

KEEPING CONNECTED IN THE FACEBOOK AGE: THE RELATIONSHIP BETWEEN
FACEBOOK USE, RELATIONSHIP MAINTENANCE STRATEGIES, AND RELATIONAL
OUTCOMES

By

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ABSTRACT

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Arguably, the technical features of social network sites simplify the process of maintaining and interacting with hundreds of social connections. At the same time, however, these sites' affordances—namely the visibility and persistence of content and the articulation of those connections (e.g., through a “Friend List”)—raise new questions about how individuals engage in relationship maintenance with various types of ties. This dissertation seeks to expand our understanding of relationship maintenance processes to account for the unique affordances of these communication technologies through a survey of adult Facebook users (N=407). First, through exploratory factor analysis, it establishes a set of Facebook relationship maintenance strategies that reflect existing theory and measures while accounting for the affordances of social media. Next, through nested OLS regressions, it tests whether engagement in these strategies with a randomly selected Facebook Friend predicts three relational outcomes: relational closeness, relational satisfaction, and access to social provisions. Third, it tests whether engagement in these strategies is associated with perceptions that using Facebook positively impacts their perceived relational closeness and relational stability with that Friend, while controlling for existing levels of relational closeness. Findings indicate main effects for all four relationship maintenance strategies on perceptions of Facebook's impact on relational closeness and relational stability, as well as interaction effects between existing relational closeness and multiple strategies in predicting these two outcomes, such that weaker ties who engage in these

strategies view the site as having a more positive impact on their relationship than stronger ties.

Subsequent analyses identify additional differences between those who primarily rely on Facebook to communicate with that Friend and those who do not, as well as those who are geographically distant from each other versus those who live nearby, while controlling for existing relational closeness. This study contributes to the extant literature on computer-mediated communication and relationship maintenance by extending our understanding of how individuals interact through mediated channels and the role that newer technologies like social network sites play in managing a wide range of relationships, especially weaker ties who are more likely to rely on social media to keep their relationship in existence.

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INTRODUCTION

The introduction of new communication technologies has dramatically impacted the process of interacting with members of one's existing social network, as well as increased individuals' ability to expand that network by lowering the costs associated with finding and connecting with previously distant or unknown individuals. Computer-mediated communication (CMC) technologies such as email and video conferencing have dramatically changed both organizational and interpersonal communication, and scholars have spent the last three decades studying the impacts they have on how, what, and with whom we communicate.

While all forms of CMC may positively impact the relationship maintenance process, recently researchers have argued that social media contain a number of unique affordances that differentiate sites like Facebook from other forms of CMC and, in some situations, may enhance communication processes (e.g., boyd, 2010; Treem & Leonardi, 2012). For example, the association of connections via the Friends¹ feature serves a vetting function to help verify one's identity on a social network site (SNS), while the persistence of content allows an archivable record of interactions that can later be searched and updated.

Facebook is currently the focal point of both researchers' and users' social media attention, with one billion active monthly users worldwide (Facebook, 2012). Half of all adult Americans (65% of Internet users) have a profile on a SNS (Madden & Zickhur, 2011), with 92% of SNS users maintaining a profile on Facebook, and the average user having 229 Friends on the site (Hampton, Goulet, Rainie, & Purcell, 2011a). Research highlights a large overlap

¹ Following previous articles on SNSs (boyd & Ellison, 2007; Ellison, Steinfield, & Lampe, 2011), capitalized instances of the word "Friend" refer to individuals with whom a person has formally articulated a relationship through Facebook, whereas lowercased instances of the word refer to its more colloquial definition.

between individuals' full social network and their Facebook Friends (Hampton et al., 2011a), and the majority of users actively use communication features to interact with other users, including broadcasting updates, "Liking" and commenting on other users' content, and engaging in private communication through the site (Rainie, Purcell, & Smith, 2011).

While sites like Facebook enable users access to a greater *quantity* of information and individuals than was previously possible, they may also affect the relationship maintenance process. These sites provide a series of tradeoffs: while SNSs prevent engagement in a number of relationship maintenance behaviors researchers have identified as requiring collocation (for a summary of strategies, see Stafford, 2010), the convenience of the sites—in terms of mobility, simplicity, and variety of communication features—may enable individuals to feel close even when they are geographically distant, a psychological condition Korzenny (1978) termed "electronic propinquity." Recently, researchers have called for more research to examine how these sites—with features that enable mass broadcasting of content, interactivity, and managing hundreds of connections—impact relationship maintenance (e.g., Tong & Walther, 2011; Walther & Ramirez, 2009). For example, many of the most common behaviors performed on Facebook—such as Liking² a status update or commenting on a photo—constitute a form of relationship maintenance and may aid the process of keeping the relationship "in a specified state or condition" (Dindia & Canary, 1993, p. 164). By this definition, Facebook may serve an equally important role for one's weaker connections—for whom Facebook may be the sole or primary method of communication—as it does for closer ties.

² Capitalized instances of "Like" and/or "Liking" refer to the Facebook feature in which users can "Like" content, including status updates, photos, links, and videos shared by Friends. Hampton et al. (2011a) found Liking content to be the most commonly performed daily activity on Facebook. Ellison et al. (2011b) argue this behavior serves a relationship maintenance purpose by signaling one's presence in a Friend's network and showing support for the Friend.

The literature is inconclusive regarding the assumption that Facebook plays any role in the relationship maintenance process. Evolutionary psychologist Robin Dunbar has repeatedly argued (e.g., 2011, 2012) that humans' cognitive capacity to engage in *meaningful* relationships remains limited even with new technologies. An analysis of server-level data by Facebook's Data Team (2009) found that most users only interacted with a very small percentage of their network while they "maintained relationships" (operationalized as monthly profile visits) with three to four times as many people. Other researchers have explicated the potential negative outcomes of SNS use, including promoting anti-social behavior and increasing narcissism (Carpenter, 2012), as well as the perceived impersonal nature of communication occurring through public, one-to-many channels (Vitak & Ellison, in press).

While SNSs provide a quick and convenient method to connect and interact with a large number of people, the true impact these sites have on users' ability to maintain satisfactory relationships with a variety of relational ties requires further examination. A decade ago, Walther and Parks (2002) noted that "modern relationships may have outgrown our theories about them" (p. 549). While the authors were reflecting on early CMC theories' inability to account for the rise of mixed mode relationships—such as those that originate online and then migrate offline—the observation still holds merit in the Facebook age, as many modern relationships move across multiple channels: public and private, online and offline, primarily text-based and those including a variety of multimedia content. Therefore, it is important to consider the role that social network sites like Facebook—which contain affordances that differentiate them from other forms of CMC—play in the relationship maintenance process, as well as the benefits individuals accrue through their use of these sites, as these findings will help drive theory development.

The dissertation will proceed as follows. Due to the unique affordances of SNSs, traditional measures of relationship maintenance do not sufficiently capture the range of behaviors individuals engage in through the site; therefore, a new set of strategies must be established. Following a review of the literature, findings will be presented from a survey of adult Facebook users who randomly selected a Facebook Friend and answered a series of behavioral and relational questions about that person. Study 1a uses exploratory factor analysis to develop a set of Facebook relationship maintenance strategies that are specific to the site and reflect social media's affordances while accounting for more than 30 years of research on relationship maintenance. Study 1b then uses a series of multivariate analyses to determine whether these relationship maintenance strategies are related to three general relational outcomes—closeness, satisfaction, and social provisions—as well as to two Facebook-specific outcomes measuring Facebook's impact on perceptions of relational closeness and relational stability. Interaction effects between existing relational closeness and engagement in relationship maintenance strategies are also tested for the latter outcomes. A final set of analyses tests whether factors such as communication channel, geographic proximity, and gender-dyad composition is correlated with engagement in the strategies and relational outcomes.

Overall, this study contributes to the extant literature in both relationship maintenance and computer-mediated communication by providing new insights into how new communication technologies are impacting individuals' relationship maintenance practices with a variety of connections in their social network. Furthermore, this research offers new methodological tools and theoretical considerations for researchers studying relationship maintenance in the digital age.

RELATIONSHIP MAINTENANCE, ON- AND OFFLINE

The process through which relationships are formed, maintained, and dissolved has been studied and theorized about for more than half a century, and communication plays a key role in “relationshiping,” (Duck, 1991), or the process through which relationships develop from strangers to friends. A number of terms have been propagated to describe the process of relationship development; for example, Knapp and Vangelisti (2005) described two main processes (Coming Together and Coming Apart) across 10 stages. In Social Penetration Theory, Altman and Taylor (1973) proposed a four-stage model of relationship development characterized by increasing depth and breadth of disclosures between partners; relationship dissolution followed an inverse path to that of formation. Knapp and Vangelisti (2005) noted that movement through relational stages is generally systematic and sequential, may occur forward or backward, may be slow or fast, and is always overlaid by dialectical tensions between partners. Baxter and Bullis (1986) favored a more non-linear approach to relationship development, arguing that relationships evolve based on critical moments that change the relationship’s momentum in either direction. Altman and Taylor’s (1973) model included both communicative and psychological processes, while Knapp and Vangelisti (2005) focus exclusively on the communicative process underlying individuals’ movement through the relational stages. As noted by Duck (1988), relationship maintenance behaviors—the steps individuals take to preserve a relationship—are performed more often than processes related to relationship formation and dissolution, as maintenance stages constitute the majority of two individuals’ relationship lifecycle.

In conceptualizing relationship maintenance, Dindia and Canary (1993) put forth four commonly used definitions. The first definition, drawing from Duck (1988), is “to keep a

relationship in existence” (p. 164), and most likely reflects the most broad-based understanding of the concept. Second is “to keep a relationship in a specified state or condition,” (Dindia & Canary, 1993, p. 164), which could be interpreted to refer to maintaining current levels of intimacy (e.g., Ayres, 1983), trust (Stafford & Canary, 1991), or any other dimension that classifies dyadic relationships. Third is “to keep a relationship in a satisfactory condition” (p. 165) and suggests that as long as both partners are satisfied with the current state of the relationship, the relationship’s quality does not matter. The final definition is “to keep a relationship in repair” (p. 165) and may reflect individuals’ desire to fix existing problems in a relationship—and bring it back to some degree of stability or satisfaction.

These definitions provide insight into important relational constructs to consider related to the relationship maintenance process individuals engage in with various others. The third definition suggests that individuals perform relationship maintenance to uphold a desired degree of relational satisfaction with a partner—presumably, when there is an inequity in the relationship and one individual feels over- or under-benefitted, s/he will take steps to restore that balance (Hatfield, 1983). Interestingly, none of these definitions specifically link increased engagement in relationship maintenance to *increased* perceptions of relational qualities like closeness or satisfaction, but rather focus on maintaining *existing* levels or, at the very least, keeping the relationship above a minimum threshold.

What types of behaviors characterize relationship maintenance? At a basic level, any interaction between a dyadic pair constitutes a form of relationship maintenance. Other behaviors may include reciprocal disclosures and provisions of social, emotional, and physical support, among others. Maintenance behaviors comprise the largest portion of a relationship’s life (Duck, 1988). Relationship maintenance is based on communication between people; as Dindia (2003)

notes, “To maintain a relationship, partners must communicate with one another. Conversely, as long as people communicate, they have a relationship. The end of a relationship occurs when people stop communicating” (p. 1). Relationship maintenance includes both verbal and non-verbal behaviors (Duck, 1986, 1988); for example, a hug may serve a greater maintenance role than a phone call, depending on the context. Both the quality and quantity of communication should vary based on the type of relationship and the strength of the tie, as noted by both Granovetter (1973) and Weiss (1974) in their definitions of tie strength.

Research over the last decade has established that technologies such as email (Baym, Zhang, & Lin, 2004; Boneva, Kraut, & Frohlich, 2001; Hampton & Wellman, 2001; Johnson, Haigh, Becker, Craig, & Wigley, 2008; Stafford, Kline, & Dimmick, 1999) and instant messaging (Miczo, Mariani, & Donahue, 2011; Ramirez & Broneck, 2009; Valkenburg & Peter, 2009) play an important relationship maintenance role, often supplementing other forms of communication when physical distance prohibits frequent face-to-face communication. When compared with “richer” communication channels such as phone calls and in-person interactions, mediated channels are often—but not always—rated as less important for maintaining a relationship (e.g., Baym et al., 2004). That said, a major difference exists between email and IM, which are conducted through a more private channel, and SNSs like Facebook, which prioritize public, one-to-many communication. Facebook provides a low-cost mechanism through which to connect and interact with a wide range of people, and users appear to be embracing the site’s many interaction-centric features, as seen in the high frequency of daily and weekly use of features such as Liking content, commenting on status updates, and commenting on photos by American adults (Hampton et al., 2011a).

Measuring Relationship Maintenance: Strategies and Behaviors

Once formed, relationships are maintained through a series of behaviors and routines (Duck, 1988). In developing their measure of relationship maintenance behaviors among romantic couples, Stafford and Canary (1991) identified four characteristics of relationship maintenance processes: control mutuality, or the degree of agreement between partners regarding who makes decisions related to goals, behaviors, and routines; commitment to one's partner, which has been linked to relational satisfaction in previous work (e.g., Rusbult, 1983); mutual liking, which has been linked to relationship longevity (see Rubin, 1973, although this may not be the case under Dindia & Canary's, 1993, third definition of relationship maintenance) and intimacy (Altman & Taylor, 1973); and relational satisfaction, which is among the most common constructs of relationship maintenance studied and features prominently in one of Dindia and Canary's (1993) definitions, i.e., "to keep a relationship in a satisfactory condition" (p. 165). From an inventory of 78 items, Stafford and Canary (1991) established a five-factor taxonomy of relationship maintenance strategies, which they labeled as *positivity*, or the quality of being polite, engaging, and maintaining enjoyable interactions; *openness*, which reflects a desire to self-disclose, especially regarding the state of the relationship; *assurances*, which includes both showing and telling one's partner that the relationship matters; *shared tasks*, or helping to complete any shared responsibilities; and *networks*, or interacting with each others friends and family. The five-factor typology was subsequently broken into 10 categories with the addition of joint activities; cards, letters, and calls; avoidance; antisocial; and humor (Canary, Stafford, Hause, & Wallace, 1993).

The role of routine and everyday communication in maintaining relationships was first highlighted by Duck (1988, 1994), and several researchers have acknowledged the role of this

form of interaction in developing measures of relationship maintenance. For example, Dainton and Stafford (1993) found that the shared tasks behavior was most frequently reported among dating and married couples; they argued that this indicated it was a routine—rather than strategic—relationship maintenance behavior. Stafford, Dainton, and Haas (2000) identified seven maintenance strategies that may be either strategic or routine in a given interaction: advice, assurances, conflict management, openness, positivity, sharing tasks, and social networks; however, the authors refrained from distinguishing between strategies that are more or less likely to be routine or strategic. Rabby (2007) created a four-item measure to more directly capture Duck's (1994) conceptualization of routine interaction, including sharing mundane details from one's day and the various daily rituals one engages in.

Recently, Stafford and Canary's (1991) original measurement underwent a significant revision to account for numerous problems, including double- and triple-barreled questions, quantifiers, modifiers, and ambiguity. Stafford (2010) details the development of the new measurement, the Relationship Maintenance Behaviors Measure (RMBM) in three studies. The new measure includes seven categories: positivity, understanding, self-disclosure, relationship talks, assurances, tasks, and networks. Some notable changes between the original (RMSM) and revised (RMBM) scales include that the original (Stafford & Canary, 1991) scale's openness factor is now reflected in two separate constructs, self-disclosure and relationship talks, while positivity has been expanded to include a second, related factor (understanding).

Since the development of Stafford and Canary's (1991) original typology, numerous studies have examined how individuals' use of these strategies varies based on individual characteristics. Stafford and Canary (1991) found both gender and relationship-type differences in use of these strategies when looking at four types of romantic relationships, suggesting that

different types of relationships call for different relational strategies when one seeks to maintain a satisfactory relationship with his or her partner. This finding was supported in subsequent research finding that people use more maintenance behaviors for romantic partner and family members than friends (Canary et al., 1993).

Relationship Maintenance Via Computer-Mediated Communication

Early research in CMC embraced the cues-filtered-out perspective (see Culnan & Markus, 1987, for a review), which argued that the medium was incapable of supporting the development and maintenance of interpersonal relationships and was best suited for task-based communication that precluded social interaction (e.g., Kiesler, 1986; Sproull & Kiesler, 1986). This perspective drew heavily on popular psycho-social theories of the time, most notably Social Presence Theory (Short, Williams, & Christie, 1976), which posited that CMC, containing few social context cues, increased task orientation, disinhibition, and hostility, and was generally suitable only for more impersonal communication (e.g., Kiesler, 1986). However, subsequent research, including case studies (e.g., Rheingold, 1993), empirical work (e.g., Parks & Floyd, 1996), and theoretical development (e.g., Walther, 1992a, 1996), established that the cues-filtered-out perspective does not generally apply to more interpersonal online communication. Specifically, Walther (1992a) proposed in his Social Information Processing (SIP) theory that interpersonal relationships can and do form via online interaction, albeit at a slower rate than comparable offline interaction due to technological constraints. Online interactions contained fewer verbal and non-verbal cues, so interaction partners based assessments on the cues available to them via text-based, asynchronous interactions.

Walther (1996, 2007) later pointed to specific technical affordances of CMC—namely the asynchronous nature of most forms of online communication and the reduced-cues

environment that minimizes the impact of verbal and non-verbal attributes such as attire, speech patterns, and facial expressions—that allow individuals to spend more time planning, composing, and editing a message than would be possible in a face-to-face interaction. Walther had previously (1992b) noted the potential benefit of this feature of CMC, saying, “With more time for message construction and less stress of ongoing interaction, users may have taken the opportunity for objective self-awareness, reflection, selection and transmission of preferable cues” (p. 229). Therefore, it is important to acknowledge that communication broadly, and relationship maintenance specifically, occurring through mediated channels such as Facebook may be enacted and interpreted differently from similar processes occurring through non-mediated channels.

Theories of CMC emerging in the 1990s tended to focus on relationship *development* processes, rather than how technology may change or attenuate the relationship *maintenance* process; consequently, researchers examining relationship maintenance have generally applied existing interpersonal communication theories and taxonomies to online communication practices. It is important to note that online communication varies from older channels (e.g., face-to-face, phone) in some notable ways. Most importantly, the asynchronous nature and low cost of using CMC make it extremely beneficial for maintaining distant relationships, as these channels remove geographic and temporal boundaries to communication. For example, Stafford, Kline, and Dimmick (1999) found that Internet users employed email primarily for relationship maintenance purposes and believed the convenience and ease of this channel afforded more opportunities to engage in maintenance behaviors to keep the relationship in a satisfactory state. Likewise, Gunn and Gunn (2000) found that, when compared with those who do not use the

Internet, people using CMC to maintain a long-distance relationship feel closer and disclose more to their partners.

The most commonly used measure for relationship maintenance, Stafford and Canary's (1991) Relationship Maintenance Strategies Measure (RMSM), includes five subscales: positivity, openness, assurances, networks, and shared tasks. While this scale has been validated (Ledbetter, 2010) and applied (Rabby, 2007; Wright, 2004) in various online settings, a major limitation to this measure is that many of the individual items in the measure are predicated on geographic proximity. Furthermore, revisions to the scale (e.g., Canary & Stafford, 1993; Stafford, 2010) have continued to stress face-to-face interactions. For example, friends who live in different cities are less likely to share tasks or engage in joint activities. Therefore, researchers arguing that relationships characterized by a greater frequency of these behaviors are in some way "better" (relationally closer, higher satisfaction, etc.) privilege geographically close friendships. At the same time, technology makes it increasingly easy to maintain relationships at a distance through a variety of channels. Johnson (2001) argued that rather than examining the *quantity* of relationship maintenance behaviors a dyad engages in, we should instead look at the *quality* of the behaviors being performed to see which is more meaningful in determining outcomes such as relational closeness and satisfaction. She found that when looking at geographically close versus long distance friendships, geographically close friends engaged in a greater quantity of maintenance behaviors, but there were no differences in perceived relational satisfaction; this finding supported the idea that certain relationship maintenance strategies, such as openness and assurances, are more important in determining long-term relational success. Subsequent research by Johnson and colleagues (2009) found many similarities in how geographically close and long-distance friends defined closeness, with a focus on "self-

disclosure” and “help and support,” both of which can be provided through CMC. In addition, when controlling for relationship length, they found no difference in reported closeness between geographically close and long-distance friends.

So how are friends—including those who are geographically close and those who live at some distance from each other—employing CMC to maintain their relationships? Most of the early research focused on email’s role in relationship maintenance. For example, Stafford et al. (1999) found that email was used more frequently for interpersonal communication than for personal gain, business, or gratification opportunities, controlling for demographic characteristics. Boneva et al. (2001) found that women were more likely to use email to maintain relationships with friends and family and to find the practice more gratifying than men. Likewise, Johnson, et al. (2008) found a number of differences in the maintenance strategies (Stafford & Canary, 1991) employed in emails sent to family, friends, and romantic partners, but few differences between emails sent to recipients geographically close versus those who lived much farther away.

While email is beneficial to relationship maintenance because it lacks temporal constraints, the “real time” quality of instant messaging (IM) allows for a more natural form of interaction between partners and has been positively linked to relationship maintenance. Longitudinal research by Ramirez and Broneck (2009) found that IM was employed as a relationship maintenance mechanism across a variety of relationships, was used to fulfill a number of relationship maintenance strategies, and was correlated with use of other online and offline channels; the authors suggest this finding may be due to the similarities between IM and other forms of synchronous communication. Likewise, Valkenburg and Peter (2009) found that Dutch adolescents’ use of IM had a positive longitudinal effect on existing friendships; they

attributed this finding to the technology facilitating increases in intimate disclosures between interaction partners.

Facebook's Impact on Relationship Maintenance

The emergence of social media—and specifically social network sites—in recent years has further encouraged relationship maintenance through online communication channels. According to Ellison and boyd (in press), a SNS is a “networked communication platform in which participants 1) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and system-level data; 2) can publicly articulate connections that can be viewed and traversed by others; and 3) can consume, produce, and interact with streams of user-generated content.” SNSs provide a simplified, low-cost method for interacting with a large number of connections and contain a wide variety of public and private communication features to facilitate relationship maintenance across a variety of ties. Tong and Walther (2011) note four features of SNSs that aid the relationship maintenance process: asynchronous communication, which removes temporal constraints; control over dissemination of content; features to foster interaction, participation, and feedback; and the ability to share and embed multimedia messages, including photos, links, and video. These features expand on previous forms of communication in a number of ways, most notably by simplifying the process of passively consuming content being produced by one’s Friends (e.g., Facebook’s News Feed, Twitter’s tweet stream) and by providing diverse communication methods that include both text-based and audio-visual sources. Furthermore, contrary to some recent commentary (e.g., Dunbar, 2011, 2012) suggesting these sites’ only contribution to relationship maintenance is extending their lifespan beyond what would have existed without the technology, recent empirical data suggest that SNS users have more close connections (Hampton et al., 2011a), more face-to-face

interactions with close friends (Brandtzaeg, 2012), more acquaintances (Brandtzaeg, 2012), and more diverse networks (Hampton, Lee, & Her, 2011b) than non-users.

