

THE AFFORDANCE UTILIZATION MODEL: THE ROLE OF AFFORDANCES AS
RELATIONSHIPS DEVELOP

BY

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A Dissertation Submitted to the Faculty of the

DEPARTMENT OF COMMUNICATION

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

2011

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

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ACKNOWLEDGEMENTS

I owe thanks and acknowledgement to many people who aided my completion of my dissertation. I would like to thank my advisor and committee for guiding me through the process: Dr. Steve Rains, who simultaneously guided me and pushed me to figure it out on my own; Dr. Chris Segrin, whose dedication to common sense and the “big picture” has and will influence my own research; and Dr. Joe Bonito, whose mentorship has been one of the most valuable experiences of my time in graduate school. I would also like to thank my friends and fellow graduate students in the department, who patiently listened to my complaints and pushed me to keep going! Last but not least, I would like to thank my family for their unwavering support and faith in my abilities to do whatever I put my mind to: particularly Dad and Jeanna for their enthusiasm and pride in my accomplishments; my sister Rachel for her humor and constant provision of a shoulder to cry on; and my husband Frank for his steadfast support and encouragement through this entire process. I truly could not have finished my Ph.D. without the help of any of you, and I hope to make you all proud as I continue my scholarship.

DEDICATION

I would like to dedicate my dissertation to the two most important men in my life. First, to my father Brent. I could never thank you enough for your support and love. You never once doubted that I could accomplish anything to which I set my mind. For as long as I can remember, you have sacrificed your time, money, energy, and attention in order to help me however you could. Your belief in me helped me to believe in myself. When I expressed my hesitations in my own abilities before I started graduate school, you assured me that I would be fine. A week after I started, you joked, “Have they kicked you out yet?” Well, I am happy to report that they finally have!

Second, to my husband Frank. I do not think you knew what you were getting into when you started dating a graduate student two months into her Master’s degree! But you have weathered all of my storms with unending love and patience. You not only did far more than your share of laundry and dishes, but you also listened as I bounced ideas off of you, handled my anxieties with humor and support, and believed in me when I did not believe in myself. Thank you so much for staying “in the trenches” with me. I can only try to return all of the love you have shown me. Thank you for being such a wonderful husband!

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ABSTRACT

This dissertation advances the affordance utilization model (AUM), which addresses the use of communication modes affordances in personal relationships. Drawing from social penetration theory and research regarding two communication mode affordances—asynchronicity and reduced cues—the AUM predicts that these affordances are positively associated with certain conversational outcomes (specifically, conversational effectiveness and appropriateness, and self-disclosure breadth and depth) but that these associations vary as a function of relationship development. As relationships become more developed, the AUM predicts that communication mode affordances exert less impact on conversational effectiveness, conversational appropriateness, and self-disclosure in conversations in relationships. As a result, the associations between communication mode affordance use and these conversational outcomes are attenuated by relationship development. Regarding self-disclosure depth, the AUM predicts that the association between communication mode affordance use and self-disclosure depth is greatest at moderate levels of relationship development. The AUM also predicts that both use and perceived importance of affordances as a proportion of communication in relationships will decrease as those relationships become more developed. Two studies were conducted to test the AUM. The first surveyed participants regarding their most recent conversation in either a friendship ($N = 147$) or romantic relationships ($N = 166$). The second study was a diary study in which participants ($N = 64$) filled out a short survey after every conversation with their partner for four days. The results of the two studies provide mixed support for the AUM. Although importance of

affordances was not associated with relationship development, use of affordances was generally negatively associated with relationship development, as predicted. In general, conversational appropriateness was positively associated with the use of communication mode affordances, and conversational effectiveness, self-disclosure breadth, and self-disclosure depth were negatively associated with affordances. In Study 1, increased relationship development attenuated the association between perceived asynchronicity and both conversational appropriateness and self-disclosure breadth in romantic relationships. In Study 2, increased relationship development attenuated the association between perceived reduced cues and conversational effectiveness. These findings and their implications for the AUM are discussed, and future research directions for the AUM are suggested.

1. INTRODUCTION

Chapter 1 is an introduction to this dissertation, which proposes a model of the role of the affordances (i.e., features that offer advantages to interactants) that some communication modes (i.e., means of communication, such as face-to-face communication, the telephone, or email) offer in the development and maintenance of personal relationships. It begins by discussing the significance of communication modes to personal relationships. Next, the current state of knowledge regarding the role of communication modes, particularly communication technologies (CTs; communication modes other than face-to-face communication) in relationship development and maintenance is discussed, followed by an explanation of the purpose of the dissertation. The chapter concludes with a preview of the dissertation structure.

Significance of Communication Modes to Personal Relationships

CTs such as e-mail, instant messaging, and mobile phones are the most recent additions to a long line of technological developments that have allowed individuals to communicate with each other outside the boundaries of face-to-face (FtF) communication. Letters have likely been around as long as written language, and the telegraph greatly increased the speed with which individuals could send messages to one another. Later, the telephone allowed individuals to communicate in real time with spoken, as opposed to written, messages. Researchers have long been interested in the role of various communication modes in relationships, for example examining the relation of need for affiliation to the use of the telephone and letters (Lansing & Heyns, 1959) or the association between letter writing style and marital satisfaction (Wagner,

Weeks, & L'Abate, 1980). Previous research has also investigated the role of communication modes in ongoing relationships and found that both letter writing (e.g., Canary, Stafford, Hause, & Wallace, 1993; Johnson, 2001; Stafford & Reske, 1990) and telephone calls (e.g., Canary et al., 1993; Dainton & Aylor, 2002; Johnson, 2001) are important to relationship development and maintenance. For example, interviews with soldiers of the Vietnam and Korean Wars and/or their spouses revealed that regular mediated communication in the form of letters was central to both individual and relational well-being when the soldiers were deployed (Maguire, 2007).

The Internet and wireless technologies such as mobile telephones combine many of the features of previous CTs (e.g., the ability to transmit text and voice messages to other individuals) while also functioning as mass media similarly to television and radio (Bargh & McKenna, 2004). For example, text messages can be likened to modern-day telegraphs (Bargh & McKenna, 2004). Wyss (2008) also pointed out similarities in the style and content of 19th-century love letters and modern-day romantic communication via email.

Although “older” CTs such as letters and the telephone have played at least some role in individuals’ development and maintenance of personal relationships, the role of CTs has arguably been expanded by the popularity of technologies made possible by the Internet, such as e-mail, instant messaging, text messaging, videoconferencing, and social network sites. Thimm (2010, p. 65) argues that e-mail can be considered “the most important single tool for communicating and developing relationships since the telephone.” A national survey by the Pew Internet & American Life Project found that

during a typical week, e-mail users sent at least one e-mail message to 25% of their core ties (i.e., ties with which individuals have emotional intimacy and frequent contact, and from whom they can seek help), mobile phone users called 36% of their core ties, and instant message users messaged 14% of their core ties. Individuals who sent e-mails to a higher percentage of their core ties in a typical week tended to also use the telephone to contact a higher percentage of their core ties in a typical week, suggesting that individuals often use multiple communication modes to communicate in their relationships (Boase, Horrigan, Wellman, & Rainie, 2006).

CTs are also relevant to a wide range of individuals and relationships. Although much of the research conducted on communication mode use in relationships (as in many topics) uses college students, and college students are often heavy adopters of newer CTs, research suggests that other age groups regularly use newer CTs as well. For example, 82% of individuals 50-64 years old and 57% of individuals 65 years old or older report having a cell phone, and 57% and 19%, respectively, report using their cell phones to send and receive text messages (Lenhart, 2010). Additionally, 42% of Internet users report using instant messaging, including 29% of individuals 69 years of age or older (Shui & Lenhart, 2004). Regarding the diversity of relationships in which individuals use CTs, research has found that individuals use a variety of CTs, in addition to FtF communication, to enact relational maintenance behaviors with a variety of relational partners, including romantic partners, friends, and family members (Johnson, Haigh, Becker, Craig, & Wigley, 2008; Ledbetter, 2009; Ramirez & Broneck, 2009). These

findings indicate that communication modes are relevant not only to communication in general but also to communication in close relationships specifically.

Part of the popularity of CT-based communication modes is likely due to the increased accessibility and portability of new CTs enabled by the Internet and wireless technologies and the subsequent ability to communicate from a range of locations and in a range of situations. Approximately 79% of U.S. adults identify themselves as Internet users (Horrigan, 2009a), and 56% of U.S. adults have accessed the Internet with a wireless device (e.g., a laptop or mobile phone; Horrigan, 2009b). Further, individuals can send and receive text messages via mobile phones anywhere that cellular service is available. Individuals see text messages as a means to keep them constantly connected to their friends and families and a convenient mode of communication in situations where other forms of communication such as the telephone would be inappropriate, such as in class or a movie theater (Pettigrew, 2009; Rettie, 2009). Some mobile phones also have Internet capabilities, allowing individuals to use them for e-mail, instant messaging, and social network sites in addition to mobile phones' typical use for text messaging and phone calls. Although mediated communication itself is not new, the pervasiveness of new CTs and the potential for rapid and widespread social changes associated with their use makes them unique (Manasian, 2003) and suggests that the use of different communication modes potentially impacts the ways in which individuals conduct their relationships.

The impact of the increased ubiquity of CT-based communication modes has been debated. Initial research argued that a lack of nonverbal and contextual cues rendered

such modes inferior to FtF communication for relationship development and maintenance (e.g., Kiesler, Siegel, & McGuire, 1984; Short, Williams, & Christie, 1976). These “cues-filtered-out” perspectives predicted that the lack of nonverbal and contextual cues in CT-based communication modes would lead to decreased social presence and increased impersonal, hostile, or uninhibited behavior (see Walther & Parks, 2002, for a review). Later research, however, revealed that CT-based modes allow for the development and maintenance of relationships (e.g., McKenna, Green, & Gleason, 2002; Parks & Floyd, 1996; Rice & Love, 1987; Walther, 1992) and that such relationships have the potential to be more intense (i.e., more extremely positive or negative) than comparable FtF relationships (Hancock & Dunham, 2001; Walther, 1996).

A better understanding of the role of communication modes in relational processes is important for several reasons. First, as CT-based communication modes become increasingly embedded in individuals’ lives and communication, their effects become more pervasive and inseparable from the fabric of relationships (Parks, 2009). Second, knowledge regarding the role and impact of communication modes on relationships allows for the testing of relational theories’ usual assumption of FtF communication to determine whether those theories also apply to mediated communication or should be revised or have scope conditions placed on them (Bargh & McKenna, 2004; Baym, 2002). Finally, systematic research regarding the effects of communication modes would allow researchers to make more informed recommendations regarding effective uses and applications (Parks, 2009). The increased variety of communication modes used in personal relationships suggests that such

recommendations would be valuable to the improvement of communication processes in personal relationships.

Development and Maintenance of Personal Relationships via Different Communication Modes

In light of these motivations for research on the role of communication modes in personal relationships, some research has been aimed at understanding how relationships develop via CT-based communication modes. Researchers have tended to examine relationship development processes that occur when individuals communicate via a single mode such as an online discussion group (e.g., Parks & Floyd, 1996; Utz, 2000; Walther, 1992, 1993), instant messaging (e.g., Ramirez, 2007; Ramirez & Burgoon, 2004; Ramirez, Zhang, & Lin, 2007; Tidwell & Walther, 2002), or social network site (e.g., Antheunis, Valkenburg, & Peter, 2010; Wang, Moon, Kwon, Evans, & Stefanone, 2010). However, less research has examined the role of communication modes in the development of relationships in which partners also communicate with each other via more than one mode. This lack of research exists despite growing evidence from both academic studies (e.g., Johnson et al., 2008; Ledbetter, 2009; Pettigrew, 2009; Ramirez & Broneck, 2009; Stafford, Kline, & Dimmick, 1999) and national survey data (Boase et al., 2006) that individuals use multiple communication modes in a variety of personal relationships.

Relationships in which partners transition from one communication mode to another as their relationship develops or in which partners use multiple communication modes in their everyday interactions with each other have been termed “mixed-mode”

relationships (Walther & Parks, 2002, p. 505). Researchers have begun to examine the development and maintenance of mixed-mode relationships. For example, research has revealed that switching communication modes can impact outcomes for newly acquainted dyads, such that expectancy violations incurred as a result of switching from CT-based modes to FtF communication tend to be rated more positively when the switch occurs earlier than when it occurs later (Ramirez & Zhang, 2007), and effects of mode switching on relational communication tend to vary based on whether dyads switched from FtF communication to CT-based communication or vice versa (Ramirez & Wang, 2008). Furthermore, individuals on dating websites who more highly value future FtF interaction with potential partners are more honest and intentional in their self-disclosures and disclose more (Gibbs, Ellison, & Heino, 2006), suggesting that awareness of the possibility for future mode switching creates unique concerns that are not salient in relationships that are confined to CT-based communication modes and that relationships that operate via multiple modes might differ from those that are only FtF or only CT-based.

In the context of ongoing relationships, research has found that individuals who meet friends or romantic partners via online discussion boards report a systematic progression from online discussion boards to private online communication (e.g., e-mail and instant messaging) to the telephone (and sometimes letters) and then to FtF communication (McKenna et al., 2002; Parks & Floyd, 1996). Rabby (2007) found that individuals reported different patterns of relational maintenance behaviors depending on whether their relationship has always been online, always been offline, had migrated

from online to offline, or had migrated from offline to online (with individuals whose relationships were exclusively online tending to engage less in the relational maintenance behaviors investigated). However, these differences between the groups were reduced or eliminated when individuals were highly committed to their relationships, suggesting that relational characteristics influence the impact of communication modes on relationships (Rabby, 2007).

As Rabby (2007) suggests, the effects of communication modes are not necessarily uniform across all relationships. This view is echoed by Walther and Ramirez (2010, p. 267), who argue that, “the study of [computer-mediated communication] is best premised on the interactions of time, cues, and interpersonal motivations on the relational functions which it may reflect.” Specifically, the use and impact of multiple communication modes in ongoing relationships likely depends on the relevant features of interaction and concerns of relational partners at a given point in the relationship. Theories of relationship development such as social penetration theory (Altman & Taylor, 1973) posit that relationship development is characterized by changes in the content of interactions within the relationship (e.g., Altman & Taylor, 1973; Aune, Aune, & Buller, 1994; Eidelson, 1980; Hays, 1984; Knapp, Ellis, & Williams, 1980; Taylor & Altman, 1987). Furthermore, individuals encounter differing concerns regarding self-presentation and message construction at different points during relationship development (e.g., Cupach & Metts, 1994; Kunkel, Wilson, Olufowote, & Robson, 2003; Wilson, Kunkel, Robson, Olufowote, & Soliz, 2009). Given evidence that individuals sometimes strategically employ communication modes to manage personal or

relational goals (e.g., Joinson, 2004; O'Sullivan, 2000; Rettie, 2009; Toma & Hancock, 2010), it is likely that individuals will use communication modes in different ways at different points in their relationships.

Purpose of the Dissertation

As outlined above, research regarding communication mode use in personal relationships has tended to examine relationships that either develop exclusively via a single communication mode or transition from exclusive use of one communication mode to exclusive use of another mode (e.g., meeting via a dating website and transitioning to FtF communication). Although such knowledge is valuable, researchers must move beyond these more simplistic comparisons to examine the role of communication modes and mode switching in everyday interaction (Parks, 2009). As Baym (2002, p. 73) argues, “Any assessment of the interpersonal import of [computer-mediated communication] requires a complex understanding of how the use of [computer-mediated communication] fits into the overall distribution and conduct of people’s interpersonal interaction.”

This dissertation seeks to contribute to knowledge regarding communication mode use in relationships by examining the use and characteristics of communication in relationships in which partners use multiple communication modes in everyday interaction and how these uses and characteristics vary as a function of both relationship development and the features associated with various communication modes. Some communication modes offer certain affordances, or features that impart advantages to interactants. Previous research has identified two central affordances, asynchronicity and

reduced cues, that individuals employ to manage impressions in the context of both potential (Joinson, 2004; Rettie, 2009; Toma & Hancock, 2010) and ongoing (Joinson, 2004; O’Sullivan, 2000; Rettie, 2009) relationships. Examining what is known about these affordances yields predictions regarding how their use should change as a function of relationship development. This dissertation advances a model of communication mode use in relationships that examines that use as a function of both relationship development and the affordances of asynchronicity and reduced cues.

Preview of Dissertation Structure

Chapter 2 describes a model of affordance use in relationships. Drawing on research regarding relationship development and the use and impact of communication modes and their affordances in relationships, I propose that as relationships develop, individuals’ use and perceptions of communication via different communication modes changes, and that these changes are tied to the extent to which a given communication mode offers the affordances of asynchronicity and reduced cues. I advance predictions regarding the nature and timing of these changes. Chapter 3 describes a pretest of the variables of interest, Chapter 4 describes a cross-sectional study on romantic relationships and friendships that was conducted to test the model’s predictions, and Chapter 5 describes a diary study of conversations in romantic relationships that was conducted to test the model’s predictions. A discussion of the findings and their implications for the model and for research regarding the role of communication modes in personal relationships is located in Chapter 6.

Chapter Summary

Chapter 1 provided an introduction to the dissertation. The significance of communication modes to personal relationships was discussed, followed by a summary of the current state of knowledge regarding communication modes and personal relationships as it relates to the purpose of the dissertation. The purpose of the dissertation was then explained, and the chapter concluded with an outline of the dissertation structure. Chapter 2 draws on research from the areas of relationship development and communication modes affordances to advance a model of affordance use at various developmental levels in personal relationships.

2. THE AFFORDANCE UTILIZATION MODEL

Chapter Preview

Chapter 2 outlines a model of affordance use in personal relationships, the affordance utilization model (AUM). Drawing on research regarding relationship development and communication modes affordances, the AUM proposes that individuals' perceptions of and self-disclosure in interactions with their partners' and individuals' use of different communication modes (i.e., FtF communication or a given CT) change as a function of both relationship development and the extent to which those modes offer the affordances of asynchronicity and reduced cues. First, the foundations for the AUM, social penetration theory and communication modes affordances, are described, along with the model's central assumptions. Second, the AUM is advanced in three sections corresponding to predictions regarding affordance use and its associated outcomes at low, moderate, and high levels of relationship development.

Foundations of the Affordance Utilization Model: Social Penetration Theory

The increasing popularity of CT-based communication modes means that individuals now also have a wider range of choices regarding the communication modes through which they can communicate. As a result, a thorough understanding of relationship development must incorporate the ways in which individuals use various communication modes in their relationships and the ways in which this use changes as relationships develop. According to social penetration theory (Altman & Taylor, 1973), relationship development is accompanied by changes in partners' communication

patterns—partners talk about different things in different ways with different goals and results.

According to social penetration theory (Altman & Taylor, 1973; Taylor & Altman, 1987), individuals' personal information lies on two general dimensions—communication depth and communication breadth. Social penetration theory predicts that the breadth and depth of information that relational partners share with each other increases as relationships develop (Altman & Taylor, 1973). Communication breadth refers to the number of content domains or facets of their personalities on which individuals disclose in a relationship. For example, coworkers might limit their conversations to work-related topics (narrow breadth) or also discuss their families, friends, and favorite television shows (wide breadth). Communication depth refers to the intimacy of information individuals share with their partners in a given content domain. Low intimacy information tends to be descriptive in nature, whereas higher intimacy information tends to be evaluative in nature (Altman & Taylor, 1973; Ayres, 1979). For example, individuals might disclose that they have a dentist appointment (descriptive and low depth) or might disclose their anxiety over the dentist appointment (evaluative and high depth).

Previous research has found that communication breadth and depth are central to the construct of relationship development. For example, one study of friend and stranger dyads found that strangers tended to use mostly descriptive questions and comments, whereas friends tended to use a fairly equal mix of descriptive and evaluative questions and comments (Ayres, 1979). Individuals tend to rate more intimate relationships as

higher in interaction depth (Knapp et al., 1980), and a longitudinal examination of friendship development revealed that self-ratings of friendship intensity were related to both the breadth and depth of topics discussed in the friendships (Hays, 1984). Furthermore, a study of isolated unacquainted dyads found that the breadth and depth of participants' disclosure increased as time passed (Taylor, Wheeler, & Altman, 1973). Changes in breadth and depth as relationships develop have been observed in both FtF-based and CT-based friendships (Chan & Cheng, 2004)

Social penetration theory identifies four stages of relationship development. Consistent with its grounding in social exchange theory (Thibaut & Kelley, 1959), relationship development is posited to be a function of the rewards (i.e., positive experiences) and costs (i.e., negative experiences) individuals derive from the relationship (Altman & Taylor, 1973; Taylor & Altman, 1987). Relationships develop when rewards are greater than costs, and a higher ratio of rewards to costs should be associated with faster relationship development (Altman & Taylor, 1973; Taylor & Altman, 1987). Although some have criticized the social exchange approach as being inapplicable to close relationships (e.g., Clark & Mills, 1979; Clark & Taraban, 1991), others have pointed out that exchange principles are relevant in even very close relationships to at least some extent (e.g., Hatfield, Utne, & Traupmann, 1979; Stafford, 2008) and that principles of exchange are associated with stability in both dating and marital relationships (Hatfield et al., 1979).

In social penetration theory's first stage of relationship development, the orientation stage, communication depth and breadth is low and responses are often

stereotypical and socially desirable. Individuals tend to be reserved in their responses and “make only a small part of themselves accessible at verbal, nonverbal, or environmental levels of functioning” (Altman & Taylor, 1973, p. 136). Furthermore, dyadic synchrony and efficiency are low and limited to that which is a result of stereotypical and culturally normative response styles.

In the second stage, exploratory affective exchange, communication still occurs mostly at superficial layers of the personality (i.e., at low levels of depth and breadth). However, both verbal and nonverbal behavior becomes smoother and more synchronized. Interaction also becomes more efficient as partners more quickly and correctly interpret each others’ verbal and nonverbal cues. According to Altman and Taylor (1973), this stage is often characteristic of casual friendships.

The third stage, affective exchange, “characterizes close friendships or courtship relationships in which people know one another well and have had a fairly extensive history of association.” (Altman & Taylor, 1973, p. 139). Interaction in this stage is still somewhat cautious, and partners still withhold parts of their personalities from each other. At the same time, greater activity is seen in the intermediate levels of personality (i.e., moderate breadth and depth) compared to the first two stages of relationship development.

In the final stage, stable exchange, interaction is open and is characterized by high levels of efficiency and synchrony (Altman & Taylor, 1973). Relational partners still share information at low and moderate levels of depth, but they also share intimate (i.e., high depth) information on a wide range of topics. Penetration through the layers of

partners' personalities continues indefinitely, or until the relationship dissolves, as partners learn more and more about each other (Altman & Taylor, 1973).

Although social penetration theory identifies four stages of relationship development, its authors acknowledge that relationship development actually occurs on a continuum (Altman & Taylor, 1973). Previous research using social penetration has found utility in categorizing relationship development according to three stages when measuring relationship development. In a sample of college students, Hays (1984) found that friendship behaviors were generally assigned to the categories of "acquaintance," "casual friend," and "close friend," whereas very few friendship behaviors were assigned solely to the category of "best friend." When the categories of "close friend" and "best friend" were combined, intimacy scores derived from the resulting 3-category scheme were consistent with the expectations of social penetration theory, with intimacy scores positively related to self-ratings of friendship intensity. Similarly, a study of married couples found that they tended to report three stages of development to their relationships before marriage—casual dating, serious dating, and engagement (Braiker & Kelley, 1979), with movement from one stage to the other being characterized by increasing love and maintenance (including self-disclosure).

