between desired features and features perceived in the selected channel was smaller than the average difference between desired features and average features perceived in non-selected channels, using paired-sample t-tests. This helps to test if individuals chose a channel they considered better than the other options available. Across all four scenarios, two features showed consistent significant differences, with the differences between thought-about feature and feature ratings for the selected channel significantly smaller than the average difference for the non-selected channels: meaningful interaction and communicating with many people (all $p < .01$). All features were significantly different in

scenarios 3 and 4; all features except quick communication were significantly different and in the expected direction for scenario 1. This suggests that, compared to the alternatives, the selected channel more closely matches the features that the participant thought about in the scenario.

Overall, in answer to RQ4, there is some evidence to suggest that the channel selected may have been better, on average, than the other channels included in this study, suggesting that fit between desired features and reported features may shape the process of channel selection. Overall rating of features of channel does not predict use of that channel, however.

Study One Discussion

This study aimed to address the value in considering a socially based approach to communication channels by asking participants to rate features present channels and how much they thought about these features in four interpersonal communication scenarios. By focusing on user ratings of channel features instead of normative or objective ratings, individual differences can be assessed to investigate how perceptions of channels may be shaped by and shape use of channels.

Hypotheses

First, I will review each hypothesis and research question and their associated results. RQ1 asked about differences in perceptions of channel features between user/non-users, age groups, and within these classifications as well. Significant variance was found suggesting that a static, objective classification of communication channels may ignore significant and meaningful variance in individual perceptions.

H1-2 and RQ2 predicted differences between age groups and their preference for channel features, based on SEST's description of changing social goals. The findings provide some support for H1 and H2, with higher ratings for younger adults in enabling communication with many people at once and higher ratings for older adults for connecting with their partners and having meaningful interactions. For features addressed in RQ2, younger adults preferred channels that compelled their partner to respond. Speed and getting partner's attention had inconsistent differences between the three outcome measures.

H3-4 addressed channel expansion theory, predicting that use of a channel would be associated with increased ratings of usefulness for that channel. Expanding upon the theory, H4 predicted that increased use would also be associated with higher feature ratings for that channel. Both these hypotheses were confirmed. H4 was strongly confirmed for older participants, and partially confirmed for younger adults.

Finally, RQ4 asked if matches between valued features and features present in selected channels could predict satisfaction. The answer was mostly no, though selected channels had better matches with desired features than did unselected channels.

Major Findings and Implications

First, broad differences between age groups and between users and non-users show the variability in participant perceptions of channels. Though a normative or objective focus on channel differences (for example, declaring "text messaging" an asynchronous or synchronous channel) simplifies research, it may fail to capture the wide array of perceptions about this feature within the channel itself.

These differences were particularly noteworthy among newer communication channels like texting, IM, video chat, and SNS. Consistently, younger participants and older users had higher ratings of features for these newer channels than older non-users. But the overall variability in perceptions was also higher than for more traditional channels, suggesting less of a consensus has emerged for what using these newer channels is like.

Exploring select differences may also offer clues into differences between age groups. Consider, for example, younger adults rating face to face as a significantly more meaningful way to interact than older adults, with the reverse trend for the telephone. This may occur first based on the power of use of a channel to influence perceptions of that channel. Younger adults (in this sample, all college students) may have more opportunities to interact face to face, while older adults may not be around as many social partners. For older adults, the telephone may be the best way to connect with someone, thus influencing perceptions that it is better for close interaction.

Another explanation may come from stereotype activation (Hummert, 1994). Older adults who appear old may trigger others to engage with them based on their appearance (judging them to be less cognitively competent). This could lead to less meaningful interactions. The telephone may act to mask these visual cues, leading to more natural interaction. This possibility is supported by younger adult perceptions of face to face as creating more connection while older adults viewed the phone as more likely to do the same.

For newer channels, the biggest and most consistent divide was between users and non-users. First, when assessing differences between age groups and user/non-user, the largest difference was between users and non-users. This suggests the power of use to shape views of a

channel (Braun, 2013). As Braun (2013) argued when studying attitudinal and behavioral predictors of social networking websites, the divide between users and non-users on attitudes about SNS challenges the predictive power of attitudes on intention to use the channel. Instead, it makes sense to test whether the patterns shown between the two groups are significantly different from one another when assessing the ability of attitudes to predict technology use behavior.

The distinction between users and non-users raises further questions for channel expansion theory (Carlson & Zmud, 1999). As predicted by this theory, greater use of a channel will lead an individual to perceive it as useful for more purposes. This study found broad support for this contention. This study also expands upon channel expansion theory by showing a connection between use of a channel and ratings of a broad range of features for older adults. For younger adults, there were multiple significant associations and no correlations were negative.

This connection suggests a mechanism influencing the use of a channel in more scenarios. If a diversity of features are more widely perceived because of use, then that channel will naturally be perceived as more useful in more situations. This contention was tested with mediation; while consistently significant, no single feature was a consistent mediator between use and usefulness. More study is needed to investigate the features that may mediate the relationship between channel use and perceptions of its usefulness. In any case, this is further confirmation of the power of use to shape how individuals perceive communication channels.

This study is unique in showing how the changing social goals, as predicted by Carstensen's socioemotional selectivity theory, shape preferences for communication channel

features. Older adults think about, select, and prefer channels that let feel connected to others and have meaningful interactions, while younger adults think about, select, and prefer channels that let them communicate with many people at once, supporting H1. RQ2 also asked if there would be differences between preference for quick communication, getting partner's attention, and compelling a response. Such features would be useful for maintaining connection with others and emotional regulation, because when one desires to connect, it is important to establish a connection right away. But they may also be associated with maintaining many connections because individuals may desire channels that do not interrupt their partner or compel a response, two things that may be needed for the transmission of (non-urgent) information. Further, compelling a partner to respond might be associated with more relational distance, as the partner may not have time to have a meaningful interaction if not allowed to respond when convenient. This claim deserves attention in future research.

The support for the hypotheses suggests that social goals, as predicted by SEST, may shape our selection for means to communicate. It is noteworthy and valuable that any trends emerge across these results, given the diversity of scenarios and ways of testing for preference. That younger adults think more about and prefer channels that let them keep up with multiple people at once directly reflect that younger adults tend to have larger social circles than older adults. That older adults think more about connecting with their partner and having meaningful interactions support Carstensen's contention that new information is less important with age than having connections with people who matter to us. For compelling partner response, this feature may have mattered more to younger adults because their social connections provide new

information, rather than emotional stability. A new source of information is only as valuable as its willingness to communicate.

For speed of communication, the lack of consistent differences across all three measures of preference suggests that both younger and older adults prefer communication channels that allow them to communicate quickly. No matter one's time perspective, faster communication may be important. For younger adults, their communication may be more time-sensitive (e.g., the location of a party; a chance to meet a friend for lunch), and their upkeep with a large social network may necessitate efficiency. For older adults, focused more on emotional stability, speedy communication may help to fulfill their desires to connect, while slower channels reduce the role of communication in emotional regulation.

Some additional support for Carstensen's Future Time Perspective (FTP) scale is found as well. This scale mediated the negative relationship between age and preference for communicating with many people at once. The mediation was not significant for feeling connected to a partner and having a meaningful interaction. More research is needed to see how FTP may play a role in shaping feature preferences. For example, college seniors and freshmen could be compared, as some past research has suggested their social goals vary widely--seniors thinking about their time in college coming to an end and freshmen looking to make new connections (e.g., the "senior year" phenomenon, Brown, 1989).

The final aim of this study was to predict satisfaction with interaction based on features thought about and rated features within the selected channel. No consistent results (and few significant results) emerged from these tests. There are several possible reasons for why this was

the case. The first possibility is that people were generally very satisfied with their interactions. This may have occurred because, in order to find situations that were broadly applicable, the situation prompts were very general (e.g., sharing important news) rather than likely to produce situations that could have ended strongly positively or negatively (e.g., sharing bad news about someone else; criticizing someone). There was little variance in overall rates of satisfaction and thus little room to explain based on matches between desired and perceived features. The issue is also complicated by the nature of volitional compared to habitual behaviors. Predicting behavior from attitudes is successful when the behavior is volitional, but more problematic if the behavior is habitual (Fishbein & Ajzen, 1975). This study does not assess if channel selection is a volitional or habitual behavior; it is probable that it contains facets of both and may differ based on scenario.

Another explanation is the nature of the items themselves. The items asked how much someone had thought about, for example, "getting partner's attention" while the perceived feature asked how much a channel "got partner's attention." It is possible that an individual thought very much about getting their partner's attention and decided she did not want to interrupt her partner; she then selected a channel accordingly. This may have lead to great satisfaction that could not be captured in the test I performed because the results would indicate a mismatch between feature thought about and feature present in the selected channel. It would have been better to ask for thinking about wanting to or not to get partner's attention than asking about the idea in general. This can be changed in future item construction for this paradigm in channel perception and preference research.

Limitations

There are several limitations in this study. To make broader conclusions, several scenarios were used. However, because the scenarios were selected to be common in the lives of both younger and older adults, they were not systematically structured to show different patterns of channel uses between them. Thus this study cannot offer conclusions about the situational aspects that may guide channel selection and limits this study's ability to draw conclusions about the full range of aspects that may guide channel selection. Given that age and social goals are limited in their predictability of channel selection, a large amount of variance remains unexplained and unexplored by this study. As noted above, it is challenging to conclude how much of channel selection is volitional behavior and therefore, including scenario type as a predictor of channel selection may help to understand this important piece.

Second, there is a much greater range of ages among older adults than younger adults, which may account for some of the similarities between younger users, younger non-users, and older users of communication channels. Older users tended to be younger than older non-users. This is further complicated by the few non-users among younger adults for channels like texting and social networking websites. It is difficult to draw complete conclusions about the effects of use or age in perceptions of channels without a young adult non-user group. One potential way to overcome this is to split participants into non-user, occasional-user, and everyday-user groups.

Third, factor analyses on perceptions of features and channel use did not produce a consistent pattern of responses that could have been used to reduce the number of variables, as I had hoped. This made analysis complicated because each feature had to be considered

individually within multiple channels. There is little that can be done, as no theory suggested an appropriate pattern, but it is noted here as a limitation of this type of research. Study two offers a specific way to overcome this limitation. Rather than focus on individual perceptions of a communication channel, study two considers the cues that each channel carries (textual, aural, and visual) to see if this affects outcomes of channel selection, and thus uses an objective classification of communication channels. This is a potentially valuable way to overcome the challenges inherent in study one's view of communication channels.

Study Two

Whereas study one focused on assessment of social perspectives of communication channels and their features, study two uses an objective approach to classify channels based around the cues (visual, aural, and textual) that they transmit. These cues are used to assess how interpersonal relationships may be affected, over time, based on communication channel choice.

An individual's preconceptions of their communication partner may hurt their interaction. For example, age-based stereotypes (Hummert, 1994) can predispose an individual to communicate with an older adult in a pandering way (e.g., Barker, Giles, & Harwood, 2004) and personal conflict in a relationship can make interactions less productive (e.g., De Dreu & Weingart, 2003). The selection of communication channel may offer a way to blunt the negative effects of inappropriate age stereotypes (from the framework of the stereotype activation model, Hummert, 1994) and conflictual relationships (using the communication orientation model, Swaab, Galinsky, Medvec, & Diermeier, 2012). As age stereotypes can harm meaningful intergenerational relationships (Harwood & Lin, 2000) and conflict can make interactions less productive (De Dreu & Weingart, 2003), it is vital to find ways to reduce these causes of failed interpersonal interaction. This study investigates how selection of channel may help or hinder relationships in which age and conflict may affect personal interactions to answer the question: Can channel selection improve personal relationships that college students have with friends, parents, and grandparents?

In the following sections, I review interpersonal interactions and how they may be hurt by age-stereotypes and conflict. I discuss the process of relational maintenance and integrate research for a new model of channel effects. I then describe the study used to test this model.

Preconceptions and Relational Hindrances

Preconceptions of an interaction partner can harm interpersonal communication before an exchange even begins (Barker et al., 2004). One type of preconception is based on age, and the detrimental effect it can have on an interaction is described by the stereotype activation model (Hummert, 1994). This model suggests that stereotypes are activated from three possible sources: preconceptions of the perceiver, characteristics of the target, and the context in which the interaction occurs. The activation of these stereotypes results in speech that may be inappropriately accommodative (that is, based on preconceptions and stereotypes; for example, that older adults are feeble-minded and should be spoken to like children; Kemper, 1994), rather than on the individual and her needs. This non-accommodative speech has been shown to result in discomfort (Barker, 2007) and miscommunication (Williams, 1999), while successful accommodation is associated with increased relational closeness (Harwood, Hewstone, Paolini, & Voci, 2005) and better health outcomes (Caris-Verhallen, Kerkstra, & Bensing, 1997; Ryan, Giles, Bartolucci, & Henwood, 1986).

Another type of preconception comes from conflict and inequity in the relationship. Conflict in relationships is associated with a wide array of negative outcomes: parent-child conflict, in part, causes child externalizing behaviors (Burt, Krueger, McGue, & Iacono, 2003; Burt, McGue, Krueger, & Iacono, 2005); friendship conflict is associated with aggression and

peer rejection (Sebanc, 2003); and roommate conflict is a significant source of stress in college student life (Ross, Niebling, & Heckert, 1999). Similar to stereotype-activation from individual preconception, conflicts can be activated from social inferences, attributing certain dispositions to a communication partner (for example, expecting that someone is hostile) (Sillars, 1980). This study aims to expand upon this research to see if channels can interact with these negative qualities in relationships to produce differential outcomes from interaction.