Researchers also suggest that social media like Facebook contain a unique set of affordances that differentiate them from other forms of CMC in some notable ways (see boyd, 2010; Treem & Leonardi, 2012). For example, the majority of interactions on Facebook are publicly visible to one's entire network and are archived on the user's profile, where they can later be searched and added to by anyone who is Friends with the user. Facebook's recent transition to the Timeline (Wortham, 2011) has made the searchability affordance even simpler for users to navigate. Sites like Facebook also differ from other forms of CMC in that users' lists of connections are visible to their entire network by default; Donath and boyd (2004) have argued that being able to see those connections serves as a reliable signal of authenticity in online spaces. Finally, because all interactions on Facebook associate users' names with the content they share, the content of users' interactions may differ in the semi-public spaces of Facebook as compared to the private spaces of email or the pseudonymous spaces of online discussion forums.

The most popular SNS, Facebook, currently maintains a user base exceeding one billion active users worldwide. Among Internet-using U.S. adults, 65% have profiles on a SNS (Madden & Zickhur, 2011) and 92% of SNS-using adults have a Facebook profile (Hampton et al., 2011a). Among certain populations, especially teens and young adults, adoption is even higher, although the most significant growth in recent years has been among those over 30. As noted by Ellison et al. (2007) and others, the majority of connections on the SNS Facebook consisted of people with whom the individual had a pre-existing offline relationship. Within their national dataset, Hampton et al. (2011a) found significant overlap between users' full social network and their

network as represented among their “Facebook Friends.” Furthermore, when examining users’ motivations for using SNSs like Facebook, maintaining existing relationships is consistently ranked as a major reason for use across different populations (Joinson, 2008; Lampe et al., 2006; Lenhart, 2009).

Relationship maintenance occurs at a number of levels through Facebook. At its most basic level, Friending another user provides access to profile information and (typically) increases the ability to interact with another user, as well as to passively consume information without formal interaction. Users can communicate with each other through public (status updates, comments, and Likes) and private (chat, closed groups, and messages) features, exchanging personal information and providing resources such as support and information. Use of Facebook to send birthday wishes is viewed by many as a form of relationship maintenance (Thelwall & Wilkinson, 2010) and in some cases, constitutes the only directed communication between two Friends (Viswanath, Mislove, Cha, & Gummadi, 2009). Perhaps the site’s most important feature in terms of relationship maintenance is the News Feed³, which was introduced in 2006 and presents users with a reverse chronological listing of Friends’ activity on the site. The News Feed provides a convenient method through which to stay updated on many Friends’ activities and to interact without having to click through to an individual user’s profile page.

Research suggests that while passive behaviors such as profile viewing are more common than more active behaviors (Metzger, Wilson, Pure, & Zhao, 2012), the mere presence in one’s Friend network is not sufficient to receive some kinds of relationship benefits, including access

³ Facebook’s News Feed is located on the user’s home page and users currently have the option to list “Top Stories” or “Most Recent” posts. The content that is presented is determined through a number of algorithms collectively known as EdgeRank. For more information on how EdgeRank determines which content to display in a user’s News Feed, see <http://techcrunch.com/2010/04/22/facebook-edgerank/>.

to social capital resources. For example, research by Burke and colleagues (2010, 2011) using server-level data found that passive consumption of information was unrelated to perceptions of social capital, as was broadcasting content without a specified audience; only inbound directed communication, such as receiving a comment on a status update or getting a private message from a Friend, was positively associated with perceptions of bonding (2010) and bridging (2010, 2011) social capital. More recently, Ellison and colleagues (2011b) have argued that specific forms of interaction on the site, such as responding to a Friend's request for advice or support or writing on a Friend's wall on his/her birthday, constitute a form of social grooming; their measure, Signals of Relational Investment (SRI), highly correlated with perceptions of bridging social capital. Finally, research by Ledbetter and colleagues (2011) found that, when looking at dyadic interaction patterns through the site, frequency of Facebook communication (e.g., wall posts, private messages, comments) was positively associated with perceived relational closeness, a common correlate in the relationship maintenance literature.

While communicating through Facebook is generally seen as a supplement to other forms of interaction, much as email was in the work of Barry Wellman more than a decade ago (e.g., Hampton & Wellman, 2001), research has yet to address whether using Facebook functions in a role beyond "filling in the gap" when other forms of communication are unavailable. In other words, researchers have yet to empirically address whether specific uses of Facebook improve the quality of users' relationships with some of their Facebook Friends and, if so, for whom those improvements are most likely to occur. For example, Facebook may be the *only* communication channel employed by some relational dyads. In these cases, Facebook is not supplementing other forms of communication; rather, it is the one link keeping the two people connected. Therefore, this dissertation addresses this gap in the literature.

STUDY 1A: ESTABLISHING A SET OF FACEBOOK RELATIONSHIP MAINTENANCE STRATEGIES

Before considering the relationship between users' behaviors on Facebook and specific outcomes of use, however, we must first identify the set of strategies they use from the range of communication behaviors facilitated through the site. To do so, it is important to evaluate existing measures to determine if and how they should be modified to accurately reflect the strategies employed through Facebook-enabled interactions.

By and large, the relationship maintenance measures that have emerged over the last three decades have focused on strategies romantically involved couples use to keep their relationship equitable (Canary & Stafford, 1992; Stafford, 2010; Stafford & Canary, 1991; Stafford et al., 2000). When considering both the role that technology plays in relationship maintenance, as well as the ways that non-romantic dyads' relationship maintenance differs from romantic dyads, several limitations of these measures emerge, especially with the earlier measures. For example, Stafford and Canary's (1991) five-factor measure included two factors that were geographically constrained: "networks," which reflected spending time with each other's friends, and "shared tasks," which measured the degree to which one's partner helped complete tasks or joint responsibilities. Another factor (assurances) was skewed toward romantic relationships, with items about showing one's love and commitment toward another. Stafford's (2010) revision of the measure, the seven-factor Relationship Maintenance Behaviors Measure, included factors that are more useful when considering non-romantic relationships (e.g., self-disclosure, understanding), although it was still developed primarily for proximate, close relationships.

In recent years, a few studies have attempted to look at how individuals engaged in multi-modal and more casual relationships employ these strategies. For example, Ledbetter (2010) validated Stafford and Canary's (1991) measure in an online setting (instant messaging). Looking at email interaction, Johnson et al. (2008) found that college students used different relationship maintenance strategies when interacting with family, friends, and romantic partners. Rabby (2007) examined four categories of romantic relationships: online-only, offline-only, online to offline, and offline to online. In addition to measuring Canary and Stafford's (1992) five-factor relationship maintenance scale, Rabby (2007) also developed a four-item "mundane interaction" scale to account for the important role that everyday interaction plays in relationship maintenance (see Duck, 1988, 1994). He found that medium impacted engagement in relationship maintenance behaviors, although even the online-only dyads—with the lowest engagement in each of the strategies—engaged in the four non-geographically proximate strategies (positivity, openness, assurances, and mundane talk). Wright (2004) compared relationships that were maintained exclusively online and those maintained primarily online using Canary et al.'s (1993) six-factor maintenance strategy measure (positivity, openness, assurances, joint activities, routine communicative activities, and avoidance) as well as an open-ended option for participants to list other strategies. He found no significant differences between the two groups in terms of which strategy they used most frequently, with openness and positivity reported most often for both online-only and primarily online relationships.

These studies suggest that while previously validated measurements of relationship maintenance may be adapted to online settings, their usefulness in accurately measuring the extent to which individuals use specific technologies to maintain a variety of relationships may be somewhat limited, due to the differences that technology creates in interaction setting

(reduced context cues, asynchronous communication; see Walther, 1996 for a review), the inability to provide physical resources (e.g., Stafford & Canary's, 1991, "shared tasks" factor), and concerns about sharing personal information in a public sphere (e.g., Vitak & Ellison, in press), among others. Furthermore, as noted above, many of the items in these scales do not translate well to the more casual friendships and acquaintances that make up the majority of relationships represented on sites like Facebook (Ellison et al., 2011a).

As noted above, Facebook enables two users to interact through a variety of public and private channels on the site, and research shows that users communicate a variety of information through the site, ranging from common everyday news to sharing information and support (Vitak & Ellison, in press). Facebook enables users to keep in touch with individuals they no longer see often in person and to reconnect with people with whom they have fallen out of touch (Joinson, 2008). Individuals also use the site to passively consume content about their network without interacting; this is one of the most frequent behaviors on the site (Burke et al., 2011).

All in all, Facebook users may perform dozens of individual communicative acts with another user through the site. An important question to consider is how these individual behaviors map onto broader sets of strategies individuals use as part of their overall relationship maintenance process with a given Friend and how the site's affordances affect the composition of these strategies versus more traditional measures (e.g., Stafford & Canary, 1991). For example, social support is consistently cited as playing an important role in the relationship maintenance process, both on- and offline (e.g., Johnson et al., 2009; Parks & Floyd, 1996; Weiss, 1974). One way in which Facebook may alter social support exchanges is that, oftentimes, requests for and provisions of support occur through semi-public channels such as status updates. In this way, forms of support that may have traditionally been limited to closer ties, such as a big favor or the

emotional support one needs after a death in the family, may now be open to one's larger network. Recent qualitative work by Vitak and Ellison (in press) suggests that even simple actions such as Liking a status update or writing a quick supportive comment in response to an update may benefit those in need of different support-based resources. Therefore, it is important to see how engagement in this strategy is related to relational outcomes, especially across different types of relationships.

A second relationship maintenance strategy one would expect to emerge through users' Facebook behaviors relates to use of the site for social interaction, as it features prominently in relationship maintenance (e.g., Dindia, 2003), CMC (e.g., Ramirez & Broneck, 2009), and SNS (e.g., Joinson, 2008) research. Facebook is constructed to facilitate interaction at many levels, ranging from private, dyadic conversations to a public post that any user can comment on. Tong and Walther (2011) note that the social exchanges that take place on Facebook, including through links, comments, and videos, act like the passing of "virtual tokens" between partners and may serve a relationship maintenance purpose. Donath (2007) refers to this set of behaviors users engage in as "social grooming" and argues that the cost in time and effort to perform activities such as commenting on a Friend's status update signals an investment in the relationship. Social interaction can be measured both by the types of communication behaviors two individuals perform through the site, as well as the frequency with which they perform them. For example, Ellison et al. (2011b) developed a measure of social grooming on Facebook that captured users' propensity to respond to various types of resource requests from Friends.

A somewhat unique affordance of SNSs—especially compared with other forms of communication—is that individuals can passively consume content posted by their Facebook Friends without any form of interaction. Research indicates that passive consumption behaviors

constitute a large proportion of users' time spent on Facebook (Burke et al., 2010, 2011) and other SNSs (Metzger et al., 2012). These activities may serve a relationship maintenance purpose by providing a low-cost mechanism through which to learn new information or keep up-to-date on people in one's social network without more costly, time-consuming communication methods such as phone calls, face-to-face interactions, or even text-based messages sent through the site. An important difference between passive consumption and any form of interaction with another person is that the individual does not need to engage in self-presentation or message construction when simply browsing a profile or photo album. Facebook's News Feed is especially important in facilitating this strategy, as users only have to log onto the site to be presented with a reverse-chronological stream of content from their network, as is the recently updated profile page (i.e., Timeline), which has simplified searching and navigation of users' uploaded content.

Finally, Facebook's communication features enable users to interact and share content related to shared interests, as well as to discover common ground with other Facebook Friends. For example, Lampe and colleagues (2007) argued that Facebook users view profile fields to seek cues about their Facebook Friends and establish common ground; these cues may also be present in other types of content being shared through the site. As a relationship maintenance strategy, establishing and maintaining shared interests is an important feature of any relationship; however, these interests typically manifest in the form of shared activities, which then raise measurement challenges related to geographic proximity. For example, Stafford and Canary's (1991) and later Stafford's (2010) relationship maintenance measures included items that speak to pursuing joint activities, while Dainton et al. (2003) highlighted the importance of spending time together in shared activities as one of four main strategies for successful maintenance of friendships. A benefit of sites like Facebook is that they provides a rich canvas through which

content can be shared and multiple people can interact about a shared interest, either publicly or through a private channel, such as a closed Group.

These strategies are derived from research on relationship maintenance and social network sites; however, as no comprehensive study of relationship maintenance strategies has been conducted that accounts for the affordances of social media, it is impossible to predict exactly how users engage with the site for this purpose. The expected Facebook relationship maintenance strategies detailed above—including social support, social interaction, passive consumption, and establishing common ground—are drawn largely from the affordances of the technology; this is not to say, however, that users are employing other strategies on the site. Therefore, it is essential to assess the full range of communication behaviors users may be performing on the site to maintain relationships with members of their network and derive the unique strategies associated with these behaviors.

RQ1: What relationship maintenance strategies do Facebook users engage in with members of their Friend network?

Study 1a Method

Instrument Development

People's motivations for using Facebook are largely related to relationship maintenance purposes (Lenhart, 2009). For example, Joinson (2008) found that Facebook users most often said they used the site to reconnect with old friends and “keep in touch,” socially surveil (through passive consumption of content), and communicate with others. Consequently, users' behaviors on the site should—to some extent—reflect relationship maintenance strategies identified in previous research in offline (e.g., Stafford, 2010; Canary & Stafford, 1992) and

online (e.g., Rabby, 2007) contexts. It is also expected that the affordances of the technology (boyd, 2010; Treem & Leonardi, 2012) enable users to engage in maintenance behaviors that were previously more difficult or not possible without the technology. Researchers have noted that CMC reduces the temporal and spatial constraints to communication (e.g., boyd, 2008; Walther, 1992a); likewise, SNSs may reduce the transaction costs associated with communication across space and time due to their largely asynchronous communication, simple messaging features, and high mobility (Ellison, Steinfield, Lampe, & Vitak, 2010). However, the extent to which Facebook users engage in these behaviors, as well as the types of relationships with whom they are performing these maintenance behaviors with, has yet to be established.

Based on these streams of literature, as well as an extensive review of the communication affordances of the site, I developed an inventory of 51 behavioral items to capture the kinds of Facebook-enabled relationship maintenance behaviors users are likely to do on the site. After receiving feedback on these items from five interpersonal communication and SNS experts, nine items were removed, seven new items were added, and the wording of six items was amended to address issues of clarity and the potential for double-barreled items, creating a final inventory of 49 items. Two of these items were later removed from analyses as they assessed negatively valenced behaviors, which, by themselves, were inconsistent with the rest of the corpus and the relationship maintenance strategies being measured.

Sampling and Participants

I obtained a random sample of 3000 non-faculty staff at Michigan State University from the Human Resources department in October 2012 and invited them, via email, to participate in an online survey regarding their use of Facebook to interact and maintain relationships with others. The invitation email stated that having a Facebook account was a requirement for

participation. The survey remained open for two weeks and garnered 415 responses.

Respondents were generally female (76.2%), 44 years old ($SD= 11.12$; range: 22 to 71), White (88.9%), and well-educated, with the majority of participants having a college degree (72.2%), and 32.5% having post-graduate training. According to the institution's employment categories, the majority of participants were professionals (49.4%), which includes positions such as administrative assistants, information technologists, accounts, and research assistants; clerical techs (26.3%), which includes positions such as secretaries, office assistants, and health care assistants; and professional supervisory (21.1%), which includes positions such as management analyst, administrative associate, and development officer. Compared with the full population of non-faculty staff at Michigan State University (6,292 employees), this sample had significantly more women (76.2% vs. 62%), $t(406)=6.70, p<.001$; was slightly younger ($M_{age}=44$ vs. $M_{age}=46.8$), $t(406)=-4.71, p<.001$; and was slightly less racially diverse (88.9% White vs. 84.6% White), $t(406)=2.79, p<.01$.

The restriction on participation to only those staff who had an active Facebook account limits the ability to generate an accurate response rate. Ignoring the fact that a percentage of invitees did not use the site, the response rate would be 13.8%. However, upon distributing the initial invite, and when distributing the two reminder emails to invitees, I removed 63 participants from the invite list after receiving emails from them saying they did not use Facebook. I also included language in the first reminder email letting invitees know that they if they did not have an account, they could remove themselves from the email list by clicking "Unsubscribe" at the bottom of the email (which SurveyGizmo requires in all email invitation to

comply with the CAN-SPAM Act⁴); an additional 129 participants clicked this button. To determine a more accurate response rate, it would be necessary to determine Facebook use within this population. In a recent study of MSU staff on their use of “online communication technologies,” 78% of respondents had an active Facebook account (Ellison et al., 2011b). Likewise, recent Pew data⁵ show that 66% of online adults in the U.S. have a SNS profile. While the language of the MSU study may have biased participation toward those who are using SNSs, it is also likely that the rate of use at MSU is higher than among the general U.S. population due to the fact that MSU employees are highly educated and generally work in more white collar jobs that provide daily access to computers, which is likely to influence their use of the site. Taking SNS participation rates into consideration, I would estimate the actual response rate for the study to be between 17.7% and 21%.

Procedure

See the Appendix for the full instrument.

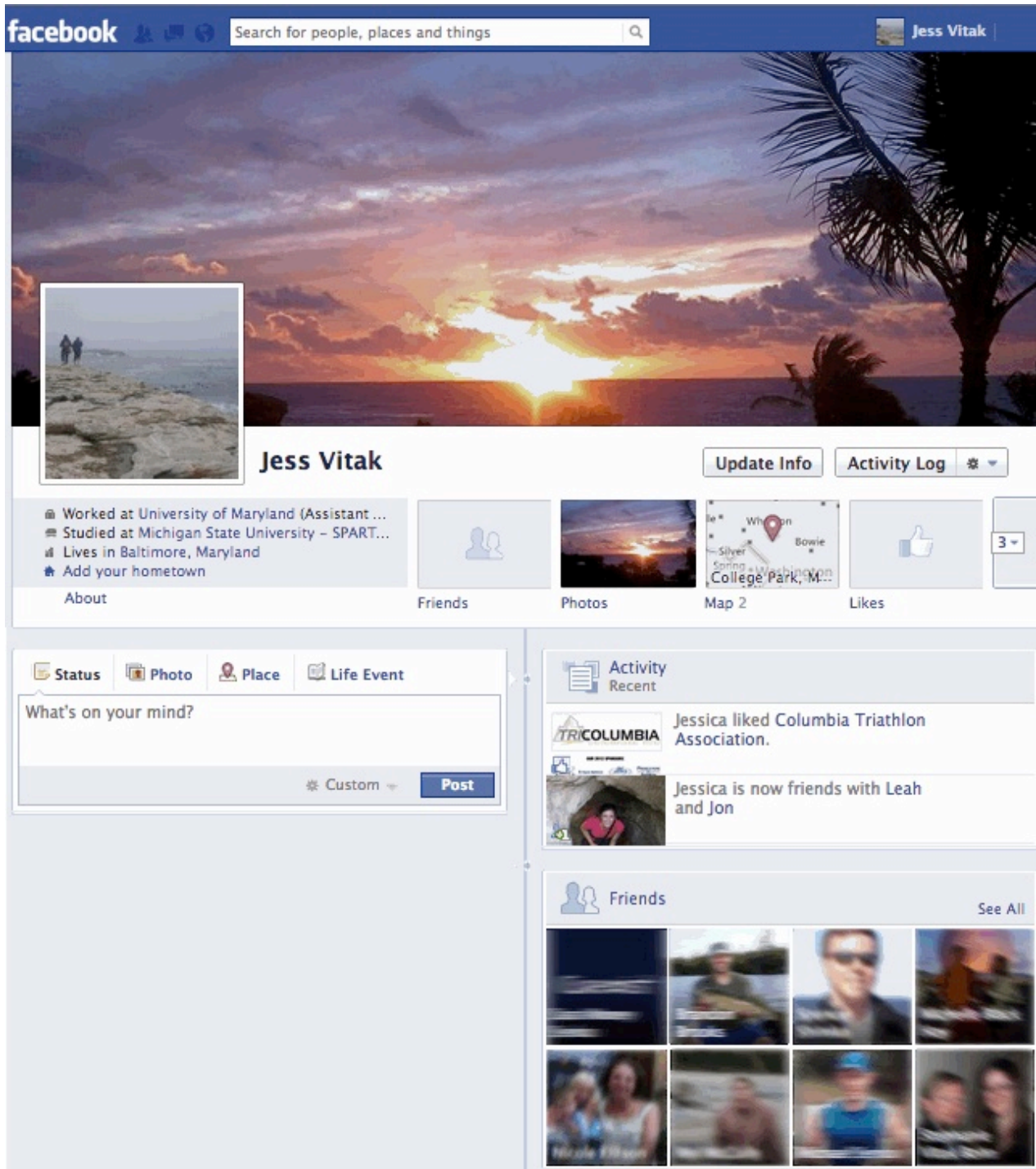
A link in the recruitment email directed participants to an informed consent page hosted on SurveyGizmo. Upon acceptance, participants were directed to a new page, which provided instructions to log into their Facebook account and select a Facebook Friend for which they

⁴ The CAN-SPAM Act of 2003 sets rules for use of commercial email. These rules include requiring recipients the right to have the sender stop emailing them, including location information, and refraining from using misleading or deceptive header and subject lines. For more information, see <http://www.business.ftc.gov/documents/bus61-can-spam-act-compliance-guide-business>

⁵ The Pew Internet Project maintains an Adult Trend Data page on its website where it updates its latest statistics, as it may collect data in surveys but not immediately publish updated numbers in reports (thus the discrepancy between the 66% reported here and the 65% reported earlier and linked to the Madden & Zickhur, 2011 report). See [http://pewinternet.org/Static-Pages/Trend-Data-\(Adults\)/Online-Activites-Total.aspx](http://pewinternet.org/Static-Pages/Trend-Data-(Adults)/Online-Activites-Total.aspx) for regularly updated trend data.

would answer a series of questions. At the time of data collection, all profiles had been converted to the Timeline layout and a rectangular Friends box was listed in the right column immediately below the main header (see Figure 1 for an example of how Facebook profiles looked in October 2012). Participants were instructed to select the person in the top left position of the Friends box to provide a pseudo-random distribution of connections. As noted by other researchers (Ledbetter et al., 2011), Facebook has not publicly discussed how the algorithm chooses which Friends to display in this box; however, in tests by those researchers and by myself prior to launching this survey, the placement of Friends in that box (and the placement of the person in the first box) appears to be pseudo-random. In other words, upon repeated visits to the profile page, different Friends appeared in the “Friends” box and in different positions in the box, although it appears priority was given to those Friends with whom one has interacted in the previous three months. This method was chosen to move beyond the common practice of having participants select the person for whom they will evaluate, which tends to skew responses very heavily toward very close ties (e.g., Ledbetter, 2009; Miczo et al., 2011). This method appeared to be successful in creating more variance across perceived relational closeness, as the closeness scale employed in the study (Dibble, Levine, & Park, 2012) was normally distributed ($M=2.95$, $SD=1.10$ on a 5-point Likert-type scale). After selecting a Friend for the survey, participants entered the person’s name (or a pseudonym if they so chose) and continued on with the survey. Whatever name they entered into this field auto-filled throughout the rest of the survey for all items to reinforce that the participant should focus only on their relationship and behaviors with that one person. In other words, if a participant entered “John” as the name of the friend he was evaluating, sample item wordings would read “John is a priority in my life” and “I browse photo albums posted in John's profile.” Participants answered questions about the frequency with

Figure 1: Sample Facebook Timeline Profile with Friends Box



Note: Image is for visual reference of profile layout at time of data collection (October 2012); therefore, individual pieces of text about profile owner are inconsequential.