Furthermore, although social penetration theory assumes that relationship development is a linear process, relationship development is not always a cumulative increase toward ultimately high levels of development (Altman, Vinsel, & Brown, 1981; Baxter & Montgomery, 1996). Partners might cycle back through previous stages or might plateau at low or moderate levels of relationship development (Altman et al., 1981;

Knapp, 1978). At the same time, many relationships likely follow a linear progression (Knapp, 1978). Furthermore, predictions regarding communication at different levels of relationship development likely hold, even if progression between different levels of relationship development do not.

Predictions of the AUM regarding the role of affordances in communication as relationships develop will tend to vary depending on whether relationships are characterized by low, moderate, or high levels of relationship development, so these labels will be used in the following sections. Such a conception is also consistent with emotion expression and experience (Aune et al., 1994) and relationship satisfaction (Eidelson, 1980) research, which has found that these variables exhibit U-shaped relationships with relationship development, suggesting that experience and communication vary depending on whether relationships are relatively undeveloped, moderately developed, or highly developed.

Foundations of the Affordance Utilization Model: Affordances of Communication

Modes

Some communication modes offer certain affordances or features that offer interactional advantages to participants. Individuals can employ affordances of communication modes to manage their self-presentation and other aspects of the conversation (Kalyanaraman & Sundar, 2008; Walther, 1996). As Walther and Ramirez (2010, p. 274) observe, “Text-based online communication remains a mainstay of Internet communication, and it appears as though this is so not only because of the way it reduces opportunity costs but also because of the situational and interpersonal

affordances it bestows.” Research has found that individuals employ communication mode affordances in order to maximize their outcomes, for example by preferring CT-based communication modes over FtF communication in face-threatening situations (O'Sullivan, 2000) or in situations involving rejection (Joinson, 2004). Some people also report preferring text messaging to phone calls in order to retain greater control over the interaction or to give the message recipient more time to think about his or her response (Rettie, 2009).

Asynchronicity

Two key affordances that have been identified in past research are asynchronicity and the number of channels or cues (e.g., visual, vocal, and verbal information) available to interactants (e.g., Nowak, Watt, & Walther, 2005; Ramirez, Dimmick, Feaster, & Lin, 2008; Utz, 2007; Walther, 1996). In regard to asynchronicity, Rafaeli argued that, “All communication is temporally sensitive” (Newhagen & Rafaeli, 1996, p. 5).

Asynchronicity refers to the time delay between when a message is constructed, transmitted, and received and allows individuals to plan and edit their messages before sending them (Walther, 1996, 2007). Unlike synchronous communication modes, in which individuals receive their partners’ messages as soon as their partners construct those messages, asynchronous communication modes allow individuals to compose their messages before sending them and to read their partners’ messages at their own convenience before constructing a response. Even in near-synchronous communication modes such as instant messaging and text messaging, a small time lag exists, and

individuals have the ability to compose and change their messages before sending them (Rettie, 2009; Rintel & Pittam, 1997).

Asynchronicity allows message senders the opportunity to plan and edit their messages, an ability that can enable them to optimize their self-presentation (Walther, 1996, 2007) and plan messages that are more effective (e.g., better establish mutual understanding between partners) than those in synchronous communication modes (Clark & Brennan, 1991). For example, in one interview study, many individuals reported preferring text messaging to the telephone because it gave message recipients time to think about their responses (e.g., to bad news) and allowed senders to avoid having to immediately deal with feedback from message recipients (Rettie, 2009). A study of task-based groups found that those who interacted via an asynchronous communication mode exhibited more of the behaviors that contribute to mutual understanding than did those who interacted via a synchronous communication mode (Honeycutt, 2001). In the context of marriage, Rudes (1992) recommended letter writing as a means for distressed couples to more carefully consider their messages to one another and, as a result, improve communication in their marriages.

In addition to allowing individuals to plan and edit their responses, asynchronous communication modes also allow for communication without copresence. Individuals can read and respond to messages on their own schedule instead of needing to coordinate a time and place to meet in order to communicate (Walther, 1993, 1996). For example, Utz (2007) found that e-mail (an asynchronous communication mode) was more popular than the telephone (a synchronous communication mode) among even very close long-

distance friendships. She speculated that the ability to overcome temporal limitations associated with long-distance relationships contributed to e-mail's popularity. This interpretation is supported by the finding that individuals perceive asynchronous communication to be more convenient than synchronous communication and more useful for communication between people in different time zones or with different work schedules (Dimmick, Kline, & Stafford, 2000).

Walther (1996) argued that the removal of temporal restrictions in asynchronous communication also allows individuals to create longer messages in which they can address more information than they might be able to do in FtF interactions. Specifically, hyperpersonal theory identifies the ability to “disentrain” interactions in asynchronous communication modes as a contributing factor to increased positivity in CT-based interactions (which are often asynchronous) relative to FtF interactions (which are synchronous). Disentrainment occurs when interactions exist outside of real-time and are therefore freed from temporal and copresence restrictions on their communication, allowing partners to address multiple facets of a conversation (e.g., both task and social dimensions) more adequately than they could in synchronous interactions (Walther, 1996). Consequently, individuals have the ability to carry on more in-depth conversations than they might in synchronous interactions (Walther, 1996).

Although asynchronous communication modes offer several benefits, as outlined above, to interactants, they can also present drawbacks. Timing is less precise in asynchronous than synchronous communication modes, and it can take longer for individuals to receive confirmation of their partners' understanding. As a result, the

establishment of common ground for mutual understanding between partners might be more difficult in asynchronous than synchronous communication modes (Clark & Brennan, 1991).

Despite this drawback, asynchronous communication—with its allowance for message planning and editing, communication outside of temporal restrictions, and disentrainment of interaction—appears to engender better outcomes than synchronous communication in some circumstances. For example, groups who completed a series of tasks over time reported more social attraction, involvement, and certainty about their communication partners and perceived that their interactions were more effective when they interacted via asynchronous communication modes than when they interacted via synchronous communication modes (Nowak et al., 2005). Similarly, dyads assigned to a “getting-to-know you” interaction reported less uncertainty and greater predicted outcome value when they interacted via asynchronous, as opposed to synchronous, communication modes (Ramirez, 2009). Furthermore, as outlined above, individuals report a preference for asynchronous communication modes under certain circumstances, such as when message planning or delayed feedback is important (Rettie, 2009). These findings suggest that both technologically-based and motivationally-based effects of asynchronicity exist in interactions. Asynchronicity appears to, on average, offer benefits to groups randomly assigned to interact asynchronously. Individuals also appear to employ asynchronicity strategically to satisfy interactional goals (such as risk of rejection) or provide capabilities that they perceive to be important (such as message planning or delayed feedback).

Reduced Cues

A second feature of some communication technologies, particularly those that are text-based (e.g., e-mail and instant messaging), is that they are characterized by a reduction in cues (e.g., verbal, vocal, or visual information) relative to FtF communication. Baym (2002, p. 38) observed that, “The notion of reduced social cues remains central” to the study of communication modes, especially as it relates to individuals’ uses of reduced cue modes and the consequences of those uses. In support of the salience of cues to interactants, an analysis of communication mode choice when attempting to manage communication failures found that individuals tended to use combinations of communication modes depending on whether those modes were text-based (e.g., e-mail), audio-based (e.g., the telephone), or FtF, suggesting that the level of cues communication modes offer influence individuals’ use of those modes (Lee, 2010).

A reduction in cues such as tone of voice, posture, gestures, or facial expressions offers several potential benefits to individuals. First, verbal messages are more controllable than are nonverbal messages (Walther, 1996). Partners receive the information individuals want them to receive, and individuals can mask possibly undesirable nonverbal behaviors (e.g., nervous gestures or difficulty maintaining eye contact). Second, individuals’ ability to send effective messages is enhanced by the reallocation of cognitive resources from such behaviors as backchanneling, managing nonverbal behaviors, and monitoring partners’ nonverbal behaviors to message planning and construction (Walther, 1996, 2007). Individuals’ ability to better control the information their partners receive, and consequently better manage their self-

presentation, via reduced-cue communication modes enables individuals to minimize both positive and negative face threat. Positive face threat refers to the desire to gain others' approval, whereas negative face threat refers to the desire to maintain one's autonomy (Brown & Levinson, 1987). Individuals report preferring CT-based communication modes to FtF communication when faced with the prospect of sharing negative information about themselves or their romantic partners with those partners (O'Sullivan, 2000). Similarly, individuals tend to prefer CT-based communication modes to FtF communication in interpersonal scenarios characterized by high risk of rejection (Joinson, 2004). In the context of managing communication failures in organizations, individuals tend to prefer a combination of audio- and/or text-based communication modes for high or moderate levels of communication failures, and only prefer FtF communication for low-level communication failures, suggesting that some communication modes provide benefits by allowing for the construction of more effective messages (Lee, 2010).

The use of reduced-cue communication modes also potentially creates costs for individuals and their relational partners. For example, because reduced-cue communication modes offer less nonverbal and contextual information, individuals must compensate by using verbal information to communicate what is usually expressed nonverbally (Walther, 1993). Such compensation might be difficult for individuals, particularly in the context of less established relationships, when relational partners have less information on which to draw when constructing their messages. Second, individuals have less access to feedback in the form of nonverbal information from their

partners. This lack of nonverbal feedback might make it more difficult for individuals to construct appropriate responses in interactions and therefore negatively impact interaction outcomes. For example, researchers have argued that the reduced-cue environment of CT-based communication modes might exacerbate conflict (Byron, 2008; Friedman & Currall, 2003); others have found that this effect is present early in relationships but dissipates over time (Hobman, Bordia, Irmer, & Chang, 2002). Clark and Brennan (1991) observed that a lack of visual and vocal cues might make the establishment of common ground for mutual understanding more difficult than it would be were those cues present. Furthermore, individuals sometimes see FtF communication as more efficient (Lee, 2010) or personal (Dimmick et al., 2000; Stafford et al., 1999) than CT-based (particularly text-only) communication.

At the same time, researchers have found that cue reduction engenders more positive outcomes in some situations. For example, a study of task-based groups interacting over several weeks found that those using a text-based communication mode reported greater perceived partner credibility, more social attraction, less uncertainty about their partners, and more involvement in the interaction than did those who used a video-based communication mode, regardless of whether interactions were synchronous or asynchronous (Nowak et al., 2005).

Assumptions of the Affordance Utilization Model

The AUM rests on three central assumptions. First, the model assumes that communication mode choice is often (although not necessarily always) goal-directed or strategic. Kellermann (1992) argued that all communication is goal-directed at some

level and that individuals adjust their behaviors (implicitly or explicitly) to respond to the constraints their goals place on their behaviors. In partial support of this argument, previous research has found that individuals strategically employ the affordances of CT-based communication modes in the context of relationships, for example by preferring CT-based modes over FtF communication in situations that threaten individuals' positive face (O'Sullivan, 2000) or when risk of rejection is high (Joinson, 2004). At the same time, individuals' behaviors are impacted by features of the communication modes they employ. In her review of research on the effects of communication modes, Baym (2002) notes the outcomes are influenced by both features of the communication modes individuals use and the context of and individuals' motives for that use. Therefore, individuals' goals and motivations are assumed to motivate communication mode use, but the outcomes of this use are assumed to be partially a function of the affordances that communication modes offer.

Second, communication mode affordances are assumed to be both objective and subjective. To some extent, the affordances of asynchronicity and reduced cues can be identified objectively. For example, the telephone is synchronous, whereas e-mail tends to be asynchronous. Text messaging tends to lie between the two and has been termed "near-synchronous" because only a small time delay generally exists between receiving and responding to a message (Rettie, 2009). In regard to cues, FtF communication and video phone services tend to provide visual, vocal, and verbal cues, whereas the telephone provides vocal and verbal cues, and text-based modes such as e-mail tend to

provide only verbal cues (and a few verbal substitutes, such as emoticons, for nonverbal cues).

However, people's perceptions of communication modes are also important to the use and consequences of those modes' affordances (e.g., Burgoon et al., 2002; Fulk & Schmitz, 1995; Schmitz & Fulk, 1991). Burgoon and colleagues (2002) argue that objective features of communication modes such as asynchronicity and cue reduction affect outcomes via their effects on the perception and experience of communication modes. In empirical tests of this hypothesis, objective features of communication modes appear to impact outcomes both indirectly, via experiences of communication modes, and directly (Ramirez, 2009; Ramirez & Burgoon, 2004). Therefore, both the affordances of communication modes and individuals' perceptions of those affordances appear to be important to communication processes and outcomes.

The final assumption concerns the types of relationships to which the AUM is expected to apply. Social penetration theory, a basis for this model, has been applied to both romantic (e.g., Knapp et al., 1980) and nonromantic (e.g., Ayres, 1979; Hays, 1984; Taylor et al., 1973) relationships. Knapp (1978) has argued that the general course of development is similar in all relationships, regardless of type. Consistent with social penetration theory, the AUM does not attempt to generate separate predictions for different relationship types but instead assumes that they share similar trajectories of relationship development and that the role of communication modes in that development is similar across relationship types.

The Affordance Utilization Model: The Role of Affordances as Relationships

Develop

Individuals have been found to strategically employ the affordances of some communication modes in relationships (Joinson, 2004; O'Sullivan, 2000) or when risk of rejection is high (Joinson, 2004). At the same time, social penetration theory argues that individuals' goals and motivations change as their relationships develop. As individuals' goals and motivations change and they acquire more knowledge about their relational partners, individuals likely use affordances in different ways or for different reasons. For example, research on long-distance friendships has found that the ratio of e-mail to telephone use for communication declines as friendships become closer (Utz, 2007), suggesting that the extent to which individuals employ communication mode affordances in their relationships might vary as a function of relationship development. In zero-history interactions, individuals also tend to disclose with greater frequency (Antheunis, Valkenburg, & Peter, 2007; Joinson, 2001; Tidwell & Walther, 2002) and intimacy (Tidwell & Walther, 2002) via instant messaging than FtF communication. However, self-disclosure also varies as a function of relationship development (e.g., Altman & Taylor, 1973; Hays, 1984; Knapp et al., 1980). Communication mode affordances and relationship development likely interact to produce different patterns of self-disclosure via various communication modes at different points in relationship development.

As outlined above, both asynchronicity and reduced cues potentially offer advantages to individuals in relationships because they allow individuals to better manage their self-presentation and construct more effective messages. Relationship

development, however, potentially impacts the extent to which the use of affordances yields these outcomes in two ways. First, as relationships develop, individuals tend to become less concerned with self-presentation (Cupach & Metts, 1994). Second, as individuals gain more experience interacting with their partners, they are likely better able to construct appropriate and effective messages without the benefit of affordances; that is, asynchronicity and reduced cues likely exert less of an impact on individuals' message construction as their relationships become more developed. These changes should result in variation in individuals' engagement in and perceptions of interactions via different communication modes as a joint function of relationship development and the extent to which those communication modes offer the potential for asynchronicity and reduced cues.

The rest of this chapter outlines expected changes in individuals' perceptions of interactions, their use of various communication modes, and the content of their interactions as they relate to communication mode affordances at different points in relationship development. These changes should correspond to changes in individuals' concerns regarding and abilities to construct effective messages as relationships develop.

The Role of Affordances at Low Levels of Relationship Development

When relationships are relatively undeveloped, individuals are highly concerned with the maximization of rewards (i.e., positive experiences) and minimization of costs (i.e., negative experiences) associated with interactions in the relationship (Altman & Taylor, 1973). At the same time, individuals have relatively little information about their partners with which to construct effective messages (Altman & Taylor, 1973). As a

result, individuals often perceive interactions in relationships that have low levels of development as less effective (Altman & Taylor, 1973) and higher in threat to negative face from rejection or imposition (Cupach & Metts, 1994; Kunkel et al., 2003; Wilson et al., 2009).

Reduced-cue, asynchronous communication modes can enable individuals to maximize their and their partners' rewards by allowing them to construct more effective messages that better accomplish their interactional goals. Communication modes that offer asynchronous, reduced-cue interactions offer individuals the ability to optimize their self-presentation via the ability to mask undesirable nonverbal cues, plan and edit messages, and reallocate cognitive resources from monitoring nonverbal and environmental behavior to constructing messages (Walther, 1996). Furthermore, because partners are less knowledgeable about and have less experience interacting with each other early in a relationship, they have less information with which to guide their actions; the possibility of saying or doing the wrong thing is therefore high (Altman & Taylor, 1973; Berger & Calabrese, 1975). Reduced-cue communication modes allow for the minimization of positive face threat by allowing individuals greater control over the information their partners receive (O'Sullivan, 2000). Previous research has found that individuals prefer CT-based communication modes to FtF communication when threat to their positive face is high (O'Sullivan, 2000). Asynchronous communication modes also allow for communication without co-presence; individuals can read and respond to messages on their own schedule instead of needing to coordinate a time and place to meet in order to communicate (Walther, 1993, 1996). As a result, individuals can minimize

the fear of imposition that Cupach and Metts (1994) cite as salient early in relationships by communicating via asynchronous communication modes.

Although costs such as reduced nonverbal and contextual information and delayed feedback are likely associated with use of communication modes that offer reduced cues and asynchronicity, respectively, these disadvantages are likely outweighed to an extent by the potential advantages of these affordances at early points in relationship development. Therefore, individuals in relationships that are characterized by low levels of development should be able to better construct effective messages in a given interaction to the extent that they use communication modes that offer asynchronous, reduced-cue interaction.

Asynchronicity and reduced cues offer individuals the potential to maximize rewards associated with effective message construction and minimize costs associated with face threats in relationships that are relatively undeveloped, when these concerns are particularly salient. Therefore individuals are likely especially inclined to use these affordances at low levels of relationship development. The potential to exert more control over one's self-presentation and construct more effective messages should lead individuals to prefer communication modes that offer reduced cue, asynchronous interactions early in their relationships to a greater extent than they do when their relationships are more developed.

Self-disclosure at low levels of relationship development will also be associated with the extent to which the communication modes used offer the potential for asynchronous, reduced cue interaction. Research has found that as relationships become

more developed, both breadth and depth of disclosures tend to increase (e.g., Berg, 1984; Chan & Cheng, 2004; Hays, 1984; Knapp et al., 1980). However, the use of asynchronous, reduced-cue communication modes also potentially impacts self-disclosure. Research examining disclosure via different communication modes has found that strangers communicating via CT-based communication modes tend to disclose with greater frequency (Antheunis, Valkenburg, & Peter, 2007; Joinson, 2001; Tidwell & Walther, 2002) and intimacy (Tidwell & Walther, 2002) than do those communicating FtF. Although some research has found that text-based and video-based CT use both encourage higher rates of self-disclosure relative to FtF communication (Antheunis et al., 2007), other research has found that disclosure occurs more frequently in text-based than in video-based interactions (Joinson, 2001), suggesting that a reduction in cues might encourage disclosure. Furthermore, the finding that adolescents' perceptions of instant messaging as providing reduced cues and increased controllability over interactions was associated with greater self-disclosure via instant messaging (Schouten, Valkenburg, & Peter, 2007) suggests that individuals perceive and take advantage of communication mode affordances to self-disclose when they might feel uncomfortable doing so without the benefit of these affordances. The tendency for individuals to self-disclose in greater amounts via CT-based communication modes than FtF in initial interactions suggests that at low levels of relationship development, individuals will tend to disclose with greater breadth to the extent that communication modes offer asynchronous, reduced cue interaction.

The Role of Affordances at Moderate Levels of Relationship Development

Moderately-developed relationships are characterized by greater openness and comfort in interactions than are relationship with low levels of development; however, interactions are still cautious and relatively superficial at this level of development (Altman & Taylor, 1973). Furthermore, as individuals escalate their relationships, they tend to experience both positive and negative face threat (Cupach & Metts, 1994; Kunkel et al., 2003; Wilson et al., 2009) and also tend to be concerned with threatening their partners' negative face (Wilson et al., 2009). As in relationships with low levels of development, asynchronicity and reduced cues can benefit individuals by enabling them to minimize awkwardness and embarrassment, better control their message production to produce effective and appropriate messages, and avoid imposing on their partners. At the same time, other considerations also come into play that might affect individuals' use of communication modes that offer asynchronous, reduced cue interaction.

First, individuals have more experience communicating with their partners, and they have begun to engage in moderate breadth and depth of self-disclosure, as opposed to the superficial levels that characterize relationships with low levels of development. Once individuals share information in a certain area, future interactions in that area are less risky. As a result, partners tend to interact freely in areas of themselves that have been previously explored in the relationship (Altman & Taylor, 1973). This tendency suggests that topics that might have been regarded as sensitive at low levels of relationship development are perceived as less risky and, as a result, individuals will be

less inclined to employ the affordances of asynchronicity and reduced cues when discussing those topics.

As relationships develop and partners gain more information about each other, they should also be better able to construct effective messages without the need for planning, editing, masking of nonverbal cues, and reallocation of cognitive resources from nonverbal to verbal behaviors. Individuals can construct more complex, concrete plans when they have more knowledge about the person or topic (Berger, 1997), and these types of plans tend to better enable individuals to jointly achieve interaction goals with their partners (Waldron & Applegate, 1994). This ability suggests that individuals in more developed relationships will have less need to change their plans during interaction and be more adept at changing those plans; their conversations should therefore be less benefited by asynchronicity and reduced cues.

Individuals also tend to become less concerned with self-presentation and more willing to reveal more personal sides of themselves as their relationships develop (Cupach & Metts, 1994), suggesting that the self-presentational advantages of some communication modes will become less salient as relationships develop. As a result of their increased experience with their partners and ability to better construct effective messages, individuals in moderately-developed relationships will likely derive fewer benefits from asynchronicity and reduced cues than will individuals whose relationships are at low levels of development. As a result, individuals in moderately-developed relationships should be less inclined to take advantage of and benefit from asynchronicity

and reduced cues in regard to those individuals' self-presentational success and message effectiveness..

The expectation that communication mode affordances should be particularly salient and helpful earlier in relationships and decrease in importance as relationships progress suggests that individuals will be less likely to use communication modes that offer these affordances as their relationships develop. As individuals' relationships develop and the affordances provided by some communication modes become less important in their relationships, partners should rely on those affordances less heavily than they did at early points in relationship development. As a result, the tendency to use reduced-cue, asynchronous communication modes in a given interaction will decline as a function of relationship development. This change should be evident in the tendency for communication via communication modes that offer asynchronicity and/or reduced cues to comprise a decreasing proportion of individuals' communication as the relationship progresses. Research comparing telephone and e-mail use in long-distance friendships has found that the proportion (but not frequency) of e-mail use decreased and the proportion of telephone use increased as a function of relationship intimacy (Utz, 2007). Given that two main differences between e-mail and the telephone are that the former offers vocal cues and is synchronous, while the latter is generally text-based and asynchronous, these findings suggest that the use of reduced-cue, asynchronous communication modes as a proportion of total communication in the relationship might decline as a function of relationship development. Furthermore, in the context of relationships initiated via CT-based communication modes, the observed tendency for

individuals to move from the Internet to the telephone and letters to FtF communication (e.g., McKenna & Bargh, 2000; Parks & Floyd, 1996) is thought to be due to partners' willingness to trade initial control over their interactions for more personal communication (McKenna & Bargh, 2000). The same tendency might apply to mixed-mode relationships.

