



Articles

Channels of Computer-Mediated Communication and Satisfaction in Long-Distance Relationships

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Abstract

In the last decade, there has been a surge in the number of ways in which romantic partners can remain in contact with each other. The use of communication technologies may have important implications for the maintenance of relationship satisfaction. Unfortunately, most research in this domain has been conducted with samples that are composed predominantly by individuals in geographically-close relationships. This study examined the use of communication technologies in long-distance relationships, including how various mediums of communication are associated with relationship satisfaction and communication satisfaction. Using a diverse online sample of individuals in long-distance relationships, we found that the frequency of utilizing various channels of communication was associated with relationship satisfaction and communication satisfaction. The most frequently used channel of communication was text messaging. However, *Skype* use was the strongest predictor of both relationship satisfaction and communication satisfaction. Further, communication satisfaction mediated the relation between *Skype* use and relationship satisfaction. We integrate our findings into theoretical perspectives on computer-mediated communication.

Keywords: communication technologies, computer-mediated communication, long-distance relationships, relationship satisfaction, communication satisfaction

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Many couples are geographically separated for an extended period of time due to factors such as work, education, and the military (e.g., Firmin, Firmin, & Merial, 2013). With the recent rise in new mediums of communication (e.g., text messages, *Skype*, social media), however, long-distance couples now have many ways to stay in contact on a daily basis and be interdependent even when separated. The availability of new forms of communication, however, does not mean that they are all used. Research on the use and effects of various communication technologies in personal relationships “is at a nascent stage” (Stafford & Hillyer, 2012, p. 290); furthermore, less is known specifically in regard to their effects, such as on satisfaction, in long-distance relationships (LDRs).

Despite their lack of frequent face-to-face contact, partners in LDRs have been found, in many studies, to have similar levels of satisfaction to those in geographically close relationships (e.g., Guldner & Swensen, 1995; Roberts & Pistole, 2009; Stafford & Merolla, 2007). In addition, early research found that greater communication in LDRs (i.e., frequent phone contact) while the partners were separated was associated with

satisfaction (Dainton & Aylor, 2002). Less is known, however, regarding how frequently those in LDRs use new communication technologies to stay in contact and how the use of the new communication modes is associated with relational quality outcomes. In this study, an international sample of 588 individuals who were currently involved in a LDR completed a survey that assessed their use of multiple communication technologies, as well as their communication satisfaction and overall relationship satisfaction.

Theoretical Perspectives on Communication Technologies Used in Romantic Relationships

Various theories have addressed the benefits and consequences of using computer-mediated modes of communication in romantic relationships, in addition to the motivations for using specific modes at specific times. Below, we will review these theories and posit several considerations that may apply to relationships that are maintained long-distance.

Media Richness Theory

Early theories in the field of communication science presented computer-mediated communication (CMC) as being detrimental to interpersonal outcomes (Culnan & Markus, 1987). For example, according to cues-filtered-out theory, there is a reduction of social presence stemming from decreased prevalence of nonverbal and contextual cues. Media richness theory (e.g., Daft & Lengel, 1986; summarized in Walther, 2011), however, qualifies this effect. According to media richness theory, although some forms of CMC may be limited in capacities such as nonverbal cues, other forms of CMC are “rich,” coming close to face-to-face communication in use of multiple information channels (e.g., both audio and visual), synchronous and immediate exchanges, natural language, and personalization of messages. Video chatting services, such as *Skype*, *Facetime*, and *Google Hangouts* represent rich forms of CMC and give users the ability to see each other, as well as convey emotions and body language (Neustaedter & Greenberg, 2012). These forms of CMC may be especially important for individuals in LDRs, who are not readily able to communicate face-to-face.

Beyond video chatting services, other forms of CMC are being adapted by geographically-close and long-distance partners alike (e.g., *Snapchat*, texting, picture messaging). These types of communications can serve as “social snacks” to long-distance partners (Gardner, Pickett, & Knowles, 2005). People can satiate their “social” appetite via various mediums, including pictures or mementos associated with a partner. Such mementos, in turn, temporarily fulfill a sense of belongingness (Gardner et al., 2005). Transmission of photos and text messages are ‘leaner’ mediums than communication mediums such as *Skype*, but they may still help to increase social and visual presence between long-distance partners. Whether use of such lean mediums facilitates positive relational evaluation, compared to other mediums, is one of the empirical notions at question.