Note: Friends' names and images have been blurred in this image.

Note: For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.

which they communicated with the person on- and offline; their relational closeness, satisfaction, and access to emotional and instrumental resources; the specific behaviors they engaged in with the person through Facebook; the impact of Facebook on their relationship; and demographic items. Finally, participants were invited to enter their email address to be entered into a drawing for one of 20 \$25 Amazon gift cards, and they were thanked for their participation. Email addresses were removed from the dataset prior to analysis.

Measures

In addition to asking participants to evaluate their engagement in a variety of communication behaviors with a randomly selected Facebook Friend, they also answered items that measured their relational closeness, relational satisfaction, perceived access to social provisions, and frequency of communication—both on Facebook and through other channels—with that person. Finally, participants answered a series of questions about their general use of Facebook and basic demographic items. In this section, only the Facebook-specific measures and relational closeness will be detailed. All other measures will be explained in the Methods section of Study 1b.

Unless otherwise noted, all composite variables are measured on a five-point Likert-type scale with response options ranging from 1=Strongly Disagree to 5=Strongly Agree.

Facebook Behavior Items. As noted above, 49 items were included in the instrument to measure the range of active, interactive, and passive behaviors individuals can perform with another Facebook Friend. Prior to answering any of the questions in this section, participants were prompted with the following instructions: “The following items tap into a wide range of ways you might use Facebook to interact with (person’s name). Your responses should reflect the extent to which you actually engage in these behaviors, not the extent to which you would

like to engage in them or what you think you would do if there were more opportunities for you to interact with (person's name). Note: Statements about 'Liking' content refer to clicking the 'Like' button on a status update or photo." These instructions were included following informal pretesting of the instrument with colleagues, as one person noted that people answering might consider behaviors they've performed in the far past or behaviors that they would like to perform—as if the participant were answering the items based on an idealized relationship with that person rather than the actual relationship.

Facebook Communication Frequency. Participants were asked to rate the frequency with which they interacted with the specified Facebook Friend through six public and private channels: private messages, Chat, private Groups, Wall posts, comments, and Likes on a five-point scale ranging from 1=Never to 5=Very Often. While these items were included in the factor analysis of behavior items, all were removed for high cross-loadings, so a second exploratory factor analysis was conducted on the six items using principal components analysis and Promax rotation. This analysis led to a four-item solution, although one item was removed during reliability analysis, as it lowered the scale's overall reliability and decreased the scale's variance. The final, three-item scale ($\alpha=.908$, $M=2.92$, $SD=.98$) measures individuals' frequency of engagement in public interactions (Wall posts, comments, and Likes) with a Facebook Friend.

Network size. Two measures are employed to capture the size of users' Facebook networks. First, participants were asked to estimate the number of total Facebook Friends they had ($M=265.19$, median=188, $SD=290.76$). Next, they were asked to estimate the number of those Friends they considered to be "actual friends" (for more on this measure, see Ellison et al., 2011a; $M=100.86$, median=55, $SD=122.94$). In the regression analyses presented in Study 1b, the base-10 logarithm were calculated for these two variables to normalize the data.

Facebook engagement. Two items were included to capture how users engaged with Facebook. The first, Facebook Checks Per Day, is a closed-ended, five-choice item that asked participants to estimate the number of times they access Facebook per day. Previous research (Burke et al., 2010) has shown that Facebook users are only moderately accurate in assessing the amount of time they spend on the site, and the open-ended question which asked participants to estimate the minutes per day they spend on the site ($M=38.32$, median=20, $SD=53.47$) exhibited a high degree of skewness (4.13) and kurtosis (23.59). An additional problem with asking participants how much time they spend on the site per day is that many users do not check the site on a daily basis, and such a measure cannot properly account for this. Facebook Checks Per Day ($M=2.40$, $SD=1.15$) included a “less than once per day” option as its lowest category and was much more normally distributed. For the second measure, Facebook Accessibility, participants were asked to indicate the devices from which they accessed Facebook from a list of seven options: personal computer, personal cellphone, work computer, work cellphone, tablet, e-reader, and public computer. The measure ($M=2.88$, $SD=1.15$) is an index of “yes” responses to items, with a higher score suggesting one has the technical ability to access the site more frequently.

Relational Closeness. While this variable will be addressed in more detail in Study 1b, it is included here because relational closeness is generally correlated with engagement in relationship maintenance strategies (Guerrero & Chavez, 2005). Therefore, Dibble et al.’s (2012) 10-item unidimensional relationship closeness scale was included in the instrument. Confirmatory factor analysis suggested the full, 10-item scale was not a good fit to the data, so one item was removed and several covariance paths were added between error estimates. The

final, nine-item scale included in analyses ($M=2.69$, $SD=.61$) was a good fit to the data, $\chi^2(19)=44.64$, $p=.001$, $CFI=.994$, $RMSEA=.058$ and was reliable ($\alpha=.85$).

Data Analysis

Missing value analysis was conducted on all items included in Study 1a prior to running any analyses. During this analysis, eight cases were removed when the missing data was deemed non-random. Among the final sample ($N=407$), missing data accounted for no more than 1.5% for any one item (i.e., there were no more than six missing cases per item), and the average number of missing cases across these items was 1.88 (.44%). As missing data were randomly distributed and accounted for such a small percentage of the sample, they were imputed using the Expectation-Maximization (EM) algorithm⁶ in SPSS' (version 20) Missing Values Analysis (Schlomer, Bauman, & Card, 2010). The same procedure was performed for the nine Facebook frequency behaviors included in the factor analysis (private messages, Chat, Group communication, Wall posts, comments, Likes, profile views, photo browsing, and viewing content in News Feed).

Following this procedure, the 56 items were entered into a single exploratory factor analysis (EFA) in SPSS version 20, using principal components analysis. An oblique rather than orthogonal rotation was employed on the EFA because oblique rotations produce correlated factors, which some researchers argue is more appropriate for research involving human behaviors, attitudes, and/or perceptions (e.g., Costello & Osbourne, 2005, Fabrigar, Wegener, MacCallum, & Strahan, 1999; Preacher & MacCallum, 2003), as these measures tend to be

⁶ For a full discussion of the Expectation-Maximization algorithm, see Moon (1996).

related to each other.⁷ Furthermore, as noted by Tabachnick (2007), researchers unsure of which rotation method to apply to their factor analysis can look at the factor correlation matrix to determine rotation; if factor correlations exceed .32, Tabachnick argues there is enough variance to warrant using an oblique rotation. In the factor correlation matrix of the final, four-factor solution, all six correlations were greater than .32 (range: .396-.546), suggesting a significant amount of inter-correlation between factors to justify use of an oblique rather than orthogonal rotation.⁸

The initial analysis yielded a 10-factor solution; however, there were significant cross-loadings across factors. Requirements for inclusion were a primary loading of .5 or higher and secondary (cross) loadings below .3. Applying this criteria, 35 items were removed, yielding a clean, four-factor solution that explained 60.85% of the variance. To determine if this was the correct number of factors to be included in the final solution, several variance analyses were employed. First, a mandatory cut-off was set for factors to have an eigenvalue of 1 or higher. Next, Cattell's (1966) scree test plotted the components (X-axis) against the eigenvalue scores (Y-axis); the test argues that once the curve makes an "elbow" and the decline straightens out, all later components should be dropped. The scree-test supported a four-factor solution. However,

⁷ See Fabrigar et al. (1999, pp. 281-282) for a detailed discussion of the benefits of using oblique rotation instead of orthogonal rotation when dealing with constructs studied in the social sciences.

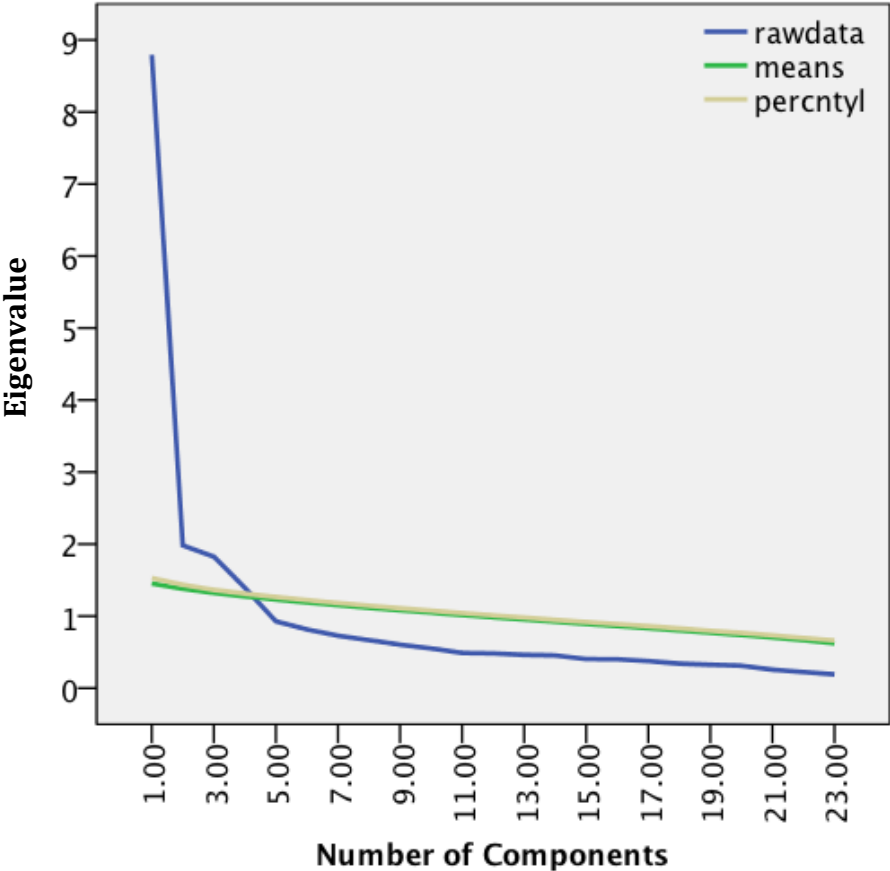
⁸ Some researchers (see, for example, Ledbetter's (2009) development and validation of the Online Communication Attitude Measure) argue that the best way to test a solution's stability is use both orthogonal and oblique rotations. While not detailed in the text of this dissertation, the corpus of behavioral items were also factored using a orthogonal (Varimax) rotation; the resulting five-factor solution was very similar to the solution presented below with the exception of a three-item fifth factor that spoke to using Facebook to interact with Friends of Friends. The first four factors closely mirrored those found in the oblique rotation and contained nearly all the same items, which generally suggest a robust solution. The results of the parallel analysis testing support the four-factor solution obtained with the oblique rotation.

scree tests are often criticized for being imprecise and subjective, so I also used a SPSS syntax script (O'Connor, 2000) that enables running of parallel analysis (Horn, 1965) in SPSS. Parallel analysis (PA) is generally recognized as the best statistical method for determining the number of optimal number components to extract (Hayton, Allen, & Scarpello, 2004). In PA, 1000 datasets were generated including correlation matrices of the sample size and number of variables in the factor analysis. The eigenvalues from the factor analysis were then compared to the average eigenvalues from the random correlation matrices; when the eigenvalue from the factor analysis is higher, it should be retained. Using the default 95th percentile cutoff, PA recommended a four-factor solution, confirming the findings of the EFA. See Figure 2 and Table 1 for results from the PA analysis and a graph plotting the eigenvalues by the components for each of the analyses.

Table 1: Partial Results of Parallel Analysis From Exploratory Factor Analysis of Facebook Behavior Items

Root	Raw Data	Means	Prcentyle
1.000000	8.794223	1.455873	1.528553
2.000000	1.981245	1.378203	1.428825
3.000000	1.826789	1.321239	1.363157
4.000000	1.392440	1.274063	1.312939
5.000000	.927352	1.229758	1.267302
6.000000	.815044	1.188625	1.221192
7.000000	.726324	1.151424	1.181820
8.000000	.666913	1.115992	1.146491
9.000000	.603983	1.081494	1.109286
10.000000	.551501	1.047752	1.075727

Figure 2: Parallel Analysis Plot of Eigenvalue Scores by Components for Facebook Relationship Maintenance Strategies Factor Analysis



Findings

Items and factor loadings can be found in Table 2. The four factors, including means, standard deviations, and sample items, are discussed in further detail below.

Table 2: Obliquely Rotated Component Loadings of 23 Facebook Behavior Items Onto Four Relationship Maintenance Strategies

Items	Component			
	1	2	3	4
My Facebook interactions with (person's name) are generally positive.	.846			
(Person's name) is upbeat when we interact through Facebook.	.710			
When I see (person's name) sharing good news on Facebook, I'll like his/her update.	.865			
I make sure to send (person's name) a note (wall post, comment, private message, etc.) on his/her birthday.	.641			
I congratulate (person's name) when he/she shares news on Facebook about something big happening in his/her life.	.797			
(Person's name) always wishes me happy birthday on Facebook.	.664			
When I post about something good going on in my life, (person's name) will like it.	.687			
I share links with (person's name) on Facebook.		.761		
(Person's name) and I use Facebook to talk about a shared interest, sport, and/or hobby.		.715		
(Person's name) and I use Facebook to coordinate events related to a shared interest, sport, and/or hobby.		.726		
(Person's name) and I use Facebook to share links or videos about a celebrity or TV show we like.		.827		
When I see something online that I think (person's name) would find interesting, I'll send him/her a note about it on Facebook.		.628		
I've posted links or videos to Facebook with (person's name) specifically in mind.		.824		
I share funny stories from my day with (person's name) over Facebook.		.652		
Estimate the frequency with which you visit his/her profile page.			.881	
Estimate the frequency with which you browse his/her photo albums.			.889	
I browse through (person's name)'s profile page to see what s/he's been doing.			.778	
I browse photo albums posted in (person's name)'s profile.			.632	
I learn about big news in (person's name)'s life from Facebook.				.752
I use Facebook to find out things (person's name) and I have in common.				.553
I use Facebook to get to know (person's name) better.				.674
I keep up to date on (person's name)'s day-to-day activities through Facebook.				.591
(Person's name) posts updates to Facebook about his/her day-to-day activities.				.784

Notes: Extraction Method: Principal Components Analysis. Rotation Method: Promax with Kaiser Normalization. Rotation converged in 6 iterations.

Factor 1, Supportive Communication ($M=3.68$, $SD=.82$, $\alpha=.88$), explains 38.2% of the variance and includes seven items that target specific behaviors users perform through the site to signal support for a specific user, such as liking a post or sending birthday wishes, and are indicative of social grooming (Donath, 2007), which is an important component of relationship maintenance. Two of the items reflect the tone of interactions, suggesting that interactions between users tend to be positive, which goes hand-in-hand with the supportive nature of the kinds of behaviors reflected in this factor. Sample items include, “When I see (person’s name) sharing good news on Facebook, I’ll Like his/her update” and “My Facebook interactions with (person’s name) are generally positive.”

Factor 2, Shared Interests ($M=2.33$, $SD=.88$, $\alpha=.87$), explains 8.6% of the variance and includes seven items that focus on how users engage with Facebook’s features to share content and interact about shared interests, whether through a Facebook Group they both belong to, through posting links on each others’ Walls, or using other site features to communicate with each other. Sample items include, “When I see something online that I think (person’s name) would find interesting, I’ll send him/her a note about it on Facebook” and “(Person’s name) and I use Facebook to share links or videos about a celebrity or TV show we like.”

Factor 3, Passive Browsing ($M=2.91$, $SD=.89$, $\alpha=.85$), explains 7.9% of the variance and includes four items that measure both the frequency and the level of agreement rated statements about browsing a friend’s profile page and photo albums. As identified by Metzger et al. (2012) and Burke et al. (2011), passive behaviors, such as viewing a Friend’s profile, are among the most common behaviors users perform on the site and may serve a relationship maintenance purpose much as the passive strategies individuals employ under Uncertainty Reduction Theory (Berger & Calabrese, 1975) help individuals gain more information about another individual. In

the case of Facebook, the technical structure of Friending typically provides direct access to a stream of content such as status updates, photo albums, and personal information posted on the profile page. Users can browse this content at their leisure and without having to actively interact with the other person—or with the other person even being aware of the browsing. While evidence suggests these behaviors are unrelated to perceptions of access to some social resources (i.e., social capital; see Burke et al., 2011), passive consumption may be valuable to the relationship maintenance process by providing a low-cost mechanism through which to keep updated about both important life events and more mundane, everyday activities of a large number of friends, which researchers have established as important to relationship maintenance generally (Duck, 1988). Sample items include, “Estimate the frequency with which you browse his/her photo albums” and “I browse through (person’s name)’s profile page to see what he/she's been doing.”

Factor 4, Social Information Seeking ($M=2.73$, $SD=.86$, $\alpha=.79$), explains 6.1% of the variance and includes five items. The name of the factor is derived from work by Ellison et al. (2011a) on the various connection strategies college students use when connecting with different types of ties through the site; they defined the “social information-seeking” strategy as “use of the site for learning more about people with whom the user has some offline connection” (p. 882) and it included items about using Facebook to “check out” people one had met socially or who lived nearby. This factor has a similar focus, including items tapping into two inter-related reasons for using the site: first, to keep up-to-date on individuals’ more mundane activities (i.e., everyday news), which numerous relationship maintenance researchers have highlighted as a key component to maintaining a relationship in a satisfactory state (e.g., Duck, 1988); and, second, to learn new things about the other person, which may help establish common ground and

strengthen the relationship. This strategy highlights the low-cost mechanism through which information can be shared and consumed through a site like Facebook, as well as the potential far-reaching impact that these more mundane updates may have for maintaining a relationship that may have otherwise disappeared over time—or to rekindle one that previously did, which Joinson (2008) identified as a primary motivation for using the site. Sample items include, “I use Facebook to get to know (person’s name) better” and “(Person’s name) posts updates to Facebook about his/her day-to-day activities.”

Following computation of the four maintenance strategies scales, a Pearson correlation matrix compared engagement in these strategies with other measures of Facebook engagement to test the construct validity of the strategies. Correlations, means, and standard deviations are presented in Table 3. Unsurprisingly, Facebook Communication Frequency is highly correlated with all four strategies—Supportive Communication ($r=.72$), Shared Interests ($r=.57$), Passive Consumption ($r=.62$), and Social Information Seeking ($r=.43$). In other words, the more frequently two people interacted through Facebook’s public communication features, the more likely they were to engage in relationship maintenance strategies through the site. All four strategies were also positively correlated with the frequency of checking Facebook per day ($r=.16 - r=.40$) and the number of places from where the person accessed the site ($r=.12 - r=.19$). The number of “actual” friends a person reported having exhibited higher positive correlations with the maintenance strategies than the total number of Facebook Friends for Supportive Communication ($r=.24$ versus $r=.20$), Shared Interests ($r=.20$ versus $r=.19$), and Passive Consumption ($r=.15$ versus $r=.06$); Social Information Seeking was uncorrelated to both measures. More in-depth analyses of the relationship maintenance strategies and the relationship to other variables of interest will be presented in Study 1b.

Discussion

The purpose of this study was to establish a set of relationship maintenance strategies individuals perform on the SNS Facebook that accounts for the unique affordances of social media, such as persistence and association of ties and content. While some general predictions could be made *a priori*, much of this area of study remains nebulous as each new technology presents itself with new features, new motivations amongst users, and new challenges. Therefore, exploratory factor analysis was employed on the corpus of items. After more than half of the items were removed for low loadings or cross-loadings, a four-factor solution emerged that was confirmed through parallel analysis of the dataset.

The four factors—Supportive Communication, Shared Interests, Passive Consumption, and Social Information Seeking—both reflect more traditional, offline relationship maintenance strategies and highlight the unique features SNSs like Facebook contribute to the relationship maintenance process. The Supportive Communication Strategy, which accounted for more than half the variance explained in the factor analysis, includes items adapted from Stafford’s (2010) positivity factor (e.g., “My Facebook interactions with this person are generally positive” and “This person is upbeat when we interact through Facebook”) as well as items consistent with her assurances factor (e.g., “When I post about something good going on in my life, this person will like it”). Likewise, the Social Information Seeking factor contains two items consistent with Rabby’s (2007) mundane interaction measure (“I keep up to date on this person’s day-to-day activities through Facebook” and “This person posts updates to Facebook about his/her day-to-day activities”), as well as an item consistent with Stafford’s (2010) assurances strategy (“I learn about big news in this person’s life from Facebook”).

Table 3: Pearson Product Correlations for Facebook Maintenance Strategies and Related Facebook Usage Variables

	1	2	3	4	5	6	7	8	9	10
1) Supportive Communication Strategy	1									
2) Shared Interests Strategy	.564**	1								
3) Passive Consumption Strategy	.572**	.484**	1							
4) Social Info Seeking Strategy	.457**	.478**	.508**	1						
5) Facebook Communication	.723**	.572**	.617**	.431**	1					
6) Facebook Checks Per Day	.402**	.310**	.164**	.244**	.352**	1				
7) Total Facebook Friends (log)	.354**	.232**	.104*	.122*	.273**	.466**	1			
8) Actual Facebook Friends (log)	.403**	.230**	.199**	.137**	.349**	.376**	.652**	1		
9) Places Accessed Facebook	.194**	.169**	.121*	.153**	.180**	.341**	.294**	.234**	1	
10) Relational Closeness	.459**	.410**	.488**	.100*	.442**	.051	.055	.182**	.009	1

* $p < .05$ ** $p < .01$

At the same time, the items in the Facebook relationship maintenance strategies reflect modes of communication that are either difficult or impossible without the technology, as well as lowered transaction costs associated with maintenance behaviors performed through Facebook versus through offline channels. The quantity and quality of content one can obtain through the Passive Consumption strategy, for example, is simplified through the site's structure, which organizes all information a user posts through a single load page and makes it easy for Friends to access, pending privacy permissions. Many of the behaviors included in these four strategies represent very low-cost behaviors, such as Liking a status update, which requires just a click of a button, or sending a happy birthday message through the site, which likely requires less effort than sending a card or making a phone call.

Facebook may make relevant information about a Friend visible that would otherwise not be shared or might not be shared until much later in time. The site's static and dynamic content sharing features—including profile fields that allow users to fill out information such as hometown, favorite books and TV shows, and organizations or content they like as well as fields that facilitate public disclosures (i.e., status updates) and interactions with network members—help users establish common ground, which may lead to interactions outside Facebook and a general strengthening of the relationship. Items in the Shared Interests strategy reflect how Facebook users take advantage of the site's features to identify common ground and subsequently use the site's features to interact and share content related to that shared interest (e.g., “This person and I use Facebook to share links or videos about a celebrity or TV show we like” and “When I see something online that I think this person would find interesting, I'll send him/her a note about it on Facebook”).