Although communication in moderately-developed relationships is more open and comfortable than communication at low levels of development, interactions still tend to be cautious and occur at relatively superficial levels of exchange (Altman & Taylor, 1973), and escalation of relationships tends to be high in the potential for threat to both positive and negative face (Cupach & Metts, 1994; Kunkel et al., 2003; Wilson et al., 2009). This characterization of moderately-developed relationships is consistent with McKenna and Bargh's (2000) finding that partners who form relationships on Internet bulletin boards do not transition directly from online to FtF communication but instead more gradually give up control by using other CT-based communication modes before transitioning to FtF communication. Given that individuals are still unsure of the relationship and their partner, but will continue exploring each others' personalities if they wish to develop the relationship further, communication modes that offer asynchronous, reduced-cue interaction likely provide a "safe" place to continue this exploration while minimizing any potential awkwardness or embarrassment that might come from increasingly intimate self-disclosures. Asynchronous, reduced cue communication modes provide greater control over interactions (Walther, 1996) and allows for the minimization of threat to one's positive face (O'Sullivan, 2000). For

example, individuals see text messaging as providing a buffer between themselves and message recipients (Rettie, 2009). Therefore, individuals might feel more comfortable engaging in self-disclosure to the extent that a communication mode offers asynchronous, reduced-cue interaction.

The Role of Affordances at High Levels of Relationship Development

As outlined above, individuals tend to become less concerned with self-presentation as their relationships become more developed. They are also better at constructing effective messages without the aid of the affordances of asynchronicity and reduced cues. Therefore, individuals should exhibit the least tendency to use reduced-cue, asynchronous communication modes in their relationships at high levels of relationship development, when individuals are less concerned with the maximization of rewards and minimization of costs to themselves and the relationship and have the most information about and experience with their partners with which to construct effective messages. As relationships develop, these affordances should offer less potential advantage over communication without these affordances. As a result, as relationships develop, individuals should perceive the affordances of asynchronicity and reduced cues as less important, tend to use communication modes that offer those affordances less as a proportion of their total communication with their partners, and report smaller differences in conversational effectiveness between interactions that do and do not provide those affordances.

As relationships continue to develop, the breadth and depth of communication that occurs via various communication modes should also continue to change, and

different patterns will likely be observed in highly developed relationships than in relationship with low or moderate levels of development. Partners should be more comfortable dealing with intimate topics in highly developed relationships. In highly developed relationships, partners' experience with each other gives them a better understanding of which topics are and are not appropriate to discuss, and individuals can better predict their partners' reactions to specific topics of conversation (Altman & Taylor, 1973; Cupach & Metts, 1994). Furthermore, individuals in highly developed relationships have a larger history of experiences and interactions on which to draw; as a result, a single negative interaction carries less potential harm to the relationship than it did at earlier points in relationship development (Altman & Taylor, 1973). Because of the greater stability and experience that characterize highly developed relationships, perceptions of risk of discussing intimate topics should lessen, and individuals should feel more comfortable discussing more intimate topics without the potential benefit of affordances than they did earlier in the relationship.

Concerns regarding the appropriateness of asynchronous or reduced-cue communication modes for discussing intimate topics might also influence individuals' tendencies to use those modes for intimate conversation topics. Individuals report perceiving email as inferior to the telephone for personal uses (Dimmick, Kline, & Stafford, 2000). It is likely that asynchronous or reduced-cue communication modes are generally perceived as inferior or inappropriate for more personal or intimate communication topics. Although this perception might also exist at earlier points in relationships, it might be overridden by concerns regarding potential face threats or the

maintenance of control over interactions. Furthermore, although conversation topics are moderately intimate at moderate levels of relationship development, conversation topics become increasingly intimate as the relationships develops further (Altman & Taylor, 1973). It might be that asynchronous, reduced-cue communication modes are considered adequate for moderately-intimate topics but inappropriate for very intimate topics. Research on long-distance friendships has found that partners tend to prefer more “personal” communication modes such as the telephone (which is synchronous and provides both vocal and verbal cues) to less “personal” modes such as email (which is asynchronous and provides only verbal cues) when discussing highly intimate topics but use e-mail for superficial topics and staying in touch (Utz, 2007). This finding suggests that in highly developed relationships, increases in the extent to which a communication mode offer asynchronous, reduced-cue interactions are likely associated with lower depth and breadth of communication, as opposed to the higher depth and breadth of communication associated with these affordances at low and moderate levels of relationship development.

Hypotheses

As outlined above, individuals’ communication mode choice, effective message construction, and self-disclosure should all be associated with the level of development in their relationships and the extent to which the communication modes those individuals use offer the affordances of asynchronicity and reduced cues. These affordances allow individuals the opportunity to better control the information their partners receive and plan and edit their messages in order to construct more effective messages. Because

individuals in more developed relationships have more information with which to construct effective messages without the potential benefits of asynchronicity and reduced cues, the extent to which these affordances are associated with more effective interactions should also decline as their relationships become more developed. The following hypotheses reflect these predictions regarding the role of affordances in interaction effectiveness.

Hypothesis 1: Conversational effectiveness is positively associated with the extent to which the communication mode used offers a) asynchronicity and b) reduced cues.

Hypothesis 2: The associations between conversational effectiveness and the extent to which communication modes offer a) asynchronicity and b) reduced cue interaction is moderated by relationship development. As relationship development increases, these associations are weaker.

Hypothesis 3: Conversational appropriateness is positively associated with the extent to which the communication mode used offers a) asynchronicity and b) reduced cues.

Hypothesis 4: The associations between conversational appropriateness and the extent to which the communication mode used offers a) asynchronicity and b) reduced cue interaction is moderated by relationship development. As relationship development increases, these associations are weaker.

As relationships develop, individuals become less concerned with their self-presentation and better able to interact effectively without the affordances of

asynchronicity and reduced cues. As a result, these affordances should become less important to individuals, and individuals should be less inclined to employ these affordances as their relationships become more developed. This tendency should be observed as a decline in the proportion of their communication that occurs via communication modes that are asynchronous and/or offer reduced cues. The following hypotheses reflect these predictions regarding the use of affordances.

Hypothesis 5: The importance of the extent to which a communication mode offers a) asynchronous and b) reduced cue interaction is negatively associated with relationship development.

Hypothesis 6: The proportion of communication that occurs via a) asynchronous and b) reduced cue communication modes is negatively associated with relationship development.

Finally, self-disclosure in relationships should be related to relationship development and the extent to which the communication modes used offer the potential for asynchronicity and reduced cues. Social penetration theory predicts that as relationships develop, self-disclosure becomes greater in both breadth and depth (Altman & Taylor, 1973; Taylor & Altman, 1987). This tendency has been found in both romantic relationships (Knapp et al., 1980) and friendships (Chan & Cheng, 2004; Hays, 1984; Knapp et al., 1980). However, the extent to which individuals engage in self-disclosure should also vary according to the extent to which the communication modes they use offer the potential for asynchronicity and reduced cues. At low and moderate levels of relationship development, these affordances can provide individuals with a

sense of control over and safety in an interaction. Individuals are likely inclined to use these affordances to engage in self-disclosure with greater breadth and depth. At high levels of relationship development, individuals' histories of self-disclosure with their partners make self-disclosure less risky, and asynchronous, reduced-cue communication modes are likely seen as inappropriate for the types of highly intimate disclosures that occur primarily at high levels of relationship development. As a result, asynchronicity and reduced cues should be associated with reduced breadth and depth of self-disclosure in highly developed relationships. The following hypotheses reflect these predictions regarding self-disclosure.

Hypothesis 7: Relationship development is positively associated with a) self-disclosure breadth and b) self-disclosure depth.

Hypothesis 8: Self-disclosure breadth is positively associated with the extent to which communication modes offer a) asynchronicity and b) reduced cues.

Hypothesis 9: Self-disclosure depth is positively associated with the extent to which communication modes offer a) asynchronicity and b) reduced cues.

Hypothesis 10: The association between self-disclosure breadth and the extent to which communication modes offer a) asynchronicity and b) reduced cues is moderated by relationship development. The association between self-disclosure breadth and the use of these affordances becomes weaker as relationship development increases.

Hypothesis 11: The association between self-disclosure depth and the extent to which communication modes offer a) asynchronicity and b) reduced cues is

moderated by relationship development. At low and moderate levels of relationship development, the association between self-disclosure depth and these affordances is positive. At high levels of relationship development, the association between self-disclosure depth and these affordances is negative.

A summary of all of the AUM's hypotheses is provided in Table 1. These hypotheses will be tested using both a cross-sectional survey regarding friends and romantic partners (Study 1) and a diary study in which individuals report on their conversations with their romantic partners (Study 2).

Chapter Summary

Chapter 2 presented a model of communication mode affordance use in personal relationships. The foundations for the model—social penetration theory and the affordances of asynchronicity and reduced cues—were reviewed. Then a model was advanced that predicts individuals' use of various communication modes and conversational effectiveness and appropriateness and self-disclosure via those modes. These outcomes are predicted to vary as a function of the level of development in the relationship and the extent to which the communication modes used offers the potential for asynchronicity and reduced cues.

Table 1.
Summary of model predictions.

Relationship Development	Variable	Level of Variable
Low	Proportion of CT-based Communication	High
	Importance of Affordances	High
	Conversational Effectiveness	Higher via asynchronous, reduced-cue communication modes
	Self-disclosure Breadth and Depth	Low Higher via asynchronous, reduced-cue communication modes
Moderate	Proportion of CT-based Communication	Moderate
	Importance of Affordances	Moderate
	Conversational Effectiveness	Somewhat higher via asynchronous, reduced-cue communication modes
	Self-disclosure Breadth and Depth	Moderate Somewhat higher via asynchronous, reduced-cue communication modes
High	Proportion of CT-based Communication	Low
	Importance of Affordances	Low
	Conversational Effectiveness	Not impacted by communication mode use
	Self-disclosure Breadth and Depth	High Lower via asynchronous, reduced-cue communication modes

3. PRETEST

Chapter Preview

Chapter 3 presents a pretest. The purpose of the pretest is to examine initial correlations between study variables and initial reliability estimates for multi-item scales for the variables of interest. The method is first described, and then the results of the pretest are presented. The chapter concludes with a brief summary.

Method

Participants

Participants in the pretest were $N = 71$ individuals referred by students in undergraduate Communication courses. Students were asked to refer participants who were at least 18 years old and were not students or employees of the University. Students received course credit for their referrals' completion of the survey. Approximately 37% of participants were male, and 63% were female. Participants' average age was 37.74 years ($SD = 16.51$ years), and 32% of participants identified themselves as students.

Forty-six participants reported on romantic relationships, and 25 participants reported on friendships. Participants who reported on romantic relationships reported an average relationship length of 17.51 years ($SD = 14.47$ years); 4 of these participants indicated that they were casually dating, 10 indicated that they were seriously dating, 4 indicated that they were engaged, and 28 indicated that they were married or had made a lifelong commitment. Participants who reported on friendships reported an average relationship length of 6.37 years ($SD = 6.66$ years); of these, 7 participants were asked to

report on an acquaintance, 14 participants were asked to report on a casual friend, and 4 participants were asked to report on a close friend.

Procedure

The pretest consisted of scales for the variables in question. Participants accessed and completed the pretest via an online survey. Participants who reported being currently involved in a romantic relationship (regardless of length or seriousness) were asked to complete the pretest with their romantic partner in mind. Those who were not currently in a romantic relationship were asked to complete the pretest with a friend in mind. In line with Hays's (1984) distinction between levels of friendship development, participants who reported on a friend were randomly assigned to complete the survey with an acquaintance, casual friend, or close friend in mind. In addition to the relationship-specific measures of relationship development and overall proportion of communication mode use, individuals were asked to think about the last conversation they had with their partner and complete conversation-specific items assessing communication mode use, perceptions of availability and importance of affordances, conversational effectiveness and appropriateness, and self-disclosure breadth and depth in their most recent conversation with their partner. Finally, individuals were asked to report on their general perceptions of the availability of affordances in different communication modes and a measure of general interpersonal (not relationship-specific) trust.

Materials

Relationship development was measured with the 20-item Interpersonal Solidarity Scale (Wheeless, 1978), which assesses “the degree of psychological, social, and perhaps even physical closeness between people” (Wheeless, 1978, p. 145). This scale is designed to measure indicators of solidarity, or closeness, such as similarity, proximity, liking and attraction, trust, frequent interaction, disclosure, and private language and symbols (Wheeless, 1978). It is unidimensional (Wheeless, 1978) and exhibits construct validity as indicated by its correlations with measures of trust (Wheeless, 1978), self-disclosure (Rocca & Martin, 1998; Wheeless, 1978), relationship stage (Wheeless, 1978), relationship satisfaction (Baus & Allen, 1996), idiomatic communication (Bell & Healey, 1992), and communication frequency (Rocca & Martin, 1998). As shown in Appendix A, the scale includes such items as “We are very close to each other,” and “We share a lot in common.” All items were rated on a 7-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (7). Participants who were in romantic relationships were also asked to indicate their relationship stage as casually dating, seriously dating, engaged, or married/lifelong commitment, categories that are adapted from previously-identified relational stages in premarital romantic relationships (Braiker & Kelley, 1979).

Proportion of communication mode use. Participants were asked to estimate the proportion of their communication with their partner that occurs via each of the following communication modes: FtF, telephone, written letters or notes, email, instant messaging, text messaging, video phone, social network sites, and other.

Affordances. Participants rated the extent to which they perceive each of the following communication modes as affording asynchronous, reduced cue interaction: FtF communication, telephone, written letters or notes, email, instant messaging, text messaging, video phone, and social network sites. Participants were asked to indicate the extent to which they agree with the statements, “This channel allows me to receive and respond to my partner’s messages on my own schedule,” (asynchronicity) and “This channel allows me to conceal a wide range of cues (such as facial expressions, tone of voice, or gestures) from my partner,” (reduced cues) on a 7-point scale with anchors of *strongly disagree* (1) and *strongly agree* (7).

Participants were also asked to think of their most recent conversation with their partner and to indicate the communication mode in which that interaction occurred. Participants were then asked to indicate the extent to which they agreed with the above statements regarding asynchronicity and reduced cues regarding that particular conversation. Additionally, communication modes were coded according to the extent to which they offer **asynchronous** and **reduced cue** interaction. Email, social network site posts, and written letters or notes were coded as asynchronous; instant messaging and text messaging were coded as near-synchronous; and FtF communication, video phone, and the telephone were coded as synchronous. Two dummy codes were used to compare asynchronous and near-synchronous communication modes to synchronous communication modes. For the first, asynchronous communication modes were coded as 1, and near-synchronous and synchronous communication modes were coded as 0. For

the second, near-synchronous communication modes were coded as 1, and asynchronous and synchronous communication modes were coded as 0.

Communication modes were also coded for whether they were low, moderate, or high cue. E-mail, text messaging, instant messaging, and written letters or notes allow for only verbal cues and were coded as low cue; the telephone allows for both verbal and vocal but not visual cues and was coded as moderate-cue; FtF communication and video phone allow for verbal, visual, and vocal cues and were coded as high-cue. Two dummy codes were used to compare low-cue and moderate-cue communication modes to high-cue communication modes. For the first, low-cue communication modes were coded as 1, and moderate-cue and high-cue communication modes were coded as 0. For the second, moderate-cue communication modes were coded as 1, and low-cue and high-cue communication modes were coded as 0.

Importance of affordances. Participants were asked to indicate how important they perceived asynchronicity and reduced cues to be in their most recent conversation with their partner. The items stated, respectively, “The ability to receive and respond to my partner’s messages on my own schedule was important to me in this conversation,” and “The ability to conceal a wide range of cues (such as facial expressions, tone of voice, or gestures) from my partner was important to me in this conversation.” Participants rated each item on a 7-point scale with anchors of *strongly disagree* (1) and *strongly agree* (7).

Conversational effectiveness and appropriateness was measured using Canary and Spitzberg’s (1987) measure of interpersonal competence, which contains subscales

for each of these constructs. The 20-item conversational effectiveness subscale has been validated via its observed associations with trust, intimacy, and satisfaction (Canary & Spitzberg, 1987), and the 20-item conversational appropriateness subscale has been validated via its observed associations with appropriate conflict strategies (Canary & Spitzberg, 1989). Self- and other-ratings of individuals' competence have also been found to be significantly associated (Canary & Spitzberg, 1990). Participants were asked to complete the scales regarding their most recent conversation with their partner. Participants rated items on a 7-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (7). Sample items for the conversational effectiveness subscale include, "I achieved everything I hoped to achieve in the conversation," and "Our conversation was unsuccessful." Sample items for the conversational appropriateness subscale include, "I was a smooth conversationalist" and "I said several things that seemed out of place in the conversation." The full measure is included in Appendix B.

Self-disclosure. The depth and breadth subscales of Parks and Floyd's (1996) measure of online relationship development were adapted to measure these constructs in this dissertation. Two of the items from the breadth subscale ("Our communication covers issues that go well beyond the topic of any one particular newsgroup," and "We contact each other in a variety of ways besides the Internet.") were dropped because they refer exclusively to relationships that began on the Internet. The remaining 3 items in the breadth subscale and eight items in the depth subscale were reworded to refer to a single conversation instead of a composite of previous conversations, and participants were

asked to respond regarding their most recent conversation with their partners. The subscales are included in Appendix C.

Generalized trust. Previous research has argued and found that generalized trust is unassociated with both self-disclosure and relationship level (Larzelere & Huston, 1980). Conceptually, generalized trust should also be unassociated with conversational appropriateness and effectiveness in a specific relationship. Therefore, Rotter's (1967) interpersonal trust scale was included to establish discriminant validity with the measures of interest to this dissertation (relationship development, conversational appropriateness and effectiveness, and self-disclosure breadth and depth). This scale is designed to measure individuals' general (i.e., not relationship-specific) expectations regarding whether or not other individuals can be relied on. It consists of items such as, "In dealing with strangers one is better off to be cautious until they have provided evidence that they are trustworthy," and "It is safe to believe that in spite of what people say most people are interested in their own welfare." Participants indicated their agreement with each statement on a 7-point Likert-type scale with anchors of *strongly disagree* (7) and *strongly agree* (1).

Control variables. Relationship length, age, and own and partner's sex were all assessed as control variables. Individuals were also asked about the amount of time spent in their most recent conversation with their partners, the communication modes they had available to them at the time of the conversation, and their perceived convenience of the communication mode they used.

Plan of Analysis

Means for the ratings of affordances were examined to confirm that they are in the expected direction, with communication modes that are objectively (according to previous research and features of the communication modes) higher in asynchronicity and reduced cues being perceived as such by pretest participants. Cronbach's alpha was used to assess the reliability of each scale, and correlations were computed between each of the variables to confirm that relationships are in the expected directions according to the dissertation hypotheses and to establish discriminant validity with generalized interpersonal trust.

Results

Relationship Development

The relationship development scale exhibited acceptable reliability, $\alpha = .92$. Among participants in romantic relationships, those who report belonging to the engage/married/lifelong commitment category should report the highest levels of relationship development, and those who report belonging to the casually dating category should report the lowest levels of relationship development. Although the number of participants in some categories was too small to draw firm conclusions, the direction of means suggests that this expectation was likely met. Participants who were casually dating ($n = 4$) reported lower relationship development ($M = 5.33$, $SD = 0.78$) than did participants who were seriously dating ($n = 10$, $M = 6.19$, $SD = 0.82$), and participants who were seriously dating reported slightly lower levels of relationship development than did participants who were married or had a lifelong commitment ($n = 28$, $M = 6.24$, $SD =$

0.62). Participants who were engaged to their romantic partners ($n = 4$) reported levels of relationship development that were inconsistent with expectations ($M = 5.65$, $SD = 1.95$). This finding is likely not representative due to the small number of engaged participants.

Among participants who completed the pretest regarding a friend, those who reported on a close friend should report the highest levels of relationship development, and those who reported on an acquaintance should report the lowest levels of relationship development. Although the number of participants who reported on each relationship type was small, preventing definite conclusions, the patterns of means reveal few to no differences in means between the three relationship types. Reported levels of relationship development were similar for participants who reported on an acquaintance ($n = 7$, $M = 5.33$, $SD = 0.58$), casual friend ($n = 14$, $M = 5.30$, $SD = 0.51$), and close friend ($n = 4$, $M = 5.30$, $SD = 1.18$). These findings suggest that relationship development as measured by the interpersonal solidarity scale, as opposed to relationship type, might more accurately represent relationship development.

Communication Mode Use

Overall, participants reported using communication modes for the following percentage of conversations with their partners: FtF communication: 64.06% ($SD = 28.93\%$), telephone: 11.03% ($SD = 12.05\%$), written letters or notes: 0.65% ($SD = 1.44\%$), email: 4.77% ($SD = 12.26\%$), instant messaging: 3.03% ($SD = 8.73\%$), text messaging: 12.61% ($SD = 15.39\%$), video phone: 0.001% ($SD = 0.12\%$), social network sites: 3.85% ($SD = 9.12\%$), and other: 0.01% ($SD = 0.12\%$). In their most recent conversations with their partners, 47 participants used FtF communication, 10 used the

telephone, 8 used text messaging, 2 used email, 2 used instant messaging, 2 used social network sites, 0 used written letters or notes, 0 used video phones, and 0 used another communication mode.

The use of asynchronous and reduced cue communication modes was expected to be negatively associated with relationship development. Because age was highly correlated with relationship development ($r = .73, p < .001$), the examination of the correlation between communication mode affordance use and relationship development controlled for age. Consistent with expectations, the proportion of participants' communication with their partners that occurs via asynchronous modes was negatively associated with relationship development, $r = -.33, p = .01$. Because the communication modes coded as asynchronous were all also text-based, these results also apply to reduced cues, although the confounding of asynchronicity and reduced cues does not allow for an analysis of which affordance is responsible for this association. There was no significant association between the use of vocal communication modes (i.e., the telephone) and relationship development, $r = -.04, p = .77$.

The correlations between relationship development and participants' perceptions of communication affordances in their conversations was also examined. When controlling for age, relationship development was not significantly associated with asynchronicity ($r = -.11, p = .37$) or reduced cues ($r = -.02, p = .86$), although the relationships were in the expected direction.

Communication Mode Perceptions

Perceptions of asynchronicity were averaged for each level of affordances. For asynchronicity, email and letters were considered to be asynchronous; text messaging and instant messaging were considered to be near-synchronous; and FtF communication, telephone, and video phone were considered to be synchronous. For reduced cues, email, letters, text messaging, and instant messaging were considered to be verbal; telephone was considered to be vocal and verbal; and FtF communication and video phone were considered to be visual, vocal, and verbal.

Because participants reported on their perceptions of asynchronicity and reduced cues for each communication mode, multilevel modeling was used to examine differences in perceptions between the levels of each affordance. The overall model for asynchronicity was significant, $F(2,140) = 10.44, p < .001$. Post hoc comparisons using Tukey's HSD revealed that perceptions of asynchronicity were not significantly higher for communication modes coded as asynchronous ($M = 5.49, SD = 1.39$) than for those coded as near-synchronous ($M = 5.15, SD = 1.49$), $t(140) = 1.59, p = .11$, although the means were in the expected direction. Participants perceived communication modes coded as synchronous ($M = 4.52, SD = 1.45$) to be significantly less asynchronous than those coded as asynchronous, $t(140) = 4.51, p < .001$ or near-synchronous, $t(140) = 2.91, p = .004$.