Social Information Processing Theory

While media richness theory considers the limitations of communication technologies – particularly those that are lean (e.g. text messages) – other theories have framed the use of such modalities as offering particular strengths to communicators. One such theory, social information processing theory (Walther, 1992), states that the exchange of social information is important for increasing intimacy in relationships. The theory argues that, despite any reduction in nonverbal and contextual cues in text-based CMC, social information can still be transmitted. In essence, communicators are motivated to adjust to leaner modalities by exchanging more intimate verbal or written information through them. Reis, Maniaci, Caprariello, Eastwick, and Finkel (2011), for

example, observed that even continuous computer-mediated chats with no face-to-face contact between strangers facilitated rapport through mechanisms such as perceived responsiveness and knowledge of the other.

Intimate communication over CMC may be particularly important in LDRs. Geographically-close partners have the option to wait until face-to-face interaction to engage in intimate communication, but partners in LDRs often need to find other ways to communicate (Kirkpatrick, 2007). As such, “lean” modalities (e.g., text messaging) are likely to be used for communicating rich, social information in LDRs, resulting in communication that is more intimate than what might occur in geographically-close relationships in the same modalities (Kelmer, Rhoades, Stanley, & Markman, 2013; Kirkpatrick, 2007; Stafford & Reske, 1990).

The Hyperpersonal Model of CMC

The way forms of CMC can be used to express intimacy may be further explained by the hyperpersonal model of CMC. The hyperpersonal model (Walther, 1996) argues that it is possible for more positive impressions to develop through CMC and other forms of communication technology than through the exclusive use of face-to-face communication. This is due to the communicators’ greater control of the communication process and the ability and increased likelihood to engage in strategic (positive) self-presentation. For example, individuals can review and edit a text message before it is sent, ensuring that it is conveying the message sender’s intended meaning. This level of control in one’s communication is not as easily maintained in face-to-face interaction. Consequently, long-distance partners who engage in frequent, intimate communication via CMC may form idealized perceptions of each other. These idealized presentations and control over communicative efforts, however, can lead to unrealistic expectations of both one’s partner and the relationship (Stafford & Merolla, 2007). Researchers have found that use of such modalities tends to be positively associated with relationship commitment, stability, and duration (Stafford & Reske, 1990). Therefore, frequent use of leaner communication technologies in a LDR may predict individuals’ satisfaction with their communication and their relationship.

Tying the Theories Together

Media richness theory, social information processing theory, and the hyperpersonal model of CMC all offer unique insights into the effects of communication channels on dimensions of romantic relationships (e.g., satisfaction). The many forms of CMC vary in their communication richness, which may in turn affect interpersonal exchanges of information. Maintaining at least some control over the interaction may provide further positive effects through fluidity in the ease of positive self-presentation. In other words, the three theoretical perspectives capture unique facets of CMC. Although their approaches may differ, the theories converge on the notion that communication in certain mediums, even if minimal in its richness, is just as important in LDRs as it is in geographically-close relationships.

Use of Communication Technologies in Long-Distance Relationships

Only a few recent studies have considered how long-distance romantic couples or friendship pairs interact across a variety of communication channels, including the potential relational outcomes of the use of different types of communication technologies. In one such study, Brody (2013) asked a large sample of undergraduate students to indicate how often they used various channels of communication in a long-distance friendship. A composite score of frequency use of various communication technologies was positively associated with friendship satisfaction and commitment, especially for individuals who had not had recent face-to-face contact with their friend. In another study, Kirk (2013) asked a small sample of undergraduate students involved in

LDRs to indicate how many hours per week they used each of several communication channels. The couples reported that *Skype* and *Facebook* were the most frequently used communication channels. Time spent on *Skype* positively predicted relationship satisfaction. *Facebook* communication, however, was negatively associated with satisfaction. Furthermore, the more time that the participants reported using the various communication technologies, the higher their scores on a relational maintenance measure. In a very recent study (Janning, Gao, & Snyder, 2017), individuals were surveyed about their communication in a LDR (past or present) for both the period when they were long-distance and the period when they were geographically close. During both periods, phone (audio), texting, and digital chatting were used frequently. Video chatting was found to be more frequently used during the long-distance period of the relationship.

As stated above, video communication may be particularly important for LDRs, as it allows for a richer format of interaction than do other forms of communication (e.g., text messages, phone calls). This channel offers both video and audio channels and makes the other person salient through a shared presence. In turn, the sense of shared space can aid in emotional closeness (Kolozsvari, 2015). Neustaedter and Greenberg (2012) found suggestive evidence of the importance of video communication for LDRs through their assessment of the use of video communication as routes of relationship maintenance in interviews of 14 persons involved in LDRs. A majority of the participants said they used video chats to be able to see each other's face and to "hang out" together, being better able to share day-to-day life. Furthermore, the participants in the Janning et al. (2017) study of LDRs reported that visual and audio communication formats were meaningful to them because of the intimacy possible in these communication modes.