Channels can play an important moderating role in the relationship between preconceptions and relational features, and interaction outcomes. In the stereotype activation model, lean channels (those that mask visual and aural cues) may reduce the presence of some stereotype-activating cues (Hummert, 1994). Though the target may look in a way that would trigger beliefs about older adults as less able and competent, a lean channel prevents transmission of the cues that may activate stereotypes. A rich channel may trigger preconceptions (or, at least, fail to change them) and the interaction context may still influence the interaction, but lean channels may succeed in reducing stereotype activation by a measurable degree. In noncooperative relationships, lean channels can mask antagonizing cues that might degrade an interaction (Swaab et al., 2012). Thus lean channels, with their ability to hide cues that would lead to negative interactions, may offer a solution to improving interpersonal interaction.

The communication orientation model (Swaab et al., 2012), however, suggests an additional complication to this simple channel moderation. The communication orientation model was tested through a meta-analysis of laboratory studies looking at tasks in which participants were conflictual (competing against each other), cooperative (in which participants

were told to work together), or neutral (in which participants were not instructed to compete or cooperate). Swaab et al. found that beneficial outcomes are more likely to result when conflictual interactions occur over lean channels and neutral interactions occur over rich channels. For conflict, fewer cues means less escalation of hostile behaviors; for neutral interactions, more cues means greater reassurance and liking between partners. In cases of cooperative relationships, the selection of channel plays no significant role in determining the outcome, because actors are already aligned and ready to act in concert. This process also occurs in the stereotype activation model (Hummert, 1994), where preconceptions of positive stereotypes about the older adult target lead to normal communication behaviors rather than inappropriately accommodative behaviors. The type of cues can lead to more positive behavior, and thus a successful model of channel effects should consider that lean or rich communication interacts with the types of cues in the relationship.

One reasonable criticism of the use of the communication orientation model to explain interpersonal interactions is that the data supporting the model is drawn from laboratory studies of dyadic and group interaction, in which the task, rather than the preexisting relationship, is used to determine the orientation (conflictual, etc.) between participants. For example, noncooperative relationships are defined as participants engaging in a zero-sum game, in which gains for one side always result in losses for the other. Further, all participants are strangers, meaning no prior relationship can complicate their completion of the task. Such conditions are far removed from interpersonal relationships, where close friends may engage in a competitive

task (for example, negotiating over who gets the larger bedroom when sharing an apartment) and hostile parties may engage in a cooperative task (fighting siblings forced to rake the yard).

Though the line of reasoning in the communication orientation model seems divorced from interpersonal relationships, the authors present the theory as one with broader potential application to the study of interpersonal relationships. Consider the anecdote that Swaab and colleagues (2012) use at the start of their manuscript. During the Camp David Accords, Egyptian president Anwar El Sadat and Israeli president Menachem Begin met to negotiate an end to their two countries' hostilities. No progress was made when the two sides met face-to-face, so the negotiator, US president Jimmy Carter, sequestered the two sides and worked with each individually until an agreement was reached. The authors suggest this as an example of hostile parties succeeding because of lean channels, but the anecdote is not a perfect mirror to a "zero-sum" task because agreement (cooperation) was favorable to both sides, even if each had to give concessions. Personal or national, rather than task-based, enmity may have strained relations and thus the selection of the channel "Jimmy Carter" improved negotiations, in part, because of personal issues between the two leaders, not because of the nature of the task.

Additionally, interpersonal relationships may not be so far removed from the competitive/ cooperative framework used in the communication orientation model. Relational maintenance (Stafford, 2011; Stafford & Canary, 1991)--behaviors, both routine and strategic, that are performed to "maintain the nature of the relationship to the actor's satisfaction" (Stafford & Canary, 1991, p. 220)--involve give and take between partners. Initial study (Stafford & Canary, 1991) identified five types of relational maintenance behaviors--positivity, openness, assurances,

shared networks, and shared tasks--while later study (Stafford, 2011) found a seven factor solution to be more appropriate--positivity, understanding, self-disclosure, relationship talk, assurances, shared tasks, and shared networks. Examples include saying "I love you" (assurances), taking care of household chores (shared tasks), spending time with friends and family (shared networks), and sharing personal information (self-disclosure).

Combined with relational maintenance behaviors, equity theory (Canary & Stafford, 1992) suggests that the most satisfying relationships are ones in which an individual gives and receives relational maintenance in equal measure. Thus a satisfying, close relationship is aligned with a cooperative task (balance between giving and receiving), while an unsatisfying, conflictual relationship is aligned with a competitive task (attempting to receive more than one gives). Thus it is a reasonable extension of the communication orientation model to test its propositions as part of a model of interpersonal interaction.

The measurement of relational maintenance behaviors does deviate from the communication orientation framework in that the processes known to predict positive dyadic, interpersonal outcomes are better understood than the processes occurring in the types of tasks used to assess the communication orientation model. That is, in Swaab and colleagues' model, they do not assess what behaviors may occur within the laboratory studies included in their meta-analysis that lead to better outcomes; instead, they focus only on richness of channel and type of task, and assume that activation of either positive or negative cues affects the information sharing necessary for positive outcomes. This approach can be forgiven due to the overall "black box"

nature of group research, in which researchers measure inputs and outputs but not the process itself (Larson, 2010).

The same reasoning cannot apply to the study of interpersonal relationships, however, because frequency of relational maintenance behaviors are associated with positive relational outcomes like relationship satisfaction and commitment, and partner liking and love (Stafford, 2011). Additionally, some preliminary research has begun to look at relational maintenance behaviors across multiple communication channels (e.g., Ledbetter, 2010; Rabby, 2007; Ramirez & Broneck, 2009). For example, Ramirez and Broneck (2009) looked at differences between IM and face-to-face interaction. Relational maintenance, thus, should be measured within an interpersonal interaction as a way to understand when and how communication leads to changes in relationships. This is an important mediating variable between interactions and outcomes. Measuring this also allows relational maintenance behaviors to be controlled for in tests of channel effects, like those described next.

The Cue Activation Model of Channel Effects

Merging the ideas from the stereotype activation model (Hummert, 1994) and the communication orientation model (Swaab et al., 2012) results in the *cue activation model of channel effects*. Simply, this model argues that communication channels vary in their ability to carry certain cues, and that cues carry information that may activate reliance on certain preconceptions to guide interaction with a communication partner. When the channel masks these cues, then these preconceptions are less likely to be activated, and the individual acts based on different sources of information. The model makes no claims that one channel is better than

another, nor any predictions about revealing or masking of cues being better overall. It is instead a valence-less process in which the cues themselves determine negative or positive outcomes. That is, a positive cue (for example, a facial expression that demonstrates a willingness to work together) that is masked can result in negative outcomes, while a negative cue (for example, an age-stereotype activating cue) that is masked can result in positive outcomes.

The model describes dyadic interaction. Both participants are recognized to present cues that shape the interaction. Cues that could cause serious detriment or benefit to the interaction can be revealed (when using rich channels) or masked (when using lean channels). Thus the selection of channels combined with the transmitted cues can predict the outcome of the interaction. Negative cues across rich channels are detrimental to the interaction, but if hidden, the interaction can continue more positively. The opposite is true for positive cues. In this study, negative cues (conflict-activating cues and age-stereotype activating cues) are assessed; future research can be done to assess the role of positive cues.

This new model makes several contributions to thinking about channel effects. First, it accounts for processes described in multiple other models of interpersonal interaction. Besides subsuming processes from the stereotype activation model (Hummert, 1994) and the communication orientation model (Swaab et al., 2012), the cue activation model also accounts for processes outlined in the hyperpersonal model (Walther, 1996). This model describes interaction over low cue channels as a process of selective self-presentation and partner idealization, in which low cue interaction, compared to high cue, can result in greater liking between partners. The model argues that interaction partners wish to be liked and thus take time

to carefully construct their message to present themselves positively. With cues that could cause one partner to dislike the other masked, the partner can act only upon the carefully constructed message and thus idealizes her partner, leading her to spend time crafting her own message in response. This process fits within the realm of the cue activation model, if we consider the masked cues to be those that would be detrimental to the interaction.

The hyperpersonal model also suggests (in theory, though not actually discussed in Walther, 1996) that negative behavior can lead to escalation of conflict. If a person constructs a message that presents himself as hostile and angry, then the masking of cues that could suggest otherwise (for example, a friendly smile) leads the partner to conclude the person is hostile, resulting in a hostile response. This process can account for "flaming" (Lea, O'Shea, Fung, & Spears, 1992), heated discussions that have been observed in anonymous, low cue communication environments. With potential positive cues masked, the hostile message is assumed to be delivered by a hostile person, thus warranting a heated response.

Second, the cue activation model accounts for interaction over channels with both high and low cues. The hyperpersonal model describes interaction only in low cue environments and does not account for times in which a high cue environment may lead to better outcomes (for example, when strangers must coordinate their work on a task; see Swaab et al., 2012, for a review).

Third, the cue activation model expands the framework of the communication orientation model (Swaab et al., 2012) to consider a wide range of cues that may cause positive or negative reactions in communication partners. Besides age-based stereotypes, other cues may be

important to be masked or revealed. Consider, for example, personal habits that an individual may associate with a lack of intelligence--gum chewing, hair twirling, vocal tics, etc. If revealed, these cues may negatively affect the interaction between two people, but when masked the interaction can proceed unhindered by the disruptive or distracting cues.

This model can also account for deceptive interactions in which non-verbal behaviors widely believed to be associated with deception (fidgeting, lack of eye contact, verbal hesitancies) can lead individuals to suspect their partners are acting deceptively (Levine, Serota, Shulman, Clare, Park, Shaw, Shim, & Lee, 2011). Masking of these cues may allow individuals who cannot control these behaviors to appear more trustworthy. It may also improve accuracy for deception detectors (Van Swol, Braun, & Kolb, in press). It is unknown, however, if selection of the channel can itself act as a cue to deception. This suggests a valuable future direction for testing the boundary conditions of the cue activation model.

To test the cue activation model, this study looks at relational behaviors between college students and three of their geographically-distant social partners: a same-age partner (SA), a parent-age partner (PA), and a grandparent-age partner (GPA). Participants report on their relationships with the partner, including the amount of conflict and inequity within the relationship. After two months, they keep a diary of their interactions with these partners over one week, including channel use and relational maintenance behaviors within the interaction. Finally, participants complete the same relational measures after the diary week is complete. The study looks to see how level of relational conflict and the presence of age-based stereotype-

activating cues interacts with channels used to communicate to predict changing relational outcomes from time one to time two.

This study adds to the literature in several ways. First, it expands upon past research on family relationships and channel use (e.g., Harwood, 2000a; Ledbetter, 2009) by considering a broader range of channels than has been considered in the past and introducing the variables of age and conflict, both of which may negatively influence interpersonal relationships. Second, it tests a theory from organizational communication (the communication orientation model, Swaab et al., 2012) in an interpersonal context. It also resolving confounds of task and relationship present in Swaab and colleagues' original model; specifically, because all data in support of the model comes from interactions with strangers, the model cannot differentiate between conflict in personal relationships and conflict caused by the nature of the task. Third, it proposes an integrated framework of channel selection as a moderator of tension-causing preconditions (stereotypes, hostile relationships, etc.) and suggests relational maintenance behaviors as a moderator between channels and cues, and relational outcomes.

Hypotheses

First, following research by Harwood (2000a), I take up his suggestion to assess patterns of communication between college students and valued others by looking at an expanded number of possible communication channels. This prompts several research questions related to patterns of communication with same-age, parent-age, and grandparent-age partners.

RQ1. Are frequency of use measures for all channels significant correlated?

RQ2. What channels will participants report using most with same-age, parent-age, and grandparent-age partners?

Contact initiation may also play an important role in relationships between generations (Harwood, 2000a). This study asks if contact initiation is related to relationships with partners in all three generations, just as Harwood found contact initiation to be associated with closeness (third-party initiation was associated with less closeness between grandchildren and grandparents).

RQ3. Is contact initiation (by participant, partner, or third party) related to factors of communication frequency, closeness, conflict, and equity?

Next, I assess relationships among communication and relational factors of closeness, conflict, and equity.

H1. Higher conflict and lower equity will be associated with lower closeness.

H2. Communication frequency will be associated with higher closeness, lower conflict, and higher equity.

Because this data was collected over the course of a semester, it enables assessment of changing relational closeness and any communication predictors of that change. First, there is the self and partner relational maintenance behaviors collected during the diary portion of the study.

H3. Self and partner relational maintenance behaviors will be associated with increased relational closeness from T1 to T2.

Second, there is the complex nature of communication channels carrying many or few cues. In line with the cue activation model of channel effects, I propose the following hypotheses.

H4. Closeness, conflict, and equity will interact channel richness to predict increased closeness. Low closeness, high conflict, low equity, and old age appearance (for grandparent-age partners) at T1 will produce increased closeness if participants interact over lean channels. Moderate closeness, conflict, equity, and age appearance (for grandparent-age partners) at T1 will produce increased closeness if participants interact over rich channels. High closeness, low conflict, high equity, and young age appearance (for grandparent-age partners) will produce increased closeness based on communication frequency alone with no interaction by channel.

Finally, assessing other potential differences based on channel selection and use, I ask the following research questions regarding channel effects on relational maintenance behaviors.

RQ4. Does channel richness predict rates of relational maintenance behaviors?

RQ5. Do relational factors of closeness, conflict, equity, and age appearance (for GPA) predict rates of relational maintenance behavior?

RQ6. Does channel and conflict and channel and age appearance (for GPA) interact when predicting relational maintenance behaviors?

Study Two Methods

Participants

200 undergraduates enrolled in communications courses at a large public Midwestern university signed up to participate in this study in exchange for extra credit; 183 participants

completed all three parts of the study for an effective participation rate of 91.5%. One participant gave her age as 17, and her responses were excluded. Of those participants completing all three parts, their ages ranged from 18 to 42 with a mean of 20.33 and a standard deviation of 2.24. The sample was overwhelmingly female (78.5%) with one participant failing to report this information. The sample was also mostly White (74%); two participants did not provide this information.

Procedure

Participants completed all three parts of the project during the fall semester. In late September, they selected three people with who they regularly communicated but could not see every day; these three people came from three different age groups--a same-age partner (SA), a parent (or someone parent's age) (PA), and a grandparent (or someone grandparent's age) (GPA).