The overall model for reduced cues was also significant, $F(2, 140) = 23.48, p < .001$. As in the analyses above, post hoc comparisons were conducted using Tukey's HSD. Participants perceived low-cue communication modes ($M = 5.31, SD = 1.50$) as

providing higher levels of reduced cues than moderate-cue communication modes ($M = 4.58$, $SD = 1.83$), $t(140) = 2.27$, $p = .02$. Participants perceived moderate-cue communication modes as providing higher levels of reduced cues than high-cue communication modes ($M = 3.13$, $SD = 2.11$), $t(140) = 4.47$, $p < .001$. These findings were consistent with expectations.

Importance of communication mode affordances was expected to be negatively associated with relationship development. The correlations between each of the affordances and relationship development were examined while controlling for age. Although relationship development was not significantly associated with either importance of asynchronicity ($r = -.11$, $p = .35$) or importance of reduced cues ($r = -.04$, $p = .76$), both associations were in the expected direction.

Chapter Summary

Chapter 3 described the method and results of the pretest study. All multi-item measures exhibited adequate reliability. Although participants reported using face-to-face communication most frequently both as a proportion of their total communication with their partners and in their most recent conversations with their partners, a substantial minority reported using other communication modes. Examination of participants' perceptions of the extent to which communication modes offer asynchronicity and reduced cues confirmed that those perceptions were in line with the proposed coding of communication modes. Although the small sample size limited statistical power to observe associations between the variables of interest, most correlations were in the expected directions.

4. STUDY 1

Chapter Preview

Chapter 4 presents the method and results for Study 1, a cross-sectional survey testing the dissertation hypotheses using participants' reports on their most recent conversation with a friend or romantic partner. The method is first described, and then the results of Study 1 are presented. The chapter concludes with a brief summary of the findings from Study 1.

Method

Participants

Students in undergraduate Communication courses referred participants who were at least 18 years of age and not students at the University of Arizona to complete an online survey. Each student was asked to refer up to 3 potential participants. As with the pretest, participants who are not currently in a romantic relationship were randomly assigned to complete the survey with either an acquaintance, casual friend, or close friend in mind. Once the desired number of participants reported regarding a romantic relationship, all subsequent participants were asked to complete the survey regarding a friend. A total of $N = 109$ participants completed the survey regarding a romantic partner, and $N = 114$ participants completed the survey regarding a friend. Because they completed the same survey questions, participants from the pretest sample were also included in the analyses, for a total of $N = 166$ participants (64.85% women; age $M = 42.36$, $SD = 14.60$) who completed the survey regarding a romantic partner and $N = 147$

participants (64.34% women; age $M = 28.04$, $SD = 12.00$) who completed the survey regarding a friend.

Procedure

Students were asked to request permission from potential participants for the research to contact those participants, and students provided the researcher with names and email addresses (or other means of contact if the individual does not have an email address) of potential participants that agreed to be contacted by the researcher. The researcher contacted these participants via email to request their participation in the study and provide a copy of the study disclosure form. The email included a link to the online survey. Participants who wished to participate were able to do so by clicking the link to the survey. The survey contained the same measures as the pretest.

Materials

The materials for Study 1 were the same as those of the pretest for the measures of **age, conversation length, convenience, relationship development, proportion of CT-based communication, affordances, importance of affordances, conversational effectiveness and appropriateness, and generalized trust**. Means, standard deviations, and Cronbach's alphas for all scales are reported in Table 2 for friends and in Table 3 for romantic relationships.

Results

Overview

Because participants were referred from individuals who were able to refer multiple participants, potential nonindependence between participants was a concern

(Kenny, Kashy, & Cook, 2006). In order to address this concern, intraclass correlations were calculated for the study outcome variables, with participants clustered within their respective referrers. Following the recommendations of Kenny and colleagues (2006), these intraclass correlations were calculated while controlling for relevant control variables (for conversational effectiveness and appropriateness, self-disclosure breadth and depth, and importance of asynchronicity and reduced cues, these included age, relationship length, convenience, and conversation length; for overall use of asynchronicity and reduced cues, these included age and relationship length). Because hypotheses were tested separately for friendships and romantic relationships, intraclass correlations were calculated separately for these groups. All intraclass correlations were nonsignificant for both friendships ($\rho_1 = .01-.20, p > .10$) and romantic relationships ($\rho_1 = .02-.16, p > .10$) with the exception of the following variables: proportion of asynchronous communication for friendships ($\rho_1 = .73, p < .001$), proportion of low-cue communication for romantic relationships ($\rho_1 = .30, p = .03$), and conversational effectiveness for romantic relationships ($\rho_1 = .40, p = .001$). In order to account for this nonindependence, these measures were group mean-centered by calculating the mean score for each cluster of participants (as clustered within their respective referrers) and subtracting this mean from participants' scores. Furthermore, for consistency in reporting and interpretation, all measure of overall use of asynchronicity and reduced cues (i.e., proportion of asynchronous, near-synchronous, low-cue, and moderate-cue communication modes used) were group mean-centered for both friendships and romantic relationships.

Table 2.
Correlations between Study 1 variables for friendships.

	<i>M (SD)</i>	α	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Relationship length	115.15 (541.97)	--	.02	-.10	.32*	.03	-.12	.02	.00	.01	.04	.01	.07	.00	.06	.01	-.01
2. Relationship development	5.46 (.93)	.91		.05	.15 [†]	-.09	.11	-.06	.11	.47*	.24*	.35*	.64*	-.07	.15 [†]	.23*	.13
3. Proportion of verbal modes	.31 (.22)	--			-.20*	.37*	.83*	-.07	.11	-.08	-.14	.00	.08	-.04	.16 [†]	-.04	.10
4. Proportion of vocal modes	.16 (.18)	--				.02	-.22*	-.10	.06	.11	.07	.13	.16 [†]	.00	.03	.05	.04
5. Proportion of asynchronous modes	.06 (.13)	--					-.21*	-.23	.04	.09	.17*	-.14 [†]	-.10	-.05	.01	-.12	-.09
6. Proportion of near-synchronous modes	.25 (.21)	--						.01	.10	-.14 [†]	-.25*	.08	.14 [†]	-.01	.16 [†]	.03	.16 [†]
7. Importance of reduced cues	3.12 (2.00)	--							.30*	-.16 [†]	-.26*	.06	-.02	.62*	.08	-.08	.12
8. Importance of asynchronicity	4.63 (1.80)	--								.19*	.08	.19*	.24*	.21*	.58*	.25*	.10
9. Conversational effectiveness	5.34 (.95)	.91									.47*	.29*	.52*	-.09	.20*	.25*	.21*
10. Conversational appropriateness	5.92 (.89)	.92										.01	.08	-.19*	.13	.33*	-.05
11. Self-disclosure breadth	4.07 (1.48)	.79											.57*	.05	.11	.08	.52*
12. Self-disclosure depth	4.82 (1.16)	.81												.01	.22*	.16 [†]	.41*
13. Perceived reduced cues	3.75 (2.19)	--													.22*	.09	.12
14. Perceived asynchronicity	5.39 (1.69)	--														.30*	.03
15. Convenience	6.13 (1.07)	--															-.15 [†]
16. Conversation length	40.69 (47.40)	--															--

Note. Relationship length was measured in months. Conversation length was measured in minutes.

* $p < .05$ [†] $p < .10$

Table 3.
Correlations between Study 1 variables for romantic relationships.

	<i>M (SD)</i>	α	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Relationship length	220.44 (269.64)	--	.19*	-.32*	-.13*	.05	-.36*	-.07	-.10	.14 [†]	.17*	-.19*	-.05	-.17*	.07	.09	-.10
2. Relationship development	6.19 (.75)	.91		-.33	-.27*	-.03	-.34*	-.08	.08	.48*	.49*	.11	.48*	-.08	.19*	.34*	.03
3. Proportion of verbal modes	.13 (.13)	--			.23*	.33*	.92*	.05	.06	-.06	-.22*	.13 [†]	.03	.08	-.05	-.18*	.11
4. Proportion of vocal modes	.10 (.10)	--				.15*	.18*	.13 [†]	.01	-.25*	-.25*	.03	-.08	.01	-.11	-.16*	-.02
5. Proportion of asynchronous modes	.04 (.05)	--					-.06	-.04	.03	.04	-.15 [†]	-.04	-.10	-.06	-.13 [†]	-.18*	-.01
6. Proportion of near-synchronous modes	.09 (.12)	--						.06	.05	-.07	-.17*	.16*	.07	.11	.00	-.12	.12
7. Importance of reduced cues	2.68 (2.02)	--							.18*	-.13 [†]	-.29*	.23*	.10	.60*	-.01	.00	.12
8. Importance of asynchronicity	4.87 (1.90)	--								.07	-.07	.00	.00	.22*	.64*	.12	-.05
9. Conversational effectiveness	5.61 (0.95)	.91									.64*	.19*	.47*	-.07	.17*	.24*	.13
10. Conversational appropriateness	6.00 (0.99)	.93										.09	.40*	-.17*	.18*	.17*	-.02
11. Self-disclosure breadth	3.60 (1.35)	.74											.40*	.21*	-.06	-.05	.43*
12. Self-disclosure depth	5.15 (1.02)	.72												.11	.01	.18*	.27*
13. Perceived reduced cues	3.13 (2.28)	--													.11	.03	.18*
14. Perceived asynchronicity	5.33 (1.82)	--														.30*	-.09
15. Convenience	6.21 (1.14)	--															.00
16. Conversation length	29.60 (45.19)	--															--

Note. Relationship length was measured in months. Conversation length was measured in minutes.

* $p < .05$ [†] $p < .10$

Scale analyses for each of the multi-item scales in the study were conducted using confirmatory factor analysis (CFA). Initial analyses found that the size and direction of effects differed between friendships and romantic relationships for several of the outcome variables. For this reason, separate hypothesis tests were conducted for friendships and romantic relationships. Because participants predominately used face-to-face communication ($n = 192$), the telephone ($n = 50$), and text messaging ($n = 48$), asynchronicity and reduced cues were largely confounded. (Other communication modes used were instant messaging, $n = 5$, social network sites, $n = 5$, videoconferencing, $n = 1$, email, $n = 6$, and letters, $n = 1$). Therefore, for communication mode use, only the hypotheses regarding reduced cues (and not asynchronicity) were tested. This was because the examination of reduced cues allowed for more distinctions in the data (i.e., comparisons of low- and moderate-cue communication modes to high-cue communication modes), compared to the examination of asynchronicity (i.e., comparison of asynchronous to synchronous communication modes). Communication mode use was dummy coded to compare low-cue (i.e., email, letters, instant messaging, and text messaging) and moderate-cue (i.e., telephone) communication modes to high-cue (i.e., face-to-face and video messaging) communication modes.

Hypothesis tests for communication mode use in conversations were conducted using hierarchical multiple regression. Because participants reported on both the communication mode they used in their conversations and their perceptions of the extent to which that communication mode offered asynchronicity and reduced cues, each hypothesis regarding participants' conversations with their partners was tested in two

ways—using the communication mode they used and using their perceptions of that communication mode. Although use and perceptions were included in the same model for each outcome variable, results for use and perceptions are reported separately in the text for simplicity. All coefficients were tested against $\alpha < .05$.

Scale Analyses

Each of the multi-item scales in the study (i.e., relationship development, conversational appropriateness and effectiveness, self-disclosure breadth and depth, and generalized trust) were submitted to confirmatory factor analyses (CFA). These measures were evaluated using the factor loadings and Hu and Bentler's (1999) dual criteria of a comparative fit index (CFI) value greater than or equal to .95 and a standardized root mean square residual (SRMR) value less than or equal to .10.

For **relationship development**, the factor loadings were adequate (.41-.91) with the exception of the item, "We feel very differently about most things" (.27). The model did not demonstrate acceptable fit, $CFI = .84$, $SRMR = .07$, $\chi^2 (df = 169) = 660.86$, $p < .001$. After dropping the previously-mentioned item and allowing some of the error variances to covary, the model demonstrated acceptable fit, $CFI=.96$, $SRMR=.05$, $\chi^2 (df = 137) = 262.39$, $p < .001$.

Because they are both intended to measure different dimensions of communication competence (Canary & Spitzberg, 1989), the factor structures for the **conversational effectiveness and appropriateness** subscales were estimated in the same model, and the two factors were allowed to covary. For conversational effectiveness, factor loadings were adequate (.41-.83) with the exception of the following items: "The

other person was more active in the conversation that I was” (.13), “I was in control of the conversation” (-.02), “I just let the other person talk most of the time” (.38), “I talked most of the time” (-.19), “The other person controlled the conversation” (.36), and “The other person dominated the conversation” (.36). For conversational appropriateness, factor loadings were adequate (.40-.90). The model did not exhibit adequate fit, CFI=.77, SRMR=.08, $\chi^2(df = 737) = 2294.77, p < .001$. Examination of the model revealed that one item from the effectiveness subscale (“I achieved everything I hoped to achieve in our conversation”) and one item from the appropriateness subscale (“I was a smooth conversationalist”) were highly correlated with the opposite factor. After dropping these two items and the above-described items with inadequate loadings, and allowing some error variances to covary within factors, the model exhibited adequate fit, CFI = .95, SRMR = .06, $\chi^2(df = 428) = 724.14, p < .001$.

The CFAs for **self-disclosure breadth and depth** were estimated in the same model, and the factors were allowed to covary. The factor loadings for self-disclosure breadth (.46-.99) were adequate. The factors loadings for self-disclosure depth (.54-.67) were adequate with the exception of the following items: “I tried to keep my personal judgments to myself when this person said or did something with which I disagree” (.11) and “Our communication stayed on the surface of most topics” (.31). The initial model did not demonstrate acceptable fit, CFI = .77, SRMR = .11, $\chi^2(df = 43) = 288.82, p < .001$. After dropping the two items with low factor loadings and allowing some of the error terms to covary within each factor, the model demonstrated acceptable fit, CFI = .96, SRMR = .06, $\chi^2(df = 22) = 64.14, p < .001$.

The factor loadings for **generalized trust** (.40-.62) were adequate, with the exception of the following items: “This country has a dark future unless we can attract better people into politics” (.38), “Parents usually can be relied upon to keep their promises” (.34) “The United Nations will never be an effective force in keeping world peace” (.27), “The judiciary is a place where we can all get unbiased treatment” (.34), “The future seems very promising” (.36), “Many major national sports contests are fixed in one way or another” (.17), “Most experts can be relied upon to tell the truth about the limits of their knowledge” (.32), “Most parents can be relied upon to carry out their threats of punishments” (.20), “Most idealists are sincere and usually practice what they preach” (.20), “A large share of accident claims filed against insurance companies are phony” (.29), and “Most people answer public opinion polls honestly” (.17). The initial model did not demonstrate adequate fit, $CFI = .60$, $SRMR = .09$, $\chi^2(df = 275) = 817.08$, $p < .001$. After excluding these items from the model, the factor loadings for the items, “Most elected officials are really sincere in their campaign promises,” and “Most people can be counted on to do what they say they will do” fell below the cutoff of .40 and were removed from the model. Some of the error variances were allowed to covary, and the final model demonstrated acceptable fit, $CFI = .97$, $SRMR = .04$, $\chi^2(df = 50) = 72.52$, $p < .05$.

In order to establish discriminant validity of the self-disclosure breadth and depth subscales, the correlations between the final self-disclosure breadth and depth scales and the final generalized trust scale were examined. Generalized trust was chosen because it assesses interpersonal trust in general, whereas the measures of self-disclosure breadth

and depth are intended to assess self-disclosure in a specific relationship. Supporting this distinction, previous research has found generalized trust to be unassociated with self-disclosure and relationship level (Larzelere & Huston, 1980). In friendships, self-disclosure breadth exhibited a significant correlation with generalized trust, $r = -.20, p < .05$, and self-disclosure depth was not associated with generalized trust, $r = -.002, p > .05$. In romantic relationships, generalized trust was not associated with self-disclosure breadth, $r = -.09, p > .05$, or depth, $r = -.09, p > .05$.

Hypotheses 1 and 2: Conversational Effectiveness

Hypotheses 1 predicted that conversational effectiveness would be positively associated with the extent to which communication modes offer a) asynchronous and b) reduced cue interaction, and **Hypothesis 2** predicted that these associations would be moderated by relationship development. These hypotheses were tested using hierarchical regression, with the control variables (age, relationship length, and convenience) entered in the first step of the model, main effects (relationship development, communication mode use—dummy-coded to compare low-cue and moderate-cue communication modes to high-cue communication modes, and perceptions of communication mode affordances) entered in the second step of the model), and the hypothesized interactions (relationship development X use of a low-cue communication mode, relationship development X use of a moderate-cue communication mode, relationship development X perceived asynchronicity, and relationship development X perceived reduced cues) entered in the third step of the model.

Communication mode use. The main effect for reduced cues on conversational effectiveness was not significant for either friendships, $F(2, 124) = 0.01, p = .93$ or romantic relationships, $F(1, 150) = 0.72, p = .40$. As shown in Table 4, the interaction of relationship development and use of a low-cue communication mode was not associated with conversational effectiveness in friendships ($\beta = -.01, p = .95$) or romantic relationships ($\beta = .01, p = .88$). The interaction of relationship development and use of a moderate-cue communication mode was not associated with conversational effectiveness in friendships ($\beta = .06, p = .52$) or romantic relationships ($\beta = .10, p = .21$). Hypotheses 1 and 2 were not supported for communication mode use.

Perceived communication mode affordances. Results regarding the association between participants' perceptions of the extent to which communication modes offer asynchronicity and reduced cues are also presented in Table 4. Asynchronicity was not associated with conversational effectiveness in friendships ($\beta = .09, p = .28$) or romantic relationships ($\beta = .07, p = .45$). Reduced cues was not associated with conversational effectiveness in friendships ($\beta = -.10, p = .20$) or romantic relationships ($\beta = -.06, p = .44$). The interaction of asynchronicity and relationship development was not significantly associated with conversational effectiveness in friendships ($\beta = .01, p = .94$) or romantic relationships ($\beta = .03, p = .73$). The interaction of reduced cues and relationship development was not associated with conversational effectiveness in friendships ($\beta = .06, p = .43$) or romantic relationships ($\beta = -.05, p = .50$). For perceptions of communication mode affordances, Hypotheses 1 and 2 were not supported.

Table 4.

Regression of conversational effectiveness on relationship development, communication mode use, and perceptions of communication mode affordances.

	Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2
Block 1			.14*			.15*
Age	.14	1.63		.06	0.73	
Relationship length	-.02	-0.29		.16 [†]	1.88	
Conversation length	.19*	2.34		.003	0.04	
Convenience	.27*	3.30		.31*	4.19	
Block 2			.18*			.03*
Relationship development	.40*	5.05		.18*	2.12	
Use of low-cue mode (Low-cue = 1, Moderate-cue = 0, High-cue = 0)	.04	0.50		-.03	-0.33	
Use of moderate-cue mode (Moderate-cue = 1, Low-cue = 0, High-cue = 0)	.04	0.52		.07	0.83	
Perceptions of asynchronicity	.09	1.06		.01	0.15	
Perceptions of reduced cues	-.10	-1.27		.00	0.00	
Block 3			.01			.01
Use of low-cue mode X Relationship Development	-.01	-0.07		.10	1.08	
Use of moderate-cue mode X Relationship development	.06	0.64		.02	0.27	
Perceptions of asynchronicity X Relationship development	.01	0.08		.02	0.21	
Perceptions of reduced cues X Relationship development	.06	0.79		.07	0.83	

Note. Dependent variable = conversational effectiveness. Final model $R^2 = .33$, $F(13, 120) = 4.49$, $p < .05$ for friends and $R^2 = .19$, $F(13, 146) = 2.64$, $p < .05$ for romantic partners. Reduced cues was dummy coded to compare low-cue modes (i.e., instant messaging, text messaging, email, and letters) and moderate-cue modes (i.e., telephone) to high-cue modes (i.e., face-to-face communication and videoconferencing). ΔR^2 = change in R^2 compared to previous model. Effectiveness was group mean-centered based on the person who referred them.

* $p < .05$ [†] $p < .10$

Hypotheses 3 and 4: Conversational Appropriateness

Hypothesis 3 predicted that conversational appropriateness would be associated with the use of asynchronicity (H3a) and reduced cues (H3b). Hypothesis 4 predicted that the associations between conversational appropriateness and the affordances of asynchronicity and reduced cues would be moderated by relationship development.

Communication mode use. Conversational appropriateness was not associated with the main effect for use of reduced cues in friendships, $F(1, 124) = 1.56, p = .21$ or romantic relationships, $F(1, 153) = 1.44, p = .23$. Hypotheses 3a and 3b were not supported for communication mode use.

The interaction between use of a low-cue communication mode and relationship development was not significant for friendships ($\beta = .01, p = .90$) or romantic relationships ($\beta = .14, p = .09$). The interaction between use of a moderate-cue communication mode and relationship development was not associated with conversational appropriateness in friendships ($\beta = .01, p = .89$) or romantic relationships ($\beta = .05, p = .51$). Hypothesis 4 was not supported for communication mode use.

Perceived communication mode affordances. Results regarding perceptions of communication modes are presented in Table 5. Perceptions of asynchronicity were not associated with conversational appropriateness in friendships ($\beta = .03, p = .71$) or romantic relationships ($\beta = .07, p = .17$). Contrary to expectations, perceptions of reduced cues were negatively associated with conversational appropriateness in

Table 5.

Regression of conversational appropriateness on relationship development, use of communication modes, and perceptions of communication mode affordances.

	Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2
Block 1			.17*			.10*
Age	.20*	2.45		.06	0.75	
Relationship length	-.01	-0.07		.12	1.36	
Conversation length	-.09	-1.12		-.002	-0.03	
Convenience	.36*	4.46		.26*	3.40	
Block 2			.07*			.20*
Relationship development	.16 [†]	1.94		.44*	5.79	
Use of low-cue mode (Low-cue = 1, Moderate-cue = 0, High-cue = 0)	.02	0.21		.09	1.20	
Use of moderate-cue mode (Moderate-cue = 1, Low-cue = 0, High-cue = 0)	-.10	-1.20		-.02	-0.27	
Perceptions of asynchronicity	.03	0.34		.07	0.98	
Perceptions of reduced cues	-.19*	-2.24		-.13 [†]	-1.84	
Block 3			.003			.05*
Use of low-cue mode X Relationship development	.01	0.13		.14 [†]	1.71	
Use of moderate-cue mode X Relationship development	.01	0.13		.05	0.65	
Perceptions of asynchronicity X Relationship development	.01	0.09		-.16*	-2.14	
Perceptions of reduced cues X Relationship development	.05	0.55		.10	1.34	

Note. Dependent variable = conversational appropriateness. Final model $R^2 = .24$, $F(13, 120) = 2.99$, $p < .05$ for friends and $R^2 = .34$, $F(13, 149) = 5.92$, $p < .05$ for romantic partners. Reduced cues was dummy coded to compare low-cue modes (i.e., instant messaging, text messaging, email, and letters) and moderate-cue modes (i.e., telephone) to high-cue modes (i.e., face-to-face communication and videoconferencing). ΔR^2 = change in R^2 compared to previous model.

* $p < .05$ [†] $p < .10$

friendships ($\beta = -.19, p = .03$). A similar marginally significant pattern of results was observed in romantic relationships ($\beta = -.13, p = .07$). Hypothesis 3 was not supported regarding perceptions of communication mode affordances.