Geographically close couples also use several communication technologies to stay in contact and express affection when not together (Boyle & O'Sullivan, 2016; Coyne, Stockdale, Busby, Iverson, & Grant, 2011; Morey, Gentzler, Creasy, Oberhauser, & Westerman, 2013; Ramirez & Broneck, 2009; Ruppel, 2015; Stewart, Dainton, & Goodboy, 2014; Toma & Choi, 2015). In both LDRs and geographically-close relationships, maintenance strategies and relationship satisfaction may be enhanced through the use of communication technology (e.g., Houser, Fleuriet, & Estrada, 2012; Miller-Ott, Kelly, & Duran, 2012; Morey et al., 2013; Pettigrew, 2009; Stewart et al., 2014; Utz, Muscanell, & Khalid, 2015). Nonetheless, newer forms of communication technology may also have mixed effects on relationships, including increased opportunities for conflict, tension, and jealousy (Hertlein & Ancheta, 2014; Murray & Campbell, 2015; Neustaedter & Greenberg, 2012; Ruppel, 2015; Schade, Sandberg, Bean, Busby, & Coyne, 2013; Stewart et al., 2014). Furthermore, some research has found no association between the use of communication technology and relationship satisfaction (Baym, Zhang, Kunkel, Ledbetter, & Lin, 2007; Coyne et al., 2011). Therefore, it is important to examine the role of newer forms of communication technology in predicting relationship outcomes, particularly in the type of relationship that relies on communication technology for its maintenance – the long-distance relationship.

Purposes to This Study

The number of couples involved in LDRs is increasing (e.g., Firmin et al., 2013; Stafford, 2010). With a changing landscape of communication technologies available to long-distance couples, it is important to expand knowledge of how long-distance couples stay in contact and how their use of different mediums of communication is associated with relationship satisfaction and other relationship outcomes. As noted by Dainton and Aylor (2002), "scholars studying the maintenance of relationships, particularly LDRs, should not

limit themselves to a focus on face-to-face interaction, but should also examine the role of all communication channels in relational maintenance (p. 127).” Today, the communication channels are numerous.

This study extends prior research in two ways. First, we provide a current description of the modes of communication that individuals in LDRs use to communicate. We were specifically interested in which channels of communication people in LDRs use most frequently to stay in contact with their partners (Research Question 1). Drawing from media richness theory (Daft & Lengel, 1986), we would expect that long-distance partners would enact communication frequently over video-chatting services (i.e., *Skype*, *Facetime*, *Google Hangouts*) as a substitute for their lack of richer communication occurring face-to-face. However, use of leaner modalities may also be frequent in LDRs. Long-distance partners can easily cater to their social appetite via leaner mediums such as texting and photo transmissions, thus increasing the social presence and connectedness between them (Gardner et al., 2005).

The second and primary goal of this research was to examine how the frequency use of various channels of communication is associated with satisfaction in LDRs, as well as more specifically with communication satisfaction. In examining how the use of communication channels in LDR is associated with relationship outcomes, we focus on relationship satisfaction because it is a central construct studied in literature on relationships (Fincham, Rogge, & Beach, 2006), and has been highly linked to other indicators of relationship quality such as commitment, love, and relationship maintenance (e.g., Anderson & Emmers-Sommer, 2006; Hendrick, 1988) and to individual health outcomes (Proulx, Helms, & Buehler, 2007). The expansive literature on relational satisfaction presents aspects of communication (quality and quantity) to be major predictors of satisfaction (e.g., Fincham et al., 2006). To our knowledge, however, with the exception of Kirk’s (2013) study, researchers have yet to examine and compare how the use of new communication technologies is associated with relationship satisfaction in LDRs. As noted above, an earlier study (Dainton & Aylor, 2002) – which was conducted before the widespread use of the newest communication technologies (e.g., digital text, video chatting) – found that the use of telephone communication was positively associated with satisfaction in LDRs. In addition to examining how forms of communication are associated with relationship satisfaction, we consider how they are also associated with communication satisfaction more specifically. People not only assess their overall satisfaction in the relationship, but also satisfaction with specific areas of the relationship, which may not always correspond with overall satisfaction (i.e., one could be dissatisfied with a specific area of the relationship, while still satisfied with the entire relationship, or vice versa).