For the first part of the study, participants reported on their relationship with this person, including conflict in the relationship, relational closeness, and relational equity. They also reported how they preferred to communicate with this person (e.g., face to face, the telephone, email, texting, etc.), how they felt the other person preferred to communicate, and (for their grandparent) measures of age perception and age accommodation behaviors.

For the second part of the study, participants completed a record of their contacts with their chosen three people over the course of one week. For each interaction, they indicated how they communicated, how long the interaction lasted, who initiated it, and measures of relational maintenance behaviors for both self and partner. Participants were also asked if they liked the channel used in the interaction and asked to speculate on how the interaction could have gone

differently over a different channel and why that channel was selected. If the participant did not interact with this person during the week of part 2, they were asked to recall the last time they did interact with this person and answer the questions about that interaction. This happened in 122 out of the 1102 reported interactions. It was most common with GPA (32.7%) than SA (7.5%) or PA (3.9%), F (2, 1096) = 78.6, $p < .001$, partial $\eta^2 = .125$. Most participants reported just once per person, but responses ranged from one to 18 interactions during the week. Once data was collected, part 2 data was aggregated into single time measures for participants reporting more than one interaction; this resulted in measures for average relational maintenance behaviors, percent of "rich" interactions (interactions carrying visual and/or aural cues), and total number of interactions.

In part three, participants again completed relationship measures from part 1 for all three of their relational partners. They also gave demographic information for their partners and for themselves.

Participants reported on a wide variety of relationship types. For SA, 73.9% of participants reported on a friend, 14.6% siblings, 7% other family (e.g., cousin), and 6.5% on a romantic partner. For PA, 74.9% of participants reported on their mother, 18.1% on their father, 3.5% on an aunt or uncle, and 2% on another type of relationship (e.g., high school teacher). For GPA, 70.8% of participants reported on a grandmother (24.6% maternal grandmother, 22.1% paternal grandmother, 24.1% grandmother unspecified), 22% reported on a grandfather (5.6% maternal grandfather, 8.7% paternal grandfather, 8.2% grandfather unspecified), 4.0% on an aunt

or uncle, and 2.5% on another type of relationship (e.g., friend's grandmother). Please see table 15.

To assess if relational measures differed between relationships types, a one-way ANOVA was used with Bonferroni corrections for post-hoc comparisons. For SA, participants reporting on siblings (M = 1.92, SD = .496) reported higher conflict than those reporting on friends (M = 1.57, SD = .505), F (3, 190) = 4.50, p = .004. For PA and GPA, there were no significant differences.

Measures

Relational Closeness. The measure of relational closeness was adapted from Canary & Spitzberg (1989) and Harwood (2000a; 2000b). It included 6 items like "I am satisfied with this relationship," "I find this relationship rewarding," and "I wouldn't want to do anything to hurt this relationship." To assess reliability of this measure, factor analysis was performed on the items for SA, PA, and GPA scales. All three showed single factor solutions, explaining 55.9% (Eigenvalue = 3.36), 72.2% (Eigenvalue = 4.33), and 67.7% (Eigenvalue = 4.06) of variance, respectively. All three scales also showed acceptable Cronbach's alphas (.836, .917, and .892). Means were taken for use in analysis for these items and for the same items at Time 2.

Relational Conflict. The measure of relational conflict contained 6 items adapted from Pierce, Sarason, and Sarason (1991). It was scored from 1-Not at all to 5-Completely and included items like "How angry does this person make you feel?," "How much would you like this person to change?," and "How much does this person want you to change?". Once again, factor analysis was performed for all three age groups. For PA and GPA, one factor emerged,

explaining 62.1% (Eigenvalue = 3.72) and 61.9% (Eigenvalue = 3.71) of variance, respectively. For SA, a two factor solution was revealed, with Eigenvalues of 3.27 and 1.02. To assess the items further, Cronbach's alpha was taken for each age group. Because Cronbach's alpha was acceptable for all three groups (.829, .872, and .866, respectively) and because no theoretical justification can be offered for a two factor solution to the conflict scale, means of all items were taken for use in analysis.

Relational equity. The measure of relational equity contained 6 items and was adapted from Canary, Weger, and Stafford (1991); one item was reverse coded. The scale contains items like "We agree on what we can expect from one another," "We are attentive to each other's comments," and "I feel my partner ignores my thoughts and feelings" [reverse coded]. The items were scored from 1-Strongly disagree to 7-Strong agree. Factor analysis for each of the three groups showed one factor solutions explaining 65.7% (Eigenvalue = 3.94), 65.0% (Eigenvalue = 3.90), and 65.2% (Eigenvalue = 3.91) of variance, respectively. Cronbach's alpha confirmed the reliability of these measures with acceptable values (.877, .875, and .862, respectively), and means were taken for use in analysis.

Measures of Older Adult Behavior and Perception. For GPA, additional measures of perception of age and accommodation behaviors were adapted from Anderson et al. (2005) and Harwood (2000). The first set of measures involved paired adjectives for describing the partner (e.g., "Sad/Happy," "Sedentary/Active," "Lonely/Not Lonely"). To assess these measures, factor analysis was used. Three interpretable factors emerged explaining a total of 70.3% of variance. Given that the items are designed to be used together, Cronbach's alpha was calculated to see if

the scale was reliable. Because Cronbach's alpha was acceptable (.884) and because no items could be removed from the scale to increase that value, a mean was taken of all items for use in analysis.

The next set of items asked participants to indicate how their GPA looked and sounded; scored from 1-Strongly Disagree to 7-Strongly Agree, the 12 item scale included items like "Looks young for his/her age," "Has wrinkly skin," "Is in generally good health," and "Is able to get around on his/her own". Items were reverse coded where needed so that higher scores indicated older appearance. While factor analysis revealed a two factor solution, the two factors were not conceptually unique; Cronbach's alpha was acceptable (.851) and thus a mean of the items was taken for use in analysis.

The final measure included accommodation behaviors. Participants were prompted to indicate how likely the items were to occur in a typical conversation with the person and to respond on a scale from 1-Not likely at all to 5-Very likely. The scale is designed to represent four sub-areas. For Accommodative Involvement, example items include "I share personal thoughts and feelings," "I compliment my grandparent," and "I don't know what to say" [reverse coded]; higher scores indicate greater accommodative involvement. For Reluctant Accommodation, example items include "I have to 'bite my tongue'," "I avoid certain ways of talking," and "I don't act like myself." For Accommodating Role-Relations, the two items are "I show respect for his/her age" and "I feel respect for his/her knowledge and wisdom." For Interpretability Strategies, the two items are "I speak louder" and "I speak slower than normal."

Factor analysis was used with all the items to see if the same factors would be revealed in this data. Four factors were revealed, validating the structure of Reluctant Accommodation, Accommodating Role-Relations, and Interpretability Strategies; these three factors explained 24.8% (Eigenvalue = 4.75), 15.9% (Eigenvalue = 2.22), and 13.7% (Eigenvalue = 1.54) of variance. Factor Accommodative Involvement was not supported through the factor analysis, with two of its items loading together, two loading with Accommodating Role-Relations, and two others failing to load on any factor. To assess the reliability of retaining this theorized structure, Cronbach's alphas were calculated. The measure was acceptable for all four factors (. 731, .840, .652, and .820, respectively) and means were taken for use in analysis.

Relational Maintenance Behaviors. In part 2, participants completed a 16 item measure of self and partner relational maintenance behaviors adapted from Rabby (2007). Items asked participants to what degree the following items were true for the interaction they had, both for themselves and for their partner; for example, "Acted cheerful and optimistic," "Did not judge my partner [alt. me]," "Was open about my [alt. his/her] feelings," and "Made my partner [alt. me] know that this relationship is important to me [alt. him/her]." Initial factor analysis showed two factors for both self and partner items. The differences were largely uninterpretable, however, and several items cross-loaded. Cronbach's alpha was calculated for both sets of items and found to be acceptable (.874 for self; .907 for partner); therefore, a mean of the items was taken for use in analysis.

Study Two Results

Analysis for this study begins with assessing overall trends for communication partners, channel use patterns, and issues of relational closeness, conflict, and inequity. Next, I investigate the types of channels used and other relational predictors on relational maintenance behaviors during the diary portion of the study. Finally, I investigate if masking or revealing of certain cues can predict relationship change, in accordance with the predictions of the cue activation model.

Rates of contact by channel

First, I assess if use of one communication channel is associated with uses of others. RQ1 asks if people selectively communicate along only a select number of channels, or if communication on one channel increases chances of communication using others. Frequencies of communication channel usage was correlated for each age group to assess if using one channel was associated with use or disuse of another. For SA, telephone use was most consistently associated with use of other channels, with significant positive correlations with all other 6 channels. Telephone use was most strongly correlated with texting. Channel use with PA did not show as many significant correlations. Face to face communication was correlated with only telephone and mail use. The channel most correlated with others was mail, which was significantly positively correlated with all other channels. For GPA, the strongest correlation was between face to face and telephone communication, suggesting that pairs who see each other more frequently also speak on the phone. Use of SNS was also correlated with other "new tech" channels, including email, texting, and video chat. It was not correlated with face to face, telephone, or paper mail channels. Email was the channel most correlated with all others, showing significant positive correlations with all other channels. For all age groups, use of no

channel negatively correlated with use of any other. This suggests a complex answer for RQ1, unlike the more straightforward answer (correlation between face to face, telephone, and mail) found by Harwood (2000).

Communication frequency may differ based on channels and age of communication partner. RQ2 asks what channels participants reporting using most with their partners in all three age groups. To examine these patterns, a two-way repeated-measures ANOVA was used to compare frequency of contact between channels and age groups. Frequency of contact for seven channels for each of the relational partners (SA, PA, and GPA) was used as within-subjects factors. Please see table 16. There were significant differences between age groups (F [2, 386] = 428.3, $p < .001$, partial $\eta^2 = .689$), communication channel (F [6, 1158] = 312.0, $p < .001$, partial $\eta^2 = .618$), and the interaction was also significant (F [12, 2316] = 239.4, $p < .001$, partial $\eta^2 = .522$). Overall, participants interacted with their distant SA as often as their PA; both groups had more frequent contact than that with GPA. The most common communication method for communicating with PA ($M = 5.52$, $SD = 1.54$) and GPA ($M = 2.85$, $SD = 1.30$) was the telephone. Texting was second most popular channel with PA ($M = 5.33$, $SD = 1.91$). Texting was most popular for communication with the SA ($M = 5.82$, $SD = 1.53$), with communication over SNS also popular ($M = 4.93$, $SD = 1.59$).

Contact Initiation

The act of initiating contact may play a significant role in shaping relationships, including issues of closeness, conflict, and equity (Harwood, 2000a). Participants were asked who usually initiates contact between themselves and their partners, with four possible options: self, partner,

someone else, or equal initiation between self and partner. No participants selected someone else for SA or PA, but several participants did choose this option for communication with GPA. Please see table 17. RQ3 asks if contact initiation is related to factors of communication frequency, closeness, conflict, and equity. To answer this question, a one-way ANOVA was conducted examining differences in frequency of communication overall and for each channel by the person initiating contact. First, looking at average rates of contact for participants, participants reported more contact with SA when contact was initiated equally between the two partners (n = 142, *M* = 3.42, *SD* = .819) than when they initiated contact themselves (n = 39, *M* = 3.09, *SD* = .880), *F* (2, 190) = 3.41, *p* = .035. There was no difference between self and other (n = 12, *M* = 3.01, *SD* = .844) or between other and equal. For PA, participants reported significantly more contact when contact was initiated equally (n = 109, *M* = 3.47, *SD* = .820) than when initiated by their partner (n = 43, *M* = 3.12, *SD* = .645), and no differences between self (n = 34, *M* = 3.26, *SD* = .815) and partner, or between self and equal, *F* (2, 183) = 2.13, *p* = .033. For GPA, participants reported higher frequencies of contact when their partner initiated contact (n = 59, *M* = 1.84, *SD* = .470) or contact was initiated equally (n = 66, *M* = 1.86, *SD* = .609) compared to when contact was initiated by a third party (n = 14, *M* = 1.40, *SD* = .207); no differences were found between self (n = 52, *M* = 1.72, *SD* = .478), other, third party, or equal; *F* (3, 187) = 3.56, *p* = .015.

Examining specific channels, for SA, no channels showed a significant difference based on who initiated contact. For PA, participants reported significantly less face to face communication when the communication was initiated by their partner (*M* = 2.78, *SD* = 1.11)

than by themselves (M = 3.46, SD = 1.01) or when equally initiated (M = 3.39, SD = .951), F (2, 183) = 6.544, p = .002. No other channels showed differences. This suggests that PA who visit the participants have less face to face interaction than those participants who make efforts to visit PA.

For GPA, participants reported less contact by telephone when initiated by someone else (M = 1.89, SD = .738) than by themselves (M = 2.88, SD = 1.36), their partner (M = 2.73, SD = 1.17), or equally initiating contact (M = 3.10, SD = 1.32), F (3, 187) = 3.76, p = .012. For mail, participants reported more contact with their GPA when their partner initiated contact (M = 1.86, SD = .809) or when contact was initiated equally (M = 1.87, SD = .904) than when they initiated contact (M = 1.44, SD = .639) or contact was initiated by someone else (M = 1.37, SD = .569), F (3, 187) = 4.61, p = .004. This suggests the limitations in contact frequency when contact is initiated by someone else, especially when communication occurs over the telephone, the most commonly used channel for communication between these two generations.