All four relationship maintenance strategies exhibited strong positive correlations with the Facebook communication frequency with that specific Facebook Friend, offering initial evidence of construct validity for these measures. Furthermore, the four strategies were all positively correlated with relational closeness, three quite strongly, suggesting that in the absence of other control variables, engagement in each of these strategies increases with tie strength. This finding, by itself, would appear to be contrary to the main thesis of this dissertation; however, an examination of the relationship between these variables is not likely to be so simple. Therefore, Study 1b undertakes an examination of the relationship between the four relationship maintenance strategies identified here and a series of relational outcomes, as well as the interaction between relational closeness and engagement in these strategies in predicting those outcomes while controlling for a number of potential variables that may influence people's use of Facebook and perceptions of relational partners.

STUDY 1B: FACEBOOK RELATIONSHIP MAINTENANCE STRATEGIES AND RELATIONAL OUTCOMES

Research over the last decade has provided an increasing amount of empirical support to the argument that CMC plays a supplemental role in supporting the relationship maintenance process. For example, Hampton and Wellman (2001) found that Internet users were more successful in maintaining distant relationships and exchanging support than their non-wired counterparts, most likely because of the convenience of the always-on technology and reduced financial cost (i.e., the Internet was free; long distance phone calls were not) of interacting. Cummings, Lee, and Kraut (2006) found that college students used CMC (email and IM) more often than phone calls or face-to-face communication to stay in touch with high school friends. Valkenburg and Peter (2009) found positive relational outcomes associated with IM use among Dutch adolescents over a six-month period, including increased perceptions of relational closeness, while Ellison et al. (2007) found that college students' intensity of Facebook use predicted their use of Facebook to keep in touch with high school friends.

However, research has yet to fully address the role that SNSs like Facebook play in the relationship maintenance process, especially considering the affordances that differentiate these sites from other forms of CMC like email and IM. Furthermore, few relationship maintenance studies have addressed the variety of relationships individuals manage through CMC, instead focusing only on close, intimate relationships (e.g., Ledbetter, 2009; Miczo et al., 2011; Rabby, 2007). Two exceptions to this trend are Baym, Zhang, Kunkel, Ledbetter, and Lin (2007), who looked at differences in interaction habits between family members, friends, acquaintances, and romantic partners, while Ledbetter et al. (2011) predicted relational closeness through

engagement in traditional and Facebook communication using a partner selection method similar to that employed in this study.

In order to address these gaps in the existing literature, several aspects of communication and relationship maintenance must be addressed, including how relationship maintenance relates to general relational outcomes and how the level of relational closeness between two individuals may impact the link between their use of Facebook and the impact they perceive that use having on that quality of the relationship.

Relationship Maintenance and Relational Outcomes

In his seminal piece on the strength of weak ties, Granovetter (1973) suggested that one way of analyzing dyadic interactions is through an analysis of tie strength. He defined tie strength as “a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie” (p. 1361) and argued that the strength of the tie between two individuals should be positively correlated with the overlap of the two friend networks. This definition explicitly references multiple components of relationship maintenance as described by researchers such as Stafford and Canary (1991; Stafford, 2010), including spending time together (e.g., shared activities), mutual confiding (e.g., self-disclosures), and reciprocal services (e.g., shared tasks). Tie strength is typically measured by assessing the “closeness” one person feels toward another, with the assumption that the closer one feels, the stronger the tie (Marsden & Campbell, 1984).

Research on relationship development and maintenance describes a process through which increases in the depth and breadth of disclosures leads to an increased sense of relational closeness until the dyad typically reaches a stable point in the relationship (Altman & Taylor, 1973). Closeness, therefore, can be conceptualized as a continuous—rather than an all-or-

nothing—construct (Aron & Fraley, 1999) that includes engagement in the behaviors and attitudes described above. Stafford's (2010) revised relationship maintenance typology specifically accounts for a self-disclosure component of relationship maintenance, finding it predictive of love, liking, and commitment among wives and of commitment among husbands.⁹ When considering the behaviors contained in the four Facebook relationship maintenance strategies, it is expected that engagement in these strategies will be associated with increased perceptions of relational closeness.

H1: Users' engagement in the (a) Supportive Communication, (b) Shared Interests, (c) Passive Consumption, and (d) Social Information Seeking relationship maintenance strategies will be positively associated with perceived relational closeness with a specific Facebook Friend.

Relational satisfaction is a frequently measured construct in the relationship maintenance literature. For example, interdependence theory posits that relational satisfaction is calculated by comparing relational outcomes one expects with outcomes experienced (Thibaut & Kelley, 1959). Likewise, equity theory suggests that relational partners experience the highest degree of satisfaction when they feel that there is a balance between what they put into a relationship (costs) and what they get out of the relationship (benefits) (Hatfield, Traupmann, Sprecher, Utne, & Hay, 1985; Utne, Hatfield, Traupmann, & Greenberger, 1984). In general, relational satisfaction can be conceived as a composite of both the equity and equality within a given relationship (Cate, Lloyd, Henton, & Larson, 1982), such that individuals in relationships see it as both equitable and that rewards are distributed equally amongst relational partners.

⁹ Neither Stafford (2010) nor Stafford and Canary (1991; Canary & Stafford, 1992) directly measured relational closeness in their research, most likely due to the expected low variance among the studied population (married couples).

Research testing the relationship between communication behaviors and relational satisfaction is unclear. Looking at the proportion of media use across three channels, Baym et al. (2007) found no relationship between use of face-to-face, phone, and Internet with relational satisfaction when controlling for relationship type. Miczo et al. (2011) also found no relationship between use of two online channels—email and IM—and relationship satisfaction. Interestingly, some research on relationship maintenance among married couples has found no relationship between use of specific relationship maintenance strategies and relational satisfaction (e.g., Ragsdale, 1996), while other research has found that specific behaviors (e.g., self-disclosures) are positively correlated with marital satisfaction (Hendrick, 1981). Stafford and Canary's (1991) earliest work in developing the measure of relationship maintenance found that the five-factor measure explained 56% of the variance in couples' relational satisfaction, while follow-up research by Stafford (2000) found that 46% of the variance in satisfaction was explained by three strategies—assurances, tasks, and openness. Due to the lack of consistency in findings for this outcome across offline and online environments, a research question is posed rather than a hypothesis:

RQ1: What is the relationship between users' engagement in Facebook relationship maintenance strategies and perceived relational satisfaction with a specific Facebook Friend?

As first described in the work of Granovetter (1973), Weiss (1974), and others, many researchers denote differences in the provision of various resources—typically codified as emotional, tangible, or informational support—based on tie strength, with stronger ties (e.g., close friends, family members) more likely to provide emotional and physical aid while weaker ties (e.g., friends of friends, acquaintances) more likely to provide novel information because of

their connections to individuals outside of one's network. In general, this assertion has been supported empirically. For example, Weiss (1974) argued that one's well-being is largely sustained through social support from one's closest relationships (e.g., family members, romantic partners); absence of this support may lead to loneliness and anomie. Wellman and Wortley (1990) found that strong ties provide emotional support, companionship, and small services.¹⁰ Granovetter (1974) found that weaker ties were more likely to provide useful job leads, while Burt (2005) has argued that bridging ties—individuals that connect two disparate clusters or groups within a network—are more likely to provide individuals with novel information or diverse perspectives.

SNSs like Facebook may be impacting both the contextual information available about network members and how resources are exchanged—as well as who is involved in the resource requests and provisions. Whereas support-based requests may have traditionally been limited to smaller networks and communicated through more private channels, Facebook provides an avenue through which to quickly broadcast messages to a large audience and, if necessary, obtain requested support resources, either through the site (e.g., supportive comments) or through coordinating offline support (e.g., facilitating a home visit to a sick friend). In Vitak and Ellison's (in press) qualitative study of adult Facebook users, participants reported using Facebook to send updates to their network when a family member was sick or to share important information quickly; they compared the convenience of a Facebook status update to more time-consuming methods such as sending individual emails or making phone calls. Likewise, individuals are more likely to trust response to questions posed on Facebook because they come

¹⁰ Wellman and Wortley (1990) define small services as services that “range from occasional baby-sitting—a service performed by women—to helping close vacation cottages for the winter—a male service hallowed in Canadian beer commercials. The services provide attentive, low-cost, and flexible aid in dealing with everyday problems” (p. 567).

from people they know—compared with requests for advice made on an online Q&A site like Yahoo! Answers (Morris, Teevan, & Panovich, 2010).

A few studies have examined specific behaviors within Facebook that predict perceived access to resources. For example, researchers have positively linked perceptions of bridging social capital—or access to new ideas, people, and information—to inbound directed communication (i.e., content received from another Friend; see Burke et al., 2011), social grooming communication practices, such as responding to a Friend’s request for advice or writing “happy birthday” on a Friend’s wall (Ellison et al., 2011b) and the amount of public disclosures users make through the site (Vitak, 2012). Looking at social support, Vitak, Ellison, and Steinfield (2011) found that specific behaviors on Facebook predicted perceptions of two social provisions—having a family member as a Friend predicted attachment and engaging in reciprocal communication¹¹ predicted guidance. Likewise, analysis of server-level data from Facebook (Burke et al., 2010) found the number of Friends in a user’s network and engagement in directed communication were positively related to bonding social capital—the social and emotional support people receive through interactions with their network—although these effects dissipated over time (Burke et al., 2011). Recent research also suggests that strong ties provide more social support than weak ties following a job loss; furthermore, communication with strong ties was more predictive of finding a job after three months than communication with weak ties, which provides counter evidence to the “strength of weak ties” argument (Burke & Kraut, 2013). However, research supports a positive relationship between the number of “actual” friends in a

¹¹ The Facebook Reciprocity Scale included in this study was operationalized as respondents’ propensity to respond to Facebook Friends’ when they shared three types of updates on the site: good news, bad news, or requests for advice or information.

user's network (a more nuanced measure of friendship than total Friends) and their perceptions of both forms of social capital (Ellison et al., 2011a).

In sum, researchers studying the relationship between Facebook use and perceived access to social resources have found a variety of positive outcomes between specific measures of engagement and access to support-based resources. Only one study has tapped into relationship maintenance behaviors in its measure of engagement—Ellison et al.'s (2011b) social grooming measure—which positively predicted perceived access to bridging resources. Therefore, it is expected that engagement in the three interaction-based strategies—Supportive Communication, Shared Interests, and Social Information Seeking—will positively predict perceived access to resources that reflect access to emotional and instrumental support—which is in line conceptually with much of the social capital (i.e., bonding and bridging dimensions) and social provisions (i.e., guidance and reliable alliance dimensions) research. In line with Burke et al. (2010, 2011), no relationship is expected between engagement in the Passive Consumption strategy and these relational outcomes.

H2: Users' engagement in the (a) Supportive Communication, (b) Shared Interests, and (c) Social Information Seeking relationship maintenance strategies will be positively associated with perceived access to emotional and instrumental resources from a specific Facebook Friend.

Facebook's Impact on Relational Outcomes

While the above section detailed the stream of research in recent years that has identified positive correlations between various measures of Facebook use and access to support and informational resources, research has not yet empirically assessed the extent to which Facebook use may impact relational outcomes, specifically perceived levels of relational closeness and

relational stability. In other words, the question that still needs to be answered is: does Facebook serve a relationship maintenance purpose and, if so, for what kinds of connections?

The site's structure is such that it should be able to facilitate relationship maintenance across a variety of connections. Partners can interact through a variety of channels, can share a range of information of various levels of intimacy, and can establish common ground through both active sharing and passive consumption of content. The low transaction costs associated with the maintenance strategies identified in Study 1a make it easier for individuals to perform behaviors that might improve relational quality or, in some cases, help keep a relationship from fading away, with those weaker ties that they do not regularly interact with outside of the site. Some researchers (e.g., Ellison et al., 2007, 2010, 2011b) have argued that this is one of Facebook's greatest benefits: that it facilitates interaction amongst users who may not have the means or desire to communicate through other channels but are able to keep in touch because of the site.

Therefore, a series of hypotheses are proposed for which two Facebook-specific relational outcomes have been developed. The first outcome is conceptually defined as the extent to which one's use of Facebook to interact with a Facebook Friend has a positive impact on the emotional intensity of the relationship. This outcome has been termed "Facebook's Impact on Perceptions of Relational Closeness." The second outcome reflects the lowered transaction costs associated with connecting and maintaining relationships through the site—and keeping those connections "alive" through the technical connection facilitated through the Friend association—that Judith Donath (2007) has detailed in her discussion of "social supernets" and Robin Dunbar (2011) has noted as a beneficial feature of the site. "Facebook's Impact on Perceptions of Relational Stability," therefore, is conceptually defined as the extent to which one's use of

Facebook to interact with a Facebook Friend has a positive impact on his/her perceptions of maintaining that relationship in a stable state, which also reflects one of the primary definitions of relationship maintenance (Dindia & Canary, 1993).

As noted in Study 1a, significant positive correlations were found between relational closeness and all four relationship maintenance strategies; therefore, it is important to control for individuals' existing level of relational closeness when assessing whether engagement in these strategies leads users to feel that their use of Facebook specifically makes them feel closer to a given Facebook Friend (relational closeness), or whether they feel that the site plays a significant role in keeping the relationship in existence (relational stability). Finally, these hypothesized relationships should also control for existing levels of relational satisfaction, which has been significantly associated with Stafford and Canary's (1991) relationship maintenance strategy measure, among others.

H3: Controlling for existing levels of relational closeness and satisfaction, users' engagement in the (a) Supportive Communication, (b) Shared Interests, (c) Passive Consumption, and (d) Social Information Seeking relationship maintenance strategies will be positively associated with the perceived impact of Facebook on their relational closeness with a specific Facebook Friend.

H4: Controlling for existing levels of relational closeness and satisfaction, users' engagement in the (a) Supportive Communication, (b) Shared Interests, (c) Passive Consumption, and (d) Social Information Seeking relationship maintenance strategies will be positively associated with the perceived impact of Facebook on their relational stability with a specific Facebook Friend.

Next, two hypotheses test whether differences exist in terms of the relationship between engagement in relationship maintenance strategies and Facebook-specific relational outcomes based on the tie strength of the relational dyad. In other words, do certain types of relationships benefit more from their engagement in relationship maintenance through Facebook? Based on arguments derived from media multiplexity (Haythornthwaite, 2005), social media affordances (boyd, 2010; Treem & Leonardi, 2012), and lowered transaction costs of these sites (Ellison et al., 2010), it is expected that an interaction between these variables will occur, such that weaker ties who engage in these strategies will view Facebook as more positively impacting their relational closeness and relational stability than stronger ties, who are more likely to be engaging in relationship maintenance through additional and/or alternate communication channels and, consequently, may not view the behaviors they perform on Facebook as mattering as much when considering the sum of relationship maintenance behaviors they perform.

H5: One's level of relational closeness with a specific Facebook Friend moderates the effect of their engagement in Facebook relational maintenance strategies on the perceived impact of Facebook on relational stability, such that as engagement in each relationship maintenance strategy increases, weaker ties will perceive Facebook to have a larger impact on their relational closeness than stronger ties.

H6: One's level of relational closeness with a specific Facebook Friend moderates the effect of their engagement in Facebook relationship maintenance strategies on the perceived impact of Facebook on relational stability, such that as engagement in each relationship maintenance strategy increases, weaker ties will perceive Facebook to have a larger impact on their relational stability than stronger ties.

In addition to weak ties, specific types of relational dyads may also benefit more from their use of Facebook relationship maintenance strategies than others and, consequently, may view the site as having a more positive impact on their relationship with another Friend. For example, some Facebook users—including both strong and weak ties, but probably more likely to be weak ties—rely primarily on the site to maintain their relationship. These people rarely interact through more traditional communication channels like in-person meetings, phone calls, or emails and instead limit their communications to the convenient—and public—interactions such as Wall posts, Likes, and comments. One reason for preferring this method of communication would be geographic constraints, such as when two friends live in different states. Another is that the public nature of Facebook communication would allow other users to add to conversations; so when one user posts a picture on another’s Wall, mutual Friends can also comment on that photo, thus providing a richer interaction than had the photo simply been emailed directly from one person to the other.

That said, people who are primarily relying on Facebook for interaction with a relational partner are likely to place a higher value on the site simply because it serves as the sole communication line connecting them. Therefore, it is predicted that when comparing Facebook dyads for whom Facebook is the primary form of communication to those who communicate more frequently through other channels, the former group will report greater engagement in the four Facebook relationship maintenance strategies and will view Facebook as a more positive influence on their relational closeness and relational stability with a Facebook Friend.

H7: When Facebook serves as a primary form of communication with a specific Facebook Friend, individuals will report (a) higher engagement in relationship

maintenance strategies and (b) higher Facebook communication frequency than those for whom Facebook is not the primary form of communication.

H8: When Facebook serves as a primary form of communication with a specific Facebook Friend, individuals will perceive Facebook to have a greater impact on their (a) relational closeness and (b) relational stability than those for whom Facebook is not the primary form of communication.

In a similar fashion, we would expect differences in engagement in Facebook relationship maintenance behaviors among geographically proximate and long-distance dyads. Research by Johnson (2001) employing Stafford and Canary's (1991) relationship maintenance typology found that geographically proximate dyads engaged in a greater quantity of strategies; however, she argues this finding may be attributed to bias in the measures. As the Facebook relationship maintenance strategies attempt to overcome issues of collocation, physical proximity should not impact engagement in relationship maintenance strategies. Indeed, as many of the behaviors encapsulated within the strategies are performed through the site, the physical location of the partners should have no impact on their *ability* to perform the behavior; however, because partners who live farther away are likely to have fewer opportunities to engage in other forms of relationship maintenance such as shared activities (e.g., Dainton et al., 2003), it is expected they will engage in these relationship maintenance strategies to a greater extent and will perceive Facebook as having a more positive impact on their perceived relational closeness and relational stability with that Friend.

H9: The greater the physical distance individuals report between themselves and a specific Facebook Friend, the greater their reported engagement in (a) relationship maintenance strategies and (b) Facebook communication frequency.

H10: The greater the physical distance individuals report between themselves and a specific Facebook Friend, the more positive an impact they will perceive Facebook to have on their (a) relational closeness and (b) relational stability with that Friend.

Finally, the composition of the interaction dyads should be considered in light of research on gender communication patterns for relationship maintenance. Research has shown that women are heavier users of the social features of the Internet and have more heavily embraced technologies that allow them to connect and interact with other people. For example, early research on email adoption revealed that women were more likely to use email to maintain relationships with family and friends, included significantly more personal content in their emails, and found email to be more gratifying when compared with men (Boneva et al., 2001). Recent research by the Pew Internet Project (Hampton et al., 2011a) found that in 2011, women comprised the majority of email users (52%), instant messaging service users (55%), bloggers (54%), those using a photo sharing service like Flickr (58%), and those using a SNS (56%). When looking specifically at Facebook, Hampton et al. (2011a) also found that women outpace men in terms of communication and interaction: women are significantly more likely to update their status daily, comment on a post at least daily, comment on photos, and “Like” content when compared with their male counterparts. Therefore, when considering the Facebook relationship maintenance strategies that users perform on the site, which are comprised of specific behaviors such as Liking a status or writing a comment, it is expected that female-female dyads will engage in these strategies with the greatest frequency while male-male dyads will engage in the strategies with the least frequency.

H11: The sex of participants will interact with the gender of the Facebook Friend being analyzed, such that female-female dyads will report the highest engagement in (a)

relationship maintenance strategies and (b) Facebook communication frequency while male-male dyads will report the lowest engagement in these behaviors.

Study 1b Method

For sampling, participants, and procedure, see Study 1a method on page 23.

Measures: Dependent Variables

Unless otherwise noted, all composite variables are measured on a five-point Likert-type scale with response options ranging from 1=Strongly Disagree to 5=Strongly Agree.

Relational Closeness. For details on this measure (Dibble et al.’s, 2012 unidimensional relational closeness scale), see the Method section of Study 1a. Table 4 contains items, means, and standard deviations for this measure.

Table 4: Items, Means, and Standard Deviations for Dibble et al.’s (2012) Unidimensional Relational Closeness Scale

Items	M	SD
My relationship with (person’s name) is close.	2.60	1.26
When we are apart, I miss (person’s name) a great deal.	3.01	1.34
(Person’s name) and I disclose important personal things to each other.	3.21	1.23
(Person’s name) and I have a strong connection.	3.11	1.15
(Person’s name) and I want to spend time together.	2.90	1.29
(Person’s name) is a priority in my life.	3.10	1.29
I think about (person’s name) a lot.	2.72	1.26
My relationship with (person’s name) is important in my life.	3.51	1.17
I consider (person’s name) when making important decisions.	2.34	1.22
Full Scale ($\alpha = .85$)	2.69	.61

Access to Emotional and Instrumental Resources. Weiss (1974) argued that individuals’ sense of well-being is sustained largely through the provision of various forms of support (e.g., emotional, instrumental, informational), with the types of provisions varying across network

members (family members, romantic partners, friends, etc.). Weiss (1974) identified six categories of social provisions: attachment, social integration, opportunity for nurturance, reassurance of worth, reliable alliance, and guidance. Cutrona and Russell (1987) subsequently developed and validated scales for each of these social provisions. Two of these subscales tap specifically into the emotional and instrumental support that members of one's social network may provide: Guidance ($\alpha=.72$, $M=3.14$, $SD=.76$) measures the degree to which a person feels s/he has people to turn to for advice, while Reliable Alliance ($\alpha=.85$, $M=3.38$, $SD=.86$) assesses whether the person believes someone will provide him/her with tangible assistance when needed.

While treated as separate constructs in work by Cutrona and Russell (e.g., Cutrona, 1982, 1984), these two scales are highly correlated ($r=.72$) and tap into the same overarching conceptual construct this study wants to measure: perceived access to social resources, which is closely tied to the concept of social capital (see Bourdieu, 1986, for a review). Access to the instrumental support highlighted in items in the Reliable Alliance subscale taps into the "big favors" typically provided by closer ties, while the informational and emotional support encapsulated in the Guidance subscale may be provided by a variety of ties, especially with the reduced transaction costs of communicating through Facebook.

The original wording of the items assessed whether there was anyone in that person's network who could provide the specified provision (e.g., "There is someone I could talk to about important decisions in my life"), so the items were reworded to assess if participants believed the Friend they were assessing would provide that resource (e.g., "This person is someone I could talk to about important decisions in my life"). Confirmatory factor analysis led to removal of one item from each of the subscales, with the final, six-item scale ($\alpha=.88$, $M=3.48$, $SD=.95$) being a

good fit to the data, $\chi^2(6)=12.16$, $p>.05$, CFI=.996, RMSEA=.05. Items, means, and standard deviations can be found in Table 5.

Table 5: Items, Means, and Standard Deviations for Access to Emotional and Instrumental Resources Scale

Items	M	SD
I can depend on (person's name) to help me if I really need it	3.64	1.14
I can't depend on (person's name) for aid if I really need it. [reverse-coded]	3.64	1.20
I can count on (person's name) in an emergency.	3.52	1.21
I would not turn to (person's name) for guidance in times of stress. [reverse-coded]	3.29	1.28
I can talk to (person's name) about important decisions in my life.	3.25	1.26
I could ask (person's name) for advice if I were having problems.	3.54	1.17
Full Scale ($\alpha=.88$)	3.48	.95

Relational Satisfaction. The Relational Satisfaction scale was derived from the Austin Contentment/Distress (ACD; Austin, 1974) measure, which was designed to measure perceptions of relational satisfaction. As noted above, relational satisfaction is conceptually defined as a combination of the equity and equality an individual perceives in his or her relationship with another person (Cate et al., 1982). Relational satisfaction is among the most common constructs studied in relation to relationship maintenance strategies; for example, Stafford and Canary's (1991) five-factor Relationship Maintenance Strategy Measure (RMSM) explained 56% of the variance in romantic couple's relational satisfaction.