As the exchange of social information is pivotal in increasing positive relational outcomes (i.e., social information processing theory, Walther, 1995), we predict that the more frequently individuals communicate with their long-distance partners, the more satisfied they are with their communication and also with their entire relationship (Hypothesis 1). However, we consider the possibility that not all types of communication channels may be equally beneficial for LDRs, and explore whether the use of some mediums of communication technology are more highly associated with relationship satisfaction and communication satisfaction than others (Research Question 2). Rich video chatting services, such as *Skype*, may be particularly beneficial for the relationship because of the social presence they provide the couples. Conversely, other communication channels (e.g., *Facebook*) may increase tension in the relationship because of jealousy that can occur (Elphinston & Noller, 2011). In addition, use of cell phones (both voice and text) could be beneficial because of the ability to stay in frequent contact, but could also generate misunderstandings that can occur without the aid of visual channels (e.g., Coyne et al., 2011).

Method

Sample and Procedure

The sample for analysis consisted of 588 participants who were in LDRs and met other qualifications for participation, as discussed below. The link to an on-line survey was distributed to an introductory social science class at a large Midwestern University, was posted to the Reddit.com subpage <http://www.reddit.com/r/LongDistance>, and was posted on an author's Facebook page. The Long-Distance subpage on Reddit serves as an online forum and discussion setting for individuals in long-distance relationships. Although we did not include a question in the survey that assessed the specific source of the link to the survey, most of the participants appeared to be from the *Reddit* subpage because of the large number of participants who reported their location outside of the Midwest USA and the large increase in participation shortly after the survey link was posted.

Our initial sample consisted of 879 participants involved in LDRs. We eliminated 155 participants who opened the online survey but either did not complete any of the items or completed only the first few, 12 participants who reported an age younger than 18, and 11 participants who replied "No" to the question "Are you currently part of a long distance relationship?" We further eliminated two participants who reported living less than 30 miles from their partner and 11 participants who reported that they saw their partner "daily" or "a few times a week" (even though they had defined the relationship as long-distant). We also decided to eliminate those who responded "We have no face-to-face interaction" ($n = 100$) to the question on how often they see their partner. People who have an exclusively online relationship may be different in many ways from those who have some face-to-face contact.

Our final sample consisted of 183 (31.1%) men and 405 (68.9%) women. Their ages ranged from 18 to 62, with a mean age of 22.65 ($SD = 4.41$). In response to a question that asked participants about their race/ethnic background, 76.6% said White, 1.4% said African American, 7.6% said Hispanic/Latino, 14.4% said Asian, and the remaining either checked "Other" (and typically wrote in a mixed race) or left the question blank. The majority of the participants came from the United States (61%), although participants came from many other countries, including the United Kingdom (9%), Canada (9%), and Australia (2%). To a question that asked the participants how they would best define their relationship, a majority (86.4%) defined their relationship as seriously dating; 5.5% were casually dating, 6.6% were engaged, and 1.5% were married. The majority of participants (53%) reported to have been in their LDR for 12 months or less, 26% of participants reported to have been in the LDR between 12 and 24 months, and the remaining (21%) were in longer-term LDRs.

Measures

Frequency Use of the Various Mediums of Communication

Participants were presented with twelve mediums of communication and were asked to indicate how often they used each medium in their LDR. The twelve mediums were: phone calls, received text messages, sent text messages, received picture messages, sent picture messages, instant messaging, *Skype*, *Facetime*, *Snapchat*, *Facebook*, *Twitter*, and *Google Hangouts*. Email was inadvertently left off the list of communication mediums. However, recent research has shown that romantic partners do not use email as frequently as cell phone texts for relaying messages (Coyne et al., 2011; Toma & Choi, 2015). Participants reported their use of each

communication medium with a 9-point response scale: 1 (*do not use*), 2 (*once a month*), 3 (*every other week*), 4 (*once a week*), 5 (*a couple of times during a week*), 6 (*four to five times a week*), 7 (*daily*), 8 (*a couple times a day*) and 9 (*several times throughout the day*).

Satisfaction With the Communication

After the participants indicated how often they used each medium of communication in their LDR, they were asked, “How satisfied are you with your communication in this relationship?” The responses ranged from 1 = *very dissatisfied*, 4 = *somewhat satisfied*, and 7 = *very satisfied*.

Relationship Satisfaction

The relationship assessment scale (e.g., [Hendrick, Dicke, & Hendrick, 1998](#)) was used to assess relationship satisfaction. Sample items of the seven-item scale include, “How well does your partner meet your needs?” and “In general, how satisfied are you with your relationship?” Participants responded to each item on a five-point response scale, with the specific anchors depending on the item (e.g., *Not at all/Completely*; *Never/Always*). Two of the items were in the negative direction (e.g., “How often do you wish you hadn’t gotten into this relationship?”) and were reverse coded before a composite score was created ($\alpha = .78$).

Results

RQ1: Which Communication Channels Do People in Long-Distance Relationships Use Most Often?