The interaction between perceived asynchronicity and relationship development was not significant for friendships ($\beta = .01, p = .93$) but was significant for romantic relationships ($\beta = -.16, p = .03, R^2 = .02$). Following the recommendations of Aiken and West (1991), the interaction was decomposed by examining the association between use of a perceived asynchronicity and conversational appropriateness at 1 standard deviation above and below the mean of relationship development. As shown in Figure 1, consistent with expectations, the association between perceived asynchronicity and conversational appropriateness in romantic relationships was significant and positive at lower levels of relationship development ($\beta = .28, p = .02$) and was not significant at higher levels of relationship development ($\beta = -.08, p = .43$).

The interaction between perceived reduced cues and relationship development was not significant for friendships ($\beta = .05, p = .59$) or romantic relationships ($\beta = .10, p = .18$). Hypothesis 4a was supported regarding perceptions of communication mode affordances for romantic relationships but not friendships, and Hypothesis 4b was not supported.

Hypotheses 5 and 6: Importance and Use of Communication Mode Affordances

Hypotheses 5 predicted that importance of a) asynchronicity and b) reduced cues would be negatively associated with relationship development. As shown in Table 6, relationship development was not associated with the importance of asynchronicity in

Figure 1. Interaction of relationship development and perceived asynchronicity on conversational appropriateness in romantic relationships.

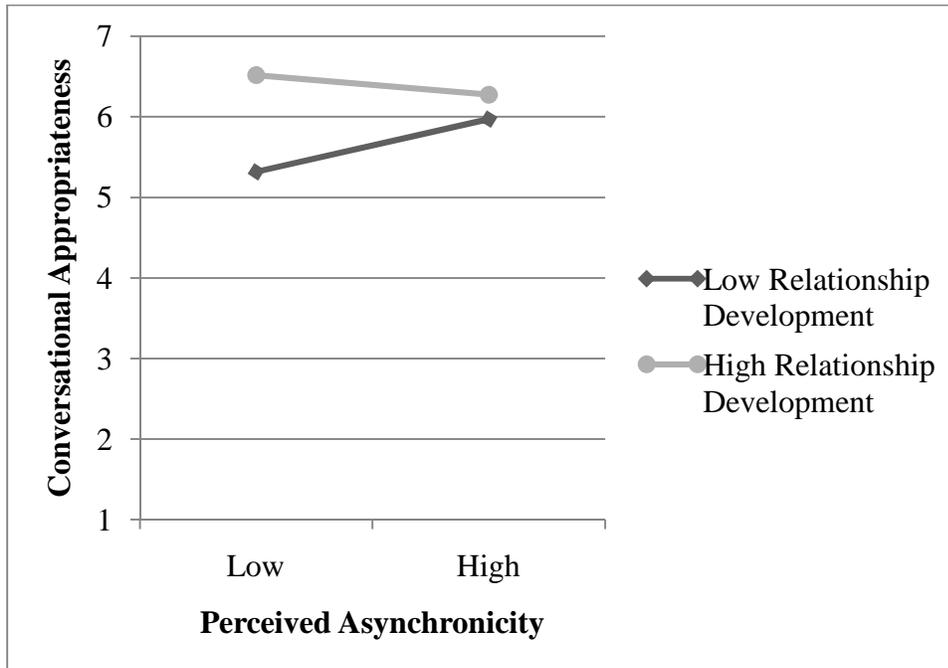


Table 6.
Regression of importance of affordances on relationship development.

	Importance of asynchronicity						Importance of reduced cues					
	Friendships			Romantic relationships			Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Block 1			.10*			.04			.03			.05
Age	.15 [†]	1.81		.12	1.35		-.10	-1.13		-.20*	-2.33	
Relationship length	-.04	-0.46		-.18*	-2.04		.05	0.54		.04	0.47	
Conversation length	.06	0.75		-.06	-0.72		.13	1.54		0.10	1.29	
Convenience	.26*	3.10		.14 [†]	1.76		-.08	.37		-.003	-0.03	
Block 2			.003			.002			.01			.003
Relationship development	.05	0.62		.05	0.63		-.07	-0.84		-.06	-0.74	

Note. Dependent variables = importance of asynchronicity and importance of reduced cues. Importance of asynchronicity: final model $R^2 = .10$, $F(5, 132) = 2.94$, $p < .05$ for friends and $R^2 = .05$, $F(5, 132) = 1.54$, $p > .05$ for romantic partners. Importance of reduced cues: final model $R^2 = .04$, $F(5, 158) = 0.97$, $p > .05$ for friends and $R^2 = .05$, $F(5, 158) = 1.77$, $p > .05$ for romantic partners. ΔR^2 = change in R^2 compared to previous model.

* $p < .05$ [†] $p < .10$

friendships ($\beta = .05, p = .54$) or romantic relationships ($\beta = .05, p = .53$). Furthermore, relationship development was not associated with the importance of reduced cues in friendships ($\beta = -.07, p = .41$) or romantic relationships ($\beta = -.06, p = .46$). Hypothesis 5 was not supported.

Hypothesis 6 predicted that use of a) asynchronous and b) reduced-cue communication modes would be negatively associated with relationship development. As shown in Table 7, relationship development was not associated with the proportion of asynchronous communication that occurred in friendships ($\beta = -.10, p = .26$) or romantic relationships ($\beta = -.04, p = .58$). As shown in Table 7, relationship development was not associated with the use of near-synchronous communication modes in friendships ($\beta = .11, p = .17$) but was negatively associated with the use of near-synchronous communication modes in romantic relationships ($\beta = -.23, p = .0003$). Hypothesis 6a was partially supported.

Regarding reduced cues, as shown in Table 8, relationship development was not associated with use of low-cue communication modes in friendships ($\beta = .05, p = .53$) but was negatively associated with use of low-cue communication modes in romantic relationships ($\beta = -.24, p = .001$). As shown in Table 8, relationship development was not associated with use of moderate-cue communication modes in friendships ($\beta = .14, p = .06$) and was significantly negatively associated with relationship development in romantic relationships ($\beta = -.25, p = .002$). Hypothesis 6b was supported for romantic relationships but not friendships.

Table 7.

Regression of proportion of asynchronous and near-synchronous communication on relationship development.

	Proportion of asynchronous communication						Proportion of near-synchronous communication					
	Friendships			Romantic relationships			Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Block 1			.05*			.02			.02			.09*
Age	.14	1.62		-.05	-0.59		-.12	-1.41		-.27*	-3.17	
Relationship length	.14	1.57		-.10	-1.12		-.02	-.20		-.06	-0.72	
Block 2			.00			.02			.02			.05*
Relationship development	.01	0.06		-.14 [†]	-1.68		.13	1.57		-.21*	-2.82	

Note. Dependent variables = proportion of asynchronous (i.e., email or letters) communication and proportion of near-synchronous (i.e., text messaging or instant messaging) communication. Participants' scores on the dependent variables were group mean-centered based on the person who referred them. Proportion of asynchronous communication: final model $R^2 = .05$, $F(3, 133) = 2.16$, $p > .05$ for friends and $R^2 = .03$, $F(3, 157) = 1.89$, $p > .05$ for romantic partners. Proportion of near-synchronous communication: final model $R^2 = .03$, $F(3, 133) = 1.59$, $p > .05$ for friends and $R^2 = .14$, $F(3, 157) = 8.28$, $p < .05$ for romantic partners. ΔR^2 = change in R^2 compared to previous model.

* $p < .05$ [†] $p < .10$

Table 8.
Regression of proportion of reduced-cue communication on relationship development.

	Proportion of low-cue communication						Proportion of moderate-cue communication					
	Friendships			Romantic relationships			Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Block 1			.01			.25*			.23*			.02
Age	-.08	-0.86		-.43*	-5.62		.22*	2.84		-.06	0.68	
Relationship length	.03	.37		-.12	-1.61		.38*	4.83		-.10	-1.14	
Block 2			.02			.05*			.02 [†]			.06*
Relationship development	.14	1.6		-.24*	-3.54		.13 [†]	1.73		-.25*	-3.21	

Note. Dependent variables = proportion of low-cue (i.e., email, letters, instant messaging, or text messaging) communication and proportion of moderate-cue (i.e., telephone) communication. Participants' scores on the dependent variables were group mean-centered based on the person who referred them. Proportion of low-cue communication: final model $R^2 = .03$, $F(3, 133) = 1.16$, $p > .05$ for friends and $R^2 = .31$, $F(3, 160) = 23.60$, $p < .05$ for romantic partners. Proportion of moderate-cue communication: final model $R^2 = .24$, $F(3, 133) = 14.34$, $p < .05$ for friends and $R^2 = .08$, $F(3, 160) = 4.55$, $p < .05$ for romantic partners. ΔR^2 = change in R^2 compared to previous model.

* $p < .05$ [†] $p < .10$

Hypotheses 7-11: Self-Disclosure Breadth and Depth

Hypothesis 7 predicted that relationship development would be positively associated with a) self-disclosure breadth and b) self-disclosure depth. As depicted in Table 9, relationship development was positively associated with self-disclosure breadth in both friendships ($\beta = .21, p = .005$) and romantic relationships ($\beta = .20, p = .01$). As depicted in Table 10, relationship development was positively associated with self-disclosure depth in both friendships ($\beta = .57, p < .0001$) and romantic relationships ($\beta = .56, p < .0001$). Hypotheses 7a and 7b were supported.

Communication mode use. Hypothesis 8 predicted that self-disclosure breadth would be associated with the extent to which the communication mode used offers a) asynchronicity and b) reduced cues. A main effect for reduced cue communication mode use on self-disclosure breadth was present in friendships, $F(1, 124) = 12.89, p < .001$ but not romantic relationships, $F(1, 153) = 0.31, p = .58$. As shown in Table 9, contrary to expectations, the use of a low-cue communication mode was associated with lower self-disclosure breadth in friendships ($\beta = -.22, p = .01$). The use of a moderate-cue communication mode was not associated with self-disclosure breadth in friendships ($\beta = .11, p = .13$). Hypothesis 8 was not supported for communication mode use.

Hypothesis 9 predicted that self-disclosure depth would be associated with the extent to which the communication mode used offers a) asynchronicity and b) reduced cues.

Table 9.

Regression of self-disclosure breadth on relationship development, use of communication modes, and perceptions of communication mode affordances.

	Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2
Block 1			.29*			.21*
Age	-.11	-1.40		-.08	-1.06	
Relationship length	.04	0.55		-.10	-1.28	
Conversation length	.53*	7.11		.40*	5.65	
Convenience	.05	0.62		-.04	-0.55	
Block 2			.14*			.07*
Relationship development	.21*	2.88		.20*	2.55	
Use of low-cue mode (Low-cue mode = 1, High-cue mode = 0)	-.22*	-2.84		-.09	-1.22	
Use of moderate-cue mode (Moderate-cue mode = 1, Low-cue mode = 0)	.11	1.51		-.18*	-2.36	
Perceptions of asynchronicity	.17*	2.17		-.03	-0.44	
Perceptions of reduced cues	-.05	-0.75		.15 [†]	1.96	
Block 3			.01			.04*
Use of low-cue mode X Relationship development	-.07	-0.76		-.15 [†]	-1.81	
Use of moderate-cue mode X Relationship development	-.10	-1.09		-.02	-0.24	
Perceptions of asynchronicity X Relationship development	.09	1.19		.15*	2.00	
Perceptions of reduced cues X Relationship development	-.02	-0.29		.07	0.96	

Note. Dependent variable = self-disclosure breadth. Final model $R^2 = .44$, $F(3, 120) = 7.31$, $p < .05$ for friends and $R^2 = .32$, $F(13, 149) = 5.36$, $p < .05$ for romantic partners. Reduced cues was dummy coded to compare low-cue modes (i.e., instant messaging, text messaging, email, and letters) and moderate-cue modes (i.e., telephone) to high-cue modes (i.e., face-to-face communication and videoconferencing). ΔR^2 = change in R^2 compared to previous model.

* $p < .05$ [†] $p < .10$

Table 10.

Regression of self-disclosure depth on relationship development, use of communication modes, and perceptions of communication mode affordances.

	Friendships			Romantic relationships		
	β	t	ΔR^2	β	t	ΔR^2
Block 1			.21*			.12*
Age	-.04	-0.48		-.16 [†]	-1.87	
Relationship length	.08	1.03		.03	0.38	
Conversation length	.41*	5.23		.25*	3.30	
Convenience	.15 [†]	1.88		.18*	2.35	
Block 2			.35*			.25*
Relationship development	.57*	8.99		.56*	7.81	
Use of low-cue mode (Low-cue mode = 1, High-cue mode = 0)	-.04	-0.65		.09	1.35	
Use of moderate-cue mode (Moderate-cue mode = 1, High-cue mode = 0)	.07	1.08		-.11	-1.65	
Perceptions of asynchronicity	.14*	2.00		-.09	-1.33	
Perceptions of reduced cues	-.01	-0.22		.11	1.52	
Block 3			.002			.01
Use of low-cue mode X Relationship development	.01	0.14		.08	0.98	
Use of moderate-cue mode X Relationship development	.01	0.17		.01	0.08	
Perceptions of asynchronicity X Relationship development	.05	0.69		.002	0.03	
Perceptions of reduced cues X Relationship development	.003	0.05		.04	0.57	
Block 4			.03			.03
Square of relationship development	-.09	-0.81		.35*	2.22	
Use of low-cue mode X Square of relationship development	.15	1.43		-.07	-0.50	
Use of moderate-cue communication mode X Square of relationship development	.12	1.15		-.14	-1.46	
Perceived asynchronicity X Square of relationship development	.20	1.62		.12	0.79	
Perceived reduced cues X Square of relationship development	-.07	-0.68		-.21	-1.59	

Note. Dependent variable = self-disclosure depth. Final model $R^2 = .59$, $F(18, 115) = 9.19$, $p < .05$ for friends and $R^2 = .41$, $F(18, 145) = 5.46$, $p < .05$ for romantic partners. Reduced cues was dummy coded to compare low-cue modes (i.e., instant messaging, text messaging, email, and letters) and moderate-cue modes (i.e., telephone) to high-cue modes (i.e., face-to-face communication and videoconferencing). ΔR^2 = change in R^2 compared to previous model.

* $p < .05$ † $p < .10$

No main effect of reduced cue communication mode use was found in friendships, $F(1, 124) = 2.20, p = .14$, but a main effect was observed in romantic relationships, $F(1, 153) = 5.13, p = .03$. However, low-cue ($\beta = .09, p = .18$) and moderate-cue ($\beta = -.11, p = .10$) communication modes did not differ from high-cue communication modes in regard to self-disclosure depth in romantic relationships. Hypothesis 9 was not supported for communication mode use.

Hypothesis 10 predicted that relationship development would moderate the association between self-disclosure breadth and the extent to which the communication mode used offers a) asynchronicity and b) reduced cues. As shown in Table 9, the interaction between use of low-cue communication modes and relationship development was not significant in friendships ($\beta = -.07, p = .45$) or romantic relationships ($\beta = -.15, p = .07$). The interaction between moderate-cue communication modes and relationship development was not significant for friendships ($\beta = -.10, p = .28$) or romantic relationships ($\beta = -.02, p = .81$). Hypothesis 10 was not supported regarding communication mode use.

Hypothesis 11 predicted an interaction between relationship development and the extent to which the communication mode offers asynchronicity and reduced cues, such that communication mode affordances are positively associated with self-disclosure depth at moderate levels of relationship development and negatively associated with self-disclosure depth at lower or higher levels of relationship development. As shown in Table 10, the interaction between use of low-cue communication modes and the square of relationship development was not associated with self-disclosure depth in friendships (β

= .15, $p = .15$) or romantic relationships ($\beta = -.07$, $p = .62$). The interaction of use of moderate-cue communication modes and the square of relationship development was not associated with self-disclosure depth in friendships ($\beta = .12$, $p = .25$) or romantic relationships ($\beta = -.14$, $p = .15$). Hypothesis 11 was not supported for communication mode use.

Perceived communication mode affordances. In regard to Hypothesis 8, as shown in Table 9, perceived asynchronicity was positively associated with self-disclosure breadth in friendships ($\beta = .17$, $p = .03$) but unassociated with self-disclosure breadth in romantic relationships ($\beta = -.03$, $p = .65$). Perceived reduced cues was not associated with self-disclosure breadth in friendships ($\beta = -.05$, $p = .45$) and was marginally associated with self-disclosure breadth in romantic relationships ($\beta = .15$, $p = .05$). Hypothesis 8a was supported in friendships but not romantic relationships, and Hypothesis 8b was marginally supported in romantic relationships but not supported in friendships.

As shown in Table 10, perceived asynchronicity was positively associated with self-disclosure depth in friendships ($\beta = .14$, $p = .047$) but not in romantic relationships ($\beta = -.08$, $p = .19$). Perceived reduced cues was not associated with self-disclosure depth in friendships ($\beta = -.01$, $p = .83$) or romantic relationships ($\beta = .11$, $p = .13$). Hypotheses 9a was supported in friendships but not romantic relationships, and Hypothesis 9b was not supported.

As shown in Table 9, the interaction between perceived asynchronicity and relationship development was not significantly associated with self-disclosure breadth for

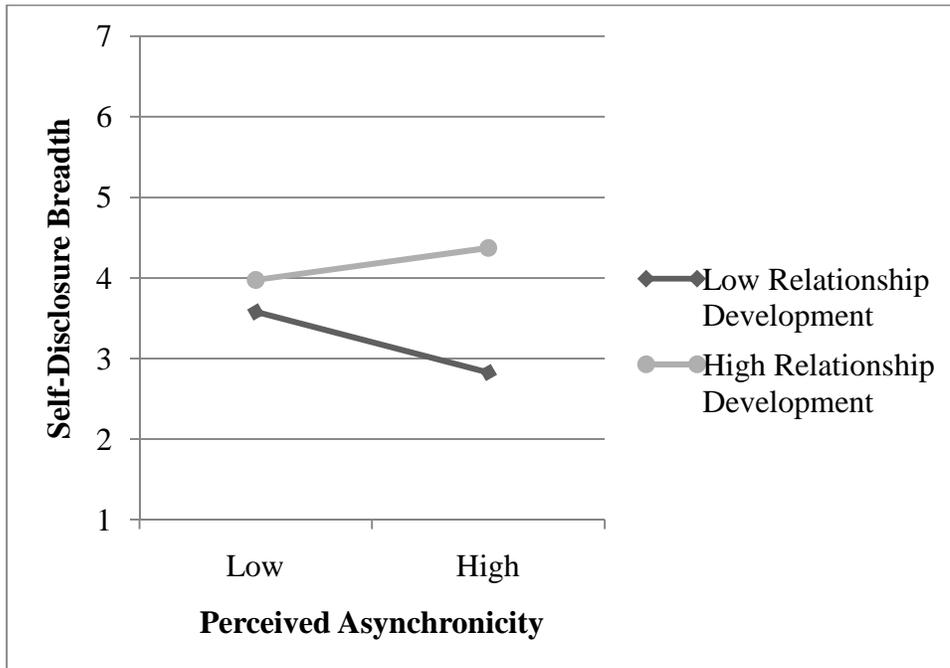
friendships ($\beta = .06, p = .23$) but was significantly associated with self-disclosure for romantic relationships ($\beta = .15, p = .047, R^2 = .02$). Following the recommendations of Aiken and West (1991), this interaction was decomposed by examining the association between perceived asynchronicity and self-disclosure breadth at 1 standard deviation above and below the mean for relationship development. As shown in Figure 2, the association between perceived asynchronicity and self-disclosure breadth in romantic relationships was marginally significant and negative at lower levels of relationship development ($\beta = -.24, p = .06$) and was not significant at higher levels of relationship development ($\beta = .10, p = .30$). The interaction between reduced cues and relationship development was not significant for friendships ($\beta = -.02, p = .78$) or romantic relationships ($\beta = .07, p = .34$). Regarding perceptions of communication mode affordances, Hypothesis 10 was not supported.

As shown in Table 10, the interaction between perceived asynchronicity and the square of relationship development was not associated with self-disclosure depth in friendships ($\beta = .20, p = .11$) or romantic relationships ($\beta = .12, p = .43$). The interaction between perceived reduced cues and the square of relationship development was not associated with self-disclosure depth in friendships ($\beta = -.07, p = .50$) or romantic relationships ($\beta = -.21, p = .11$). Hypothesis 11 was not supported.

Chapter Summary

Chapter 4 tested the hypothesized associations using a cross-sectional study of individuals' most recent conversation with a friend or romantic partner. Results revealed several findings. As predicted, self-disclosure breadth (H7a) and self-disclosure depth

Figure 2. Interaction of relationship development and perceived asynchronicity on self-disclosure breadth in romantic relationships.



(H7b) were positively associated with relationship development in both friendships and romantic relationships. Regarding communication mode use, use of low-cue communication modes was associated with less self-disclosure breadth in friendships (H8b); communication mode use was not otherwise associated with conversational outcomes (i.e., effectiveness, appropriateness, or self-disclosure depth).

Regarding perceived communication mode affordances, as hypothesized, perceived asynchronicity was positively associated with self-disclosure depth in friendships. Significant interactions between perceived asynchronicity and relationship development were observed for conversational appropriateness (H4a) and self-disclosure breadth (H10b) in romantic relationships. As hypothesized, perceived asynchronicity was positively associated with conversational appropriateness for romantic relationships at lower levels of relationship development but not at higher levels of relationship development. The association between perceived asynchronicity and self-disclosure breadth was more negative (although only marginally significant) at lower levels of relationship development and not significant at higher levels of relationship development. Contrary to predictions, perceived reduced cues was negatively associated with conversational appropriateness in friendships, and a marginally-significant negative association between these variables was also observed in romantic relationships (H4b).

Regarding use of communication modes in the relationship, as predicted, proportion of communication that occurs through near-synchronous (H6a), low-cue (H6b), and moderate-cue (H6b) communication modes was negatively associated with relationship development in romantic relationships but not associated with relationship

development in friendships. Use of asynchronous communication modes (H6a) was not associated with relationship development in friendships or romantic relationships.

5. STUDY 2

Chapter Preview

Chapter 5 presents the method and results for Study 2, a diary study testing the dissertation hypotheses using participants' reports on their conversations with their partners over 4 days. The method is first described, and then the results of Study 2 are presented. The chapter concludes with a brief summary of the findings from Study 2.

Method

Overview

Participants in Study 2 completed a diary study in which they reported on their conversational effectiveness and appropriateness, self-disclosure breadth and depth, and communication mode used for conversations with their romantic partners over a 4-day period of time. Bolger, Davis, and Rafaeli defined diaries as “self-report instruments used repeatedly to examine ongoing experiences” (2003, p. 580). This method yields a multilevel design (with conversations nested within individuals) and allows for trends to be observed within participants over a number of days. Study 2 participants were also complete one-time measures of relationship development and control variables.

Participants

Participants ($N = 64$, $n = 57$ women and $n = 7$ men) were recruited from undergraduate Communication courses. Participants were required to identify a proximal (i.e., not long-distance) romantic partner. It was made clear that this relationship did not have to be long-term, committed, or serious, but could be at any level of intimacy as long as the participant considered it to be romantic in nature. Participants

in Study 2 received monetary compensation of \$20 (\$5 after completion of the introductory session and \$15 upon returning the diary booklets) per person in exchange for their participation in the study.