In Austin's (1974) original measure, participants were asked to think about what they and their partner put into and get out of their relationship and to assess how they feel about the relationship along four dimensions—content, happy, angry, and guilty—on a four-point scale ranging from 1=Not at All to 4=Very Much. Relational Satisfaction was then calculated by

summing the scores for the two positively valenced words (content and happy) and subtracting the scores for the two negatively valenced words (angry and guilty). This provided a potential range of scores from -6.0 to +6.0.

While this scale has been used in a number of psychological studies over the years (see Sharpe & Heppner, 1992, for a review), it has never been validated, so in the current study, an additional positively valenced word (satisfied) and negatively valenced word (disappointed) were added. Participants were provided with similar instructions (“Now think about what you and (person’s name) put into and get out of this relationship. Assess the extent to which the following words describe how you feel about your relationship with (person’s name)”), although the response range was increased to 1=Not at All to 5=Very Much to be consistent with other items included in the instrument.

Before computing a composite measure of the six items, they were looked at individually. All three negatively valenced items exhibited a strong positive skew (>2) and high kurtosis (>9), while the three positively valenced items were relatively normally distributed, with small negative skews. The “angry” item, however, had a kurtosis score of 25.293 and skewness of 4.841, the only of the six items to have not one response for the highest category (i.e., in this case, the word “very much” described how the participant felt about the person). Therefore, the item was removed before computing the scale. However, this raised a problem, as the scale was meant to be balanced on the neutral midpoint of 0; to alleviate this, the other two negatively valenced items were weighted to account for the missing third item. The final scale, then, had a possible range of -12 to +12 and an actual range of -6 to +12, with a mean score of 7.96 ($SD=3.91$). Skewness and kurtosis values in the final scale were within acceptable ranges (-.983 and .470,

respectively). Table 6 includes individual item means, SDs, skewness, and kurtosis scores for the five items included in the final scale.

Table 6: Descriptive Statistics for Items Included in Relational Satisfaction Measure

	Positively Valenced Words			Negatively Valenced Words	
	Happy	Content	Satisfied	Guilty	Disappointed
Mean	3.9136	3.9404	3.8768	1.2104	1.3029
Standard Deviation	1.17651	1.15175	1.17007	.56828	.71186
Skewness	-.917	-1.020	-.899	3.135	2.859
SE of Skewness	.121	.121	.121	.121	.121
Kurtosis	-.069	.294	-.018	10.825	8.945
SE of Kurtosis	.241	.241	.241	.241	.241

Note: Due to imbalance between the number of positively valenced (3) and negatively valenced (2) words, the negatively valenced words were weighted with a value of 1.5 when creating the scale.

Facebook’s Impact on Relational Outcomes. In addition to examining the relationship between engagement in the Facebook relationship maintenance strategies and perceptions of general relational outcomes, a primary goal of this dissertation is to determine how these strategies function above and beyond those measures in predicting the perceived impact of site use on relational outcomes. Nineteen items were included in the instrument that tapped into ways in which use of the site might make one feel closer to another Friend (e.g., “Facebook helps me understand this person better”; “Being Facebook Friends with this person has improved our relationship”) and maintain a relationship that might otherwise fade away without the technology (e.g., “Without Facebook, I would communicate with this person less”; “Because of Facebook, I feel like I know what's going on in this person’s life”). The 19 items were entered into a principal components factor analysis with Promax rotation; as with the maintenance behaviors, it was

expected that the resulting factors would be correlated, and an examination of the correlation matrix of the final solution showed correlations between the three factors ranging from .412 to .643.

Initial results suggested a four-factor solution; however, five items had to be removed from the solution due to high cross-loadings. The final three-factor solution accounted for 75.87% of the variance. An examination of Cattell's (1966) scree plot provided support for a three-factor solution, while parallel analysis (Horn, 1965) of the items suggested a two-factor solution. However, as Turner (1998) notes, a large first factor in PA—as was the case in this analysis, with the first factor accounting for 54.94% of the variance—may lead to underfactoring. The third factor's values were not significantly lower than the eigenvalues from the random correlation matrices (1.11 vs. 1.23) and a subsequent analysis of this factor showed it to be highly correlated with the other dependent variables, which provides additional support for its inclusion. See Table 7 for items and factor loadings from the EFA and Figure 3 for a graph plotting the eigenvalues by the components for the three values compared through parallel analysis.

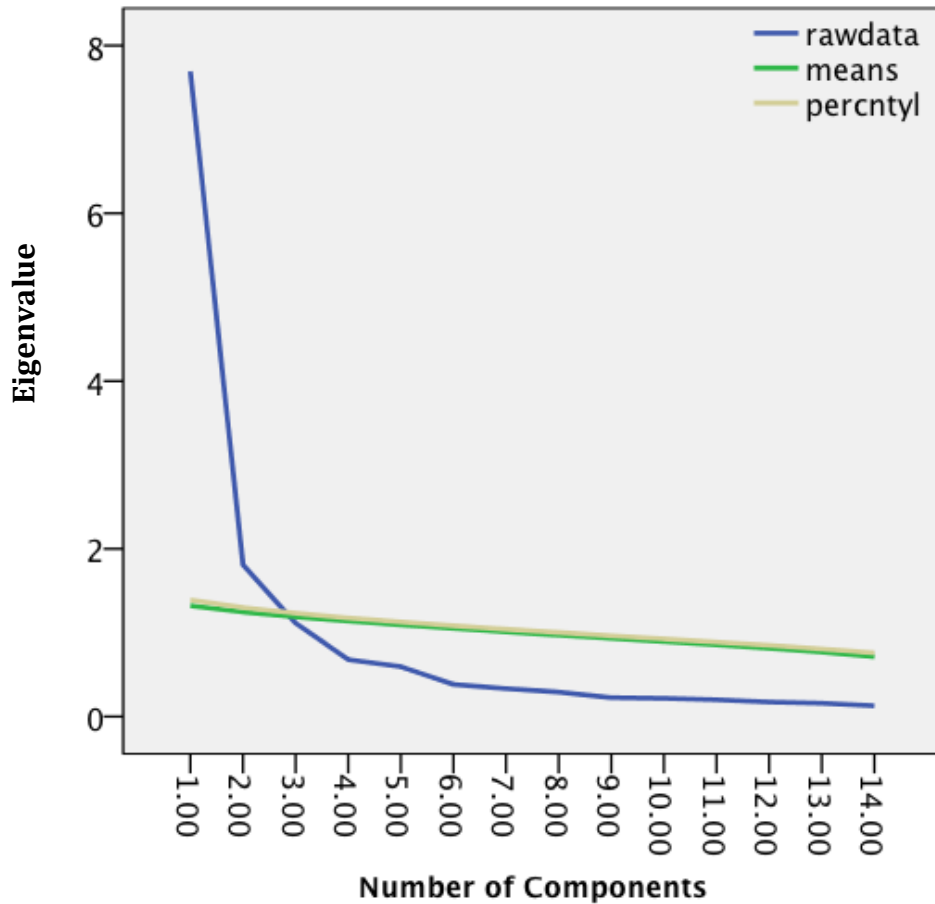
The inclusion of this third factor is important, as only the first and third factors from the EFA are included in analyses here. The first factor, Facebook's Impact on Relational Closeness ($\alpha=.92$, $M=2.91$, $SD=.99$) includes five items capturing positive relational outcomes associated with Facebook use, including helping one understand a friend better, feel closer to that friend, and improving the relationship. The third factor, Facebook's Impact on Relational Stability ($\alpha=.83$, $M=2.76$, $SD=1.01$), accounted for 8% of the variance in the factor analysis and includes four items that focus on the users' perceptions of the role Facebook plays in keeping the relationship in existence.

Table 7: Obliquely Rotated Component Loadings of 14 Facebook-Specific Relational Outcome Items Included in Outcome Variables

Items	Component		
	1	2	3
FBC1: Facebook makes me feel closer to (person's name).	.872		
FBC3: Facebook has positively impacted my relationship with (person's name).	.891		
FBC4: Facebook helps me understand (person's name) better.	.790		
FBC5: Interacting with (person's name) through Facebook makes me feel like I know him/her better.	.837		
FBC7: Being Facebook Friends with (person's name) has improved our relationship.	.880		
FBS6: Facebook is a convenient way to stay in touch with (person's name).		.854	
FBS9: Facebook keeps me up to date on (person's name)'s life.		.829	
FBS10: Because of Facebook, I feel like I know what's going on in (person's name)'s life.		.733	
FBS11: Facebook makes it easy for me to keep in touch with (person's name).		.874	
FBS12: Because of Facebook, I feel like I know what (person's name) has been up to, even when we haven't interacted in a while.		.890	
FBS8: Without Facebook, (person's name) and I would fall out of touch.			.923
FBS4: Facebook is the only way I stay in touch with (person's name).			.956
FBS5: Overall, Facebook isn't very important in maintaining my relationship with (person's name).			-.659
FBS7: Facebook plays an important role in maintaining my relationship with (person's name).			.584

Notes: Extraction Method: PCA. Rotation Method: Promax with Kaiser Normalization. Rotation converged in 5 iterations.

Figure 3: Parallel Analysis Plot of Eigenvalue Scores by Components for Facebook-Specific Relational Outcomes



Measures: Independent Variables

Facebook Relationship Maintenance Strategies. Four relationship maintenance strategies, identified in Study 1a through exploratory factor analysis, are included in this study’s analyses. These are Supportive Communication ($M=3.68$, $SD=.82$), Shared Interests ($M=2.33$, $SD=.88$), Passive Consumption ($M=2.91$, $SD=.89$), and Social Information Seeking ($M=2.73$, $SD=.86$). Items, means, and standard deviations for the four scales are listed in Table 8.

Table 8: Items, Means, and Standard Deviations for Facebook Relationship Maintenance Strategy Scales

Items	M	SD
Factor 1: Supportive Communication ($\alpha=.88$)	3.68	.82
My Facebook interactions with (person's name) are generally positive.	4.11	.76
(Person's name) is upbeat when we interact through Facebook.	3.62	.90
When I see (person's name) sharing good news on Facebook, I'll like his/her update.	3.82	1.06
I make sure to send (person's name) a note (wall post, comment, private message, etc.) on his/her birthday.	3.53	1.32
I congratulate (person's name) when he/she shares news on Facebook about something big happening in his/her life.	3.79	1.08
(Person's name) always wishes me happy birthday on Facebook.	3.47	1.16
When I post about something good going on in my life, (person's name) will like it.	3.45	1.11
Factor 2: Shared Interests ($\alpha=.87$)	2.33	.88
I share links with (person's name) on Facebook.	2.57	1.21
(Person's name) and I use Facebook to talk about a shared interest, sport, and/or hobby.	2.60	1.25
(Person's name) and I use Facebook to coordinate events related to a shared interest, sport, and/or hobby.	2.34	1.23
(Person's name) and I use Facebook to share links or videos about a celebrity or TV show we like.	1.90	1.04
When I see something online that I think (person's name) would find interesting, I'll send him/her a note about it on Facebook.	2.54	1.22
I've posted links or videos to Facebook with (person's name) specifically in mind.	2.17	1.18
I share funny stories from my day with (person's name) over Facebook.	2.18	1.08
I use Facebook to find out things (person's name) and I have in common.	2.33	1.10
Factor 3: Passive Communication ($\alpha=.85$)	2.91	.89
Estimate the frequency with which you visit his/her profile page.	2.61	1.01
Estimate the frequency with which you browse his/her photo albums.	2.72	.98
I browse through (person's name)'s profile page to see what s/he's been doing.	2.89	1.20
I browse photo albums posted in (person's name)'s profile.	3.44	1.11
Factor 4: Social Information Seeking ($\alpha=.79$)	2.73	.86
I use Facebook to find out things (person's name) and I have in common.	2.33	1.10
I use Facebook to get to know (person's name) better.	2.55	1.14
I learn about big news in (person's name)'s life from Facebook.	3.13	1.22
I keep up to date on (person's name)'s day-to-day activities through Facebook.	2.57	1.17
(Person's name) posts updates to Facebook about his/her day-to-day activities.	3.06	1.21

Traditional Communication Frequency. The instrument asked participants to rate the frequency with which they interacted with their selected friend through six communication channels that were non-Facebook-specific: in-person, phone calls, text messages, email, non-Facebook instant messages, and video calls like Skype. Items were measured on a five-point scale ranging from 1=Never to 5=Very Often. The six items were entered into a principal components factor analysis with Promax rotation; results led to the removal of the IM and Skype items. The remaining four items were combined to make the Traditional Communication Frequency ($\alpha=.85$, $M=2.36$, $SD=1.01$).

It is widely accepted that engagement in communication through the channels included in this measure have a significant positive association with relational outcomes (e.g., Baym et al., 2004). Initial analyses of this dataset support this finding, with Pearson correlations exceeding $r = .64$ for two of the three initial outcomes (relational closeness and emotional and instrumental resources). As the purpose of this study is to explore the effect of Facebook use—and specifically engagement in relationship maintenance strategies through the site—on these outcomes, the inclusion of Traditional Communication as a control variable may suppress other meaningful relationships. Therefore, this variable will be excluded from all regression analyses with the understanding that, in the first set of analyses, it is highly correlated with the dependent variables and in the second set of analyses, relational closeness is included as an independent variable (which it is correlated with at $r = .75$).

Relationship Length. Participants were asked through an open-ended question to estimate how long they had known their selected Friend in years and months. Participants reported, on average, knowing the person 18.25 years (median=14.17, $SD=14.55$). The item exhibited low kurtosis (.070) but was slightly positively skewed (.910).

Geographic Distance Between Friends. Participants were asked to estimate how far away the selected Friend lived from six options: (1) less than a 30-minute drive, (2) 30 minutes-1 hour drive, (3) 1-2 hour drive, (4) 2-4 hour drive, (5) 4-6 hour drive, (6) 6+ hour drive.¹² The options were meant to provide a range of responses from in-town friends to those requiring a flight or multiple days worth of travel. Participants reported that their selected friend lived, on average, slightly over two hours away ($M=3.13$, $SD=2.05$), although the item exhibited high negative kurtosis (-1.503), with a significant percentage of respondents in the closest geographic category (33.9%) and the farthest geographic category (27.8%). See Figure 4 for a histogram of the distribution of the variable (range=1-6).

Facebook Usage Variables. Facebook Communication Frequency, Facebook Checks Per Day, and the number of total and actual Facebook Friends—described in Study 1a—are included in multivariate analyses below.

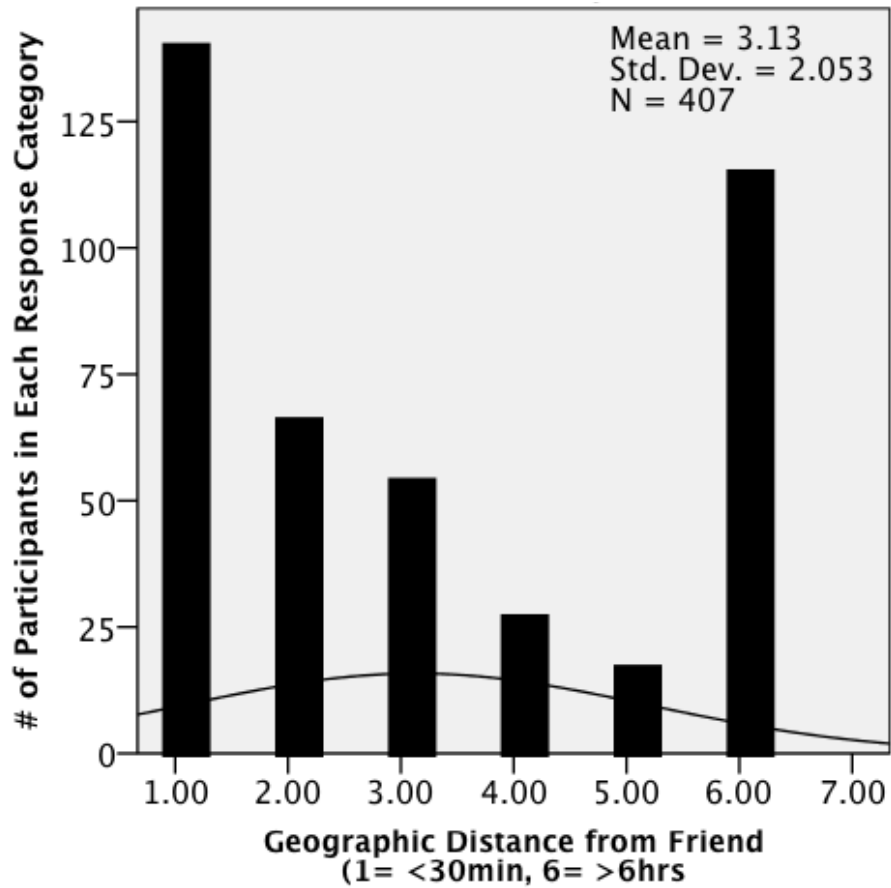
Controls. Sex (female=76.2%), age ($M=44.20$, $SD=11.12$), and education (23.6% with some college, 39.7% with a bachelor's degree, 32.5% with post-graduate training) are included in all regression analyses as control variables.

Data Analysis

As with above, Missing Value Analysis was conducted on all variables included in analyses prior to hypothesis testing. No single item had more than six missing cases (1.5% of total cases) so with the exception of one item, all missing data were imputed using the

¹² While this variable is not a true interval variable, an attempt was made to create as close to equal distances between response options as made practical sense in the context of the question. Furthermore, research indicates that regression analyses are generally robust against violations of normality assumptions (see Bohrnstedt & Carter, 1971).

Figure 4: Histogram of Distribution of Responses for Geographic Distance of Facebook Friend



Expectation-Maximization (EM) algorithm (Schlomer et al., 2010). In the case of the actual friends item, using this imputation could lead to a higher number of actual friends than total Facebook Friends (which is technically impossible); therefore, the ratio of actual to total Facebook Friends was calculated for the corpus using median values of the dataset. From this, the expected actual friends for the six missing cases were imputed.

See Table 9 for a correlation matrix of all DVs and IVs used in multivariate analyses.

Table 9: Pearson Correlation of Primary Variables Included in Multivariate Analyses

	1	2	3	4	5	6	7	8	9	10	11	12
1) Composite Closeness Items	1											
2) Relational Satisfaction Scale	.405**	1										
3) Resource Access	.770**	.450**	1									
4) Facebook's Impact on Relational Closeness	.110*	.026	.056	1								
5) Facebook's Impact on Relational Stability Scale	-.379**	-.251**	-.376**	.538**	1							
6) Supportive Communication Strategy	.459**	.291**	.462**	.416**	.105*	1						
7) Shared Interests Strategy	.410**	.209**	.389**	.381**	.107*	.564**	1					
8) Passive Consumption Strategy	.488**	.222**	.362**	.410**	.081	.572**	.484**	1				
9) Social Info Seeking Strategy	.100*	-.013	.032	.663**	.495**	.457**	.478**	.508**	1			
10) Traditional Communication	.754**	.365**	.662**	-.066	-.507**	.333**	.406**	.377**	-.026	1		
11) Facebook Communication	.442**	.230**	.363**	.372**	.155**	.723**	.572**	.617**	.431**	.354**	1	
12) Geographic Distance	-.124*	-.093	-.164**	.144**	.324**	.038	-.067	.121*	.112*	.304**	.043	1

* $p < .05$ ** $p < .01$

Multiple Testing and the Bonferroni Correction

When researchers conduct a large number of tests on a set of data, they increase the likelihood of incurring a Type I error, i.e., incorrectly rejecting a true null hypothesis (Bland & Altman, 1995; Holm, 1979; Rice, 1989). For example, as Perneger (1998) notes, when a researcher conducts 20 independent tests and the null hypothesis is true for all 20 tests, the chance of one of those tests being significant increases to 64% (based on the formula $1-(1-\alpha)^n$, where n is the number of tests).

To reduce the likelihood of reporting non-significant findings, the Bonferroni correction (Dunn, 1961) proposes that researchers should divide the critical alpha (.05) by the number of tests performed to generate a new maximum significance value for results from analyses. For example, if five tests t-tests revealed results of .05, .03, .01, .003, and .001, the Bonferroni correction ($.05/5=.01$) would state that only the latter three findings should be reported as significant. The Bonferroni correction is considered extremely conservative (Cabin & Mitchell, 2000; Moran, 2003; Perneger, 1989) and at least one alteration (Holm, 1979) has been made to increase its statistical power and make it less restrictive. The Holm-Bonferroni sequentially rejective test is very similar to the original Bonferroni correction, but ranks p-values from smallest to largest, then tests each one individually, decreasing the correction number by one for each subsequent test. In the previous example, the first p-value would be tested at $.05/5$, the second at $.05/4$ and so on, until a significant finding did not meet the criteria. In this case, the result would be the same as the more conservative Bonferroni correction, as $.05/2=.025$, which is less than the second-highest p-value in this set (.03), meaning it would be rejected for not meeting the significance criteria.

While the Holm-Bonferroni correction is considered less conservative than the original correction, many researchers still consider it overly conservative (e.g., Westfall & Young, 1993) and a large number of critiques exist for alpha corrections generally and the Bonferroni correction specifically. First, as one decreases the likelihood of Type I errors, the likelihood of causing Type II errors—accepting the null hypothesis when the alternative hypothesis is true—increases. In other words, by taking such a conservative approach to determining significance of findings, researchers may overlook significant findings in their data, which could be as serious an issue (Cabin & Mitchell, 2000; Nakagawa, 2004; Perneger, 1998; Rothman, 1990). If concern for both Type I and Type II errors are equally important, an important question to address becomes, how do you balance the likelihood of causing either when interpreting results?

A second critique of the Bonferroni correction is that there is no standardization regarding the application of the correction to a set of data (Cabin & Mitchell, 2000; Moran, 2003; Perneger, 1989). For example, Moran (2003) notes, “The logical concern is that it is not possible to develop a standard way to apply multiple testing procedures to data sets. Should one apply it to a particular table, the entire paper, all the papers in a particular journal issue, or to a lifetime of research” (p. 404)? In surveying editors of three ecological journals, Cabin and Mitchell (2000) found significant discrepancies in respondents’ decisions on whether and when a Bonferroni correction should be applied to a dataset and echo Moran (2003) in saying that “increases in the scale of Bonferroni corrections can quickly degenerate into the absurd” (p. 248).