Next, initiation of contact at T1 was used to predict relational factors of closeness, conflict, and equity at T2 in a series of one-way ANOVAs. For SA, there was a significant main effect of contact initiation on closeness, F (2, 175) = 4.54, p = .012, partial η^2 = .049. Post hoc tests using Fisher's LSD found significantly higher closeness when contact is initiated equally than when contact is initiated by the participant; no other comparisons were significant. There was a marginally significant main effect of contact initiation on conflict, F (2, 174) = 2.94, p = .055, partial η^2 = .033. Post hoc tests using Fisher's LSD found higher conflict when contact is usually initiated by the participant compared to equal initiation. No other comparisons were

significant. For equity, there was a significant main effect of contact initiation, F (2, 175) = 3.973, p = .021, partial η^2 = .043. Post hoc tests using Fisher's LSD found significantly higher equity when contact was initiated equally than when initiated by the participant. No other comparisons were significant.

For PA, there was a significant main effect of initiation on closeness, F (2, 168) = 6.10, p = .003, partial η^2 = .068. Post hoc tests using Fisher's LSD showed higher closeness when contact was initiated by the participant or initiated equally than when contact was initiated by PA; there was no difference between participant and equal initiation. When predicting conflict, there was a significant main effect, F (2, 168) = 4.54, p = .012, partial η^2 = .051. Post hoc tests using Fisher's LSD showed higher conflict when contact was initiated by partner than when initiated equally. No other comparisons were significant. There was also a significant main effect when predicting equity, F (2, 168) = 8.66, p < .001, partial η^2 = .093. Post hoc tests using Fisher's LSD showed higher equity when contact is initiated by the participant or equally initiated compared to partner initiation; there was no difference between self and equal initiation.

For GPA, there was a significant main effect of contact initiation on closeness, F (3, 171) = 6.31, p < .001, partial η^2 = .10. Post hoc tests using Bonferroni corrections found higher closeness when contact is initiated equally than when contact is initiated by partner or by someone else. No other comparisons were significant. For conflict, there was not a significant effect of contact initiation, F (3, 171) = 1.32, p = .270, partial η^2 = .023. For equity, there was a significant main effect of contact initiation, F (3, 170) = 6.30, p < .001, partial η^2 = .10. Post hoc tests using Bonferroni corrections showed higher equity when participants initiated contact

themselves or when contact was initiated equally, compared to contact being initiated by a third-party. Equal initiation also showed higher equity than when contact was initiated by partner. No other comparisons were significant.

In answer to RQ3, when participants are usually the ones to initiate contact with SA, participants report more relational conflict and less closeness. The opposite pattern occurred for PA; when contact was initiated by partner, the relationship was less close. For GPA, equal contact was the most beneficial for the relationship.

Cue Activation Model of Channel Effects

Hypotheses 1 through 4 relate to the cue activation model of channel effects. These relationships are tested with multi-step regression predicting relational closeness at T2. Initial theorizing suggested that high, medium, and low levels of conflict would produce different effects. Because there was no evidence of curvilinearity with these groups, regression analysis was used; three total analyses were run, one for each age group, predicting closeness at T2. In the first step, factors of relational closeness, relational conflict, relational equity, and age appearance (for GPA) were entered. In the second step, factors from the diary portion of the study were added: self and partner relational maintenance behaviors, total interactions over rich channels, and total interactions over lean channels. In the final step, interaction terms were added: interactions between conflict and rich and lean interactions and between age appearance and rich and lean interactions for GPA. Please see table 18.

For SA, the only significant predictors of closeness at T2 were closeness at T1 (significant in all three steps) and partner relational maintenance behaviors (entered in step 2 and

remaining significant in step 3). Additionally, while step 2 explained significantly more variance than step 1 (F-change [4, 168] = 12.04, $p < .001$), step 3 did not explain significantly more variance. For PA, only relational closeness at T1 predicted relational closeness at T2. Step 2 did explain more variance than step 1 (F-change [4, 165] = 6.35, $p < .001$), but the F-change for step 3 was not significant.

For GPA, closeness at T1 was a significant predictor of closeness at T2 in all steps of the model, as was partner relational maintenance behavior in both steps 2 and 3. Both step 2 (F-change [4, 163] = 7.07, $p < .001$) and step 3 (F-change [4, 158] = 3.58, $p = .008$) explained significantly more variance. One additional term was significant in step 3, the interaction between rich interactions and conflict positively predicted closeness at T2, the opposite of what was predicted. In no steps of the model was age appearance a significant predictor of closeness at T2.

From these results, we can assess hypotheses 1 through 4. Hypothesis 1 predicted that higher conflict and lower equity would predict lower closeness. This hypothesis was not supported. For all three partners, conflict and equity at T1 did not predict closeness at T2. The only significant relationship predictor was closeness at T1. Hypothesis 2 predicted that communication frequency would predict closeness. This was not supported. Hypothesis 3 predicted that self and partner relational maintenance behavior would predict closeness. This hypothesis was partially supported. For SA and GPA, partner relational maintenance behavior predicted increased closeness at all stages of the model; this factor was not a significant predictor for PA. Self relational maintenance behavior did not predict closeness for any partner.

Finally, hypothesis 4 described the interaction between relationship at T1 and closeness at T2. This interaction was not supported. That is, conflict at T1 was unrelated to closeness at T2, even when considering the number of interactions occurring over rich and lean channels. For example, interacting more over rich channels did not produce any significant effect of conflict at T1 on closeness at T2. These results fail to support the patterns predicted by the cue activation model. Specifically, the lack of additional variance explained by the interaction terms suggests that different relational factors, when combined with interactions on rich and lean channels, suggests that factors that may harm relational closeness are not masked by communicating over lean channels.

Finally, RQ4-6 asked if rates of relational maintenance behaviors differed between channels, partners, or an interaction between the two. Multistep regression was used to predict self and partner relational maintenance behaviors as reported during the diary portion of the study. In the first step, relational factors from T1 were entered, including age appearance for GPA. In the second step, the channel (as a dichotomous predictor, 0 = Lean, 1 = Rich) was entered. In the final step, an interaction term for conflict and channel (and for age appearance and channel for GPA) was entered. Please see table 19 for self relational maintenance and table 20 for partner relational maintenance.

Several consistent patterns emerged from these tests. First, confirming previous non-support for the cue activation model, adding interaction terms in step 3 did not explain significantly more variance in any of the six models; similarly, the interaction terms were never significant predictors. (It was marginally significant when predicting partner relational

maintenance behaviors for PA, but the interaction term itself was not significant.) Closeness at T1 was a consistent predictor across all steps and in all six models, demonstrating that partners who are closer engage in more relational maintenance. Channel richness was also a consistent predictor in step 2 (though often not significant in step 3). Richer channels showed higher rates of both self and partner relational maintenance behaviors. No other predictors were consistently significant.

Study Two Discussion

Study two aimed to investigate the predictive and differential power of dividing communication channels objectively, based on the cues they carry, to communication patterns between college student participants and same-age (SA), parent-age (PA), and grandparent-age (GPA) communication partners. In the paragraphs that follow, I will review the findings related to the study's hypotheses and research questions, discuss the specific findings related to communication patterns and the tests of the cue activation model of channel effects, discuss relational maintenance among college students, and assess the value of objective channel classifications.

Hypotheses

RQ1-3 asked about communication patterns and channel use between participants and their three partners. RQ1 asked if frequency of use measures by channel were correlated with each other. Use of some channels are correlated with others and no channel usage is negatively correlated; in short, more communication via one channel often begets additional communication by another. RQ2 asked what channels were most popular with the three partners. Telephone

remains a popular communication channel for partners with all ages, topping the most popular channel for PA and GPA. The telephone as a device is also popular, with texting being the most popular channel for communicating with SA. RQ3 asked if contact initiation (by participant, partner, a third party, or equally between self and partner) was related to closeness, conflict, and equity. Equal communication initiation is associated with more closeness, while communication initiated by participant (for SA) and partner (for PA) is associated with higher conflict.

H1-4 are based on the communication orientation model and assess the prediction of closeness at T2 based on relational (closeness, conflict, equity) and behavioral (relational maintenance behaviors, communication frequency) factors. H1 predicted that higher conflict and lower equity would be associated with lower closeness. This was not supported. The only relational factor predicting closeness at T2 was closeness at T1. H2 predicted that communication frequency would be associated with higher closeness. This hypothesis was not supported. Communication frequency did not predict closeness at T2. H3 predicted that relational maintenance would be associated with higher closeness. This was supported for SA and GPA with factor partner relational maintenance behavior. Self relational maintenance was not a significant predictor for any partner, and neither predicted closeness for PA. H4 failed to find support for the propositions of the cue activation model of channel effects. There was no significant interaction between relational factors of conflict and age appearance (for GPA) with the leanness or richness of the channel used to interact.

RQ4 and RQ5 asked if rates of relational maintenance behaviors differed based on the the channel used and the nature of the relationship (close, conflictual, equitable). Channel richness

significantly predicted both self and partner relational maintenance behaviors, with richer channels showing higher rates of relational maintenance. Closeness at T1 also predicted relational maintenance behaviors. The interaction effect between channel and conflict, asked in RQ6, was not supported, however.

Cue Activation Model of Channel Effects

The study failed to find support for the cue activation model of channel effects or for the models it is synthesized from--the communication orientation model (Swaab et al., 2012) and the stereotype activation model (Hummert, 1994). No additional variance in the data was explained by considering an interaction between the channel used to communicate (rich or lean) and conflict (and age appearance for GPA) in the relationship. For example, communicating over lean, text-based channels was not associated with increased closeness among participants with higher conflict or for GPA with older age appearance.

There are many potential explanations for this lack of findings, prime among them the possibility that close, personal relationships between individuals that participants choose are simply not subject to the same effects found for task manipulations used to demonstrate support for the communication orientation model (Swaab et al., 2012). Given that the majority of these relationships were close and relatively conflict free, the divide between different levels of conflict may not be a strong enough effect to identify differences caused by channel of communication.

Closeness, also, changed very little over the course of the study. The most significant decline in closeness came from a person who reported on his girlfriend at T1 and his ex-

girlfriend at T2; naturally, this breakup resulted in less closeness and less communication frequency between the two partners. Few relationships showed this level of instability. The mean change was less than .2 out of a possible swing of 6 for all three age groups. The change was especially small for established, mostly-familial relationships (PA and GPA), less than .05 for both groups. With standard deviations less than 1, there was little variance to capture with these relational measures. This helps explain why closeness at T1 was such a strong predictor at T2. When adding in other factors to predict closeness at T2, it is not surprising that few were significant.

The small amount of change in relational closeness may have occurred because of the relationships measured. Participants were able to choose their partners, and this may have results in selection of people with whom participants felt close and comfortable. For those participants without a close relationship with a parent or grandparent, they were able to choose a partner of a similar age. Assigning partners to participants (e.g., randomly assigning participants to report on their mother, father, or another person of a similar age) may have resulted in greater variability in relational closeness, but it also may have resulted in less frequent communication. Less frequent communication would have made it difficult to determine if channel effects did affect the relationship.

When examining changes in closeness, the direction of change was consistent with regression toward the mean. That is, least close relationships became more close from T1 to T2, while the closest relationships grew more distant; the same pattern was observed for conflict and equity. This suggests that, overall, the relationships participants reported on for this study were

generally of equal closeness, conflict, and equity and that the lack of variability in the relationships did not offer enough variance to explore with channel effects.

Another reason for the lack of significant support for the cue activation model is that the use of multiple channels of communication complicates the neat effects demonstrated with laboratory-based studies used in Swaab et al.'s (2012) meta-analysis. Individuals are communicating regularly with their communication partners across a wide variety of channels. Thus there is no control for preventing high conflict partners from, for example, seeing each other face to face. If gains in their relationship had been made through text-based channels, these gains could be undermined and the results muddled if the two interact over the phone or in person. The magnitude of change for any one of these interactions is not possible to assess in this data, thus leaving an open question about whether these patterns reduced the effect of channel on relational closeness. In this dataset, because the data was collected in the United States in the fall, many participants may have seen their partners over the break for the Thanksgiving holiday.

Despite this lack of support, channels did affect relational maintenance behaviors. Text only channels were associated with less self and partner relational maintenance behaviors. Relational factors mattered here as well: As relationships grew more close, rates of relational maintenance behaviors for both self and partner increased. A cure for relational woes may not depend on channel itself, but inasmuch as relational maintenance behaviors are positive for relationships (and numerous studies suggest they are), then text-based channels may be the least effective for remaining close with others.

The model still offers intriguing possibility for understanding the role that channels play in changing relationships. In addition to finding greater relational variability, additional contexts can also be studied to test the model's predictions. Consider, for example, interactions in the workplace, where relationship closeness and conflict may be more varied. Research on the model can expand beyond the orientation of interaction studied by Swaab and colleagues (2012) and focus on other features that may affect interactions; gender and race represent two starting points to consider. Work structure can be used to test differences in rich or lean channels. For example, in companies with geographically dispersed workgroups, does the use of video conferencing software impact gender or racial discrimination; does this pattern exist if the employees are working cooperatively, or competitively?

From the data presented here, however, it is reasonable to conclude that relatively close relationships are not being significantly undermined because of the communication channel used. This, in itself, represents relatively good news for communication partners. Rather than needing to dedicate time to see each other face to face or use a richer channel like video chatting, participants can use the channels that are convenient for them. There is no evidence that such behavior reduces partner closeness; rather, communication frequency is associated with higher closeness.

Maintaining Relationships for College Students

This study offers valuable information for those interested in how college students maintain relationships with geographically distant partners. First, following research by Harwood (2000), I investigated the rates of communication by channel and age group. Confirming patterns

Harwood observed when investigating just three communication channels (face to face, telephone, and mail), participants communicated with GPA most frequently by telephone; the same was true for PA. For SA, communication was most frequently using texting and social networking websites, and texting was also a popular choice for communicating with parents. For intergenerational communication, traditional channels like the telephone still hold sway. Importantly, for same generation communication, texting (a channel rooted in mobile phones) was popular. Texting and telephone use were significantly correlated for this group as well.