A priori power estimates are complicated in multilevel designs because both lower-level sample size (i.e., cluster size; here, the number of conversations on which participants report) and higher-level sample size (here, the number of participants) influence power estimates, as does the intraclass correlation (Hox, 2002). Hox (2002) recommends using the expected intraclass correlation and cluster size to adjust recommended sample sizes derived from multiple regression power analysis. A medium effect size of $r = .30$ with 8 independent variables would require 107 participants to achieve power of .80 at $\alpha = .05$ (Cohen, 1992). One study of daily conversations found that over a 2 week period, participants reported engaging in an average of approximately 19 conversations with their romantic partners (Overall & Sibley, 2008). Given that the current study occurred over a shorter time frame of 4 days, participants were expected to engage in an average of approximately 6 conversations with their partners during the study period, yielding a cluster size of 6. If the intraclass correlation of individuals' reports of their conversations were medium at .30, then a total sample size of approximately 268 observations would be needed to obtain an effective sample size of 107 participants. This total sample size would equate to approximately 45 participants. A total of 64 individuals completed an average of 11.25 conversations, suggesting that power was adequate to observe medium effect sizes.

Procedure

Study 2 employed a diary method, in which participants reported on their conversations with their romantic partners. Participants were asked to report on each conversation that they had with their partners lasting 5 minutes or more as soon as possible after it occurred. Such a method allows for the assessment of everyday communication in relationships across a wider range of conversations and situations than if single conversations were studied, thereby likely providing data that are more representative of the relationship as a whole (Duck, Rutt, Hurst, & Strejc, 1991). Diary studies in which participants report on a conversation shortly after that conversation are also beneficial because they minimize the potential bias of retrospective reports while being fairly unobtrusive (Bolger et al., 2003; Duck et al., 1991). Diary methods also allow for the examination of within-person variation in processes and their antecedents and consequences (Bolger et al., 2003), such as variations in self-disclosure and conversation effectiveness that are expected to be associated with relationship development and the presence of affordances in this dissertation.

Participants completed baseline measures of the relevant variables (as described below) in an introductory session prior to the beginning of the study. At this time, they were also provided with instructions regarding the diary reports of conversations and were instructed to complete a diary entry regarding their most recent conversation with their partners. This procedure allowed participants to clarify any questions or concerns at the beginning of the study. Participants also received an email on the fourth day of the study reminding them of when their diary booklets were due. Diary booklets were due at

the same time and location as participants' introductory sessions one week after the introductory session occurred. Participants were instructed to complete four days in a row if possible, but were allowed one week to complete 4 days' diaries to allow for the potential that participants would forget to fill out their logs or not interact with their partners on some days.

Instructions for participants' recording of conversations were drawn from previous diary studies of routine conversations (e.g., Aubé, 2008; Duck et al., 1991; Erickson, Newman, & Pincus, 2009; Overall & Sibley, 2008; Sibley & Overall, 2008) that have used Wheeler and Nezlek's (1977) instructions for participants to record all conversations in which interactants attend to each other, converse, and adjust their responses based on the other person. As outlined by Wheeler and Nezlek (1977), participants were advised that simply sitting next to someone or exchanging greetings does not count as a conversation. Because the definition of a conversation might be less clear when using communication modes such as email or text messaging, participants were also provided with additional instructions to aid them in determining what constitutes a conversation via such modes. Conversations were described as typically having multiple messages exchanged per person in a single block of time (usually via synchronous communication modes such as FtF, the telephone, or instant messaging) or over a range of time (usually via asynchronous or near-synchronous communication modes such as email or text messaging, respectively). Individuals were advised that simply sending or receiving a message without the other person responding was not considered a conversation. Participants were asked to complete the daily diary measures

for all such conversations with their partners and were instructed to complete their surveys as soon as possible after each conversation. Participants were also instructed to contact the researcher if they had any questions about the survey, including questions about whether or not something constitutes a conversation. The diary instructions appear in Appendix D.

Materials

Diary. Participants were provided with 4 small paper booklets, one for each day of the diary portion of the study. Booklets included the instruction page as depicted in Appendix D, along with 15 copies of the diary questionnaire. As shown in Appendix E, the diary questionnaire included items assessing the communication mode used in the conversation, the length of the conversation, the approximate time at which the conversation occurred, perceptions of the availability and importance of asynchronicity and reduced cues, conversational effectiveness and appropriateness, and self-disclosure breadth and depth.

Relationship development was measured during the introductory meeting using the 20-item Interpersonal Solidarity Scale (Wheeless, 1978) as described in the pretest materials.

Affordances. Communication modes were coded according to the extent to which they offer **asynchronicity** and **reduced cues**, as outlined in the pretest materials. Also as outlined in the pretest materials, for each conversation, participants were asked to indicate the extent to which they perceive the communication mode they used as affording asynchronicity and reduced cues.

Proportion of CT-based Communication. The number of conversations in which individuals engaged via each communication mode when communicating with their partners during the study period was calculated from their reports of their conversations.

Importance of affordances. For each conversation, participants were asked to complete single item measures of how important they perceived the extent to which the communication mode they used offered asynchronicity and reduced cues to be. The items stated, respectively, “The ability to receive and respond to my partner’s messages on my own schedule was important to me in this conversation,” and “The ability to conceal a wide range of cues (such as facial expressions, tone of voice, or gestures) from my partner was important to me in this conversation.” Participants rated each item on a 7-point scale with anchors of *strongly disagree* (1) and *strongly agree* (7).

Conversational effectiveness and appropriateness were measured using items from Canary and Spitzberg’s (1987) measure of interpersonal competence, which contains subscales for each of these constructs. The the highest-loading non-reverse-coded item and the highest reverse-coded item from each subscale, as determined in the pretest data, were included in the diary questionnaire. Items were rated on a 7-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (7). For conversational effectiveness, the items used were, “I found the conversation to be very useful and helpful,” and, “The conversation was unprofitable.” For conversational appropriateness, the items used were, “Some of my remarks were inappropriate,” and

“Everything I said was appropriate.” Participants were also asked to complete the entire scale at baseline regarding their most recent conversation with their partner.

Self-disclosure. The depth and breadth subscales of Parks and Floyd’s (1996) measure of online relationship development were adapted to measure these constructs in this dissertation. Based on the pretest data, the highest-loading non-reverse-coded item and the highest reverse-coded item from each subscale were used in the diary questionnaire. For self-disclosure breadth, these items were, “Our communication was limited to just a few topics,” and “Our communication ranged over a variety of topics.” For self-disclosure depth, these items were, “I told this person things about myself that he or she could not get from any other source,” and “I did not tell this person anything intimate or personal about myself.” Participants also completed both subscales in their entirety at baseline (excluding inapplicable items, as described in the pretest materials) at baseline in regard to how they generally interact with their partners. Both full subscales are included in Appendix C.

Control variables. Along with baseline measures of the variables of interest, as described above, relationship length, age, and own and partner’s sex were assessed at baseline. Amount of time spent on each conversation was also included as a control variable.

Plan of Analysis

Overview. The use of diary methods produces multilevel data, with reports nested within participants. This nesting often produces nonindependence in reports within participants, such that reports are more highly correlated within participants than

between participants (Bolger et al., 2003; Kenny et al., 2006). Therefore, linear regression methods, which assume independence of observations, are inappropriate. Instead, multilevel modeling is appropriate except where responses are aggregated within participants (e.g., overall percentage use of various communication modes). Multilevel modeling allows one to model and control for associations within individuals. Furthermore, when time is a factor, as it is here, data are often autocorrelated—observations that are temporally closer to each other have more strongly associated error terms than do observations that are temporally further from each other, which results in standard errors that are biased downward and, consequently, increased risk of Type I error (Bolger et al., 2003). Multilevel modeling allows for the modeling of autocorrelations of within-person error terms and therefore corrects for this bias (Bolger et al., 2003; Kenny et al., 2006). Following the recommendation of Kenny and colleagues (2006), all continuous predictor variables will be mean-centered.

Results

Overview

Participants reported on both the communication mode they used in their conversations and their perceptions of the extent to which that communication mode offered asynchronicity and reduced cues, so each hypothesis regarding participants' conversations with their partners was tested in two ways—using the communication mode they used and using their perceptions of that communication mode as the predictor variables. Because participants predominately used face-to-face communication ($n = 355$ conversations), the telephone ($n = 99$ conversations), and text messaging ($n = 218$

conversations), asynchronicity and reduced cues were largely confounded. (Other communication modes used were instant messaging, $n = 17$, social network sites, $n = 11$, videoconferencing, $n = 9$, and email, $n = 2$). Therefore, for communication mode use, only the hypotheses regarding reduced cues (and not asynchronicity) were tested. The rationale for doing so was that the examination of reduced cues allowed for more distinctions in the data (i.e., comparisons of low- and moderate-cue communication modes to high-cue communication modes), compared to the examination of asynchronicity (i.e., comparison of asynchronous to synchronous communication modes). Communication mode use was dummy coded to compare low-cue (i.e., email, letters, instant messaging, and text messaging) and moderate-cue (i.e., telephone) communication modes to high-cue (i.e., face-to-face and video messaging) communication modes. Although use and perceptions were included in the same model for each outcome variable, results for use and perceptions are reported separately in the text for simplicity.

Because conversations were nested within participants, it was likely that each of the conversational measures (i.e., perceived asynchronicity, perceived reduced cues, importance of asynchronicity, importance of reduced cues, conversational effectiveness, conversational appropriateness, self-disclosure breadth, self-disclosure depth, conversational length, and convenience) would exhibit nonindependence within individuals. This expectation was confirmed, with intraclass correlations ranging from .02 to .44. Therefore, hypothesis tests for communication mode use and perceptions in conversations were conducted using multilevel modeling, and unstandardized coefficients

are reported for all effects. All coefficients were tested against $\alpha < .05$. For each outcome variable, the unconditional (i.e., intercept-only) model, which estimates the proportion of variance attributable to nonindependence within individuals, was estimated first. The second model added the control variables (age, relationship length, conversation length, and convenience), the third model added the main effects, and the fourth model (where appropriate) added the predicted interactions between communication mode and relationship development. The hypothesis tests for self-disclosure depth also added a fifth model testing the quadratic interactions between communication mode and the square of relationship development. See Table 11 for means, standard deviations, reliabilities, intraclass correlations, and correlations between study items.

Hypotheses 1 and 2: Conversational Effectiveness

Hypotheses 1 predicted that conversational effectiveness would be positively associated with the extent to which communication modes offer a) asynchronous and b) reduced cue interaction, and **Hypothesis 2** predicted that these associations would be moderated by relationship development. These hypotheses were tested using multilevel modeling and the procedure specified in the overview for this chapter..

Communication mode use. Although a main effect for use of reduced cues did not exist for conversational effectiveness, $F(2, 648) = 2.21, p = .10$, as shown in Table 12, contrary to expectations, conversational effectiveness was negatively associated with the use of low-cue communication modes ($b = -.33, SE = .14, p = .02$). The interaction of

Table 11.
Correlations between study variables.

	<i>M (SD)</i>	α	2	3	4	5	6	7	8	9	10	11	12	13
Age	20.77 (3.07)	--	.53*	-.04	-.05	-.21 [†]	-.03	-.12	-.04	.04	-.04	-.03	-.02	.06
Relationship length	29.22 (29.11)	--	--	.17	-.01	-.03	-.19	-.16	-.03	-.02	.09	.003	-.04	.13
Relationship development	6.39 (.74)	.93	--	.11	.03	-.02	.01	.19	-.07	.19	-.05	.05	.21	
Perceived asynchronicity	5.04 (2.17)	--			.36	.49*	.60*	.15*	-.03	.09*	-.20*	-.14*	-.14*	.23*
Perceived reduced cues	3.67 (2.30)	--				.17	.32*	.25*	-.08*	.05	-.22*	-.23*	-.12*	.08 [†]
Importance of asynchronicity	4.02 (2.18)	--					.43	.31*	-.03	-.03	-.12*	-.08*	-.02	.11*
Importance of reduced cues	2.46 (1.75)	--						.44	.01	-.15*	-.04	.09*	.08*	-.03
Conversational effectiveness	3.84 (.57)	.79							.20	.11*	.16*	.34*	.17*	.13*
Conversational appropriateness	3.91 (.57)	.86								.28	-.12*	-.17*	-.16*	.15
Self-disclosure breadth	4.04 (.47)	.96									.02	.26*	.43*	-.03
Self-disclosure depth	4.02 (.87)	.72										.20	.21*	-.07 [†]
Conversation length	48.82 (77.43)	--											.23	.07
Convenience	6.28 (1.03)	--												.29

Note. Where individual-level measures are correlated with conversation-level measures, the individual's mean on the conversation-level variable was used. Calculations of Cronbach's alphas for conversation-level variables and correlations between two conversation-level variables controlled for nonindependence within individuals. Intraclass correlations are reported on the diagonal.

* $p < .05$ [†] $p < .10$

relationship development and use of low-cue communication modes was not associated with conversational effectiveness ($b = -.19, SE = .27, p = .49$). The interaction of relationship development and use of moderate-cue communication modes was not associated with conversational effectiveness ($b = -.28, SE = .26, p = .26$). Hypotheses 1 and 2 were not supported for communication mode use.

Perceived communication mode affordances. Results regarding the association between perceived asynchronicity and reduced cues of the communication mode used are also presented in Table 12. Asynchronicity ($b = .01, SE = .03, p = .67$) and reduced cues were not associated with conversational effectiveness ($b = -.01, SE = .02, p = .63$). The interaction of asynchronicity and relationship development was not significantly associated with conversational effectiveness ($b = .03, SE = .05, p = .52$), but the interaction of reduced cues and relationship development was significantly associated with conversational effectiveness ($b = .14, SE = .05, p = .01$). Following the recommendation of Aiken and West (1991), this interaction was decomposed by examining the association between perceived reduced cues and conversational effectiveness at 1 standard deviation above and below the mean of relationship development. As shown in Figure 3, contrary to expectations, this association was significant and negative at low levels of relationship development ($b = -.09, SE = .04, p = .01$) and was not significant at high levels of relationship development ($b = .07, SE = .04, p = .08$).

Table 12.

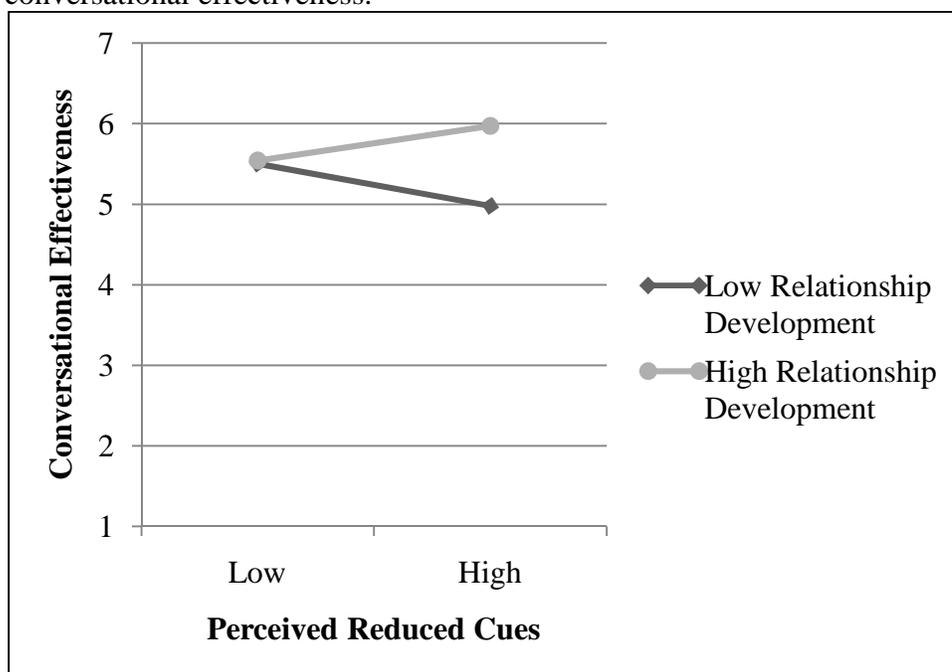
Multilevel model predicting conversational effectiveness from relationship development, communication mode use, and perceived communication mode affordances.

	Model 1 <i>b</i> (<i>SE</i>)	Model 2 <i>b</i> (<i>SE</i>)	Model 3 <i>b</i> (<i>SE</i>)	Model 4 <i>b</i> (<i>SE</i>)
Block 1				
Intercept	5.35* (.09)	5.35* (.09)	5.51* (.10)	5.50* (.10)
Block 2				
Age		-.01 (.03)	-.01 (.03)	-.02 (.03)
Relationship length		-.001 (.004)	-.002 (.003)	-.003 (.003)
Conversation length		.002* (.001)	.002* (.001)	.001* (.001)
Convenience		.19* (.04)	.21* (.05)	.22* (.05)
Block 3				
Relationship development			.15 (.13)	.35 (.23)
Low-cue communication mode			-.33* (.14)	-.31* (.14)
Moderate-cue communication mode			-.15 (.16)	-.18 (.16)
Perceived asynchronicity			.01 (.03)	.01 (.03)
Perceived reduced cues			-.01 (.02)	-.01 (.02)
Block 4				
Low-cue communication mode X Relationship development				-.19 (.27)
Moderate-cue communication mode X Relationship development				-.28 (.26)
Perceived asynchronicity X Relationship development				.03 (.05)
Perceived reduced cues X Relationship development				.14* (.05)
-2*log likelihood change		73.0*	67.6*	1.6

Note. Dependent variable = conversational effectiveness. Reduced cues was dummy coded to compare low-cue (i.e., instant messaging, text messaging, email, letters) and moderate-cue (i.e., telephone) modes to high-cue modes (i.e., face-to-face communication, videoconferencing).

* $p < .05$

Figure 3. Interaction of relationship development and perceived reduced cues on conversational effectiveness.



Hypotheses 3 and 4: Conversational Appropriateness

Hypothesis 3 predicted that conversational appropriateness would be associated with the use of asynchronicity (H3a) and reduced cues (H3b). Hypothesis 4 predicted that the associations between conversational appropriateness and the affordances of asynchronicity and reduced cues would be moderated by relationship development.

Communication mode use. A main effect for use of reduced cues was observed for conversational appropriateness, $F(2, 661) = 6.82, p = .001$. As shown in Table 13, conversational appropriateness was positively associated with the use of low-cue communication modes ($b = .51, SE = .17, p = .003$) and the use of moderate-cue communication modes ($b = .61, SE = .18, p = .001$). The interaction between use of low-cue communication modes and relationship development was not associated with conversational appropriateness ($b = .38, SE = .33, p = .24$). The interaction between use of moderate-cue communication modes and relationship development was not associated with conversational appropriateness ($b = .31, SE = .31, p = .31$). Hypothesis 3b was supported for communication mode use, and Hypothesis 4 was not supported for communication mode use.

Perceived communication mode affordances. Results regarding perceptions of communication modes are also presented in Table 13. Perceived asynchronicity was not associated with conversational appropriateness ($b = -.02, SE = .04, p = .63$). Contrary to expectations, perceived reduced cues was negatively associated with conversational appropriateness ($b = -.06, SE = .03, p = .046$). The interactions between relationship development and a) perceived asynchronicity ($b = -.07, SE = .05, p = .20$) and b)

Table 13.
Multilevel model predicting conversational appropriateness from relationship development, communication mode use, and perceived communication mode affordances.

	Model 1 <i>b</i> (<i>SE</i>)	Model 2 <i>b</i> (<i>SE</i>)	Model 3 <i>b</i> (<i>SE</i>)	Model 4 <i>b</i> (<i>SE</i>)
Block 1				
Intercept	5.60* (.11)	5.60* (.11)	5.32* (.14)	5.34* (.14)
Block 2				
Age		.01 (.04)	.01 (.04)	.01 (.04)
Relationship length		-.0003 (.005)	.0001 (.005)	.0002 (.005)
Conversation length		-.003* (.001)	-.002* (.001)	-.002 (.001)
Convenience		.24* (.05)	.23* (.06)	.24* (.06)
Block 3				
Relationship development			.02 (.18)	-.25 (.29)
Low-cue communication mode			.51* (.17)	.50* (.17)
Moderate-cue communication mode			.61* (.18)	.59* (.18)
Perceived asynchronicity			-.02 (.04)	-.02 (.04)
Perceived reduced cues			-.06* (.03)	-.06* (.03)
Block 4				
Low-cue communication mode X Relationship development				.38 (.33)
Moderate-cue communication mode X Relationship development				.31 (.31)
Perceived asynchronicity X Relationship development				-.07 (.05)
Perceived reduced cues X Relationship development				.01 (.06)
-2*log likelihood change		81.0*	69.4*	-8.2

Note. Dependent variable = conversational appropriateness. Reduced cues was dummy coded to compare low-cue (i.e., instant messaging, text messaging, email, letters) and moderate-cue (i.e., telephone) modes to high-cue modes (i.e., face-to-face communication, videoconferencing).

* $p < .05$

perceived reduced cues ($b = .01, SE = .06, p = .87$) were not significant. Hypotheses 3 and 4 were not supported regarding perceived communication mode affordances.

Hypotheses 5 and 6: Importance and Use of Communication Mode Affordances

Hypothesis 5 predicted that importance of a) asynchronicity and b) reduced cues would be negatively associated with relationship development. As shown in Table 14, relationship development was not associated with the importance of asynchronicity ($b = .02, SE = .29, p = .95$) or reduced cues ($b = .07, SE = .24, p = .78$). Hypothesis 5 was not supported.

Hypothesis 6 predicted that use of a) asynchronous and b) reduced-cue communication modes would be negatively associated with relationship development. Because proportions were calculated from participants' communication mode use during the study period (and therefore, asynchronicity and reduced cues were confounded), only Hypothesis 6b was tested. As shown in Table 15, relationship development was negatively associated with use of low-cue communication modes during the study period ($\beta = -.32, p = .01$) and was not associated with use of moderate-cue communication modes during the study period ($\beta = -.09, p = .50$). Hypothesis 6b was partially supported.

Hypotheses 7-11: Self-Disclosure Breadth and Depth

Hypothesis 7 predicted that relationship development would be positively associated with a) self-disclosure breadth and b) self-disclosure depth. As depicted in Table 16, relationship development was not associated with self-disclosure breadth ($b = .22, SE = .17, p = .21$). As depicted in Table 17, relationship development was not

Table 14.
Multilevel models predicting importance of affordances from relationship development.

	Importance of asynchronicity			Importance of reduced cues		
	Model 1 <i>b (SE)</i>	Model 2 <i>b (SE)</i>	Model 3 <i>b (SE)</i>	Model 1 <i>b (SE)</i>	Model 2 <i>b (SE)</i>	Model 3 <i>b (SE)</i>
Block 1						
Intercept	4.23* (.19)	4.23* (.19)	4.23* (.20)	2.66* (.16)	2.66* (.16)	2.67* (.16)
Block 2						
Age		.04 (.07)	.05 (.07)		-.03 (.06)	-.03 (.06)
Relationship length		-.01 (.01)	-.01 (.01)		-.01 (.01)	-.01 (.01)
Conversation length		-.001 (.001)	-.001 (.001)		.002* (.001)	-.002* (.001)
Convenience		.21* (.07)	.21* (.07)		-.08 (.06)	-.08 (.06)
Block 3						
Relationship development			.02 (.29)			.07 (.24)
-2*log likelihood change		73.9*	-0.7		48.6*	-1.0

Note. Dependent variables = importance of asynchronicity and importance of reduced cues.

* $p < .05$

Table 15.
Regressions of proportion of reduced-cue communication on relationship development.