A third critique of Bonferroni is that researchers are penalized for performing more detailed analyses, since the correction becomes more restrictive with each additional test performed (Moran, 2003). This is especially problematic with exploratory research, where researchers may want to test the relationship between a large number of independent variables

and multiple outcomes; for example, applying a Bonferroni correction to 100 correlation tests would require a p-value of $.05/100=.0005$ for the result to be considered significant. Many regard this approach as overly conservative and argue that it is likely inflating the Type II error rate to an unsatisfactorily high level. Finally, several researchers highlight that the obsession with significance testing is misplaced and that we should not blindly adhere to a particular p-value (Yoccoz, 1991), but instead focus on effect sizes (Cabin & Mitchell, 2000; Nakagawa, 2004; Yoccoz, 1991) and apply common sense to data analysis (Cabin & Mitchell, 2000; Moran, 2003; Perneger, 1989).

The critiques detailed above do not imply that we should disregard the possibility of increased Type I error because of multiplicity. They simply argue that the most commonly applied solutions—the Bonferroni correction and its later altered form, the Holm-Bonferroni—create too conservative a testing environment that have yet to be sufficiently defined in terms of families of tests and do not sufficiently balance Type I and Type II errors. Therefore, a straightforward solution, as suggested by Moran (2003) and others, will be applied in the Findings section below. Rather than use the standard asterisk notation system to designate significance in the regression tables and discussion of results, exact p-values will be reported. This allows the reader to interpret the findings with a desired level of caution. All hypothesized relationships, as well as non-hypothesized findings significant at $p < .0025$ ($.05/20$ regressions), will be presented in the text of the Findings section. This allows for reasonable interpretations of the data based on significance, effect size, and basic logic, and will avoid the increased likelihood of missing an important significant finding that would occur with an overly conservative treatment (Moran, 2003) while accounting for the increased likelihood of false positive results associated with multiple tests.

Findings

Facebook Relationship Maintenance Strategies Predicting General Relational Outcomes

The first set of hypotheses (H1-H3) predicted positive relationships between the four relationship maintenance strategies (Supportive Communication, Shared Interests, Passive Consumption, and Social Information Seeking) and two relational outcomes (Relational Closeness, Access to Social Provisions), while the research question (RQ1) asked how these strategies were related to a third relational outcome, relational satisfaction. For each of the analyzed relationships, four nested OLS regressions were conducted to assess the individual contributions of the Facebook use variables and each maintenance strategy to the model. In the first step, six control variables were entered into the model: Sex, Age, Education, Relationship Length, Geographic Distance, and Traditional Communication Frequency. In the second step, three measures of Facebook use were entered: Facebook checks per day, Ratio of Actual to Total Friends, and Facebook Communication Frequency. In the final step, the maintenance strategy was entered to the model. This was repeated for each of the four maintenance strategies and each of the dependent variables.

Relational Closeness. See Table 10 for standardized betas for the four models predicting Relational Closeness. In the first step, relationship length ($\beta=.196, p<.001$) significantly predicted Relational Closeness, such that those who reported knowing their Friend longer reported higher intimacy with that person. The addition of the Facebook variables made Geographic Distance a significant predictor ($\beta=-.162, p<.001$), such that participants rated those who lived closer as more intimate. At the same time, engagement in interaction through Facebook had an extremely high positive beta ($\beta=.454, p<.001$), meaning that engagement in

these types of behaviors was associated with higher perceived Relational Closeness. After the second step, the adjusted R^2 for the model was .251.

Table 10: Nested OLS Regressions Predicting Relational Closeness

	Step 1: Controls	Step 2: FB Use	Step 3: Relationship Maintenance Strategy			
			Support. Comm.	Shared Interests	Passive Consump	Info- Seeking
Standardized Betas (p-values)						
Sex: Female	.094 (.056)	.008 (.866)	.007 (.870)	.052 (.239)	-.007 (.873)	.005 (.906)
Age	-.078 (.138)	-.043 (.400)	-.028 (.572)	-.055 (.263)	-.026 (.595)	-.036 (.479)
Education	-.061 (.235)	-.057 (.214)	-.060 (.174)	-.048 (.278)	-.051 (.238)	-.055 (.233)
Relationship Length	.196 (.000)	.166 (.001)	.149 (.002)	.188 (.000)	.162 (.000)	.163 (.001)
Geographic Distance	-.149 (.003)	-.162 (.000)	-.163 (.000)	-.143 (.000)	-.197 (.000)	-.155 (.001)
Facebook Checks Per Day		-.095 (.063)	-.134 (.008)	-.123 (.001)	-.080 (.100)	-.086 (.098)
Total Facebook Friends (log)		-.083 (.187)	-.102 (.091)	-.102 (.014)	-.049 (.405)	-.083 (.187)
Actual Friends on Facebook (log)		.122 (.038)	.089 (.118)	.133 (.093)	.103 (.064)	.119 (.043)
Facebook Communication		.454 (.000)	.238 (.000)	.293 (.000)	.231 (.000)	.484 (.000)
Facebook Relationship Maintenance Strategy			.343 (.000)	.280 (.000)	.358 (.000)	-.073 (.135)
F Test	5.799 (.000)	16.109 (.000)	18.508 (.000)	18.299 (.000)	20.784 (.000)	14.768 (.000)
Adjusted R^2	.056	.251	.302	.299	.328	.254

In Step 3, each of the relationship maintenance strategies was added separately.

Supportive Communication ($\beta=.34, p<.001$), Shared Interests ($\beta=.28, p<.001$), and Passive Consumption ($\beta=.36, p<.001$) positively predicted Relational Closeness with a specific

Facebook Friend while controlling for the other variables, providing partial support for H1.

Social Information Seeking ($\beta=-.07, p=.135$) was unrelated to Relational Closeness. The addition of the relational maintenance strategies to the model improved the model's adjusted R^2 between .003 and .077.

Relational Satisfaction. See Table 11 for standardized betas for the four models predicting Relational Satisfaction. In Step 1, none of the five variables met the minimum criteria of $p < .0025$. In the Second Step, the frequency of interacting with a Facebook Friend through Facebook's public communication features positively predicted perceived levels of Relational Satisfaction ($\beta=.180, p<.001$), such that greater interaction was associated with higher satisfaction. Overall, the variables included in the first two steps of the regression accounted for 7.1% of the variance in Relational Satisfaction.

Step 3 added the four relationship maintenance variables. Supportive Communication ($\beta=.265, p<.001$) had the strongest association with Relational Satisfaction, but all four strategies were associated with the dependent variable to varying degrees at a significance of $p \leq .031$, including Shared Interests ($\beta=.131, p=.031$), Passive Consumption ($\beta=.145, p=.019$), and Social Information Seeking ($\beta=-.138, p=.011$). Importantly, the association between the Social Information Seeking strategy and Relational Satisfaction was negative, such that the more a person used Facebook to find out new and everyday information about a specific Facebook Friend, the less satisfied they reported being with their relationship with that person. At the same time, in the Social Information Seeking regression only, the Facebook Communication Frequency variable remained significant with the addition of the relationship maintenance strategy ($\beta=.236, p<.001$). Improvements to the adjusted R^2 from the addition of the relationship maintenance strategies ranged from .009 to .029.

Table 11: Nested OLS Regressions Predicting Relational Satisfaction

	Step 1:	Step 2:	Step 3: Relationship Maintenance Strategy			
	Controls	FB Use	Support. Comm.	Shared Interests	Passive Consump	Info- Seeking
Standardized Betas (p-values)						
Sex: Female	.122 (.015)	.082 (.099)	.081 (.096)	.102 (.042)	.076 (.124)	.077 (.116)
Age	.020 (.712)	.046 (.411)	.058 (.297)	.041 (.469)	.053 (.342)	.059 (.293)
Education	.042 (.421)	.035 (.490)	.033 (.515)	.039 (.440)	.038 (.460)	.040 (.434)
Relationship Length	.011 (.847)	.001 (.985)	-.012 (.823)	.011 (.831)	.000 (.995)	-.004 (.935)
Geographic Distance	-.108 (.036)	-.110 (.029)	-.111 (.025)	-.101 (.044)	-.124 (.014)	-.097 (.053)
Facebook Checks Per Day		.075 (.191)	.045 (.427)	.062 (.280)	.081 (.155)	.093 (.104)
Total Facebook Friends (log)		-.144 (.039)	-.160 (.021)	-.153 (.028)	-.131 (.060)	-.144 (.038)
Actual Friends on Facebook (log)		.159 (.016)	.134 (.040)	.164 (.012)	.151 (.021)	.153 (.019)
Facebook Communication		.180 (.001)	.013 (.850)	.105 (.104)	.090 (.175)	.236 (.000)
Facebook Relationship Maintenance Strategy			.265 (.000)	.131 (.031)	.145 (.019)	-.138 (.011)
F Test	2.111 (.063)	4.440 (.000)	5.493 (.000)	4.501 (.000)	4.594 (.000)	4.714 (.000)
Adjusted R ²	.014	.071	.100	.080	.082	.084

Emotional and Instrumental Resources. See Table 12 for standardized betas for the four models predicting Access to Emotional and Instrumental Resources. In the first step, only Geographic Distance ($\beta=.236, p<.001$) met the criteria for reporting results. With the addition of the Facebook variables in Step 2, the number of actual friends in one's network was positively associated with Perceived Access to Resources from a specific Facebook Friend ($\beta=.194,$

$p=.002$), as was the frequency of public communication through Facebook ($\beta=.333, p<.001$).

The variables entered in the first two steps accounted for 17.9% of the variance in Access to Emotional and Instrumental Resources.

Table 12: Nested OLS Regressions Predicting Access to Emotional and Instrumental Resources

	Step 1: Controls	Step 2: FB Use	Step 3: Relationship Maintenance Strategy			
			Support. Comm.	Shared Interests	Passive Consump	Info- Seeking
Standardized Betas (p-values)						
Sex: Female	.036 (.467)	-.034 (.468)	-.034 (.438)	.010 (.831)	-.044 (.339)	-.038 (.415)
Age	-.128 (.017)	-.083 (.117)	-.065 (.200)	-.095 (.065)	-.071 (.169)	-.072 (.176)
Education	.007 (.887)	.001 (.987)	-.003 (.944)	.009 (.839)	.005 (.920)	.005 (.919)
Relationship Length	.131 (.016)	.110 (.030)	.090 (.064)	.132 (.008)	.108 (.030)	.105 (.037)
Geographic Distance	-.187 (.000)	-.193 (.000)	-.194 (.000)	-.174 (.000)	-.217 (.000)	-.181 (.000)
Facebook Checks Per Day		-.005 (.925)	-.052 (.310)	-.033 (.535)	.006 (.916)	.012 (.829)
Total Facebook Friends (log)		-.119 (.070)	-.143 (.022)	-.138 (.030)	-.096 (.135)	-.119 (.068)
Actual Friends on Facebook (log)		.194 (.002)	.154 (.009)	.205 (.001)	.181 (.003)	.189 (.002)
Facebook Communication		.333 (.000)	.067 (.292)	.174 (.003)	.179 (.004)	.384 (.000)
Facebook Relationship Maintenance Strategy			.424 (.000)	.277 (.000)	.248 (.000)	-.125 (.014)
F Test	4.172 (.001)	10.838 (.000)	15.015 (.000)	12.831 (.000)	12.091 (.000)	10.493 (.000)
Adjusted R ²	.038	.179	.257	.226	.215	.190

In Step 3, the relationship maintenance strategies were added, with each significantly predicting the dependent variable and three at a significance level of $p<.001$. Unsurprisingly,

Supportive Communication ($\beta=.424, p<.001$) had the single strongest impact of the four strategies, followed by Shared Interests ($\beta=.277, p<.001$), Passive Consumption ($\beta=.248, p<.001$), and Social Information Seeking ($\beta=-.125, p=.014$). As in the Relational Satisfaction model, Social Information Seeking was negatively associated with the dependent variable, meaning that increased engagement in the strategy was associated with decreased perceptions of access to emotional and instrumental resources. At the same time, there was a very strong positive association between Facebook Communication Frequency and the dependent variable ($\beta=.384, p<.001$) in this regression. The addition of the relationship maintenance strategies raised the adjusted R^2 between .011 and .078.

Facebook Relationship Maintenance Strategies Predicting Facebook's Impact on Relational Outcomes

The second set of hypotheses tested the impact of engagement in the four relationship maintenance strategies with a specific Facebook Friend. These models contain the same set of predictor variables as the previous models, with two additions: Relational Closeness and Relational Satisfaction were included in the models to assess the role that the relationship maintenance strategies play while controlling for these relational measures.

Facebook's Impact on Perceptions of Relational Closeness. See Table 13 for standardized betas for the four models predicting Facebook's impact on perceptions of relational closeness. In the first two steps, only Facebook Communication Frequency met the minimum significance criteria ($\beta=.375, p<.001$). These steps accounted for 15.4% of the variance in the Facebook's impact on perceptions of relational closeness.

Table 13: Nested OLS Regressions Predicting Facebook’s Impact on Perceptions of Relational Closeness

	Steps 1 & 2 are common to all regressions		Facebook Relationship Maintenance Strategy							
			Supportive Communication		Shared Interests		Passive Consumption		Social Info-Seek	
	Step 1: Controls	Step 2: FB Use	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn
	Standardized Betas (p-values)									
Sex: Female	-.030 (.547)	-.093 (.051)	-.091 (.049)	-.100 (.030)	-.047 (.319)	-.053 (.263)	-.106 (.021)	-.116 (.011)	-.079 (.039)	-.084 (.029)
Age	-.049 (.357)	.016 (.763)	.030 (.569)	.027 (.605)	.001 (.983)	-.011 (.840)	.029 (.582)	.038 (.466)	-.043 (.323)	-.042 (.335)
Education	.086 (.100)	.076 (.122)	.070 (.142)	.070 (.139)	.081 (.088)	.089 (.061)	.076 (.109)	.077 (.099)	.055 (.163)	.055 (.162)
Relationship Length	-.018 (.749)	.004 (.937)	-.003 (.959)	.007 (.897)	.038 (.458)	.047 (.353)	.018 (.727)	.020 (.691)	.024 (.559)	.024 (.564)
Geographic Distance	.148 (.004)	.108 (.026)	.094 (.046)	.088 (.063)	.116 (.014)	.106 (.026)	.058 (.222)	.047 (.320)	.061 (.121)	.057 (.144)
Relational Closeness	.154 (.005)	-.015 (.794)	-.076 (.182)	-.090 (.114)	-.081 (.156)	-.109 (.060)	-.116 (.045)	-.128 (.025)	.008 (.869)	-.010 (.828)
Relational Satisfaction	-.022 (.690)	-.047 (.363)	-.071 (.153)	-.071 (.156)	-.052 (.299)	-.051 (.304)	-.048 (.326)	-.047 (.320)	.020 (.624)	.021 (.615)
Facebook Checks Per Day		.024 (.660)	-.018 (.733)	-.020 (.707)	-.010 (.851)	-.018 (.739)	.030 (.576)	.016 (.756)	-.061 (.169)	-.067 (.131)
Total Facebook Friends		.022 (.739)	-.006 (.922)	.016 (.805)	-.004 (.952)	.007 (.915)	.046 (.478)	.069 (.284)	.033 (.535)	.041 (.451)
Actual Facebook Friends		.042 (.508)	.020 (.742)	-.001 (.987)	.062 (.314)	.052 (.396)	.036 (.549)	.018 (.761)	.054 (.290)	.049 (.3320)
Facebook Communication Frequency		.375 (.000)	.190 (.005)	.195 (.004)	.242 (.000)	.241 (.000)	.206 (.001)	.208 (.001)	.099 (.046)	.101 (.042)

Table 13 (cont'd)

		Steps 1 & 2 are common to all regressions		Facebook Relationship Maintenance Strategy							
				Supportive Communication		Shared Interests		Passive Consumption		Social Info-Seek	
		Step 1: Controls	Step 2: FB Use	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn
		Standardized Betas (p-values)									
Relationship Maintenance Strategy				.347 (.000)	.329 (.000)	.287 (.000)	.313 (.000)	.346 (.000)	.348 (.000)	.618 (.000)	.623 (.000)
Facebook Communication X Relational Closeness					-.106 (.023)		-.106 (.025)		-.116 (.010)		-.059 (.133)
F Test		3.074 (.004)	7.694 (.000)	9.498 (.000)	9.264 (.000)	9.482 (.000)	9.235 (.000)	10.406 (.000)	10.258 (.000)	29.230 (.000)	27.243 (.000)
Adjusted R ²		.035	.154	.201	.210	.201	.209	.218	.229	.455	.457

Note: Interaction variables have been centered.

In the third step, each of the relational maintenance strategies was added, all adding significantly to the model and providing full support to H3. Supportive Communication ($\beta=.347$, $p<.001$) increased the R^2 to .201. Shared Interests ($\beta=.287$, $p<.001$) increased the R^2 to .201. Passive Consumption ($\beta=.346$, $p<.001$) increased the R^2 to .218. Social Information Seeking ($\beta=.618$, $p<.001$) increased the R^2 to .455. In two of the models—Shared Interests ($\beta=.242$, $p<.001$) and Passive Consumption ($\beta=.206$, $p<.001$)—Facebook Communication Frequency met the minimum significance criteria after the addition of the relationship maintenance strategy.

In Step 4, the interaction effect of Relational Closeness by Relationship Maintenance Strategy was tested. Each of the variables was centered and an interaction term was created and included in the regression. The interaction term was significant for Supportive Communication ($\beta= -.106$, $p=.023$), Shared Interests ($\beta=-.106$, $p=.025$), and Passive Consumption ($\beta=-.116$, $p=.010$). The significant negative term suggests that for weaker ties, greater engagement in the relationship maintenance strategies is associated with perceiving Facebook to have a greater impact on one's relational closeness than such engagement does for stronger ties. To further investigate this finding, the interactions were plotted using the Interactions in Multiple Linear Regression (IRSE) Excel tool (Meier, 2008), which plots two- and three-way interactions based on the full hierarchical regression model output. As can be see in Figures 5-7, weaker ties (“Relational Closeness-Low”) are at or slightly above stronger ties (“Relational Closeness-High”) for low engagement in each of the three maintenance strategies in terms of their level of agreement on the outcome scale. However, as engagement increases, the slope for weaker ties is much steeper for all three strategies, supporting H5, which predicted that weaker ties who engage

in Facebook relationship maintenance strategies will more strongly agree that Facebook impacts their relational closeness with a specific Friend than stronger ties.

Figure 5: Interaction Effect of Relational Closeness by Supportive Communication on Facebook's Impact on Perceived Relational Closeness

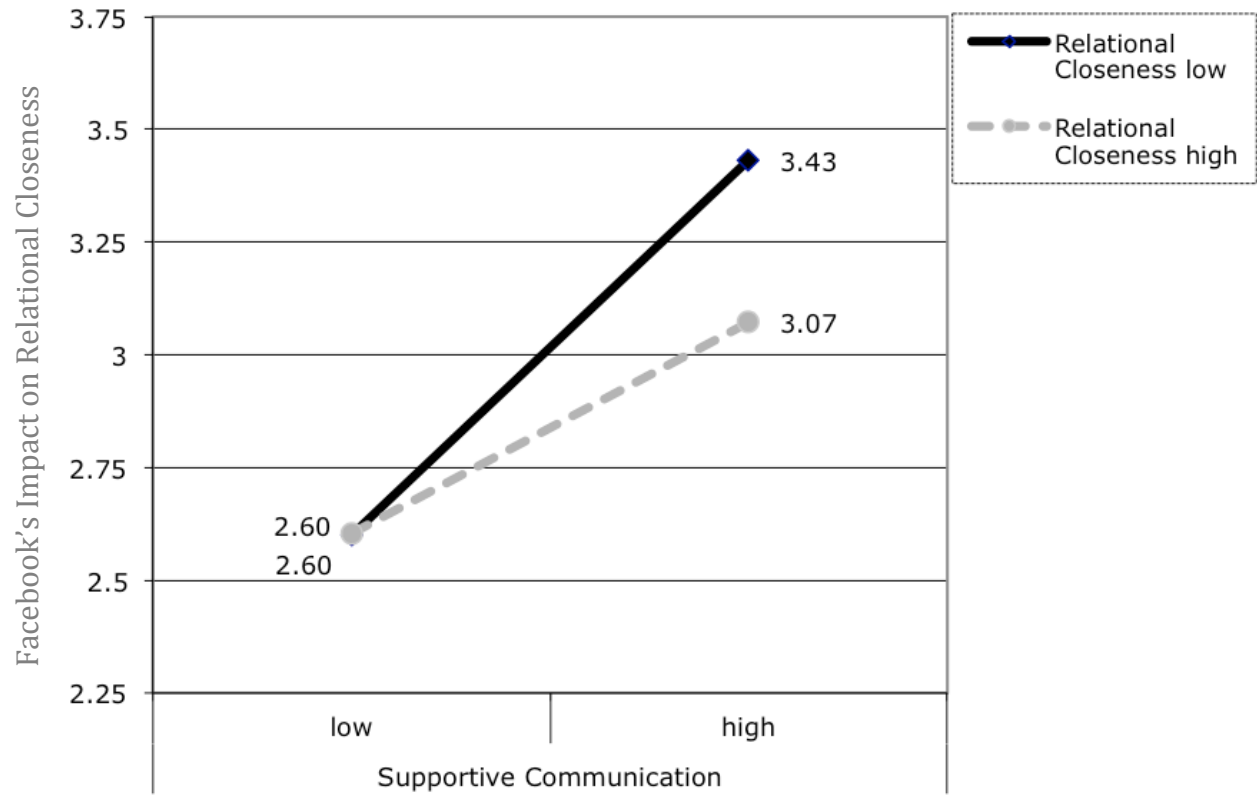


Figure 6: Interaction Effect of Relational Closeness by Shared Interests on Facebook's Impact on Perceived Relational Closeness