For newer communication channels, SNS use was correlated with other new communication channels for interactions with GPA. This suggests a broad array of new communication options that open up for intergenerational communication because so many channels are rooted in mobile and personal computing devices. This suggests good news for those worried that preference for new communication technologies may lead to an unbridgeable gap between generations. When older adults do master new technologies, they communicate more across multiple communication channels.

Not all channel frequency of use measures correlated so strongly, however. Generally, only one or two channels, per age group, correlated consistently with others (for example, for PA, mail was most consistently positively correlated with other communication channels). This is different from the strong correlations Harwood (2000) found and may suggest that the diversity of channel options has diluted the value of communicating across all platforms. With increased options, participants may find keeping up with partners to not require a diversity of channels, perhaps because features can overlap between these channels. The consistent connection between

texting and the telephone suggests that use of a device may be a stronger predictor than use of any particular channel itself. For example, using a mobile phone is associated with communicating on it in a variety of ways.

Why is texting and SNS use so common between SA? The answer may have to do with how involved these channels require their users to be. Texting, as many a frustrated parent and professor knows, can be done relatively furtively. SNS use may require little active use (seeking out a partner) by posting status updates alerting friends and family to life's minutiae. Use of these channels may form part of routine relational maintenance behaviors (Dainton & Aylor, 2002; Ramirez & Broneck, 2009; Stafford, Dainton, & Haas, 2000) and allow for relational upkeep with little extra work required. These channels may enable ongoing conversations that stretch over days. For example, the average amount of messages exchanged for a text message interaction was about 12 (length of time was not measured).

Relational factors may be related to channel use. In general, closer partners communicated more frequently. This relationship also showed consistent association with use of the telephone and texting for all three age groups. It was also associated with face to face communication for PA and GPA. This again confirms findings from Harwood (2000a), that telephone was most associated with closeness in the grandparent-grandchild relationships he studied, while also expanding to include the use of text messages. Equity did not show as consistent a pattern, but was correlated with telephone use (for PA and GPA) and texting (for SA and GPA).

Conflict was not correlated with contact, but it did show interesting patterns when looking at who initiates contact. Higher conflict is associated with participant contact initiation more so than equal contact initiation for SA, but it is associated with partner contact initiation more than equal initiation for PA. The burden of an imbalance in contact initiation among partners does seem to cause more conflict in relationships. For SA, participants feel more conflict when they are responsible for keeping up connections; for PA, participants feel more conflict when it is their PA who are reaching out to them.

There was no association with conflict and contact initiation for GPA. But here, contact initiation matters in a different way. Unlike SA and PA, multiple participants reported that their contact with GPA is most often initiated by a third party (say, a parent). For participants reporting third-party initiation, contact frequency was lowest. This may be due to distance between GPA and participants while at college. If those people initiating contact were parents, then the participant has more opportunity to communicate with GPA when living at home, rather than away at college. Indeed, participant distance from GPA during the school year negatively correlates with frequency of contact, but only for participants who report a third-party usually initiates contact. Third-party initiation also lead to the lowest levels of closeness and equity.

This suggests room for an active role in relationship maintenance between generations. These college students maintained more frequent communication with GPA when these partners initiated contact. This was especially true with the mail. This relationship may be compounded because of the channels that are more common among these intergenerational relationships. Non-intrusive channels are common between SA and PA, suggesting that communication may take

the form of an ongoing conversation, while communication with grandparents is much less frequent. Further, given that PA are not easily recreated with relationships formed in college (unlike connections formed with SA), it is possible that channels like the telephone may serve as vital links for transmitting large, complex information and debating important life issues upon which college students are still likely to need with their parents.

Objective Measures of Channel Features

The reality of close personal relationships also suggests that objective measures of channel features may have overly simplified the complex role that communication channels play in the lives of college students maintaining relationships with others. First, this study helped to highlight how the hyperpersonal model (Walther, 1996) and the communication orientation model (which draws some of its bases from the hyperpersonal model, Swaab et al., 2012) are limited in their predictive powers. As a boundary test for these models, the data here demonstrates that these models may be less predictive when communication partners have existing, close relationships formed over many years (or an entire lifetime in the case of relationships with parents and grandparents). The hyperpersonal model may explain the rapid growth of friendship between strangers when interacting in low cue environments; in this study, however, it has little to add.

Where can we turn instead for explanation? One option may be a greater exploration of the meaning of communication channels. Sitkin and colleagues (1992) argue that communication channels operate as dual channels--they transmit information and also meaning in the channel itself. That is, there may be a fundamental difference in meaning, separate from the information

itself, when one chooses to call rather than text. Capturing this requires something beyond categorization of what cues are carried by the channel, and different relationships may develop different meanings from the channel.

For example, consider the use of social networking websites between participants and GPA. For some, this channel may represent an intrusion and prompt the participant to hide certain elements of their profile from their connections; they prefer to hide aspects of their life from GPA. For others, however, this channel may represent a sincere attempt by their GPA to reach out to them and communicate over a channel that is convenient for the participant.

In my anecdotal conversations with grandparents and their grandchildren (at events like the University of Wisconsin's Grandparents University), texting and video chat were frequently mentioned as ways that grandparents were adapting to newer channels to maintain more frequent contact with their grandchildren. While these relationships are very close (as evidenced by the groups spending two days and one night together on a college campus), it is striking to note that the two channels most frequently mentioned are objectively categorized as opposites of each other: Text messaging carries a character-limited bit of text while video chat transmits both aural and visual cues.

Models that posit relational changes based on cues transmitted, including the cue activation model, are limited in their ability to comment on such a phenomenon, and in this study, though textual channels contained lower reported rates of relational maintenance behaviors, the channels used did not explain changes in closeness, conflict, or equity. This may be because, in some relationships, a low cue channel may still carry strong symbolic meaning.

For example, receiving a text message from a faraway friend may carry objectively little information, but it may be "the thought that counts."

There is a negative side, though, to overall rates of communication. For example, when PA most frequently initiated contact, participants reported less closeness and more conflict. Too much communication (in this case, more than the participant desires) was associated with negative relational facets. This matches findings from Hall and Baym (2011), who observed that calling and texting frequency could lead to over-dependence between partners and decrease satisfaction in the relationships. Again, here, there is room for more nuance. A continually ringing phone, with an expectation of time to dedicate to a phone call, may be perceived differently than a string of text messages or Facebook wall posts. These differences can be better captured outside an objective categorization framework.

General Discussion

These two studies demonstrate two separate approaches to the study of multiple communication channels--a socially-driven approach, in which individual views of communication channels are used, and an objective approach, in which richness classifications are used to assess channel effects. Both approaches have strengths and weaknesses.

The variability in channel feature perceptions suggests the value of a socially-driven approach to channel classification. Especially for newer communication channels (but present for all), the variability in perceptions of features like speed of communication suggest that individuals have widely divergent views on what behaviors they can enact with a communication channel (an observation made by channel expansion theory, Carlson & Zmud, 1999). Consider,

for example, the nature of assessing how much an individual feels she could engage in a conversation-like interaction over a channel like text messaging. The widely divergent opinions on the features of this channel suggest that a researcher-centric classification of the channel will be constrained in its ability to explain variance in the use of that channel.

This issue becomes particularly prominent when investigating the channels that individuals feel allow them to feel connected to their partner and have a meaningful interaction. Consider the results from study two suggesting that text based interaction results in less relational maintenance behaviors, but the use of text-based channels is not predictive of closeness at T2. This pattern held true even when considering an interaction between relational factors and channel. The measure of channel differences, however, was elementary. Perhaps, for those individuals who find text-based channels to be effective ways to have meaningful interaction, there are no differences in rates of relational maintenance behaviors. This factor may increase variance in the data and hide any (likely small) effects of relationship change based on channel and relational interaction.

This possibility also points to a weakness in the socially-constructed approach: the ever increasing complications in the data structure and analysis plan. Considering repeated ratings of channel features, as well as selection of different channels, results in complex patterns of analysis that become increasingly difficult to interpret, let alone hypothesize about. To justify this increased complications, a significant additional portion of variance explained must be demonstrated. Attempting to demonstrate satisfaction with interaction based on features desired and features present was not successful in study one. While more evidence is needed to conclude

the additional explanatory power of socially-defied channel classifications, there is reason for skepticism about the value of this approach. At the least, more research is needed before a conclusion can be offered.

For objectively-classified channels, grouping based on cues results in simpler analysis and easier interpretation. Methods that use two groupings (lean, rich) or three (text, A or V, and A&V) means comparisons can be conducted with no adjustment in critical values (using Fisher's LSD for the latter grouping). Further, for effects that relate to the activation of stereotypes or negative feelings (as is the case in interactions with older adults, Hummert, 1994), these objectively-based classifications are the only classification needed, as these stereotypes are activated by sight and sound. Because a text-based channel prevents these cues, this evidence is enough to theorize about how perceptions may be shifted, even if no significant results were found in this study.

But conclusions about why differences between channels occur are hampered by a lack of individual perception data. As noted above, exploring lower rates of relational maintenance behaviors in text-based channels requires individual ratings for what behaviors the individual feels she can enact over the channel. After controlling for this, if differences still occur, then a channel-driven explanation becomes plausible. Until then, however, we should treat any such explanation with caution.

These two perspectives represent a powerful debate in technology use literature. Those presenting theories that describe behavior as shaped by technology (e.g., Swaab et al., 2012; Walther, 1996) suggest that, for example, text-based channels would naturally constrain

expression. The valence of this restriction is complex, but the conclusion is the same: The channel influences how people interact. This same kind of explanation can be used to explain the lower rates of relational maintenance behaviors found in study two. The other side of the debate is the social construction perspective (Fulk, 1993). This perspective argues that individual behavior is what shapes how technology is used; a user has unlimited ability to shape technology to her purposes. This perspective suggests, for example, that lower rates of relational maintenance behaviors occur over text-based channels because those channels are used for purposes that are inherently less likely to contain relational maintenance behaviors. For example, people might exchange text messages to coordinate a social activity or send a short supportive message. They would not use the channel to express strong feelings of love and devotion to a partner. These norms could change, however, and text messaging could become a channel associated with meaningful interaction and intimate conversation. Valkenberg & Peter (2009) found this exact effect for instant messaging use in adolescents: It encouraged self-expression (especially for boys) and was associated with relationships growing closer over time.

As is so often the case, the truth likely lies somewhere in between, in a perspective called the "social shaping of technology" (for review, see Baym, 2010). In this perspective, no device creates an outcome, but a combination of human choices and technological availability does result in changing usage. For example, consider historians grouping periods of time by technology (e.g., "the Bronze Age") or crediting devices as leading to great change (e.g., use of nuclear weapons and the end of World War II): This grouping is dependent upon individuals who use the technology available.

This debate is further reflected in theoretical advancements of affordances. Gibson (1977; 1979) advocated for a technologically centered approach, in which affordances exist regardless of a user's perception. Norman (1988) argued the opposite, saying perception was all that mattered. Recent theorizing (Chemero, 2003; Stoffregen, 2003), however, suggests that the truth is in between and is governed by intention. Nuclear weapons, by this logic, are only threats if one intends to use them, and thus the bellicose rhetoric (though relative peace) between the US and USSR during the Cold War.

These two studies present strengths and weaknesses of each approach and point to the value of an approach that combines both. In study one, the data is rich with individual perspectives but presents no data-driven way to simplify these perspectives into consistent patterns of use or belief. Factor analysis failed to produce a consistent reduction in measures of channel features. Do all six features measured in study one thus stand alone? From both a theoretical and measurement perspective, the answer is not clear and more research is necessary. Because of the diverse ratings, even among users of the same age, for each channel, the variability represents both a useful demonstration of a socially-constructed approach and a challenge to systematic study of the same.

In study two, the data is clearer but more nuanced views from researchers like Sitkin et al. (1992) cannot be studied. This would not be a problem had the tests of the cue activation model revealed effects for the masking or revealing of aural and visual cues. Without these effects (for the reasons discussed earlier), it is difficult to affirm or deny if the simplicity of an objective approach is worth the loss of individual perspectives. Additional assessment is needed

and can investigate different means of grouping communication channels. For the individual, what features (separate from those thought to differ based on theory) separate communication channels? If asked to group channels, how many pairings do individuals perceive?

These questions help to address a significant weakness in past research on multiple channels: the notion of "computer-mediated communication." While internet connectivity has driven the expansion of communication channel options (email, instant messaging, video chat, SNS, among others), no evidence in these two studies suggest a clustering supportive of the umbrella term CMC. Individuals are selective in the channels they use and the range of cues carried over computer-based channels suggest that groupings based on the device used are overly reductive. Past researchers must be forgiven for this oversight, as few have predicted the proliferation of communication channels, even as several researchers have long suggested methods that would alleviate the problems of chasing after the newest channels (e.g., Griffith & Northcraft, 1994).

Future Directions

These two studies leave more questions unanswered than the number of conclusions one can draw from them. From a methodological standpoint, however, they suggest a way forward. First, more basic research is needed to identify the salient defining features of communication channels. From this, and from researcher-centric perspectives (for example, separating by cues transmitted), an ontology of communication channels can begin to take shape. Future channels can be assessed based on these features and tested to see if similar outcomes result from their use. Over time, our conclusions can grow to reflect a timeless approach to a line of research that

is only growing more important as channel multiplicity (Dennis, Fuller, & Valacich, 2008) becomes the norm for many interpersonal relationships.

From here, multi-channel research can expand into domains where it began--workplace technology use (e.g., Daft & Lengel, 1986; Fulk et al., 1990). Here, theories like the cue activation model of channel effects may hold more sway, especially for remote teams who do not meet and may be acting cooperatively or competitively. In health contexts too this style of research can offer powerful tests for relationship between doctor and patient, as antagonistic feelings (say, fear of visiting the doctor) may be enhanced or overcome based on channel effects, while older adults may be treated more effectively by hiding those cues that lead healthcare providers to speak in simplistic ways (e.g., Kemper, 1994). The ideal is for these two projects to provide a numerous future directions for researchers.