	Proportion of low-cue communication			Proportion of moderate-cue communication		
	β	t	ΔR^2	β	t	ΔR^2
Block 1			.08 [†]			.01
Age	-.22	-1.52		.001	.01	
Relationship length	-.11	-0.74		.09	0.60	
Block 2			.10*			.01
Relationship development	-.32*	-2.65		-.09	-0.67	

Note. Dependent variables = proportion of low-cue (i.e., instant messaging, text messaging, email, or letters) communication and proportion of moderate-cue (i.e., telephone) communication. Proportion of low-cue communication: final model $R^2 = .18$, $F(3, 60) = 4.38$, $p < .05$. Proportion of moderate-cue communication: final model $R^2 = .02$, $F(3, 60) = 0.32$, $p > .05$.
 * $p < .05$ [†] $p < .10$

associated with self-disclosure depth ($b = .25, SE = .43, p = .50$). Hypothesis 7 was not supported.

Communication mode use. Hypothesis 8 predicted that self-disclosure breadth would be associated with the extent to which the communication mode used offers a) asynchronicity and b) reduced cues. A main effect for use of reduced cues on self-disclosure breadth was observed, $F(2, 614) = 13.43, p < .001$. As shown in Table 16, contrary to expectations, the use of low-cue ($b = -.98, SE = .23, p < .0001$) and moderate-cue ($b = -1.20, SE = .25, p < .0001$) communication modes was negatively associated with self-disclosure breadth. Hypothesis 8b was not supported for communication mode use.

Hypothesis 9 predicted that self-disclosure depth would be positively associated with the extent to which the communication mode used offers a) asynchronous and b) reduced cues. A main effect for use of reduced cues on self-disclosure depth was observed, $F(2, 659) = 4.06, p = .02$. As shown in Table 17, contrary to predictions, the use of low-cue ($b = -.59, SE = .22, p = .005$) and moderate-cue ($b = -.46, SE = .23, p = .12$) communication modes was negatively associated with self-disclosure depth. Hypothesis 9 was not supported for communication mode use.

Hypothesis 10 predicted that relationship development would moderate the association between self-disclosure breadth and the extent to which the communication mode used offers a) asynchronicity and b) reduced cues. As shown in Table 16, the interaction between use of low-cue communication modes and relationship development was not significant ($b = .48, SE = .44, p = .28$). The interaction between moderate-cue

Table 16.

Multilevel model predicting self-disclosure breadth from relationship development, use of communication modes, and perceptions of communication mode affordances.

	Model 1 <i>b</i> (<i>SE</i>)	Model 2 <i>b</i> (<i>SE</i>)	Model 3 <i>b</i> (<i>SE</i>)	Model 4 <i>b</i> (<i>SE</i>)
Block 1				
Intercept	3.99* (.11)	3.95* (.11)	4.49* (.15)	4.50* (.15)
Block 2				
Age		-.02 (.04)	-.04 (.04)	-.04 (.04)
Relationship length		.0005 (.005)	.001 (.004)	.001 (.004)
Conversation length		.01* (.001)	.01* (.001)	.01* (.001)
Convenience		-.11 (.07)	-.12 (.08)	-.13 [†] (.08)
Block 3				
Relationship development			.22 (.17)	-.10 (.34)
Low-cue communication mode			-.98* (.23)	-.98* (.24)
Moderate-cue communication mode			-1.20* (.25)	-1.19* (.26)
Perceived asynchronicity			-.01 (.05)	-.001 (.05)
Perceived reduced cues			-.04 (.04)	-.04 (.04)
Block 4				
Low-cue communication mode X Relationship development				.48 (.44)
Moderate-cue communication mode X Relationship development				.26 (.42)
Perceived asynchronicity X Relationship development				-.03 (.07)
Perceived reduced cues X Relationship development				-.12 (.08)
-2*log likelihood change		187.3*	147.0*	-4.9

Note. Dependent variable = self-disclosure breadth. Reduced cues was dummy coded to compare low-cue modes (i.e., instant messaging, text messaging, email, and letters) and moderate-cue modes (i.e., telephone) to high-cue modes (i.e., face-to-face communication and videoconferencing).

* $p < .05$ † $p < .10$

Table 17.
Regression of self-disclosure depth on relationship development, use of communication modes, and perceptions of communication mode affordances.

	Model 1 <i>b (SE)</i>	Model 2 <i>b (SE)</i>	Model 3 <i>b (SE)</i>	Model 4 <i>b (SE)</i>	Model 5 <i>b (SE)</i>
Block 1					
Intercept	4.87* (.12)	4.84* (.13)	5.10* (.15)	5.09* (.16)	5.12* (.16)
Block 2					
Age		-.03 (.05)	-.04 (.04)	-.04 (.05)	-.03 (.05)
Relationship length		-.002 (.01)	-.003 (.01)	-.003 (.01)	-.003 (.01)
Conversation length		.004* (.001)	.003* (.001)	.003* (.001)	.003* (.001)
Convenience		-.09 (.06)	-.07 (.07)	-.09 (.07)	-.05 (.07)
Block 2					
Relationship development			.13 (.19)	.38 (.39)	.25 (.43)
Low-cue communication mode			-.58* (.21)	-.55* (.21)	-.59* (.22)
Moderate-cue communication mode			-.35 (.22)	-.34 (.22)	-.46* (.23)
Perceived asynchronicity			.05 (.04)	.04 (.04)	.04 (.05)
Perceived reduced cues			-.11* (.04)	-.10* (.04)	-.08* (.04)
Block 4					
Low-cue communication mode X Relationship development				-.38 (.40)	-.37 (.58)
Moderate-cue communication mode X Relationship development				-.73 [†] (.38)	.24 (.59)
Perceived asynchronicity X Relationship development				.04 (.07)	.001 (.11)
Perceived reduced cues X Relationship development				-.03 (.07)	-.14 (.10)
Square of relationship development				-.05 (.12)	-.18 (.25)

(continued)

	Model 1	Model 2	Model 3	Model 4	Model 5
	<i>b (SE)</i>				
Block 5					
Low-cue communication mode X Square of relationship development					.09 (.36)
Moderate-cue communication mode X Square of relationship development					.38 (.24)
Perceived asynchronicity X Square of relationship development					-.02 (.04)
Perceived reduced cues X Square of relationship development					-.08 (.08)
-2*log likelihood		63.8*	108.1*	-6.0	-1.4

Note. Dependent variable = self-disclosure depth. Reduced cues was dummy coded to compare low-cue modes (i.e., instant messaging, text messaging, email, and letters) and moderate-cue modes (i.e., telephone) to high-cue modes (i.e., face-to-face communication and videoconferencing).

* $p < .05$ † $p < .10$

communication modes and relationship development was also not significant ($b = .26$, $SE = .42$, $p = .54$). Hypothesis 10 was not supported regarding communication mode use.

Hypothesis 11 predicted an interaction between relationship development and the extent to which the communication mode offers asynchronicity and reduced cues, such that communication mode affordances are positively associated with self-disclosure depth at moderate levels of relationship development and negatively associated with self-disclosure depth at lower or higher levels of relationship development. As shown in Table 17, the interaction between use of low-cue communication modes and the square of relationship development was not associated with self-disclosure depth ($b = .09$, $SE = .36$, $p = .81$). The interaction of use of moderate-cue communication modes and the square of relationship development was also not associated with self-disclosure depth ($b = .38$, $SE = .24$, $p = .12$). Hypothesis 11 was not supported for communication mode use.

Perceived communication mode affordances. In regard to Hypothesis 8, as shown in Table 16, perceived asynchronicity ($b = -.01$, $SE = .05$, $p = .88$) and reduced cues ($b = -.04$, $SE = .04$, $p = .27$) were not associated with self-disclosure breadth. In regard to Hypothesis 9, as shown in Table 17, perceived asynchronicity was not associated with self-disclosure depth ($b = .05$, $SE = .04$, $p = .23$). Contrary to expectations, perceived reduced cues was negatively associated with self-disclosure depth ($b = -.11$, $SE = .04$, $p = .003$). Hypotheses 8 and 9 were not supported.

As shown in Table 16, the interaction between asynchronicity and relationship development was not significantly associated with self-disclosure breadth ($b = -.03$, $SE = .07$, $p = .71$). The interaction between reduced cues and relationship development was

also not significant ($b = -.12$, $SE = .08$, $p = .14$). Regarding perceptions of communication mode affordances, Hypothesis 10 was not supported.

As shown in Table 17, the interaction between perceived asynchronicity and the square of relationship development was not associated with self-disclosure depth ($b = -.02$, $SE = .04$, $p = .63$). The interaction between perceived reduced cues and the square of relationship development was also not associated with self-disclosure depth ($b = -.08$, $SE = .08$, $p = .32$). Hypothesis 11 was not supported.

Chapter Summary

Chapter 5 tested the hypothesized associations using a diary study in which participants responded regarding each conversation of 5 minutes or more with their romantic partners over a 4-day period. Results revealed several findings. First, consistent with expectations, use of low-cue and moderate-cue communication modes was associated with greater conversational appropriateness (H3b). Contrary to expectations, however, use of low-cue and moderate-cue communication modes was associated with lower self-disclosure breadth and depth. Also contrary to expectations, use of low-cue (but not moderate-cue) communication modes was associated with lower conversational effectiveness.

Perceived reduced cues was negatively associated with conversational appropriateness and self-disclosure depth, contrary to predictions. Perceived reduced cues was also negatively associated with conversational effectiveness at lower, but not higher, levels of relationship development. Although the finding that the association between perceived reduced cues and conversational effectiveness weakened as

relationship development increased was consistent with expectations (H2b), the finding that this association was negative at lower levels of relationship development was not consistent with predictions.

Finally, the proportion of participants' communication during the study period that was conducted via low-cue communication modes was negatively associated with relationship development. This finding is consistent with predictions (H6b).

6. CONCLUSION

Chapter Preview

Chapter 6 is a conclusion to the dissertation. Key findings from the studies reported in Chapters 4 and 5 are reviewed, and their implications for the affordance utilization model (AUM) are discussed. Limitations of the studies are addressed, and directions for future research in the area of communication mode affordances in personal relationships are discussed. The chapter concludes with a brief review of the dissertation.

Key Findings and Implications

The purpose of this dissertation was to test the AUM, which concerns the role of communication mode affordance use and relationship development in conversational outcomes such as conversational competence (effectiveness and appropriateness) and self-disclosure (breadth and depth). This model predicts that the use of communication modes that offer asynchronicity and reduced cues is positively associated with conversational effectiveness, conversational appropriateness, self-disclosure breadth, and self-disclosure depth, but that these associations change as relationship development increases. The model predicts that the associations between communication mode affordances and conversational effectiveness, conversational appropriateness, and self-disclosure breadth become weaker as relationship development increases and that the associations between communication mode affordances and self-disclosure depth are strongest at moderate levels of relationship development. Furthermore, the model predicts that both use and importance of communication mode affordances decline as relationships become more developed. Findings from two studies testing these

expectations are reviewed below, and the implications of those findings for the AUM and communication mode affordance use in personal relationships are discussed.

Reduced Cues

In order to examine the associations between reduced cues and the outcome variables of interest, the communication modes that participants reported using in their conversations were dummy-coded to compare low-cue (i.e., email, instant messaging, text messaging, and letters) and moderate-cue communication modes (i.e., the telephone) to high-cue communication modes (i.e., face-to-face communication and video conferencing).

Use of reduced cues was predicted to be negatively associated with relationship development, such that individuals in more developed relationships would use reduced-cue communication modes for a smaller proportion of their communication with their partners. In Study 1, this hypothesis was tested by asking participants to estimate the proportion of their communication that occurred via each of several different communication modes. In Study 2, the proportions of communication that occurred via low-cue and moderate-cue communication modes during the study period were calculated, and these values were used to test the hypothesis. The results revealed that in romantic relationships in Study 1, use of both low-cue and moderate-cue communication modes was negatively associated with relationship development. Use of low-cue communication modes was also negatively associated with relationship development in Study 2. These findings provide support for the AUM in the context of romantic relationships and are also consistent with previous research on long-distance friendships

that finds that the proportion of email, relative to the telephone, decreases as relationships become more developed (Utz, 2007). Of particular relevance to the AUM is the fact that these findings persisted after controlling for age and relationship length, which explained up to 33% of the variance in the use of communication mode affordances, suggesting that relationship development is still important after accounting for major demographic, such as age, associations with affordance use. Furthermore, these findings applied not only to individuals' reports of the proportions of communication mode use in their relationships (Study 1) but also to the proportions of communication mode use as calculated from their diary questionnaires (Study 2), suggesting that these findings represent actual communication mode use and are not merely an artifact of individuals' perceptions of communication in their relationships.

Importance of reduced cues in interaction was expected to be negatively associated with relationship development. This expectation was not supported, however. Importance of reduced cues was not associated with relationship development in either Study 1 or Study 2. In contrast to the AUM's prediction that increased relationship development and its associated decrease in concern regarding self-presentation and imposition would be central to understanding the importance of affordances in interaction, it is likely that other situational factors are more influential in determining the importance of reduced cues. For example, previous research has found that text-based communication is important in situations in which individuals are engaged in other tasks (e.g., in class or a meeting) and therefore cannot speak face-to-face or on the telephone (Rettie, 2009).

Conversational effectiveness. Contrary to the AUM, the use of low-cue communication modes was negatively associated with conversational effectiveness in Study 2. Although reduced cues offer potential benefits such as the ability to mask nonverbal cues, they also present potential drawbacks to interaction. For example, reduced cues might make it more difficult for interactants to establish common ground and mutual understanding in interactions (Clark & Brennan, 1991). The lack of visual and vocal feedback from one's partner that is inherent in low-cue communication modes might also make it more difficult for interactants to adjust their communication to their partners' responses and therefore make them less effective in interaction. These different potential impacts of reduced cues on conversational effectiveness suggest that future iterations of the AUM might be improved by examining the multiple mechanisms via which reduced cues might be associated with conversational effectiveness. Such mechanisms might also be more or less important at different levels of relationship development. For example, because partners are better at predicting each others' responses in interaction (Altman & Taylor, 1973), visual and vocal feedback might be less important in more developed relationships.

Furthermore, the interaction of perceived reduced cues and relationship development on conversational effectiveness was significant. The AUM predicts that the association between reduced cues and conversational effectiveness will be weaker as relationship development increases. Decomposition of the interaction confirmed this expectation, such that the association between perceived reduced cues and relationship development was statistically significant at low but not high levels of relationship

development. However, the direction of the association between perceived reduced cues and conversational effectiveness at low levels of relationship development was negative, not positive as expected. It might be that individuals in more developed relationships are better able to cope with a lack of feedback from their partners because of their greater knowledge of and comfort with their partners.

Conversational appropriateness. Use of both low- and moderate-cue communication modes was positively associated with conversational appropriateness in Study 2. This finding supports the AUM, which (drawing from hyperpersonal theory; Walther, 1996, 2007) argues that increased controllability and the ability to reallocate cognitive resources from monitoring of one's own and one's partner's nonverbal behaviors to message planning in reduced-cue interactions enables individuals to construct what they perceive to be more appropriate messages. Furthermore, this finding extended to moderate-cue communication modes such as the telephone, which offer vocal cues such as tone of voice but not visual cues such as facial expressions, body posture, and hand gestures. The finding that use of moderate-cue communication modes was associated with greater appropriateness in Study 2 suggests that even smaller reductions in available cues (compared to the reductions associated with low-cue, text-based communication modes) might enable message planning during conversations.

Use of low-cue communication modes was positively associated with conversational appropriateness but negatively associated with conversational effectiveness in Study 2. This finding is particularly noteworthy given that conversational effectiveness and conversational appropriateness were positively

correlated in that study and are subscales of the same conversational competence scale (Canary & Spitzberg, 1989). Taken together, these findings suggest that the associations between communication mode affordances and conversational outcomes are complex. Future research using the AUM will require a more nuanced examination of the multiple ways in which communication mode affordances might simultaneously positively (e.g., via reallocation of cognitive resources and control over message sending) and negatively (e.g., via reduced feedback from one's partner) influence conversations between romantic partners.

In contrast to the findings regarding use of low- and moderate-cue communication modes and the predictions of the AUM, perceived reduced cues was negatively associated with conversational appropriateness in all tests of this hypothesis (i.e., in both friendships and romantic relationships in Study 1 and in romantic relationships in Study 2). As outlined above regarding conversational effectiveness, it might be that the lack of feedback makes it more difficult for interactants to achieve mutual understanding (Clark & Brennan, 1991) and respond effectively to their partners' feedback. This finding runs counter to the finding (also in Study 2) that use of low-cue and moderate-cue communication modes was positively associated with conversational appropriateness. These findings suggest that more specifically incorporating perceptions into the AUM, likely as they relate to norms or expectations established within individuals' ongoing relationships, would help improve the explanatory power of the model.

Self-disclosure breadth. The AUM predicts that self-disclosure breadth is positively associated with the use of reduced cues. Contrary to this expectation, the use

of low-cue communication modes was negatively associated with self-disclosure breadth in two out of three tests of this hypothesis (i.e., for friendships but not romantic relationships in Study 1 and for romantic relationships in Study 2). The use of moderate-cue communication modes was also negatively associated with self-disclosure breadth in two out of three tests of the hypothesis (i.e., for romantic relationships but not friendships in Study 1 and for romantic relationships in Study 2). These findings contradict previous research using zero-history interactions that find greater self-disclosure frequency when interactants use reduced-cue communication modes (Antheunis, Valkenburg, & Peter, 2007; Joinson, 2001; Tidwell & Walther, 2002) and suggest that instead, partners in proximal relationships likely use reduced-cue communication modes for communication that is fairly limited in scope, including routine everyday communication such as expressing affection (Coyne, Stockdale, Busby, Iverson, & Grant, 2011) or sending short messages to keep in touch or relay mundane information (Tong & Walther, 2010). In contrast to the AUM, such a pattern would be consistent with media richness theory, which argues that “leaner” (i.e., lower-cue, less-synchronous) communication modes are best-suited for communicating information that is lower in ambiguity (Daft & Lengel, 1986). It might be the case that the AUM is more applicable to strategic interactions, such as those when individuals have specific self-presentational goals in mind (e.g., Joinson, 2004; O’Sullivan, 2000), but not to more routine, everyday use of communication modes. Future research using the AUM will need to distinguish between these two uses of communication modes and their affordances.

Self-disclosure depth. Use of low-cue communication modes was negatively associated with self-disclosure depth in Study 2. Similarly, perceived reduced cues was negatively associated with self-disclosure depth in Study 2. Together, these findings suggest that the increased self-disclosure depth via low-cue (i.e., text-based) communication modes observed in studies of zero-history interactions (Tidwell & Walther, 2002) is likely not applicable to ongoing, mixed mode relationships. Instead, these findings support research that finds that in ongoing relationships, partners tend to prefer higher-cue communication modes for intimate conversations (Utz, 2007) and think that higher-cue communication modes are more personal than lower-cue communication modes (Dimmick, Kline, & Stafford, 2000; Stafford, Kline, & Dimmick, 1999). One goal of the AUM was to reconcile these disparate findings regarding zero-history and ongoing relationships. It might be the case that once an initial familiarity with one's partner is gained (e.g., after only one or a few interactions), the positive effects of reduced cues on self-disclosure depth disappear and are instead replaced with effects that are more consistent with media richness theory (Daft & Lengel, 1986) or social presence theory (Rice, 1993; Short, Williams, & Christie, 1976). If this is the case, then the current studies might have assessed relationships too far past the point at which this switch would occur, suggesting that tracking relationships from the first meeting to later stages of development might yield results that are more consistent with the AUM.

Asynchronicity

Because use of asynchronous and reduced-cue communication modes was confounded, tests of the dissertation hypotheses regarding use of asynchronous

communication modes could not be performed. However, tests of the hypotheses were performed regarding perceptions of the extent to which the communication mode used offered asynchronicity.

Conversational effectiveness. Contrary to the predictions of the AUM, perceived asynchronicity was not associated with conversational effectiveness in either Study 1 or Study 2. Although use and perceptions of reduced cues were negatively associated with conversational effectiveness in Study 2, perceptions of asynchronicity were not. This finding suggests that the lack of nonverbal cues inherent in reduced-cue communication modes might be a driving factor in the observed associations, as opposed to enhanced message planning abilities that both asynchronicity and reduced cues provide. If message planning factors were driving observed associations between communication mode affordances and conversational effectiveness, then we would expect to see these associations for both reduced cues (which allow the reallocation of cognitive resources from monitoring nonverbal behaviors to message planning; Walther, 1996) and asynchronicity (which allows individuals time to plan and edit messages before sending them; Walther, 1996). Future tests of the AUM should examine both of these mechanisms—lack of nonverbal cues and enhanced message planning—in order to determine whether and to what extent each mechanism is associated with conversational effectiveness. Such tests would allow for greater refinement of the model and the potential elimination of irrelevant theoretical pathways in the model.

Conversational appropriateness. Although no main effect was observed for the association between conversational appropriateness and perceived asynchronicity, a

significant interaction of perceived asynchronicity and relationship development on conversational appropriateness was observed in friendships in Study 1. At low levels of relationship development, perceived asynchronicity was positively associated with conversational appropriateness. In contrast, at high levels of relationship development, perceived asynchronicity was not associated with conversational appropriateness. These findings are consistent with the hypothesized associations and provide support for the AUM. The findings suggest that individuals' ability to take their time in constructing and sending a response to their partners is associated with constructing messages that those individuals perceive to be more appropriate, but that this association becomes weaker as relationships become more developed. At higher levels of relationship development, individuals have more experience with and knowledge about their partners (Altman & Taylor, 1973). According to the AUM, this experience and knowledge should diminish the extent to which asynchronicity will improve message construction. However, the interaction between perceived asynchronicity and relationship development was observed only in friendships, not in romantic relationships, suggesting that different types of relationships might derive benefits from asynchronicity to different extents. It is also not currently possible to know the reason for this association. Although the AUM provides the reason described above, it might be the case that topics of conversation that generally encourage greater appropriateness (e.g., talking about a familiar or easy topic) might tend to be discussed via asynchronous communication modes in friendships. Future research examining the specific content of communication via different modes would allow for more rigorous testing of these different explanations for the observed associations.

Self-disclosure breadth. Perceived asynchronicity was positively associated with self-disclosure breadth in friendships in Study 1. This finding is consistent with the AUM and also extends previous research regarding long-distance friendships that finds that friends tend to use asynchronous communication modes to “keep up” with each other and maintain their relationships (Tong & Walther, 2010; Utz, 2007) to proximal friendships.

However, a different pattern of associations was observed for romantic relationships in Study 1. At low levels of relationship development, the association between perceived asynchronicity and self-disclosure breadth was negative. At high levels of relationship development, this association was not significant. This finding is consistent with the logic of the AUM, given that the association between perceived asynchronicity and self-disclosure breadth was weaker as relationship development increased. However, this finding is also inconsistent with the model because the model predicts that self-disclosure breadth will be positive, not negative, at low levels of relationship development. If, as discussed above in regard to reduced-cue communication modes, individuals generally use asynchronous or near-synchronous communication modes such as text messaging for a limited range of tasks such as expressing affection (Coyne et al., 2011) or sending short messages to keep in touch or relay mundane information (Tom Tong & Walther, 2010), then this would explain the negative association between perceived asynchronicity and self-disclosure breadth at low levels of relationship development in romantic relationships. As romantic relationships become more developed, however, perceived asynchronicity becomes less strongly

associated with self-disclosure breadth, and asynchronous and synchronous communication modes appear to become more similar in regard to self-disclosure breadth. This finding suggests that the underlying logic of the AUM regarding the role of relationship development in effects of communication mode affordances is potentially correct, but that further theorizing is needed regarding the nature of these effects and the circumstances under which they occur. For example, as outlined above, the AUM might apply to strategic, but not routine, communication mode use.