Initial analyses of frequency of each communication medium indicated that the majority of the sample did not use *FaceTime* (76%), *Google Hangouts* (80%), and *Twitter* (88%) to communicate with their romantic partners. We had initially considered aggregating *Skype*, *FaceTime*, and *Google Hangouts* into an overall video chatting index. *Skype* use, however, was negatively correlated with the use of both *FaceTime* ($r = -.18, p < .0001$) and *Google Hangouts* ($r = -.13, p = .0015$). Furthermore, the use of *FaceTime* and *Google Hangouts* was unrelated, $r = -.06, p = .178$. Thus, we maintained *Skype* as the sole video chatting platform in our analyses, omitting *FaceTime* and *Google Hangouts*. *Twitter* was also omitted because of the large proportion of our sample not utilizing this channel for relationship communication. There was a high degree of correlation between sent and received text messages ($r = .98$) and sent and received picture messages ($r = .94$); these two sets of variables were collapsed, yielding measures of frequency of text messaging and frequency of picture messaging. See [Table 1](#) for mean frequencies of each of the seven communication mediums.

To test whether some channels are used more than others, we employed a within-subjects ANOVA, which yielded a main effect of communication medium, $F(6, 3,490) = 90.73, p < .0001, \eta^2 = .11$ (see [Figure 1](#)). Overall, people used text messaging the most and *Snapchat* the least. Recall that we had eliminated *FaceTime*, *Google Hangouts*, and *Twitter* from the analyses, but these were the least common modes of communication. Post-hoc analyses with Šidak corrections revealed that the use of all channels yielded statistically significant differences (at $p \leq .012$) with three exceptions: the use of instant messages did not differ from *Skype*; the use of phone calls did not differ from the use of *Facebook*; and the use of *Facebook* did not differ from the use of *Snapchat*.

Table 1

Mean Frequencies of Use of the Seven Communication Mediums of Interest

Medium	<i>M</i>	<i>SD</i>
Text Messaging	6.92	3.10
Picture Messaging	5.44	2.51
Instant Messaging	4.77	3.62
Skype	4.74	2.75
Phone Calls	4.02	2.72
Facebook	3.87	3.01
Snapchat	3.54	3.13

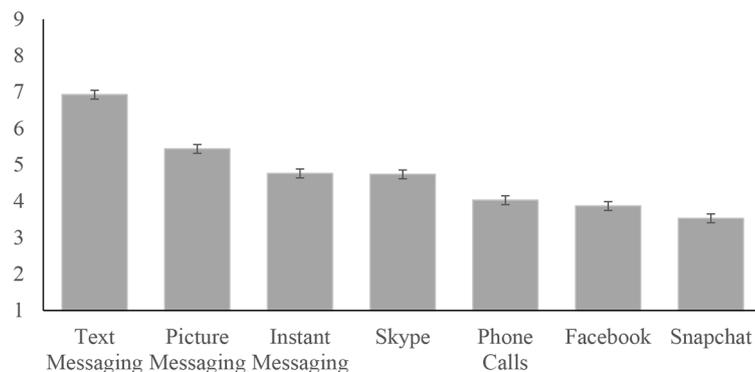


Figure 1. General frequency of use for each medium of communication. Error bars represent standard errors for each mean.

H1: Associations Between Frequency of Communication Mediums and Relationship Satisfaction and Communication Satisfaction.

We tested H1 using a series of correlations between the use of each communication medium and relationship and communication satisfaction. As demonstrated in Table 2, only one communication medium was related to relationship satisfaction: *Skype*. In other words, the more that partners video chatted on *Skype*, the greater was their reported level of relationship satisfaction. Furthermore, both *Skype* and picture messaging were positively related to communication satisfaction. Taken together, these results suggest that video chatting may be the best route in maintaining relationship and communication satisfaction in long-distance relationships. Tests of potential influences of sex revealed no differences between men and women in the use of each medium of communication.

Table 2

The Associations of Each Communication Medium With Relationship Satisfaction, Communication Satisfaction, and Sex

Medium	Relationship Satisfaction		Communication Satisfaction		Sex	95% CI
		95% CI		95% CI		
Phone	.02	-.06, .10	.05	-.04, .13	.02	-.06, .10
Text Messaging	.04	-.04, .12	.04	-.04, .13	-.003	-.08, .08
Picture Messaging	.06	-.02, .14	.14**	.06, .21	.001	-.08, .08
Skype	.12*	.04, .20	.21***	.13, .29	-.02	-.10, .06
Instant Messaging	.05	-.04, .13	.07	-.01, .16	-.07	-.15, .01
SnapChat	-.01	-.10, .07	.01	.07, .09	-.04	-.12, .04
Facebook	.08	-.01, .16	.06	-.03, .14	.002	-.08, .08

Note. Displayed are correlation coefficients between each communication medium and the variable in the respective column, followed by the 95% Confidence Interval of each correlation coefficient.