For study one, features were derived based on social goals that may change with age, befitting the focus on interpersonal social goals. For future studies, these same features may be applicable, but other features can be studied, based on the situations of interest. Situations may also drive channel selection, overriding preferences for channels. For example, a situation with an urgent message may require features of quick communication, necessitating the use of the telephone even when the person prefers and uses text messaging more frequently. Matching features and scenarios may enable better prediction of channel selection.

Partner preferences and selections may matter as well. An individual may sometimes make choices based on her own preferences and habits, but at other times may adjust to match her partner's. This adjustment is an interesting phenomenon to investigate and may be predicted

by aspects of the relationship between the two people. A person might feel comfortable opting for her preferred channel when communicating with a friend but acquiesce to her partner when communicating with a grandparent or a person with more social power.

A final direction for future research is to investigate the features that individuals use naturally to differentiate one channel from another. Prompting participants with pre-derived features may prompt introspection that did not occur during the actual interaction. Participants can be asked to make their own groupings of communication channels and then describe the features that led to the grouping. For example, a participant might group all mediated channels separate from face to face, and differentiate based on the need for a device. A participant might not separate channels based on something more abstract, like ability to communicate complex information. This represents more of the valuable foundational research that can be conducted in this area.

Conclusion

These two studies investigated social and objective ways of classifying and studying the use of multiple communication channels in interpersonal relationships. Study one showed significant variance in perceptions of features of communication channels, suggesting the importance of considering social definition of communication channels. It also found some support for socioemotional selectivity theory driving preference for certain features of communication channels and showed that increased use increases perceptions of usefulness in a greater variety of interpersonal communication scenarios (in line with channel expansion theory, Carlson & Zmud, 1999) and increases perceptions of features within those channels as well.

Study two found that text-based channels are associated with less relational maintenance behaviors, but also found that channels are not predictive of closeness at T2 when closeness at T1 is also a predictor. These results suggest the value of social and objective channel classification schemes and offer new methodological approaches to the study of multiple communication channels.

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Appendix A. Study One Survey Instrument

How much does the telephone… Let you get your message out quickly Make you feel like you are really connected to your partner Let you have a long, meaningful conversation Get your partner's attention that you are trying to reach them Compel your partner to respond to your message Let you communication with a lot of people at the same time How frequently do you use the telephone to communicate? (1-Rarely or Never, 2-A few times per month, 3-A few times per week, 4-A few times per day, 5-Almost constantly)	Telephone
How much does paper mail (sending a letter or card)… Let you get your message out quickly Make you feel like you are really connected to your partner Let you have a long, meaningful conversation Gets your partner's attention that you are trying to reach them Compels your partner to respond to your message Let you communication with a lot of people at the same time How frequently do you use the paper mail to communicate? (1-Rarely or Never, 2-A few times per month, 3-A few times per week, 4-A few times per day, 5-Almost constantly)	Paper Mail
How much does e-mail… Let you get your message out quickly Make you feel like you are really connected to your partner Let you have a long, meaningful conversation Gets your partner's attention that you are trying to reach them Compels your partner to respond to your message Let you communication with a lot of people at the same time How frequently do you use email to communicate? (1-Rarely or Never, 2-A few times per month, 3-A few times per week, 4-A few times per day, 5-Almost constantly)	Email

How much does text messaging (sending text messages from a cell phone)… Let you get your message out quickly Make you feel like you are really connected to your partner Let you have a long, meaningful conversation Gets your partner's attention that you are trying to reach them Compels your partner to respond to your message Let you communication with a lot of people at the same time How frequently do you use text messaging to communicate? (1-Rarely or Never, 2-A few times per month, 3-A few times per week, 4-A few times per day, 5-Almost constantly)	Text Messages
How much does using a social networking website (posting updates about yourself--'Status Update' or posting items targeted at someone else 'Writing on someone's wall')… Let you get your message out quickly Make you feel like you are really connected to your partner Let you have a long, meaningful conversation Gets your partner's attention that you are trying to reach them Compels your partner to respond to your message Let you communication with a lot of people at the same time How frequently do you use social networking websites to communicate? (1-Rarely or Never, 2-A few times per month, 3-A few times per week, 4-A few times per day, 5-Almost constantly)	SNS
The following features are asked for each of the following scenarios: In this situation, how much did you think about the following features when selecting a way to communicate? How quickly I can get my message out How much the channel will help me feel connected to my partner How much the channel lets me have a personal, meaningful interaction How much the channel gets my partner's attention that I am trying to reach him/her (e.g., like a ringing phone) How much my partner will feel compelled to get back to me quickly How much the channel lets me communicate with many people at once, rather than having to say the same thing multiple times	Scenarios

These next questions ask you to think about certain scenarios when you had a reason to communicate with others. For each situation, please think of a time in which you were communicating (in part or in whole) with people who you cannot see face-to-face every day. That could be people you know who live in the same town but whose schedules are too busy for you to get together every day, or it could be people who live far away. Don't think of times in which you were communicating with someone who you do see every day, like someone you live with or very close to. 1. Think of a time in which you wanted to share some important news with others. In a sentence or two, describe the basics of the situation (what was the important news, etc.). In this situation, what channel did you use to communicate? (with option "Other" and a space to write in specific channel) How well did this channel work? 1-Not at all well; 7-Extremely well If a situation like this happened in the future, how well do you think each of these channels would work? 1-Not at all well; 7-Extremely well In the future, if a situation like this happened again, please rank your preference for communication channel, where 1 represents your first choice, 2 your second choice, etc. If there is another channel you would use, please write it in the "Other" space and rank it along with the rest of the channels listed.	Scenarios
2. Think of a time you were trying to keep up with what is going on in the lives of other people you know. In a sentence or two, describe the basics of the situation (what was the important news, etc.). In this situation, what channel did you use to communicate? How well did this channel work? 1-Not at all well; 7-Extremely well If a situation like this happened in the future, how well do you think each of these channels would work? 1-Not at all well; 7-Extremely well In the future, if a situation like this happened again, please rank your preference for communication channel.	

3. Think of a time you wanted to get some advice from others. In a sentence or two, describe the basics of the situation (what was the important news, etc.). In this situation, what channel did you use to communicate? How well did this channel work? 1-Not at all well; 7-Extremely well If a situation like this happened in the future, how well do you think each of these channels would work? 1-Not at all well; 7-Extremely well In the future, if a situation like this happened again, please rank your preference for communication channel.	
4. Think of a time you were inviting others over for a dinner or a party. In a sentence or two, describe the basics of the situation (what was the important news, etc.). In this situation, what channel did you use to communicate? How well did this channel work? 1-Not at all well; 7-Extremely well If a situation like this happened in the future, how well do you think each of these channels would work? 1-Not at all well; 7-Extremely well In the future, if a situation like this happened again, please rank your preference for communication channel.	
Please provide the following information about yourself: Age, Sex, Highest Degree Earned (1-Less than high school; 2-High school diploma; 3- Currently enrolled in college; 4-Associate's degree; 5-Bachelor's degree; 6-Master's degree; 7-Professional degree (MD, JD, MBA, etc.); 8-Ph.D. How often do you use the internet? (1-Never to 7-Almost constantly) For how many years have you been an internet user? If you use a social networking website, what is the social networking website that you use the most? Do you own a desktop computer? Laptop computer? Cell phone? If yes, is it a smart phone (e.g., iPhone, Android phone, Blackberry)? How far does your immediate family live from you? (1-Same town to 5-Over 500 miles away) How far do your closest friends live from you? How many people would you say you are very close to? How many people would you say make up your social network or social circle?	Demographics

Future time perspectives scale (Carstensen & Lang, 1996; Lang & Carstensen, 2002) (Scored 1-Very Untrue to 7-Very True) Many opportunities await me in the future. I expect that I will set many new goals in the future. My future is filled with possibilities. Most of my life lies ahead of me. My future seems infinite to me. I could do anything I want in the future. There is plenty of time left in my life to make new plans. I have the sense that time is running out. (Reverse code) There are only limited possibilities in my future. (Reverse code) As I get older, I begin to experience time as limited. (Reverse code)	Future time perspective

Appendix B. Study Two Survey Instrument

Relational closeness (From Canary & Spitzberg, 1989; Harwood, 2000) Scored from 1-Not at all true to 7-Completely true I am satisfied in this relationship This relationship is rewarding I would not want to do anything that would hurt this relationship I get along well with this person I feel emotionally close to this person I have good communication with this person	Relational closeness (6*3 Items)
Conflict - from Pierce, Sarason, & Sarason, 1991, - Not At All, A Little, Somewhat, Mostly, Completely How angry does this person make you feel? How often does this person make you feel angry? How much do you argue with this person? How often do you have to work hard to avoid conflict with this person? How much would you like this person to change? How much does this person want you to change?	Conflict (6*3 Items)
Control Mutuality (From Canary, Weger, & Stafford, 1991) - Scored from 1-Strongly Disagree to 7-Strongly Agree Both of us are satisfied with the way we handle decisions between us W agree on what we can expect from one another We are attentive to each other's comments We both have an equal 'say' We are cooperative with each other I feel my partner ignores my thoughts and feelings (reverse coded)	Control Mutuality (6*3 Items)
Communication Patterns Who typically initiates contact with this person? (Options--altered as appropriate: You, Your Friend, Your Parent(s), Your Sibling, Your Grandparent, Your Parent, Someone Else); Additional option includes "Both my partner and I initiate contact equally."	Contact Initiation (1*3 Items)

Scored along a 1-8 scale, with each point labeled: Almost Never, A Few Times A Year, About Once A Month, A Few Times Each Month, About Once Each Week, A Few Times Each Week, About Once Each Day, A Few Times Each Day How often do you communicate with this person face-to-face? How often do you communicate with this person on the phone? How often do you communicate with this person by writing letters? How often do you communicate with this person by sending email? How often do you communicate with this person by texting? How often do you communicate with this person using a social networking website? Do you use any other channels to communicate with this person? What channel? How frequently?	Channel Use (7*3 Items)
To measure preferences, these two items should have options reflecting the channels used above: face-to-face, phone, letters, email, texting, SNS, and a blank, other option. When communicating with this person, how much do you prefer the following channels? When communicating with this person, how much do you think they prefer the following channels?	Channel Preference (6*3 Items)
Additional Measures for Grandparent *Stereotyped Beliefs (Anderson et al., 2005)* Sad-Happy Depressed-Not Depressed Sedentary-Active Unhealthy-Healthy Lonely-Not Lonely Not Sociable-Sociable Disagreeable-Agreeable Ill-tempered-Good-Natured Inarticulate-Articulate Incompetent-Competent Dependent-Independent	(11 Items)

Appearance My grandparent… Looks young for his/her age Looks old Has wrinkly skin Has a young looking face Has grey or white hair Is in generally good health Has an upright posture Is able to get around on his/her own Needs a cane, walker, or wheelchair to get around Takes care of his/her self Has a strong, clear voice Sounds old	(10 items)
Grandchild Accommodation (from Harwood, 2000) Think about a typical conversation you might have with this grandparent. To what extent are the following statements likely to happen in this typical conversation? (Scored from 1-Not at all likely 5-Very likely) I share personal thoughts and feelings. I talk about topics my grandparent enjoys. I compliment my grandparent. I don't know what to say. (reverse coded) I look to end the conversation. (reverse coded) I want to leave. (reverse coded)	(15 Items Total) Accommodative Involvement
I have to 'bite my tongue' I avoid certain ways of talking. Don't always say what I think. I don't act like myself. I avoid certain topics.	Reluctant Accommodation
I show respect for his/her age. I feel respect for is/her knowledge and wisdom.	Accommodating Role-Relations
I speak louder. I speak slower than normal.	Interpretability Strategies

Interaction Measures 1. Who was it with? 2. How much time did it last? (Or how many messages were exchanged back and forth?) 3. What channel did you use? 4. Who initiated the interaction? 5. In a sentence or two, describe what this interaction was about. If you feel uncomfortable sharing this information, please write "Private".	
In this interaction, to what degree were the following items true, for you? For your partner? (Scored on 7 point Likert scale - Strongly Disagree to Strongly Agree; Shortened version adapted from Rabby, 2007) Acted cheerful and optimistic Was upbeat and positive	Positivity
Did not judge my partner [alt. me] Was understanding	Understanding
Was open about my [alt. his/her] feelings and thoughts Encouraged my partner [alt. me] to share thoughts and feelings	Self-disclosure
Showed or told my partner [alt. me] how much he/she [alt. I] means to me [alt. him/her] Made my partner [me] know that this relationship is important to me [him/her]	Assurances
For this interaction, was this your preferred channel? Would you have preferred a different channel? Why? Why did you or your partner select this channel? Do you think the interaction would have gone differently over another channel? In what ways?	Channel Assessment
Time 2 Measures Relationship measures (see items above) Grandparent measures (see items above) Communication patterns for partners Channel preferences for partner Partner channel preferences	

Please provide the following information about yourself: Age, Sex, Highest Degree Earned (1-Less than high school; 2-High school diploma; 3- Currently enrolled in college; 4-Associate's degree; 5-Bachelor's degree; 6-Master's degree; 7-Professional degree (MD, JD, MBA, etc.); 8-Ph.D. How often do you use the internet? (1-Never to 7-Almost constantly) What social networking website do you use the most? How many people are you very close to? How many people make up your general social network or social circle?	Demographics 7 Items
Please provide the following information about your partner: Age, Sex, Highest Degree Earned (1-Less than high school; 2-High school diploma; 3-Currently enrolled in college; 4-Associate's degree; 5-Bachelor's degree; 6-Master's degree; 7-Professional degree (MD, JD, MBA, etc.); 8-Ph.D.). Do they: use the internet, use the phone, send letters, send email, send text messages, use a social networking website. When you are at school, how far away do their live from you (1-Same town to 5-Over 500 miles away).	10*3 Items