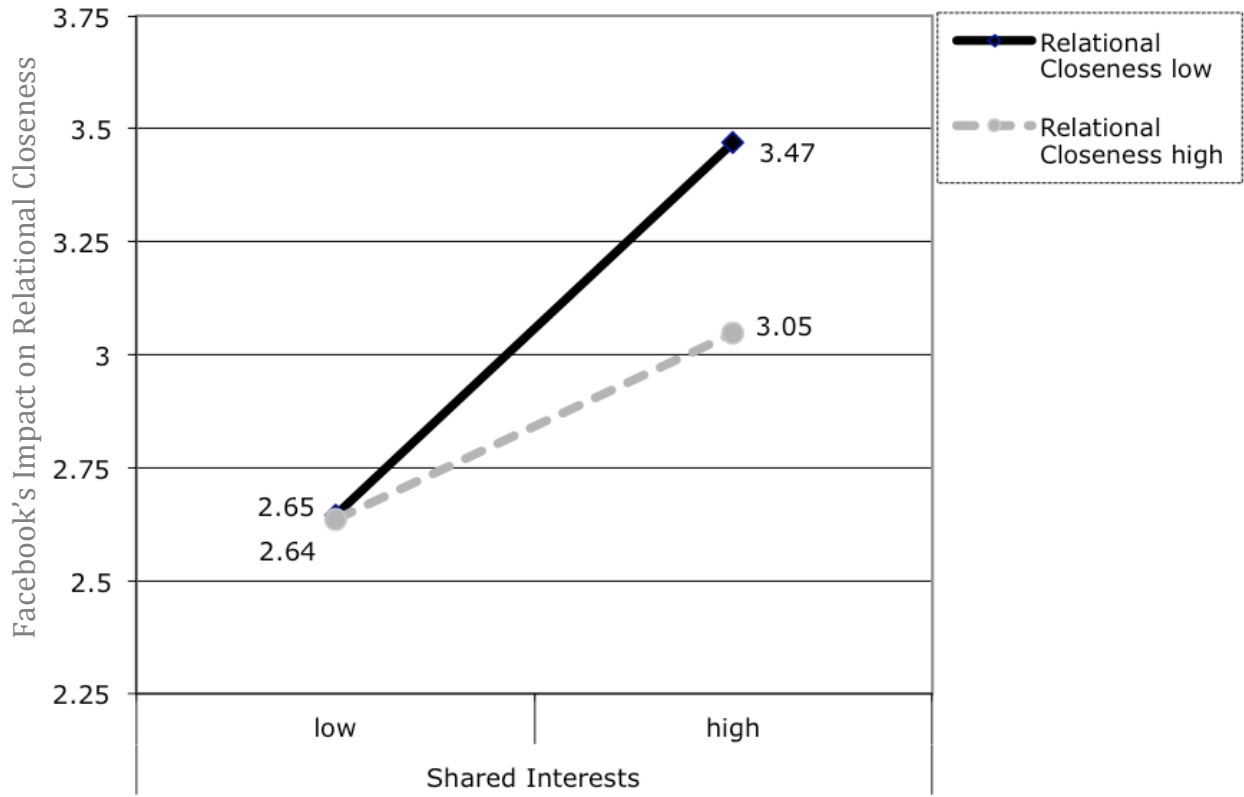
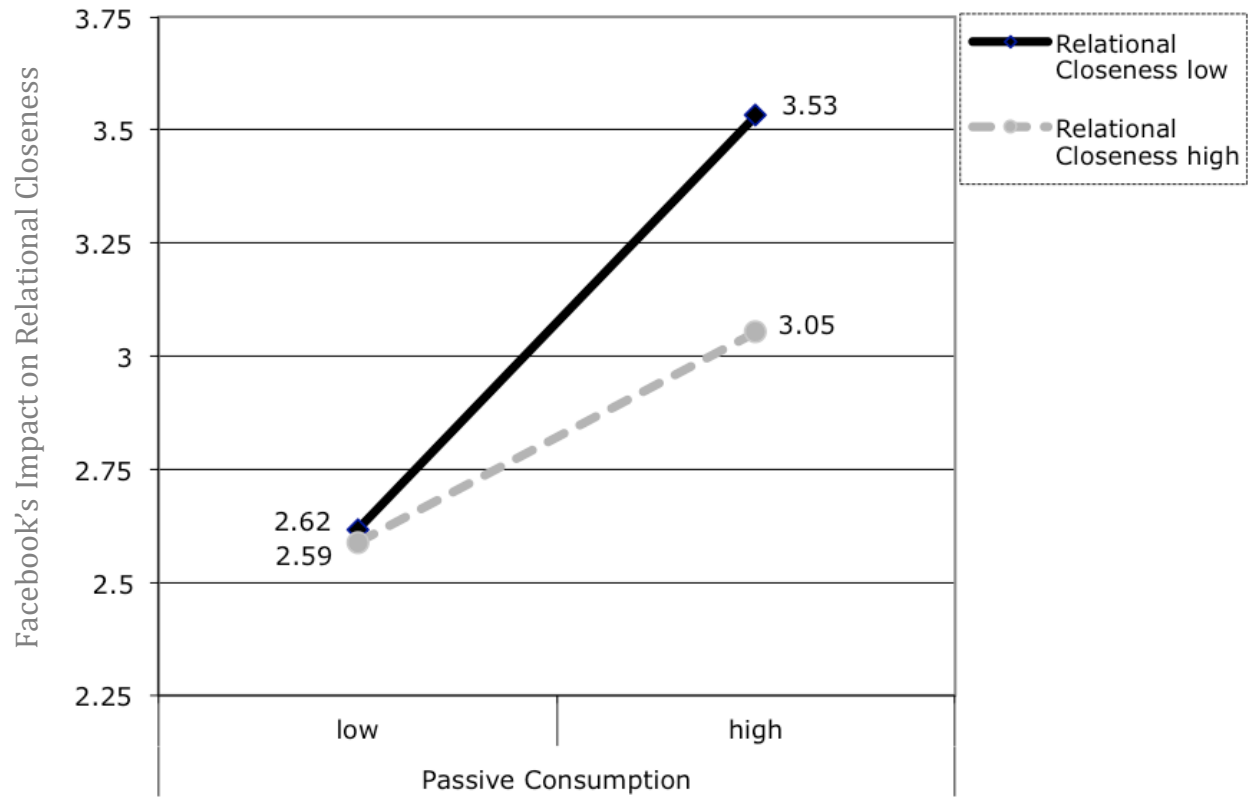


Figure 7: Interaction Effect of Relational Closeness by Passive Consumption on Facebook’s Impact on Perceived Relational Closeness



Facebook’s Impact on Perceptions of Relational Stability. See Table 14 for standardized betas for the four models predicting Facebook’s impact on perceptions of relational stability. In predicting the extent to which participants believed that their use of Facebook helped keep their relationship in existence, two factors were significant in the first step: Geographic Distance ($\beta=.266, p<.001$) and Relational Closeness ($\beta=-.306, p<.001$). Those who lived farther away, and who were weaker ties saw Facebook as more important to keeping their relationship with a specific Facebook Friend stable. In the second step, these variables remained significant, and the addition of Facebook communication frequency was also significant ($\beta=.365, p<.001$). These variables accounted for 33.7% of the variance in Facebook’s Impact on Perceptions of Relational Stability.

Table 14: Nested OLS Regressions Facebook’s Impact on Perceptions of Relational Stability

	Steps 1 & 2 are common to all regressions		Facebook Relationship Maintenance Strategy							
			Supportive Communication		Shared Interests		Passive Consumption		Social Info-Seek	
	Step 1: Controls	Step 2: FB Use	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn
	Standardized Betas (p-values)									
Sex: Female	-.013 (.775)	-.073 (.081)	-.073 (.083)	-.081 (.052)	-.042 (.319)	-.044 (.296)	-.079 (.059)	-.088 (.036)	-.063 (.084)	-.068 (.063)
Age	-.083 (.084)	-.021 (.660)	-.015 (.748)	-.018 (.705)	-.031 (.506)	-.036 (.450)	-.016 (.740)	-.008 (.861)	-.064 (.123)	-.063 (.130)
Education	.019 (.679)	.009 (.843)	.006 (.887)	.006 (.884)	.012 (.774)	.015 (.721)	.008 (.843)	.010 (.820)	-.007 (.857)	-.007 (.858)
Relationship Length	.035 (.477)	.056 (.229)	.053 (.251)	.061 (.184)	.079 (.087)	.082 (.074)	.061 (.182)	.063 (.166)	.070 (.080)	.070 (.081)
Geographic Distance	.266 (.000)	.228 (.000)	.223 (.000)	.217 (.000)	.234 (.000)	.230 (.000)	.207 (.000)	.198 (.000)	.194 (.000)	.190 (.000)
Relational Closeness	-.306 (.000)	-.473 (.000)	-.498 (.000)	-.511 (.000)	-.518 (.000)	-.529 (.000)	-.516 (.000)	-.526 (.000)	-.456 (.000)	-.475 (.000)
Relational Satisfaction	-.100 (.039)	-.125 (.006)	-.135 (.003)	-.134 (.003)	-.128 (.004)	-.128 (.004)	-.125 (.005)	-.124 (.006)	-.076 (.056)	-.075 (.057)
Facebook Checks Per Day		.011 (.815)	-.006 (.897)	-.008 (.870)	-.012 (.803)	-.015 (.757)	.014 (.777)	.003 (.952)	-.051 (.231)	-.058 (.179)
Total Facebook Friends		.016 (.792)	.004 (.950)	.024 (.687)	-.002 (.970)	.002 (.974)	.026 (.663)	.045 (.448)	.024 (.646)	.031 (.546)
Actual Facebook Friends		.058 (.295)	.049 (.374)	.030 (.587)	.072 (.190)	.068 (.216)	.056 (.311)	.041 (.455)	.067 (.168)	.063 (.198)
Facebook Communication Frequency		.365 (.000)	.288 (.000)	.293 (.000)	.274 (.000)	.274 (.000)	.293 (.000)	.294 (.000)	.163 (.001)	.164 (.001)

Table 14 (cont'd)

		Steps 1 & 2 are common to all regressions		Facebook Relationship Maintenance Strategy							
				Supportive Communication		Shared Interests		Passive Consumption		Social Info-Seek	
		Step 1: Controls	Step 2: FB Use	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn	Step 3: Strategy	Step 4: Interactn
		Standardized Betas (p-values)									
Relationship Maintenance Strategy				.144 (.024)	.128 (.045)	.196 (.000)	.205 (.000)	.148 (.007)	.149 (.006)	.452 (.000)	.458 (.000)
Facebook Communication X Relational Closeness					-.095 (.024)		-.040 (.343)		-.095 (.021)		-.060 (.109)
F Test	17.584 (.000)	19.734 (.000)	18.705 (.000)	17.840 (.000)	19.853 (.000)	18.391 (.000)	18.983 (.000)	18.126 (.000)	34.540 (.000)	32.211 (.000)	
Adjusted R ²	.223	.337	.344	.351	.358	.358	.348	.355	.498	.500	

Note: Interaction variables have been centered.

In Step 3, the four relational maintenance strategies were added one at a time, with each significantly improving the model fit: Supportive Communication ($\beta=.144, p=.024$) to .344, Shared Interests ($\beta=.196, p<.001$) to .358, Passive Consumption ($\beta=.148, p=.007$) to .348, and Social Information Seeking ($\beta=.452, p<.001$) to .498. This provides full support for H4. All significant predictors from the previous step retained significance in Step 3.

In Step 4, interaction terms of relational closeness by relationship maintenance strategies were created and tested. As with the models predicting Facebook's impact on perceived relational closeness, significant negative betas were observed for Supportive Communication ($\beta=-.095, p=.024$) and Passive Consumption ($\beta=-.095, p=.021$), while the interaction terms for Shared Interests and Social Information Seeking were non-significant. As seen in Figures 8 and 9, regardless their level of engagement in the two strategies, weaker ties see Facebook as playing a more significant role in maintaining a given relationship's stability; as engagement in the strategies increases, Facebook's perceived role in keeping that relationship stable increases at a much greater rate for weaker ties than for stronger ties. This finding provides partial support for H6, as the interaction was observed for just two of the four strategies.

Figure 8: Interaction Effect of Relational Closeness by Supportive Communication on Facebook's Impact on Perceived Relational Stability

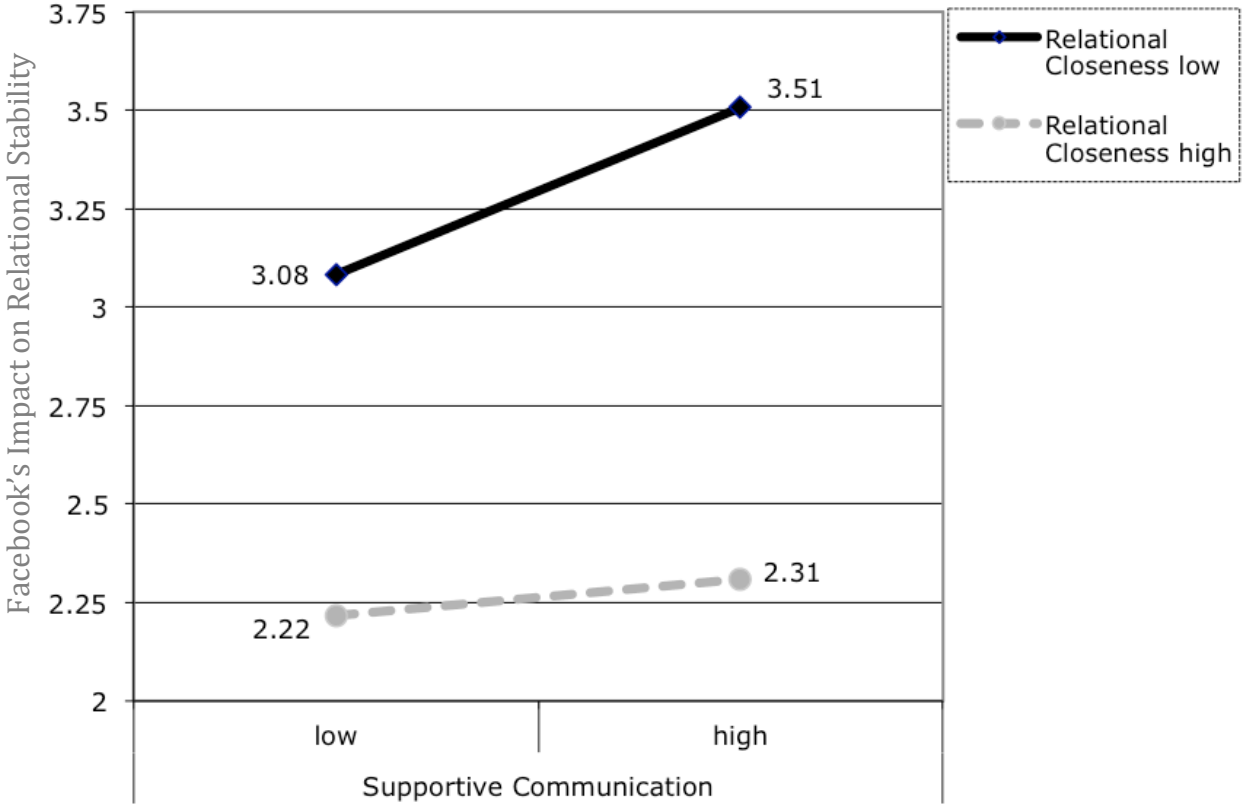
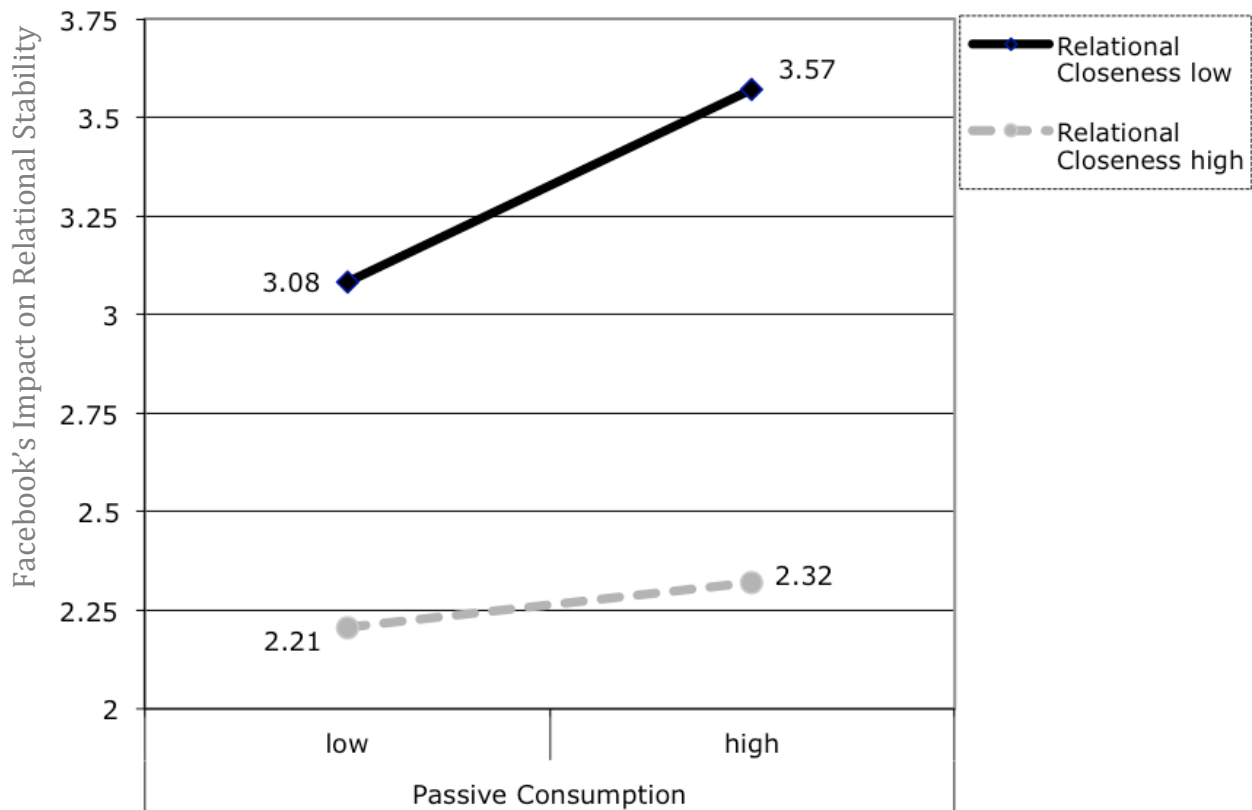


Figure 9: Interaction Effect of Relational Closeness by Passive Consumption on Facebook's Impact on Perceived Relational Stability



Facebook As a Primary Form of Communication

In order to compose a measure that accurately reflects the subset of users for whom Facebook is most likely to be seen as the primary form of communication, both frequency of communication through traditional channels (face-to-face, phone, email, and IM) and Facebook (Wall posts, likes, comments) must be considered. First, the frequency distributions for these two variables were plotted, including cut points for every 10 percentage points. Determining cut-points was complicated by the large number of cases at specific frequencies (e.g., 21.8% of participants' Facebook communication frequency score was a 3). Furthermore, as the computed measure needed to account for low interaction through traditional communication channels *and* high interaction through Facebook communication channels, this further limited the number of

cases. New variables were constructed at three sets of cut-points (see Table 15). For analyses, the most restrictive measure was used, including cases where participants reported, on average, communicating with their selected friend at a score below 2.25 for the traditional communication measure (where 1=never, 2=rarely and 3=sometimes) and a score above 3 for the Facebook communication measure (where 4=often and 5=very often). Scores below 2.25 on traditional communication comprised the lowest 45.5% of responses, while scores above 3 on Facebook communication comprised the highest 38.6% of responses. Fifty-two participants (12.8% of the full sample) met both requirements.

Table 15: Frequency Statistics for Traditional Communication and Facebook Communication Variables and Criteria for Developing a “Facebook as Primary Communication” Variable

		Traditional Communication Frequency	Facebook Communication Frequency	Facebook as Primary v1 ¹	Facebook as Primary v2 ²	Facebook as Primary v3 ³
Mean		2.358	2.916	.1278	.1646	.2850
Median		2.250	3.000	n/a	n/a	n/a
Std. Deviation		1.006	.9780	.3342	.3712	.4519
Percent- iles	10	1.000	1.666			
	20	1.250	2.000			
	30	1.750	2.334			
	40	2.000	3.000			
	50	2.250	3.000			
	60	2.500	3.000			
	70	2.750	3.335			
	80	3.250	3.666			
	90	3.750	4.000			

¹ Traditional Communication < 2.25 AND Facebook Communication > 3

² Traditional Communication < 2.5 AND Facebook Communication > 3

³ Traditional Communication < 2.5 AND Facebook Communication ≥ 3

Once the variable was computed, independent samples t-tests were conducted to test for differences in engagement in the four relationship maintenance strategies using “Facebook as Primary Communication” as the grouping variable. Results indicate that those who primarily interact with a Facebook Friend through public, site-based communication engage in a greater amount of Supportive Communication ($M=4.02, SD=.45$ vs. $M=3.64, SD=.85$), $t(114.11)=-5.00, p<.001$; Passive Consumption ($M=3.14, SD=.84$ vs. $M=2.88, SD=.88$), $t(405)=-2.01, p<.05$; and Social Information Seeking ($M=3.24, SD=.80$ vs. $M=2.65, SD=.84$), $t(405)=-4.81, p<.001$, when compared with the rest of the sample, providing partial support for H9. To test whether this finding held when taking into consideration one’s level of relational closeness, which was significantly lower for those who primarily interacted through Facebook ($M=2.69, SD=.61$) compared with those who did not ($M=2.98, SD=1.15$), $t(112.74)=2.80, p<.01$, a MANCOVA was conducted including the four maintenance strategies as dependent variables, Facebook as Primary Communication as the fixed factor, and the Relational Closeness scale as a covariate. MANCOVA was used rather than separate ANCOVAs due to the moderate correlations between the four relationship strategies ($r = .46 - .57$; see Tabachnick & Fidell, 2007). Results indicate that, even when controlling for relational closeness, a significant difference exists between those who primarily interact through Facebook and the rest of the sample, Wilks’ $\Lambda = .92, F(4, 401)=8.94, p<.001, \eta^2=.082$. As with the previous analysis, significant differences were found for Supportive Communication, $F(1, 404)=21.01, p<.001, \eta^2 = .050$; Passive Consumption $F(1, 404)=11.22, p=.001, \eta^2=.027$; and Social Information Seeking strategies, $F(1, 404)=25.45, p<.001, \eta^2=.059$.

Finally, to test whether individuals who primarily use Facebook to interact with a specific

Friend perceive the site as having a greater impact on their relational closeness and relational stability, independent samples t-tests show that those primarily interacting through Facebook see the site as positively impacting how close they feel to that person ($M=3.34$, $SD=.93$ vs. $M=2.85$, $SD=.98$), $t(405)=-3.41$, $p<.001$ and that relationship's stability ($M=3.52$, $SD=.81$ vs. $M=2.65$, $SD=.99$), $t(405)=-6.88$, $p<.001$, when compared with the rest of the sample, supporting H10. A MANCOVA conducted on the two dependent variables to control for the effect of relational closeness was also significant, Wilks' $\Lambda=.93$, $F(2, 403)=16.44$, $p<.001$, $\eta^2=.075$. Both Facebook's impact on relational closeness, $F(1, 404)=13.28$, $p=.001$, $\eta^2=.032$ and Facebook's impact on relational stability, $F(1, 404)=32.95$, $p=.001$, $\eta^2=.075$ were significantly higher for those who primarily communicated through Facebook, even when controlling for their reported level of relational closeness.