Self-disclosure depth. Perceived asynchronicity was positively associated with self-disclosure depth in friendships in Study 1. This finding is contrary to some research that suggests that individuals prefer more synchronous communication modes when talking about intimate topics (e.g., Utz, 2007) but is consistent with the predictions of the AUM. Most research examining self-disclosure depth has examined reduced cues (e.g., Antheunis et al., 2007; Joinson, 2001; Tidwell & Walther, 2002), not asynchronicity. However, the results of the current study suggest that perceived asynchronicity might also be associated with increased self-disclosure depth in friendships. The AUM also predicts that self-disclosure depth will be associated with asynchronicity at moderate—but not high or low—levels of relationship development because at this point in relationships, individuals are beginning to explore each other in more depth but might feel threatened by deep self-disclosure. Asynchronicity can provide a “buffer” of sorts for messages that carry interpersonal risk (Joinson, 2004; O’Sullivan, 2000; Rettie, 2009); for deeper self-disclosures, partners can think about what they want to say and plan and edit both their own self-disclosures and their responses to their partners’ self-

disclosures. In contrast to this prediction, the association between perceived asynchronicity and self-disclosure depth in friendships did not vary as a function of relationship development, suggesting that asynchronicity might function similarly in regard to self-disclosure depth at different levels of relationship development.

Importance of asynchronicity. The AUM predicts that the importance of asynchronicity will be negatively associated with relationship development. This hypothesis was not supported. Instead, the main factor associated with the importance of asynchronicity in all three samples (although this association was only marginally significant in romantic relationships in Study 1) was convenience. This finding suggests that, as opposed to relationship development, the desire to use a convenient form of communication likely influences the extent to which asynchronicity is important in conversation. This finding does not, however, address why convenience—and as a result, asynchronicity—might be important in certain cases. For example, convenience was positively associated with relationship development in both friendships and romantic relationships in Study 1. It might be that individuals who have more experience with their partners give less thought to the communication mode that they use to communicate and simply choose what they perceive to be the most convenient communication mode (which also tends to be an asynchronous communication mode, according to zero-order correlations between those variables in the three samples). Such a phenomenon would be consistent with the mindlessness/mindfulness perspective on communication mode use, which suggests that over time, individuals fall into communication mode use patterns and give less consideration to strategic concerns regarding communication mode use

(Timmerman, 2002). Given the AUM's focus on relationship development, this perspective might fruitfully be integrated with the AUM to examine changing (or stabilizing) patterns of communication affordances use as relationships become more developed.

Use of asynchronicity was expected to be negatively associated with relationship development. This component of the AUM was only tested in Study 1 because use of asynchronicity and use of reduced cues were confounded in Study 2. In Study 1, this hypothesis was tested regarding the proportion of individuals' use of both asynchronous (i.e., email or letters) and near-synchronous (i.e., instant messaging and text messaging) communication modes in their relationships. No association between asynchronous or near-synchronous communication mode use and relationship development was observed in friendships. In romantic relationships in Study 1, consistent with the AUM, a negative association between use of near-synchronous communication modes and relationship development was observed. Although near-synchronous communication modes included both instant messaging and text messaging, the bulk of participants' interactions in this category occurred via text messaging. Previous research has found that partners often use text messaging as a way to send brief messages of affection or updates about one's day (Coyne et al., 2011; Rettie, 2009). Paired with Duck's observation that relationships are often maintained through routine, everyday interaction (Duck, 1988), this finding suggests that people in more developed relationships might use text messaging as a way to stay in contact with their partners and maintain their relationships. It is also noteworthy that this association was observed after controlling for age (which accounted

for 25% of the variance in use of near-synchronous communication modes), suggesting that relational factors such as relationship development are important above and beyond more commonly-examined demographic factors in text messaging or instant messaging use.

Convenience

Convenience of the communication mode used was included in all of the analyses of conversations as a control variable and exhibited consistent, and often fairly large, associations with the outcome variables of interest. Given the consistency of these associations and the potential relevance of convenience to the AUM, these findings are discussed below.

Convenience was positively associated with conversational effectiveness and appropriateness in all three tests of each outcome variable. Individuals who use channels that they perceive to be more convenient will likely feel more comfortable in the interaction and will feel less like they are imposing on their partners. This finding is not necessarily opposed to the AUM, which proposes that concern regarding imposition is one reason why individuals might prefer asynchronous communication modes, particularly at lower levels of relationship development. Important to this point is the finding that convenience exhibited significant zero-order correlations with perceived asynchronicity in all three samples. These associations suggest that the convenience of conversations via asynchronous communication modes might be one mechanism by which such modes encourage greater conversational competence and self-disclosure, as observed in previous studies. Researchers need to more closely examine the

mechanisms—such as convenience, message planning, and message editing—that are thought to encourage more positive outcomes in asynchronous communication modes in order to better understand the nature and extent of each mechanism’s influence on conversations.

Implications for the AUM

Overall, support for the AUM was mixed. In line with the model, relationship development was negatively associated with the proportion of near-synchronous, low-cue, and moderate-cue communication modes in romantic relationships in Study 1 and with the proportion of low-cue communication modes used in Study 2. These findings suggest that the model’s predictions regarding communication mode use as a function of relationship development were supported. Use of low- and moderate-cue communication modes was positively associated with conversational appropriateness in Study 2. Furthermore, perceived asynchronicity was positively associated with self-disclosure breadth and depth in friendships (Study 1), and was positively associated with appropriateness at low but not high levels of relationship development in friendships (Study 1).

Contrary to the model’s predictions, however, use of low- and moderate-cue communication modes was negatively associated with breadth in friendships (Study 1), and use of low-cue communication modes was negatively associated with conversational effectiveness, self-disclosure breadth, and self-disclosure depth in Study 2. Perceived reduced cues was negatively associated with appropriateness in all three samples. In Study 2, perceived reduced cues was negatively associated with self-disclosure depth and

was negatively associated with conversational effectiveness at low but not high levels of relationship development (the finding that the association was attenuated at higher levels of relationship development is consistent with the AUM, but the finding that this association was negative at lower levels of relationship development is not).

Taken as a whole, these findings suggest that revision of the model is necessary. Particularly, main effects for use of communication mode affordances were only consistent with the AUM for conversational appropriateness, whereas these main effects were contrary to the model for conversational effectiveness and self-disclosure breadth and depth. Use of reduced cues exhibited fairly consistent negative associations with self-disclosure breadth, suggesting that the ability to conceal one's nonverbal behaviors and reallocate cognitive resources from nonverbal monitoring to message planning and construction does not encourage individuals to self-disclose in greater scope to their partners. Instead, other mechanisms are likely in play regarding these findings, such as using reduced-cue communication modes for more task-based interactions (e.g., arranging a time to meet). It might be that individuals generally choose communication modes mindlessly in their personal relationships, based on previous patterns of use or reciprocation of their partners' communication mode choice (Timmerman, 2002). Combined with the finding that asynchronicity and reduced cues were associated with shallow, narrow communication, this argument would suggest that most communication in relationships is routine. It is likely that the associations predicted in the AUM apply to strategic but not routine interactions in personal relationships, and that examining

strategic interaction more specifically would yield findings more consistent with the model's predictions.

The AUM's predictions regarding role of relationship development in the associations between communication mode affordances and conversational outcomes were also generally not supported. As described above, it might be the case that the moderating role of relationship development in the associations of communication mode affordances and conversational outcomes is only present when individuals engage in strategic communication mode use. It might also be the case that the attenuation of these associations occurs very quickly in relationships, and that testing the AUM at earlier stages of relationship development than those tested in the current study would yield results that are more consistent with the model.

Furthermore, the AUM predicted separate but similarly-valenced associations of use and perceptions of communication mode affordances with conversational outcomes. However, in some cases these associations differed. For example, use of low-cue communication modes (which are also asynchronous or near-synchronous) was negatively associated with breadth in friendships (Study 1), but perceived asynchronicity was positively associated with breadth in the same sample. Similarly, in Study 2, use of low- and moderate-cue communication modes was positively associated with conversational appropriateness, but perceived reduced cues was negatively associated with conversational appropriateness. Future research using the AUM would likely benefit from more closely examining the nature and source of differences between perceived and "objective" communication mode affordances. An understanding of these

perceptions is particularly relevant given that the former tended to be more frequently related to conversational outcomes than were the latter. Furthermore, relationship development likely influences perceptions of communication mode affordances. Perceptions are likely more idiosyncratic to the relationship in more developed relationships, as individuals gain experience communicating with their partners via multiple communication modes.

Finally, further testing of the model could help to determine when and why associations between the variables in the model will occur. Previous research regarding the associations between communication mode use, conversational competence, and self-disclosure have tended to rely on experimental manipulations of communication modes in interactions between strangers. The findings of this dissertation suggest a more complex view of communication mode use for ongoing relationships. Because it incorporates theory and research regarding personal relationships into an understanding of communication mode use, the AUM presents a potential starting point for reconciling findings regarding communication mode use in zero-history and ongoing relationships.

Limitations

Although several strengths exist in the current studies, such as the assessment of both use and perceptions, the examination of both friendships and romantic relationships, and the use of a diary study in Study 2, several limitations exist as well. First, the methodologies employed in the current studies do not allow for causal claims to be made regarding the observed associations between communication mode affordance use and conversational outcomes. In ongoing relationships, where individuals regularly engage in

interactions with their partners and often have a choice regarding which communication mode to use in those interactions, the associations between communication mode affordance use and conversational outcomes is likely to be complex. Such associations are likely attributable to a range of cooccurring factors, such as strategic use of communication modes to achieve desired conversational outcomes, routine use of frequently-used communication modes, and retrospective attributions about communication mode affordances based on perceived outcomes of interactions. Mixed congruence between the current findings and previous experimental findings underline this likelihood. Although this dissertation presents an initial step in testing the AUM and the role of affordances in conversational outcomes, more research is needed to disentangle these multiple likely influences within the model.

Second, the majority of participants in each study were women. This pattern was particularly pronounced in Study 2, in which almost 90% of the sample was women. The predominance of women in the sample could bias the findings in several ways. First, it is unclear whether women might be more or less benefitted than are men by the opportunity to mask their nonverbal cues in reduced-cue communication modes. Women tend to be more adept at nonverbal communication and more likely to exhibit congruent verbal and nonverbal messages than are men in face-to-face interactions (Laurenceau & Kleinman, 2006). As a result, women might be less benefitted by the ability to conceal nonverbal cues via reduced-cue communication modes than are men, leading to an attenuation of associations between affordance use and conversational outcomes in the current studies. Alternatively, women tend to be more nonverbally expressive than men (Hall, Carter, &

Horgan, 2000), suggesting that they might benefit to a greater degree than men do from the ability to mask their nonverbal cues via reduced-cue communication. Second, research regarding instant messaging interactions in personal relationships has found that women tend to report greater communication quality than do men (Ramirez & Broneck, 2009), suggesting that men and women might differently use or benefit from communication mode affordances.

Third, participants tended to report fairly high levels of relationship development, and little variation in relationship development within each sample. Participants who reported on both friendships and romantic relationships tended to be engaged in long-lasting, highly developed relationships in which they presumably had high levels of knowledge about their relational partners with which to construct effective and appropriate messages and tend to self-disclose freely. This combination of a ceiling effect and restriction of range for relationship development present challenges to testing the AUM, given that the model focuses on relationship development as a key moderator of the associations between communication mode affordances and conversational outcomes. Because the AUM predicts weak or nonexistent associations between affordance use and conversational outcomes at high levels of relationship development, the lack of support for the model in the current studies could be attributed to the generally high levels of relationship development in the samples. It is possible that the hypothesized main effects that were not found (e.g., positive associations between self-disclosure and affordance use, positive associations between conversational effectiveness and affordance use) would be found at truly low levels of relationship development, as

they have been for strangers in previous research. Similarly, examining a broader range of relationship development might lead to finding more significant interactions between affordance use and conversational outcomes.

Third, asynchronicity and reduced cues were confounded in the coding of communication affordance use. Participants primarily used face-to-face communication, the telephone, and text messaging for their conversations with their partners. Therefore, it is not clear to what extent the asynchronicity of a communication mode, as opposed to the reduced cues of a communication mode, are responsible for the observed associations of conversational outcomes with communication mode use. Future research might randomly assign participants to report on interactions via different communication modes in order to allow the disentanglement of asynchronicity and reduced cues in communication mode use. Furthermore, the fact that the majority of conversations occurred via one of three communication modes means that it is also difficult to disentangle the use of the particular modes from the use of the affordances provided by those modes. Future research could deal with by randomly assigning respondents to multiple communication modes that offer the same set of affordances (e.g., using face-to-face or video conferencing for high-cue synchronous communication; using instant messaging or text messaging for low-cue near-synchronous communication), although such a design would be limited by the availability of multiple communication modes with each set of affordances.

Directions for Future Research

The current studies suggest several different directions for future research. Future research needs clearer understandings of how and why communication mode affordances might affect communication in personal relationships. Furthermore, future research should examine how these effects differ as a function of relationship type.

Role of Communication Mode Affordances

Although the AUM hypothesized main effects of communication affordances on conversational effectiveness, conversational appropriateness, self-disclosure breadth, and self-disclosure depth based on previous research, support for these hypotheses was inconsistent. Much research on the associations between these variables has occurred in interactions between strangers (e.g., Antheunis et al., 2007; Joinson, 2001; Tidwell & Walther, 2002; Walther, 2007) or in task-based interactions (e.g., Honeycutt, 2001; Nowak, Watt, & Walther, 2005). A better understanding is needed of what aspects of conversation in personal relationships are influenced by communication mode affordances, and under what circumstances those influences will be observed. Survey research on these influences likely combines multiple phenomena—including the tendency for communication mode affordances to influence interaction and the tendency for individuals to choose communication modes that suit their purposes. Future experimental research could help to disentangle these two simultaneous influences on associations between communication mode affordances and conversational outcomes by randomly assigning partners to specific communication modes.

Experimental research in the domain of communication mode affordance and personal relationships could also help to identify the nature and extent of the multiple mechanisms hypothesized to be at work in the influence of communication mode affordances on conversational outcomes. Current research and theory identifies several potential benefits and drawbacks to asynchronicity and reduced cues in conversation. For example, asynchronicity allows individuals time to plan and edit their responses (Walther, 1996) but can also impair responses to one's partner because feedback regarding one's message is delayed. Similarly, reduced cues allow individuals to mask potentially undesirable nonverbal behaviors (Walther, 1996), but the social information one receives from one's partner's nonverbal behaviors can be important to reducing uncertainty in an interaction (Burgoon et al., 2002). Future research needs to disentangle these competing influences in order to better predict the overall effect that communication mode affordances will have on conversations. Experimental research could do so by, for example, allowing individuals to observe their partners while visually obscuring individuals from their partners' view.

Influence of Relationship Type

Study 1 examined both friendships and romantic relationships. Although the hypotheses associated with the AUM were initially assumed to apply similarly to both friendships and romantic relationships, this assumption was not supported by the data. Four of the observed associations in Study 1 were significant for friends but not romantic relationships (although one of these was marginally significant for romantic relationships), and six of the observed associations in Study 1 were significant for

romantic relationships but not friendships (although one of these was marginally significant for romantic relationships). In no cases was the same significant association observed for both friendships and romantic relationships. These findings suggest that communication mode affordances play different roles in romantic relationships and friendships. Future research will need to examine potential reasons for these differences. Norms and expectations regarding communication mode use likely differ in friendships and romantic relationships. Friends and romantic partners also likely use communication mode affordances differently. For example, the finding in previous research that romantic partners primarily use text messaging to send brief notes of affection (Coyne et al., 2011; Rettie, 2009) is probably less applicable to friendships, especially those that are not particularly close.

Chapter Summary

Chapter 6 reviewed the findings of the two studies testing the dissertation hypotheses derived from the AUM, discussed the implications of those findings for the AUM and research regarding communication mode affordances in personal relationships, and offered suggestions for future research in this area. Overall, the AUM—which predicted that use of communication mode affordances and the outcomes of that use will vary as a function of relationship development—was not supported. However, several associations between communication mode affordance use and conversational outcomes of conversational effectiveness, conversational appropriateness, self-disclosure breadth, and self-disclosure depth were observed that suggest directions for future research. Future research needs to strive for a better understanding of mutual,

opposing influences on the role of communication mode affordances in personal relationships. Furthermore, observed differences between friends and romantic relationships suggest the need for a more comprehensive understanding of how and why relationship type is associated with use of communication mode affordances and the outcomes of that use.

APPENDIX A: INTERPERSONAL SOLIDARITY SCALE (WHEELESS, 1978)

We are very close to each other.

This person has a great deal of influence over my behavior.

I trust this person completely.

We feel very differently about most things.^b

I willingly disclose a great deal of positive and negative things about myself, honestly and fully (in depth) to this person.

We do not really understand each other.^a

This person willingly discloses a great deal of positive and negative things about himself honestly and fully (in depth) to me.

I distrust this person.^a

I like this person much more than most people I know.

I seldom interact/communicate with this person.^a

I love this person.

I understand this person and who he (she) really is.

I dislike this person.^a

I interact/communicate with this person much more than with most people I know.

We are not very close at all.^a

We share a lot in common.

We do a lot of helpful things for each other.

I have little in common with this person.^a

I feel very close to this person.

We share some private ways of communicating with each other

^a Item is reverse-coded.

^b Item was dropped based on results of the confirmatory factor analysis.

APPENDIX B: CONVERSATIONAL APPROPRIATENESS AND EFFECTIVENESS

SCALES (CANARY & SPITZBERG, 1987)

Conversational Appropriateness

I said several things that seemed out of place in the conversation.^a
 I was a smooth conversationalist.^b
 Everything I said was appropriate.
 Occasionally, my statements made him/her feel uncomfortable.^a
 My conversation was very suitable to the situation.
 Some of the things I said were awkward.^a
 My communication was very proper.
 I said some things that should not have been said.^a
 S/he was embarrassed at times by my remarks.^a
 Some of my remarks were inappropriate.^a
 S/he was comfortable throughout the conversation with my remarks.
 Some of the things I said were in bad taste.^a
 None of my remarks were embarrassing to him/her.
 I said some things that were simply incorrect to say.^a
 I did not violate any of his/her expectations in the conversation.
 The way I said some of my remarks was unsuitable.^a
 The things I spoke about were all in good taste as far as I'm concerned.
 Some of my remarks were simply improper.^a
 I interrupted him/her in the conversation.^a
 At least one of my remarks was rude.^a

Conversational Effectiveness

Our conversation was very beneficial.
 The other person was more active in the conversation than I was.^{a, b}
 I achieved everything I hoped to achieve in our conversation.^b
 It was a useless conversation.^a
 I was in control of the conversation.^b
 I was effective in the conversation.
 Our conversation was unsuccessful.^a
 I just let the other person talk most of the time.^{a, b}
 I got what I wanted out of the conversation.
 The conversation was unprofitable.^a
 It was an advantageous conversation.
 I was an ineffective conversationalist.^a
 I didn't know what was going on in the conversation.^a
 It was a rewarding conversation.
 The other person dominated the conversation.^a

I talked most of the time.^b

I found the conversation to be very useful and helpful.

The other person controlled the conversation.^{a, b}

The conversation went pretty much the way I wanted.

The conversation was very unrewarding.^a

^a Item is reverse-coded.

^b Item was dropped based on results of the confirmatory factor analysis.

APPENDIX C: SELF-DISCLOSURE BREADTH AND DEPTH SCALES (PARKS &
FLOYD, 1996)

Breadth

Our communication was limited to just a few specific topics.^a
Our communication ranged over a wide variety of topics.
Once we got started we moved easily from one topic to another.

Depth

I told this person exactly how I feel.
I felt quite close to this person.
I tried to keep my personal judgments to myself when this person said or did something
with which I disagree.^{a, b}
I told this person what I liked about her or him.
I felt I could confide in this person about almost anything.
I did not tell this person anything intimate or personal about myself.^a
I told this person things about myself that he or she could not get from any other source.
Our communication stayed on the surface of most topics.^{a, b}

^a Item is reverse-coded

^b Item was dropped based on results of the confirmatory factor analysis.

APPENDIX D: DIARY INSTRUCTIONS

This booklet contains several copies of a survey that ask about conversations you have with your partner, the same person about whom you completed the first survey in the lab session. Please fill out 1 of these surveys every time you have a conversation with this person. Conversations can occur in many different channels, such as face-to-face or over the phone, text messaging, or email. You should record all of your conversations with this person, regardless of the channel it occurs in. Just sitting next to the other person or exchanging greetings is not a conversation. A conversation is usually an exchange of multiple messages between at least two people about a topic or several topics and might occur in a single time and place (such as a face-to-face conversation) or over a longer time period (such as an email conversation over the course of a day or two). If you're unsure whether or not an interaction you had should be recorded, it's best to be safe and record it. You can also contact the researcher, Erin Ruppel, at eruppel@email.arizona.edu or 520-395-7841 if you have questions about whether or how to record a conversation.

Please record every conversation as soon as you can after it happens. It is very important that you record every conversation as soon as possible and report on it as accurately as possible. Each booklet is designed to capture a day's worth of conversations with your partner. Once the day is over, you should seal the booklet and keep it someplace safe until you can return it to the researcher. Although you have been provided with several copies of the survey in each booklet, do not feel like you have to fill out all of the surveys. Just fill out 1 for every conversation you have with your partner.

If you have **any questions** about the survey or how to properly fill it out (including whether or not something counts as a conversation), please contact the researcher, Erin Ruppel, immediately at eruppel@email.arizona.edu or 520-395-7841.

APPENDIX E: DIARY QUESTIONNAIRE

Please choose one of the following to indicate how you communicated with your partner in this conversation.

___ Face-to-face ___ Telephone ___ Email ___ Instant messaging
 ___ Text messaging ___ Video conferencing ___ Social network sites
 ___ Other: _____

About how much time would you say you spent in this conversation with your partner? If the conversation lasted over a period of time (for example, a text message conversation where there were gaps between sending and receiving messages), only include the time you actually spent constructing or reading messages, not the time gaps in between messages.

_____ minutes

About what time did the conversation happen? (you can provide the starting time or, if the conversation occurred over a long period of time, a range of times) _____

Please circle how much you agree/disagree with each of the following statements about your conversation with your partner.

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
The channel I used allowed me to receive and respond to my partner's messages on my own schedule.	1	2	3	4	5	6	7
The ability to receive and respond to my partner's messages on my own schedule was important to me in this conversation.	1	2	3	4	5	6	7
The channel I used allowed me to conceal a wide range of cues (such as facial expressions, tone of voice, or gestures) from my partner	1	2	3	4	5	6	7
The ability to conceal a wide range of cues (such as facial expressions, tone of voice, or gestures) from my partner was important to me in this conversation.	1	2	3	4	5	6	7
Some of my remarks were inappropriate.	1	2	3	4	5	6	7
I was a smooth conversationalist.	1	2	3	4	5	6	7
I achieved everything I hoped to achieve in our conversation.	1	2	3	4	5	6	7

I was an ineffective conversationalist.	1	2	3	4	5	6	7
Our communication was limited to just a few specific topics.	1	2	3	4	5	6	7
Our communication ranged over a wide variety of topics.	1	2	3	4	5	6	7
I felt I could confide in this person about almost anything.	1	2	3	4	5	6	7
I did not tell this person anything intimate or personal about myself.	1	2	3	4	5	6	7

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