Table 1. Ratings of features for face to face

Channel-Feature		Young n = 147*	Old n = 145
FTF-Quickly	Non-User	N/A	N/A
	User	6.12 (SD = 1.37, range = 1-7)[a]	6.06 (SD = 1.52, range, 1-7)[a]
FTF-Connection	Non-User		
	User	6.71 (SD = .573, range = 4-7)[a]	6.37 (SD = 1.21, range = 1-7)[b]
FTF-Meaningful	Non-User		
	User	6.56 (SD = .877, range = 2-7)[a]	6.48 (SD = .958, range = 1-7)[a]
FTF-Attention	Non-User		
	User	6.49 (SD = .806, range = 3-7)[a]	6.23 (SD = 1.37, range = 1-7)[a]
FTF-Response	Non-User		
	User	6.67 (SD = 1.34, range = 4-7)[a]	6.21 (SD = 1.34, range = 1-7)[b]
FTF-Many People	Non-User		
	User	5.04 (SD = 1.76, range = 1-7)[a]	4.85 (SD = 2.22, range = 1-7)[a]
FTF-Use	Non-User		
	User	5.62 (SD = .692)[a]	4.50 (SD = 1.18)[b]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 2. Ratings of features for telephone

Channel-Feature		Young n = 149	Old n = 146
Telephone-Quickly	Non-User	N/A	N/A
	User	6.25 (SD = .979, Range = 2-7)[a]	6.52 (SD = .896, Range = 1-7)[b]
Telephone-Connection	Non-User		
	User	5.46 (SD = 1.04, Range = 2-7)[a]	5.90 (SD = 1.38, Range = 1-7)[b]
Telephone-Meaningful	Non-User		
	User	5.97 (SD = 1.06, Range = 2-7)[a]	6.18 (SD = 1.02, Range = 1-7)[a]
Telephone-Attention	Non-User		
	User	5.94 (SD = .967, Range = 2-7)[a]	6.14 (SD = 1.11, Range = 1-7)[a]
Telephone-Response	Non-User		
	User	5.80 (SD = 1.19, Range = 2-7)[a]	5.89 (SD = 1.29, Range = 1-7)[a]
Telephone-Many People	Non-User		
	User	3.15 (SD = 1.69, Range = 1-7)[a]	3.10 (SD = 2.15, Range = 1-7)[a]
Telephone-Use	Non-User		
	User	4.52 (SD = .810)[a]	4.52 (SD = 1.07, Range = 1-7)[a]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 3. Ratings of features for mail

Channel-Feature		Young	Old
Mail-Quickly	Non-User	1.30 (SD = .914, Range = 1-6), n = 43[a]	1.50 (SD = 1.26, Range = 1-6), n = 22[a]
	User	1.65 (SD = 1.17, Range = 1-7), n = 105[a]	2.68 (SD = 1.59, Range = 1-7), n = 120[b]
Mail-Connection	Non-User	2.21 (SD = 1.46, Range = 1-6)[a]	1.91 (SD = 1.44, Range = 1-6)[a]
	User	3.30 (SD = 1.87, Range = 1-7)[b]	3.58 (SD = 1.75, Range = 1-7)[b]
Mail-Meaningful	Non-User	1.67 (SD = 1.29, Range = 1-6)[a]	1.45 (SD = 1.22, Range = 1-6)[a]
	User	1.97 (SD = 1.48, Range = 1-7)[a]	2.53 (SD = 1.67, Range = 1-7)[b]
Mail-Attention	Non-User	2.49 (SD = 1.59, Range = 1-7)[a]	2.32 (SD = 1.70, Range = 1-6)[a]
	User	3.70 (SD = 2.07, Range = 1-7)[b]	4.12 (SD = 1.78, Range = 1-7)[b]
Mail-Response	Non-User	2.53 (SD = 1.62, Range = 1-7)[ab]	1.95 (SD = 1.53, Range = 1-6)[b]
	User	3.35 (SD = 1.90, Range = 1-7)[a]	3.18 (SD = 1.81, Range = 1-7)[a]
Mail-Many People	Non-User	1.86 (SD = 1.82, Range = 1-7)[a]	2.09 (SD = 1.97, Range = 1-7)[ab]
	User	2.38 (SD = 1.78, Range = 1-7)[a]	3.17 (SD = 2.01, Range = 1-7)[b]
Mail-Use	Non-User		
	User	2.28 (SD = .546, Range = 1-7)[a]	2.54 (SD = .718, Range = 1-7)[b]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 4. Ratings of features for email

Channel-Feature		Young n = 147	Old n = 145
Email-Quickly	Non-User	N/A	N/A
	User	5.67 (SD = 1.48, Range = 1-7)[a]	6.12 (SD = 1.12, Range = 1-7)[b]
Email-Connection	Non-User		
	User	3.18 (SD = 1.33, Range = 1-7)[a]	4.38 (SD = 1.57, Range = 1-7)[b]
Email-Meaningful	Non-User		
	User	2.97 (SD = 1.46, Range = 1-7)[a]	3.81 (SD = 1.79, Range = 1-7)[b]
Email-Attention	Non-User		
	User	4.26 (SD = 1.49, Range = 1-7)[a]	5.01 (SD = 1.58, Range = 1-7)[b]
Email-Response	Non-User		
	User	4.34 (SD = 1.51, Range = 1-7)[a]	4.20 (SD = 1.81, Range = 1-7)[a]
Email-Many People	Non-User		
	User	5.61 (SD = 1.59, Range = 1-7)[a]	5.56 (SD = 1.86, Range = 1-7)[a]
Email-Use	Non-User		
	User	4.39 (SD = .980, Range = 1-7)[a]	4.32 (SD = 1.13, Range = 1-7)[a]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 5. Ratings of features for text messages

Channel-Feature		Young n = 146	Old
Text-Quickly	Non-User	N/A	3.86 (SD = 2.47, Range = 1-7), n = 70[b]
	User	6.70 (SD = .626, Range = 4-7)[a]	6.28 (SD = 1.24, Range = 1-7), n = 75[a]
Text-Connection	Non-User		2.64 (SD = 1.85, Range = 1-7)[b]
	User	4.23 (SD = 1.48, Range = 1-7)[a]	4.45 (SD = 1.83, Range = 1-7)[a]
Text-Meaningful	Non-User		2.00 (SD = 1.46, Range = 1-6)[b]
	User	3.86 (SD = 1.61, Range = 1-7)[a]	3.29 (SD = 1.88, Range = 1-7)[c]
Text-Attention	Non-User		3.41 (SD = 2.29, Range = 1-7)[b]
	User	5.52 (SD = 1.16, Range = 2-7)[a]	5.67 (SD = 1.28, Range = 1-7)[a]
Text-Response	Non-User		2.70 (SD = 1.88, Range = 1-7)[b]
	User	5.07 (SD = 1.39, Range = 1-7)[a]	5.00 (SD = 1.53, Range = 1-7)[a]
Text-Many People	Non-User		2.79 (SD = 2.02, Range = 1-7)[b]
	User	5.79 (SD = 1.48, Range = 1-7)[a]	4.32 (SD = 2.17, Range = 1-7)[c]
Text-Use	Non-User		
	User	5.69 (SD = .639)[a]	3.99 (SD = 1.35)[b]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 6. Ratings of features for instant messaging

Channel-Feature		Young n = 141	Old n = 143
IM-Quickly	Non-User	N/A	4.07 (SD = 2.33, Range = 1-7), n = 81[b]
	User	6.20 (SD = 1.08, Range = 2-7)[a]	5.65 (SD = 1.44, Range = 1-7), n = 62[a]
IM-Connection	Non-User		2.98 (SD = 1.94, Range = 1-7)[b]
	User	3.78 (SD = 1.54, Range = 1-7)[a]	4.66 (SD = 1.60, Range = 1-7)[c]
IM-Meaningful	Non-User		2.96 (SD = 1.95, Range = 1-7)[b]
	User	4.35 (SD = 1.57, Range = 1-7)[a]	4.34 (SD = 1.63, Range = 1-7)[a]
IM-Attention	Non-User		3.41 (SD = 2.10, Range = 1-7)[b]
	User	4.86 (SD = 1.47, Range = 1-7)[a]	5.06 (SD = 1.48, Range = 1-7)[a]
IM-Response	Non-User		2.88 (SD = 1.93, Range = 1-7)[b]
	User	4.84 (SD = 1.57, Range = 1-7)[a]	4.44 (SD = 1.79, Range = 1-7)[a]
IM-Many People	Non-User		3.04 (SD = 1.97, Range = 1-7)[b]
	User	5.14 (SD = 1.87, Range = 1-7)[a]	3.98 (SD = 2.08, Range = 1-7)[c]
IM-Use	Non-User		
	User	4.23 (SD = 1.03)[a]	3.25 (SD = 1.11)[b]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 7. Ratings of features for video chat

Channel-Feature		Young	Old
Video Chat-Quickly	Non-User	4.86 (SD = 2.21, Range = 1-7), n = 14[a]	3.78 (SD = 2.23, Range = 1-7), n = 99[b]
	User	5.34 (SD = 1.66, Range = 1-7), n = 134[a]	5.37 (SD = 1.66, Range = 1-7), n = 43[a]
Video Chat-Connection	Non-User	6.00 (SD = .877, Range = 5-7)[a]	3.79 (SD = 2.23, Range = 1-7)[b]
	User	6.04 (SD = .992, Range = 2-7)[a]	5.49 (SD = 1.60, Range = 1-7)[a]
Video Chat-Meaningful	Non-User	5.71 (SD = 1.14, Range = 3-7)[a]	3.84 (SD = 2.24, Range = 1-7)[b]
	User	6.00 (SD = 1.13, Range = 127)[a]	5.42 (SD = 1.75, Range = 1-7)[a]
Video Chat-Attention	Non-User	5.57 (SD = 1.16, Range = 4-7)a	3.71 (SD = 2.14, Range = 1-7)b
	User	5.51 (SD = 1.35, Range = 2-7)[a]	5.51 (SD = 1.67, Range = 1-7)[a]
Video Chat-Response	Non-User	5.93 (SD = 1.21, Range = 3-7)[a]	3.59 (SD = 2.15, Range = 1-7)[b]
	User	5.79 (SD = 1.37, Range = 1-7)[a]	5.40 (SD = 1.51, Range = 1-7)[a]
Video Chat-Many People	Non-User	3.14 (SD = 2.02, Range = 1-7)[a]	3.26 (SD = 2.02, Range = 1-7)[a]
	User	3.59 (SD = 1.87, Range = 1-7)[a]	4.19 (SD = 2.17, Range = 1-7)[a]
Video Chat-Use	Non-User		
	User	3.16 (SD = .999, Range = 1-7)[a]	2.96 (SD = .965, Range = 1-7)[a]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 8. Ratings of features for social networking websites

Channel-Feature		Young	Old
SNS-Quickly	Non-User	N/A	3.36 (SD = 2.20, Range = 1-7), n = 69[b]
	User	5.92 (SD = 1.23, Range = 1-7), n = 146, Range = 1-7)[a]	5.46 (SD = 1.46, Range = 1-7), n = 74[a]
SNS-Connection	Non-User		2.38 (SD = 1.57, Range = 1-6)[b]
	User	3.41 (SD = 1.46, Range = 1-7)[a]	3.89 (SD = 1.69, Range = 1-7)[a]
SNS-Meaningful	Non-User		2.13 (SD = 1.39, Range = 1-5)[b]
	User	2.85 (SD = 1.44, Range = 1-7)[a]	3.55 (SD = 1.71, Range = 1-7)[c]
SNS-Attention	Non-User		2.57 (SD = 1.64, Range = 1-7)[b]
	User	4.21 (SD = 1.60, Range = 1-7)[a]	4.51 (SD = 1.65, Range = 1-7)[a]
SNS-Response	Non-User		2.25 (SD = 1.55, Range = 1-7)[b]
	User	3.98 (SD = 1.54, Range = 1-7)[a]	3.74 (SD = 1.83, Range = 1-7)[a]
SNS-Many People	Non-User		3.28 (SD = 2.24, Range = 1-7)[b]
	User	5.97 (SD = 1.27, Range = 2-7)[a]	5.82 (SD = 1.38, Range = 1-7)[a]
SNS-Use	Non-User		
	User	5.08 (SD = .851, Range = 1-7)[a]	3.74 (SD = 1.15, Range = 1-7)[b]

Note. Superscripts indicate significant differences between groups ($p < .05$) per feature.