* $p = .0037$. ** $p = .001$. *** $p < .0001$.

RQ2: Which Media of Communication Are Most Highly Associated With Relationship Satisfaction and Communication Satisfaction?

Our tests of H1 suggested that not all media are related to the two outcome variables overall. For example, *Snapchat*, and perhaps surprisingly, phone calls, showed little to no relation between both variables. *Skype* showed a consistent positive association with both outcome variables, whereas picture messaging was also positively associated with communication satisfaction. Thus, it appears that an avenue in which one can see the partner most strongly affects relationship and communication satisfaction.

We followed-up our correlation analyses with two complementary multiple regressions in which all seven communication media were considered as potential predictors of communication and relationship satisfaction. An advantage to such analyses is that the results allow us to further examine each medium's unique effect on the outcome variable. To account for potential violation of the assumption of homogeneity of variance, we used robust standard errors in our analyses.

See [Table 3](#) for the results of the regression analysis. We present the standardized slopes (β s) to ease interpretation. When controlling for the use of the remaining communication media, *Skype* was the sole predictor of relationship satisfaction; and picture messaging and *Skype* were the sole predictors of communication satisfaction.

Table 3

Regression Analyses for the Relations Between Communication and Relationship Satisfaction and Each Communication Medium

Outcome Variable	Medium	β
Relationship Satisfaction		
	Phone	.01
	Text Messaging	.08
	Picture Messaging	.06
	Skype	.11*
	Instant Messaging	.03
	SnapChat	-.06
	Facebook	.08
Communication Satisfaction		
	Phone	.04
	Text Messaging	.001
	Picture Messaging	.14**
	Skype	.21**
	Instant Messaging	.02
	SnapChat	-.03
	Facebook	.03

* $p = .012$. ** $p \leq .001$.

Ancillary Analysis: Does Communication Satisfaction Serve as an Indirect Effect Behind the Relation Between Skype Use and Relationship Satisfaction?

Thus far, the results of our research suggest that the optimal media of communication appear to be visual. Picture messages and *Skype* both offer relationship partners the opportunity to see one another. Still, *Skype* offers an additional advantage: because it is specifically a video chat platform, it offers relationship partners a surrogate social interaction given its ability to provide both visual and audio cues (e.g., vocal tone). It is perhaps not surprising, then, that *Skype* served as the best predictor of communication satisfaction and relationship satisfaction. Media richness theory (Walther, 2011) may in turn suggest that *Skype* predicted relationship satisfaction due to its sizeable link with communication satisfaction. In other words, because communication and conversation tend to build intimacy (e.g., Reis et al., 2011) which may in turn translate into positive relationship outcomes such as satisfaction, it is possible that *Skype* contributes to greater relationship satisfaction due to its positive relation with communication satisfaction. This speculation led us to wonder whether communication satisfaction may, in turn, serve as an indirect effect for the relation between *Skype* use and relationship satisfaction. Still, it is important to note that we did not approach this analysis to reach causal conclusions. Rather, we simply tested whether such an effect may exist.

To test this potential indirect effect, we used a non-parametric *Monte Carlo* simulation method, in which the indirect effect obtained from the *a* (the link between the predictor variable and the indirect effect variable) and *b* (the link between the indirect effect variable and the dependent variable, controlling for the remaining predictors) paths in a series of regression analyses is simulated *k* number of times using the slopes and standard errors obtained from the data (we used $k = 50,000$). If a 95% Confidence Interval of the indirect effect does not contain a zero, then the mediation can be considered statistically significant at $p \leq .05$ (Preacher &

Selig, 2012; see Selig & Preacher, 2008 for an online utility for computing *Monte Carlo* indirect effect Confidence Intervals). We obtained the *a* path from the multiple regression analysis we performed on communication satisfaction above.

The analysis yielded a statistically significant indirect effect (95% CI [0.01, 0.03]). In other words, *Skype*'s ability to predict relationship satisfaction potentially stems from its link to communication satisfaction: regardless of their use of other communication channels, the more people talk to their partners on *Skype*, the more satisfied they will be in their communication, which in turn bolsters relationship satisfaction. A complementary indirect effect analysis in which we used picture messaging as a predictor of the *a* path yielded evidence for an indirect effect (95% CI [0.006, 0.03]). Because picture messaging did not predict relationship satisfaction, this result may further demonstrate the importance of satisfactory communication in evoking relationship satisfaction.