Table 9. Count of channels selected by age group and scenario

	FTF	Telephone	Mail	Email	Text	IM	Video Chat	SNS
Scenario 1								
Young	21	71	1	5	38	1	2	11
Old	22	79	3	23	10	3	2	6
Scenario 2								
Young	3	31	3	2	49	18	18	25
Old	7	60	9	45	10	7	2	7
Scenario 3								
Young	7	12	0	2	88	7	1	31
Old	18	71	5	31	6	5	1	4
Scenario 4								
Young	61	33	0	1	30	13	6	3
Old	23	87	0	17	10	4	3	2
Totals								
Young	92	147	4	10	205	39	27	70
Old	70	297	17	116	36	19	8	19

Table 10. Features rating differences between two age groups

Features Thought About	Young (n = 146) M (SD)	Old (n = 135) M (SD)
Quickly**	4.94 (1.32)	4.42 (1.74)
Connection	4.33 (1.31)	4.40 (1.79)
Meaningful*	4.42 (1.21)	4.86 (1.72)
Attention*	5.08 (1.28)	4.72 (1.83)
Response***	5.40 (1.21)	4.66 (1.86)
Many People*	3.90 (1.25)	3.48 (1.90)
Features of Selected Channel	Young (n = 147)	Old (n = 137)
Quickly	6.37 (.682)	6.50 (.716)
Connection***	5.00 (.970)	5.72 (1.20)
Meaningful***	4.97 (1.05)	5.59 (1.14)
Attention*	5.71 (.768)	5.97 (1.10)
Response	5.52 (.897)	5.49 (1.40)
Many People***	5.11 (1.27)	4.27 (1.89)
Features of Preferred Channel		
Quickly*	6.27 (.901)	6.49 (.682)
Connection*	5.64 (.994)	5.89 (1.14)
Meaningful	5.59 (1.11)	5.72 (1.19)
Attention	6.01 (.793)	6.09 (1.07)
Response*	5.96 (.901)	5.63 (1.39)
Many People**	5.19 (1.34)	4.53 (1.90)

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 11. Mediation of relationship between age and feature ratings of selected channels, by Future Time Perspective

	Features Ratings for Selected Channels		
	Connection	Meaningfulness	Many People
Age Group (1 = Older) to FTP Scale (a path)	-1.55***	-1.55***	-.155***
FTP Scale to Feature Rating (b path)	.082	.042	.346***
Total Effect of Age Group on Feature Rating (c path)	.718***	.616***	-.843***
Direct Effect of Age Group on Feature Rating (c' path)	.844***	.681***	-.308
Bootstrap Estimates of Significant Indirect Effect (ab paths)	-.122	-.065	-.534***
F	17.10***	12.04***	18.60***
df	2, 297	2, 297	2, 297
R^2	.103	.075	.111
Adjusted R^2	.097	.069	.105

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 12. Correlations between frequency of use of channel and ratings of feature for all participants

		Ratings of Features Present in Channel					
	Channel	Speed	Connection	Meaningful	Attention	Response	Audience
Younger	FTF	.061	.173*	.226**	-.008	.137*	.078
	Telephone	.195**	.107	.107	.049	-.074	.151*
	Mail	.232**	.276***	.11	.234**	.189*	.103
	Email	.163*	.071	.146*	.165*	.095	.168*
	Text	.114	-.074	.162*	.016	-.028	.318***
	IM	.140*	.268***	.228**	.147*	.053	.233**
	Video Chat	.128	.008	.057	.030	.051	.192*
	SNS	.226**	.099	-.014	.127	.059	.335***
Older	FTF	.328***	.408***	.331***	.329***	.309***	.250**
	Telephone	.231**	.399***	.389***	.353***	.319***	.307***
	Mail	.364***	.421***	.284***	.295***	.3251**	.240**
	Email	.499***	.317***	.333***	.402***	.196**	.306***
	Text	.486***	.511***	.461***	.464***	.524***	.486***
	IM	.352***	.424***	.399***	.387***	.410***	.323***
	Video Chat	.280***	.332***	.329***	.401***	.371***	.208**
	SNS	.559***	.489***	.453***	.538***	.443***	.543***

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 13. Perceptions of features as mediators of the relationship between channel use and perceptions of channel usefulness

	FTF	Telephone	Mail	Email
Channel Use to Features (a paths)				
Quickly	.272***	.209***	.635***	.388***
Connection	.355***	.376***	.782***	.273**
Meaningful	.231***	.289***	.433***	.366***
Attention	.274***	.250***	.665***	.415***
Response	.321***	.227**	.440***	.253**
Many People	.330**	.509***	.503***	.406***
Features to Channel Usefulness (b path)				
Quickly	.189*	.0970	.346***	.215**
Connection	.194	.1366	.080	.226**
Meaningful	.138	.0553	.001	.140*
Attention	.007	.1654	-.040	.051
Response	.149	-.0386	-.020	-.013
Many People	.082	.0350	.024	-.091
Total Effect of Use (c path)	.357***	.296***	.515***	.410***
Direct Effect of Use (c' path)	.288**	.158*	.251***	.233**
Bootstrap Estimates of Significant Indirect Effect (ab paths) Total	.065	.141*	.262*	.1793*
Quickly	.054*	.021	.218*	.081*
Connection	.065	.051	.061	.063*
Meaningful	-.030	.017	.005	.054
Attention	-.002	.040	-.029	.022
Response	-.048	-.009	-.007	.004
Many People	.026	.019	.012	.035
F	3.53**	6.78)***	8.303***	12.54***
df	7, 285	7, 286	7, 280	7, 286
R^2	.080	.142	.172	.235
Adjusted R^2	.057	.121	.151	.216

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 13 (continued). Perceptions of features as mediators of the relationship between channel use and perceptions of channel usefulness

	Text	IM	Video Chat	SNS
Channel Use to Features (a paths)				
Quickly	.525***	.490***	.500***	.577***
Connection	.329***	.301***	.592***	.263***
Meaningful	.409***	.422***	.592***	.162***
Attention	.387***	.392***	.547***	.369***
Response	.455***	.466***	.618***	.374***
Many People	.663***	.583***	.255**	.591***
Features to Channel Usefulness (b path)				
Quickly	.099	.020	.080	.070
Connection	.086	.039	.273	.076
Meaningful	.138*	.112	.114	.090
Attention	.196*	.249**	-.106	.066
Response	.057	-.125	.147	.016
Many People	.022	.046	-.117*	.023
Total Effect of Use (c path)	.626***	.728***	.904***	.613***
Direct Effect of Use (c' path)	.373***	.593***	.632***	.495***
Bootstrap Estimates of Indirect Effect (ab paths) Total	.255*	.135*	.267*	.117*
Quickly	.051	.011	.037	.041
Connection	.030	.010	.167	.018
Meaningful	.056	.049	.056	.014
Attention	.075	.097*	-.049	.024
Response	.027	-.057	.086	.007
Many People	.016	.025	-.030*	.013
F	48.49***	30.56***	33.02***	26.39***
df	7, 284	7, 282	7, 280	7, 283
R^2	.544	.431	.452	.395
Adjusted R^2	.533	.417	.439	.380

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 14. Interactions between feature ratings and age group predicting channel use

	FTF	Telephone	Mail	Email
F for model	13.52***	5.036***	6.126***	6.156***
df	13. 280	13, 281	13, 276	13, 280
R^2	.386	.189	.224	.222
Age Group (Older Adult = 1)	-2.817*	-1.816*	-.049	-2.510***
Speed	-.026	.179	.110	.057
Connection	.102	.065	.091*	-.061
Meaningful	.186	.019	-.062	.097
Attention	-.096	-.001	.044	.104
Response	.004	-.166*	-.011	-.067
Many People	.019	.067	.013	.080
Speed * AG	.125	-.221	.006	.274*
Connection * AG	.251	.124	.031	.095
Meaningful * AG	-.194	.168	.062	-.004
Attention * AG	.062	.059	-.033	.028
Response * AG	-.003	.157	.011	.032
Many People * AG	.048	.042	.049	-.009

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 14 (continued). Interactions between feature ratings and age group predicting channel use

	Text	IM	Video Chat	SNS
F (df) for model	53.06***	22.56***	12.09***	40.47***
df	13, 278	13, 276	13, 276	13, 278
R^2	.713	.515	.363	.654
Age Group (Older Adult = 1)	-4.361***	-1.831**	-1.920**	-2.950***
Speed	.087	.117	.070	.087
Connection	-.072	.211*	-.192	.140
Meaningful	.094	.048	.143	-.137
Attention	.027	.027	-.084	.102
Response	-.085	-.203*	.036	-.086
Many People	.136	.144*	.108*	.218**
Speed * AG	.110	-.087	-.141	.060
Connection * AG	.128	-.116	.181	-.046
Meaningful * AG	.031	.037	-.149	.255
Attention * AG	-.156	-.039	.333*	-.077
Response * AG	.324*	.288*	.017	.136
Many People * AG	.016	-.062	-.155*	-.042

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 15. Age and sex averages for participants and partners

	M	SD	Range (L-H)
Participant Age	20.33	2.24	18-42
Sex (% female)	78.33		
Same-Age Age	20.61	2.87	16-49
Sex (% female)	68.89		
Parent-Age Age	50.46	5.12	33-68
Sex (% female)	78.98		
Grandparent-Age Age	77.15	7.47	60-97
Sex (% female)	77.15		

Table 16. Frequency of communication by age group and channel

Frequency	Same-Age (M = 3.32, SE = .061)[a]	Parent-Age (M = 3.37, SE = .059)[a]	Grandparent-age (M = 1.79, SE = .040)[b]
FTF (M = 2.97, SE = .061)[a]	3.19 (1.51)[a]	3.30 (1.13)[a]	2.42 (.873)[b]
Telephone (M = 4.05, SE = .076)[b]	3.79 (1.62)[a]	5.52 (1.54)[b]	2.85 (1.30)[c]
Mail (M = 1.51, SE = .046)[c]	1.30 (.780)[a]	1.51 (.840)[b]	1.72 (.833)[c]
Email (M = 2.26, SE = .072)[d]	1.66 (1.18)[a]	3.48 (1.70)[b]	1.64 (1.17)[a]
Text (M = 4.20, SE = .074)[b]	5.82 (1.53)[a]	5.33 (1.91)[b]	1.46 (1.06)[c]
Video Chat (M = 1.97, SE = .070)[e]	2.53 (1.55)[a]	2.20 (1.58)[b]	1.18 (.483)[c]
SNS (M = 2.81, SE = .068)[a]	4.93 (1.59)[a]	2.22 (1.76)[b]	1.28 (.782)[c]
Top Channel	6.22 (1.36)[a]	6.35 (1.29)[a]	3.30 (1.27)[b]

Note: Differing superscripts represent significant differences, $p < .05$. Superscripts in margins represent main effect significant differences.

Table 17. Participant responses for who usually initiates contact by generation for T1 and T2

	Self	Partner	Other	Equal
Same-Age T1*	39	12	0	194
T2	42	22	0	182
Parent-Age T1	35	45	0	111
T2	31	54	0	97
Grandparent-age T1	53	61	14	66
T2	62	49	15	56

Note. * = Difference between T1 and T2 are significant at $p < .05$, using McNemar-Bowker test of symmetry (looks to see if two repeated measure categorical variables are symmetrical)

Table 18. Multi-step regression predicting closeness at T2

	Same Age	Parent Age	Grandparent Age
Step 1			
F (df)	27.82 (3, 175)***	95.79 (3, 169)***	105.22 (4, 167)***
R^2	.327	.63	.846
Closeness T1	.712***	.772***	.782***
Conflict T1	.134	-.172	-.092
Equity T1	.156	-.05	.08
Age Appearance T1			-.041
Step 2			
F (df) change	12.04 (4, 168)***	6.35 (4, 165)***	7.07 (4, 163)***
R^2	.477	.679	.871
Closeness T1	.563***	.699***	.682***
Conflict T1	.129	-.133	-.002
Equity T1	.06	-.068	.043
Age Appearance T1			-.007
Self Relational Maintenance	.089	.138	.014
Partner Relational Maintenance	.319***	.102	.279***
Total Rich Interactions	-.038	.015	-.071
Total Lean Interactions	.053	.005	.018
Step 3			
F (df) change	.322 (2, 166)	.718 (2, 163)	3.58 (4, 158)**
R^2	.479	.682	.882
Closeness T1	.566***	.697***	.683***
Conflict T1	.097	-.214	-.563
Equity T1	.058	-.062	.029
Age Appearance T1			.164
Self Relational Maintenance	.093	.125	.032
Partner Relational Maintenance	.313***	.109	.277***
Total Rich Interactions	.036	-.088	-.214
Total Lean Interactions	-.034	.001	.319
Rich * Conflict	-.049	.052	.546**
Lean * Conflict	.055	.005	.15
Rich * Age Appr			-.16
Lean * Age Appr			-.133

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 19. Multi-step regression predicting self relational maintenance behaviors

	Same Age	Parent Age	Grandparent Age
Step 1			
F (df)	F (3, 361) = 3.47*	F (3, 452) = 9.90***	F (4, 196) = 23.84***
R^2	.028	.062	.327
Closeness T1	.227*	.273**	.369***
Conflict T1	.178	-.057	-.109
Equity T1	.052	.021	.108
Age Appearance T1			.075
Step 2			
F (df) change	F (1, 360) = 4.49*	F (1, 451) = 13.59***	F (1, 195) = 8.76**
R^2	.040	.089	.356
Closeness T1	.219*	.244**	.381***
Conflict T1	.176	-.07	-.084
Equity T1	.068	.028	.103
Age Appearance T1			.066
Channel Richness (1 = Rich)	.224*	.367***	.396**
Step 3			
F (df) change	F (1, 359) < 1	F (1, 450) = 2.57	F (2, 193) = 1.15
R^2	.040	.094	.364
Closeness T1	.218*	.265**	.392***
Conflict T1	.162	.104	.023
Equity T1	.069	.018	.095
Age Appearance T1			-.083
Channel Richness (1 = Rich)	.159	.849**	-.033
Richness * Conflict	.039	-.259	-.138
Richness * Age Appr			.184

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 20. Multi-step regression predicting partner relational maintenance behaviors

	Same Age	Parent Age	Grandparent Age
Step 1			
F (df)	F (3, 361) = 16.68***	F (3, 453) = 11.18***	F (4, 195) = 21.29***
R^2	.122	.069	.304
Closeness T1	.446***	.236**	.344***
Conflict T1	.048	-.188	-.149
Equity T1	.205*	-.003	.134
Age Appearance T1			-.009
Step 2			
F (df) change	F (1, 360) = 4.69*	F (1, 452) = 5.61*	F (1, 194) = 2.64
R^2	.133	.080	.313
Closeness T1	.437***	.211*	.351***
Conflict T1	.046	-.196	-.134
Equity T1	.224**	.002	.131
Age Appearance T1			-.014
Channel Richness (1 = Rich)	.264*	.23*	.246
Step 3			
F (df) change	F (1, 359) < 1	F (1, 451) = 3.71	F (2, 192) < 1
R^2	.134	.088	.315
Closeness T1	.441*	.236**	.359***
Conflict T1	.096	.005	-.146
Equity T1	.221*	-.01	.127
Age Appearance T1			-.099
Channel Richness (1 = Rich)	.487	.785*	-.132
Richness * Conflict	-.135	-.298	.016
Richness * Age Appr			.106

Note. * = $p < .05$; ** = $p < .01$; *** = $p < .001$