We also considered an alternative model in which the effect of *Skype* use on communication satisfaction may be driven by relationship satisfaction. That is, we considered whether *Skype* increases communication satisfaction through increased relationship satisfaction. The results revealed that controlling for *Skype* use, relationship satisfaction indeed predicted communication satisfaction, $b = 1.19$, $SE = 0.08$, $p = .001$. *Skype* use, however, remained a statistically-significant predictor in this model, $b = 0.07$, $SE = 0.02$, $p < .001$. *Monte Carlo* tests revealed support for such an indirect effect, 95% CI [0.01, 0.05]. Still, because *Skype* use continued to be a predictor of communication, this indirect effect was only partial, compared to the full effect we saw in our initial test.

Discussion

The advances in modern computing have substantially facilitated the ease to which two people can communicate with one another, regardless of whether they are two rooms or two countries apart. Our purpose in this research was to investigate the use of various mediums of communication technologies in long distance relationships (LDRs) and how their use is associated with relational outcomes (e.g., relationship satisfaction). Participants reported using a diverse array of communication mediums to stay in contact with their LDR partners, although some channels were infrequently used (e.g., *Twitter*, *Google Hangouts*, *FaceTime*). The participants in the current study most favored text messaging (both sent and received) above all other communication platforms. This finding may be explained by the large surge of hyperconnectivity in recent years (Rainie & Wellman, 2012). With the recent increase in the desire to be socially connected, people (especially today's young adults) have their cell phone readily available to them. The communicative options that a modern cell phone allows can provide a wide range of channels of communication for long-distance couples.

We found that participants generally did not use social media outlets such as *Facebook*, *Twitter*, and *SnapChat* as common means of communication in their LDRs. This may be due, in part, to public availability of the information shared between persons in such communication mediums. Couples in LDRs may prefer more private and easily accessible communication channels (Yang, Brown, & Braun, 2014). Thus, social media is not an optimal medium of private communication for long-distance couples. Concerning video-based communication, *Skype* was the most-commonly used platform, although the use of alternative video communication platforms (i.e., *Facetime* and *Google Hangouts*) was limited. This discrepancy may have resulted from computer operating system constraints in the use of this software. Whereas *Skype* is available on

most major computer operating systems, *Facetime* is limited to users of *Apple* products (*Google Hangouts* appears to be relatively unpopular in general, even though it is also cross-platform).

Beyond exploring the frequency that various communication technologies are used in LDRs, we were specifically interested in whether one or more communication mediums would be associated with overall relationship satisfaction and with communication satisfaction. As predicted, the use of the various communication platforms was not uniformly associated with relational outcomes. *Skype* was the only medium of communication that was positively associated with overall relationship satisfaction – this communication medium was also most strongly associated with communication satisfaction, compared to all other mediums. It is evident that *Skype*, compared to all other communication channels, is unique in its association with positive relational outcomes in LDRs. Indeed, our ancillary mediation analysis revealed that *Skype* facilitated relationship satisfaction by bolstering communication satisfaction. In other words, *Skype* use led to communication satisfaction, which in turn evoked relationship satisfaction. Still, it is possible that rather than *Skype* use increasing relationship satisfaction through communication satisfaction, satisfaction in these domains leads to increased *Skype* usage between partners; alternatively, both causal directions could be in operation. Further research is warranted to clarify these causal paths.

Our findings align with several theoretical perspectives. Supporting media richness theory (Daft & Lengel, 1986), participants who used *Skype* as a medium of communication had the opportunity to enrich their interaction in a way that no other communication platform allows: in real time, with audio and visual support. *Skype* allows partners to see each other, and can thus create a shared social presence between them, allowing the benefit of both verbal and nonverbal cues for understanding. Furthermore, it is reasonable to suggest that participants who used *Skype* frequently had the opportunity to accomplish their interaction goals with their long-distance partners. That is, this shared presence could have given couples the ability to respond to body and facial expressions (which aid in avoiding miscommunications that other channels may elicit), confront relationship problems in a way that is productive (allowing opportunities to reflect and further explain individual perspectives), and even sexually express themselves – all of which contribute to positive relational outcomes (Janning et al., 2017; Neustaedter & Greenberg, 2012). Although not as rich as video chatting, exchanging picture messages also allows for richer communication than mere words exchanged, such as in text messages. Indeed, we did see that this channel predicted communication satisfaction, although *not* relationship satisfaction, in LDR couples. Thus, in line with media richness theory, our results suggest that the use of richer forms of interaction is associated with more positive outcomes for the relationship.

These channels' "riches" also align with perspectives from social information processing theory. In other words, seeing cues beyond mere words allows for greater abilities to exchange a wider array of social information, from emotion to how one may appear that day. Finally, in the view of the hyperpersonal model of CMC, these channels allow for further control of positive self-presentation, as persons may have sufficient time to get themselves ready for a conversation or a quick picture to their significant other. Taken together, these three theoretical perspectives capture unique aspects of the ways in which such channels of CMC may offer positive effects to one's relationship.

Another theoretical construct that can capture the positive effects of technological mediums of communication on relationship satisfaction is Gardner et al.'s (2005) idea of *social snacking*. As noted in the introduction, people can "snack" to fulfill their sense of belongingness even via small social cues. In LDRs, it is possible that

forms of communication such as text messaging, and especially video communication, can serve as viable social snacks and facilitate closeness and satisfaction between the two members of a romantic couple. Thus, the richness of the mediums of communication that members of a LDR can use (cf. [Daft & Lengel, 1986](#)) serve as social snacks, perhaps to different degrees. A person may feel socially full after either a text message or a video conversation, although the latter may lead to a larger alleviation of social hunger than the former. This idea, however, warrants future investigation.

Strengths, Limitations, and Suggestions for Future Research

The field of relationship science focuses much of its efforts on examining the easily accessible and readily available samples of individuals in geographically close relationships. As LDRs are becoming more prevalent, there is an increased need for research to analyze the relational processes that occur in them ([Firmin et al., 2013](#)). As technology and specifically channels of communication continue to grow, so does the feasibility of maintaining a satisfying LDR ([Janning et al., 2017](#)). No prior research has examined and compared the associations of several communication technologies with relational outcomes in such a large and diverse sample of individuals in LDRs. The current study fills this gap and, through multiple analyses, highlights *Skype* (above and beyond other mediums) as a unique tool that LDR partners can use to better maintain communicative and relational satisfaction.

Our study was limited in its underrepresentation of couples who do not use *Reddit*. It may be possible that those who are active on *Reddit* use internet-based communication channels (e.g., Facebook, instant messaging) more frequently than long-distance partners who do not frequent the forum. Some *Reddit* users on the long-distance forum may also be qualitatively different from other individuals in LDRs if they utilize the forum to receive advice regarding their relationships. While our sample did hold these limitations, we believe that it also affords our study a key strength, in that it allowed us to examine our questions with a sample of those who not only use computers, but who are specifically in LDRs from many areas of the world.

It is also worth noting that we did not assess the reasons behind the geographical separation of the LDRs. It is possible that factors behind being in a LDR, such as whether it is because the partners attend different colleges or because they are separated due to work or military service, may affect the dynamics of communication and their effects on the relationship itself. In addition, only a unidimensional measure of communication satisfaction was implemented. While it was our intent to reduce the length of the survey for participants, future research would benefit from utilizing a multidimensional measure of communication satisfaction, such as [Hecht's \(1978\)](#) communication satisfaction scale.

This study is only an initial step in learning more about LDRs in the modern technological age. Future research should implement longitudinal methods to examine the variability in communication technology's effects on relationships, as well as any variables that may affect its influence on relational outcomes. An additional route for future research is to examine communication technology's effects on different types of relationships, such as casual versus committed. It is possible that varying mediums of communication may be more important to committed relationships that are characterized by investment ([Rusbult, 1980](#)). It is perhaps equally as important to examine when communication technology may *impede* relationships. Research has already demonstrated that the use of social networking can evoke jealousy ([Elphinston & Noller, 2011](#)). An interesting question for future research is whether any specific type of communication, or a particular combination of channels, may

negatively affect a LDR. Finally, our sample consisted of *individuals* in relationships. Future work should employ dyadic methods to examine *both* partners' communications tactics and relational outcomes in pursuit of a more in-depth, comprehensive understanding of the topic at hand.

Implications and Concluding Remarks

Overall, the findings of the present study not only relate to the existing literature on satisfaction in LDRs, but also expand upon the limited research that has examined the impact of communication technology on relational outcomes. Our findings hold certain implications for individuals in LDRs – namely, if face-to-face contact is limited, couples should find other ways to create a sense of a shared social presence in real time. The closest medium of communication to physical, face-to-face contact is *Skype* (or other video chat services). Unfortunately, *Skype* comes with its own set of difficulties, such as finding a common time to set aside for video chat, potential time zone differences, and having a strong internet connection to support such a service. These reasons, among others, could explain why participants in the current study did not utilize *Skype* to the extent that they used asynchronous communication channels such as text messages. With only moderate occurrences of a shared social presence, video chatting services such as *Skype* afford LDR partners the opportunity to fulfill what is vital to satisfaction in *any* relationship – being with each other.

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Competing Interests

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