Geographic Distance's Role in Engagement in Relationship Maintenance Strategies and Relational Outcomes

As noted in the Measures section, the geographic distance measure is bimodally distributed, with 61.7% of participants describing their selected Friend as living either geographically proximate (i.e., within a 30-minute drive; 33.9%) or very far away (i.e., greater than a six-hour drive away; 27.8%). Therefore, these cases were isolated and a new variable was computed to examine differences in engagement in relationship maintenance strategies and relational outcomes between Friends who live near one another and those who live very far apart.¹³

¹³ Prior to conducting this analysis, the relationship between Facebook as Primary Form of Communication and Geographic Distance variables were analyzed to see how they were associated. A small but significant correlation existed for the full geographic distance

Looking at the four relationship maintenance strategies, independent samples t-tests revealed significantly higher engagement in Passive Consumption ($M=3.06$, $SD=.80$ vs. $M=2.81$, $SD=.94$), $t(248.69)=-2.33$, $p<.05$, and Social Information Seeking ($M=2.85$, $SD=.85$ vs. $M=2.60$, $SD=.88$), $t(249)=-2.25$, $p<.05$ amongst geographically distant Friend dyads. There were no significant differences observed in engagement in the Supportive Communication or Shared Interests strategies or in general Facebook Communication Frequency based on geographic distance of the Friend. This provides only partial support to H1 1a and no support to H1 1b. In order to account for the potential impact of relational closeness on engagement in these strategies, a MANCOVA was conducted with the four relationship maintenance strategies and Facebook communication frequency as dependent variables. Findings indicated a significant effect of geographic distance on engagement in relationship maintenance strategies while controlling for relational closeness, Wilks' $\Lambda = .91$, $F(4, 244)=4.847$, $p<.001$, $\eta^2=.090$. In examining the between-subjects effects, Supportive Communication, $F(1, 248)=4.58$, $p<.05$, $\eta^2=.02$; Passive Consumption, $F(1, 248)=17.19$, $p<.001$, $\eta^2=.07$; Social Information Seeking, $F(1, 248)=5.49$, $p<.05$, $\eta^2=.02$; and Facebook Communication Frequency, $F(1, 248)=4.76$, $p<.05$, $\eta^2=.02$, were significant. Therefore, when controlling for relational closeness, support for H1 1 should be revised, with H1 1a being supported for all strategies but Shared Interests and H1 1b (Facebook Communication Frequency) being supported.

Initial support for a positive correlation between geographic distance and Facebook-specific relational outcomes was provided through the regression analyses (see results from the

variable ($r=.17$) and the dichotomous version of the variable ($r=.23$); however, as these two variables measure theoretically different concepts, it is important to analyze them separately.

nested OLS regression predicting Facebook's impact on relational stability in Table 15); however, due to the distribution of this measure, further analysis should be conducted. Therefore, the same process used for the relationship maintenance strategies was repeated for the two Facebook-specific relational outcomes. Results from independent-samples t-tests show that, for dyads who live farther apart, they perceive Facebook to have a larger impact on their relational closeness ($M=3.11, SD=.89$ vs. $M=2.70, SD=1.02$), $t(248.04)=-3.37, p<.001$ and relational stability ($M=3.17, SD=1.04$ vs. $M=2.31, SD=.89$), $t(249)=-6.88, p<.001$, when compared with Friend dyads who live within a 30-minute drive. Using MANCOVA analyses to control for the effect of relational closeness, geographic distance emerges as a significant predictor in the model, Wilks' $\Lambda=.86, F(2, 247)=19.66, p<.001, \eta^2=.137$. Geographic distance remains significant for both Facebook's Impact on Relational Closeness, $F(1, 248)=10.55, p=.001, \eta^2=.044$ and Facebook's Impact on Relational Stability, $F(1, 248)=38.99, p=.001, \eta^2=.136$, providing support for H12.

Sex Dyad Differences in Facebook Relationship Maintenance Strategies

To analyze whether differences existed in engagement in the Facebook relationship maintenance strategies based on the sex of participants and the Friend they were evaluating, a one-way univariate analysis of variance (ANOVA) was conducted for each of the relationship maintenance strategies (dependent variables) and the three possible dyadic combinations: female-female, mixed sex (male-female or female-male), and male-male as the factor. Results indicate an overall significant difference for three of the four strategies: Supportive Communication, $F(2, 404)=7.876, p<.001$; Passive Consumption, $F(2, 404)=6.553, p<.01$; and Social Information Seeking, $F(2, 404)=8.457, p<.001$. No significant differences were observed

for the Shared Interests strategy. Pairwise post-hoc (Scheffe) differences existed between female-female dyads and male-male dyads for all three strategies, such that females dyads engaged in each of the strategies to a higher extent than their male counterparts. Furthermore, differences existed between mixed-sex dyads and male-male dyads, with mixed-sex dyads also engaging in Supportive Communication and Passive Consumption to a significantly greater extent than the male dyads. No significant differences existed between female-female and mixed-sex dyads in post-hoc analyses. The same trend was seen when evaluating engagement in Facebook communication more broadly, $F(2, 404)=9.211, p<.001$, with female-female and mixed-sex dyads engaging in significantly more communication via wall posts, Likes, and comments than male-male dyads, while no significant differences were seen between female-female dyads and mixed sex dyads. These findings generally support H13. See Table 17 for full details of the Scheffe post-hoc analyses.

Further analyses analyzed whether these findings held while controlling for relational closeness. A MANCOVA including the four relationship maintenance strategies as the dependent variables was significant, Wilks' $\Lambda = .92, F(8, 800) = 4.09, p < .001, \eta^2 = .039$, with significant differences existing across the three groups for Supportive Communication, $F(2, 403)=3.62, p<.05, \eta^2=.018$ and Social Information Seeking, $F(2, 403)=7.92, p=.001, \eta^2=.038$. The interaction of sex dyad by relational closeness was non-significant.

Table 16: Results of Scheffe Post-Hoc Test of Differences Between Sex Dyads' Engagement in Facebook Relationship Maintenance Strategies

Dependent Variable	Sex Dyads (I)	Sex Dyads (J)	Mean Diff (I-J)	Std. Error	Sig.
Supportive Communication Strategy	Female-Female	Mixed-Sex	.14640	.08692	.243
		Male-Male	.49755*	.12710	.001
	Mixed-Sex	Female-Female	-.14640	.08692	.243
		Male-Male	.35115*	.13326	.032
	Male-Male	Female-Female	-.49755*	.12710	.001
		Mixed-Sex	-.35115*	.13326	.032
Shared Interests Strategy	Female-Female	Mixed-Sex	.07364	.09541	.743
		Male-Male	.05684	.13951	.920
	Mixed-Sex	Female-Female	-.07364	.09541	.743
		Male-Male	-.01680	.14627	.993
	Male-Male	Female-Female	-.05684	.13951	.920
		Mixed-Sex	.01680	.14627	.993
Passive Consumption Strategy	Female-Female	Mixed-Sex	.11448	.09448	.481
		Male-Male	.49897*	.13815	.002
	Mixed-Sex	Female-Female	-.11448	.09448	.481
		Male-Male	.38449*	.14485	.030
	Male-Male	Female-Female	-.49897*	.13815	.002
		Mixed-Sex	-.38449*	.14485	.030
Social Information Seeking Strategy	Female-Female	Mixed-Sex	.35318*	.09100	.001
		Male-Male	.31337	.13306	.064
	Mixed-Sex	Female-Female	-.35318*	.09100	.001
		Male-Male	-.03981	.13951	.960
	Male-Male	Female-Female	-.31337	.13306	.064
		Mixed-Sex	.03981	.13951	.960
Facebook Communication Frequency	Female-Female	Mixed-Sex	.21765	.10371	.112
		Male-Male	.63254*	.15165	.000
	Mixed-Sex	Female-Female	-.21765	.10371	.112
		Male-Male	.41489*	.15900	.034
	Male-Male	Female-Female	-.63254*	.15165	.000
		Mixed-Sex	-.41489*	.15900	.034

Discussion

This dissertation contributes to existing research on technology and relationship maintenance in two important and distinct ways. First, it extends our understanding of the role newer communication technologies such as social network sites play in the relationship maintenance process. Second, it directly addresses two challenges CMC researchers have faced when measuring relationship maintenance—the focus on strong tie relationships and strategies requiring proximity—and acknowledges that these technologies enable people to maintain a variety of relationships in new ways because of the technical structure of the sites and the lowered transaction costs to interaction. Findings from a survey of adult Facebook users (N=407) indicate that Facebook users engage in a variety of relationship maintenance strategies with their connections on the site. Importantly, while engagement in these strategies is generally correlated with relational closeness, findings from OLS nested regressions and MANCOVAs suggest that close relationships do not benefit the most from being connected on the site; rather, those who primarily rely on Facebook to interact, those who live at a greater physical distance from each other, and weaker ties see the site as having the greatest positive impact on the quality of their relationship. In this way, while Facebook may serve a supplemental role for closer relationships—similar to Hampton and Wellman’s (2001) findings about email more than a decade ago—findings suggest the site may actually serve to enhance the quality of weaker relationships and prevent those connections from fading away completely.

First, when considering Facebook’s potential impact on relationship maintenance processes, researchers have recently suggested that social media contain a unique set of affordances that differentiate them from other forms of CMC (boyd, 2010; Treem & Leonardi, 2012). For example, interactions between Friends on SNSs may be visible to a user’s entire

Friend network and persist long after that interaction takes place—and can be added to and updated at a later time. Furthermore, connections on these sites are formally associated through “Friending,” while all content users create and post are associated to their names. Consequently, the highly persistent, visible, and connected nature of interaction on SNSs likely impacts relationship maintenance practices; for example, in studying teens’ SNS practices, boyd and Marwick (2011) identified a set of strategies teens employed on Facebook and other social media sites to maintain privacy while sharing content with the public and/or their other connections on the site. Finally, when studying interactions facilitated through SNSs—which are largely based on quick and convenient communication rather than the lengthy, more complex interaction patterns associated with in-depth disclosures—researchers must begin to expand their conceptualization of what kinds of behaviors constitute relationship maintenance. For example, Liking is the most frequently performed behavior by Facebook users (Hampton et al., 2011a), most likely because of the low effort in time and cognition associated with clicking the Like button on a Friend’s status, link, video, or photo. Tong and Walther (2011) note that these kinds of behaviors are reminiscent of the passing of “virtual tokens” between two relational partners and could be comparable—to some extent—to engaging in a shared activity, which has long been identified as a primary form of relationship maintenance.

Second, when considering relationship maintenance research broadly, studies have consistently relied on samples of close-tie relationships and measures—like Stafford and Canary’s (1991) Relationship Maintenance Strategy Measure—that are biased toward geographically proximate dyads. In the framework of close ties such as spouses, the focus of much of the initial research, measures that assessed the extent to which partners shared housework and interacted with each other’s family made sense; however, these same measures

have continued to be applied in subsequent years, both among non-intimate dyads and in online settings, raising questions about the validity of some of the items. For example, in his study of individuals who maintained primarily and exclusively Internet-based relationships, Wright (2004) found that a significant proportion of people listed a strategy other than one of Stafford and Canary's (1991) as the most important strategy for maintaining their relationship. With SNSs, these measures may be even less inappropriate, considering the average users' Friend network in the U.S. contains 229 connections (Hampton et al., 2011a). Considering the number of meaningful relationships individuals can cognitively maintain (Dunbar, 1995), this means that the site is potentially being used to maintain a much larger percentage of weaker ties than stronger ties. Therefore, measures structured to reflect strong-tie relationships would seem insufficient. Furthermore, as with any form of CMC, a benefit of Facebook is that it removes geographic constraints to relationship maintenance; therefore, measures structured to reflect geographic proximity would also seem insufficient. As we move forward in this area of research, it is essential that researchers acknowledge the affordances of technology and consider how individuals may be using specific features of technology—whether it is the asynchronous nature of email or the view-when-you-like component of passive consumption on social network sites—to manage both close connections as well as ties that may have otherwise faded away without technology.

With these factors in mind, the first section of the dissertation detailed the development of four Facebook-specific relationship maintenance strategies: Supportive Communication, Shared Interests, Social Information Seeking, and Passive Consumption. These strategies both reflect the long tradition of scholarship on relationship maintenance and acknowledge the unique ways in which relationships can be maintained through the site. While three strategies identified

through this analysis are non-medium specific, the fourth, Passive Consumption, reflects behaviors *almost* exclusively afforded by technology—as one could argue that a person could passively consume information about another by observing them at a local restaurant or park (an uncertainty reduction strategy noted by Berger & Bradac, 1982). Passive strategies were also identified as one of four online information-seeking strategies in research by Ramirez, Walther, Burgoon, and Sunnafrank (2002); in their work, the focus was on information that could be drawn about another through mediated channels without that person’s knowledge, such as being blind-carbon copied on an email or “lurking” on a message board.

An important difference between passive strategies employed outside SNSs and the behaviors underlying the Passive Consumption strategy relates to the affordances of the site: due to the persistence and visibility of content, Facebook Friends can typically visit each others’ profile pages at any time and view a significant amount of content, including static information, such as work and educational information, and more dynamic information, such as status updates, interactions with other users, and photo albums. Facebook’s profile layout—especially in its latest update, known as Timeline—makes the process of browsing through a user’s profile simple and efficient. Unlike the passive strategy highlighted in Ramirez et al.’s (2002) work, the association of connections on Facebook gives users a greater degree of control over both knowing the potential audience of profile browsers as well as the ability to restrict access to specific pieces of content to specific individuals of subsets of their Friend network.

Establishing the Relationship Between Maintenance Strategies and Relational Outcomes

Following development of the Facebook relationship maintenance strategies, the next major step in determining the role that SNSs play in relationship maintenance processes was to establish how users’ engagement in these strategies with their Facebook Friends impacted

Table 17: Study 1b Hypotheses—Predictions and Support

	Hypothesis	Supported (S) or Not Supported (NS)?
H1:	Relationship Maintenance Strategies + Relational Closeness	S: Supportive Communication, Shared Interests, Passive Consumption NS: Social Information Seeking
RQ1	Relationship Maintenance Strategies + Relational Satisfaction	S: Supportive Communication, Shared Interests, Passive Consumption NS: Social Information Seeking
H2	Relationship Maintenance Strategies + Emotional & Instrumental Resources	S: Supportive Communication, Shared Interests, Passive Consumption NS: Social Information Seeking
H3:	Relationship Maintenance Strategies + Facebook's Impact on Relational Closeness	S: All Strategies
H4:	Relationship Maintenance Strategies + Facebook's Impact on Relational Stability	S: All Strategies
H5:	Interaction Effect: Relational Closeness X Relationship Maintenance Strategies in Predicting Facebook's Impact on Relational Closeness	S: Supportive Communication, Shared Interests, Passive Consumption NS: Social Information Seeking
H6:	Interaction Effect: Relational Closeness X Relationship Maintenance Strategies in Predicting Facebook's Impact on Relational Stability	S: Supportive Communication, Passive Consumption NS: Shared Interests, Social Information Seeking
H7:	Facebook as Primary Communication + Relationship Maintenance Strategies & Facebook Communication Frequency	S: Supportive Communication, Passive Consumption, Social Information Seeking, Facebook Communication Frequency NS: Shared Interests
H8:	Facebook as Primary Communication + Facebook's Impact on Relational Outcomes	S: Both Outcomes
H9:	Geographic Distance + Relationship Maintenance Strategies	S: Supportive Communication, Passive Consumption, Social Information Seeking, Facebook Communication NS: Shared Interests
H10:	Geographic Distance + Facebook's Impact on Relational Outcomes	S: Both Outcomes
H11:	Sex Dyad Composition + Relationship Maintenance Strategies	S: Supportive Communication, Passive Consumption, Social Information Seeking, Facebook Communication NS: Shared Interests

Note: The + sign indicates a positive correlation between variables predicted in the hypothesis.

relational outcomes. See Table 17 for a listing of all tested hypotheses and whether or not they were supported. In the first stage of analysis, a series of nested OLS regressions tested whether engagement in each of the four maintenance strategies predicted four general relational outcomes: closeness, satisfaction, and access to social resources. The Supportive Communication strategy, which explained the most variance in the factor analysis, exhibited the strongest effect size across the initial three regressions. Positivity is generally recognized as a key factor in relationship maintenance (Stafford & Canary, 1991; Stafford, 2010) and some of the items included in this measure are similar to Stafford's (2010) positivity strategy, which was significantly predictive of spouses' degree of relational satisfaction, commitment, and liking in her study. Many of the items included in this scale represent more low-cost behaviors, such as wishing a Friend "happy birthday" or congratulating a Friend sharing good news, which Ellison et al. (2011b) have argued serves a social grooming purpose on the site: they signal attention, can build trust between users, and may create expectations of reciprocity, which is especially important in the early stages of relationship development (Altman & Taylor, 1973), but may also be important for relationship maintenance among connections who do not interact frequently through other channels. Facebook's focus on public sharing through status updates also creates an environment where content that may have previously been shared with a subset of one's network is now shared with a much broader range of people; qualitative research by Vitak and Ellison (in press) has found that, for some users, the site provides a low-cost mechanism through which to provide a variety of support resources and that support is provided from a variety of ties—not just one's closer friends.

Like Supportive Communication, Passive Consumption had strong correlations with all three dependent variables, including the access to emotional and instrumental resources variable,

for which no relationship was predicted. Weiss' (1974) social provisions tend to focus on more "active" forms of assistance specific ties can provide (e.g., help with a flat tire, advice about buying a new car) which can only be achieved through interaction with another person; that said, the items included in this measure reflected resources that can typically be provided through mediated channels, such as offering a friend advice about a big decision or providing emotional support in a time of need. Recent research suggests that some users see the benefits of using Facebook to exchange these types of resources (e.g., Vitak & Ellison, in press) while other research has linked specific measures of use to bonding social capital (Ellison et al., 2007, 2011), a measure of users' perceptions that their Friend network contained people who could provide them with various support-based resources. That said, the findings regarding passive consumption of content are somewhat surprising when considering research by Burke et al. (2010) using surveys and Facebook server-level data; they found no relationship between passive consumption and perceptions of bonding social capital. Contrast this with relational closeness, where viewing a person's photo album from a recent vacation might increase one's sense of propinquity with that person (Korzenny, 1978), even if they haven't physically spoken about the trip yet. That said, Passive Consumption may serve as a way for an individual to determine if a Facebook Friend is currently available to provide a specific resource; for example, by browsing a Friend's profile page, one could quickly learn if a Friend was on vacation that week and would therefore be unavailable to help out with a home improvement project. Likewise, seeing a recent post may signal that Friend is still online and might be available to chat about an upcoming decision. Finally, being able to consume content without interacting could be one way to keep a relationship in a low-level but "satisfactory condition" (Dindia & Canary, 1993).

Shared Interests, or using Facebook as a platform through which to share content and interact about a shared interest—be it a hobby, TV show, sports team, or anything else—positively predicted each of the three outcomes, although to a lesser extent than Supportive Communication or Passive Consumption. Like other forms of communication on- and offline, friends use Facebook to talk about their common interests; however, they can also take advantage of the site's affordances to elevate interactions through the infusion of non text-based features. Whereas two coworkers might talk about the TV show they watched last night, through Facebook they can share video clips of their favorite scenes from the show, previews for an upcoming episode, or a relevant meme about a character. If two Friends like the same football team, they can share links to news stories from the past weekend's game and comment or Chat about it on the site. These interactions will be archived and can be searched and referred to at a later time. Finally, like water-cooler conversations at work, other members of their network can join in the conversation through comments on the shared link, enabling a potentially richer interaction than if the conversation were limited to a one-on-one email or phone call.

Social Information Seeking, which included items about using Facebook to keep up to date about a Friend's everyday activities and to learn new information about a Friend, was unrelated to Relational Closeness and negatively correlated with Relational Satisfaction and Access to Emotional and Instrumental Resources. The role this strategy plays in relationship maintenance has been highlighted most prominently in the literature in Duck's (1988) references to the important role that sharing everyday information plays in relationships, Dainton and Stafford's (1993) examination of which strategies are more routinized in relationships, and Rabby's (2007) inclusion of a four-item mundane interaction scale. The non-significant finding for Relational Closeness suggests that this strategy crosses all relational types and is perhaps due

to the fact that the strategy includes both mundane communication, which is typical of more developed relationships (Duck, 1988), and gaining new information, which is typical of less developed relationships (Altman & Taylor, 1973). The negative correlations are somewhat surprising and deserve further consideration. One explanation is that those who are dissatisfied with their relationships or do not perceive they can access resources from a particular Friend are less likely to spend time on Facebook reading that Friend's updates or interacting with her as there are probably many other people with whom they would much rather interact. Future research should continue to explore these findings.

It is also worth noting that in all of the models, there were significant predictors among the Facebook variables, even if the specific relationship maintenance strategy was non-significant. For example, while Social Information Seeking was non-significant or negatively correlated with the outcome variables, the overall frequency of Facebook communication positively predicted all three outcomes. In this way, there was still a connection between direct communication—in this case, public communication through Wall posts, comments, and Likes—and perceptions of relational outcomes. The number of actual friends participants reported in their network—a measure developed by Ellison et al. (2011a) to get a more detailed understanding of network composition than total Friends—positively predicted Perceived Access to Emotional and Instrumental Resources. In this way, one's general social network, not just their relationship with the individual Friend, appears to matter when considering relational outcomes with an individual.

Two other variables emerged as significant in the regressions. The length of the relationship with the selected Friend positively predicted perceived Relational Closeness, which is in line with our general understanding of the relational development and maintenance process

(Altman & Taylor, 1973; Duck, 1988). In addition, as has been noted in several other areas of communication research, “distance matters”: when the Friend being rated lived geographically closer to the participant, they were seen as relationally closer and offering greater access to emotional and instrumental resources than Friends who lived farther away. That said, the Geographic Distance variable was bimodally distributed; as we see in later analyses comparing geographically proximate with long-distance Friends, these two groups differ in both their behaviors and perceptions of Facebook’s impact on the relationship.

For Whom Does Facebook Positively Impact Relationship Maintenance Most?

These findings provided a foundation guiding the next series of regressions, which focused on two important questions that have been debated heavily in media and popular press but have been subject to little to no empirical evaluation: (1) to what extent does one’s use of Facebook to connect and interact with another person impact the quality of that relationship and (2) do certain types of relationships benefit more from their use of Facebook than others? Within the subset of Facebook research focusing on social capital (for a summary, see Steinfield, Ellison, Lampe, & Vitak, 2012), researchers have repeatedly posited that weaker ties are likely to benefit more from their use of Facebook due to the concept of “media multiplexity” (Haythornthwaite, 2005), or the idea that because stronger ties communicate through a greater quantity of channels, more distant ties are likely to be relying primarily—or perhaps solely—on Facebook to maintain that relationship. At the same time, server-data analyses from 2009—before the introduction of Likes and other simplified interaction features—revealed that Facebook users only interacted with a small proportion of their network (Facebook Data Team, 2009); Viswanath et al.’s (2009) analysis of log data found that only 12.2% of dyads had interacted over a two-year period, 81% of those had interacted less than five times, and most dyads’ interactions were limited to

communications on the Friend's birthday. While each of these streams of research provides a partial understanding of what is going on, neither provides the full picture, and the Facebook data are especially unlikely to remain accurate as the site rolls out new features that enable a greater quantity and variety of interaction. As noted above, these server-level data were collected prior to Facebook's development of the Like button; research by the Pew Internet Project in 2011 found that 25% of U.S. Facebook users Liked at least one piece of content on an average day, 20% commented on a photo on an average day, and 21% commented on at least one status update on an average day (Hampton et al., 2011a). While their analysis did not distinguish between level of engagement and *who* users were engaging with, these findings suggest an increase in levels of interaction on the site between 2009 and 2011, and the frequency of behaviors would suggest that users are most likely using the site to interact with a variety of connections. However, studies have not yet paired these data.

Therefore, the second set of regressions set out to establish whether engaging in Facebook relationship maintenance strategies were positively associated with two outcomes: Facebook's impact on relational closeness (e.g., "Facebook has positively impacted my relationship with this person") and relational stability (e.g., "Without Facebook, this person and I would fall out of touch"). In order to address whether these effects were more likely to occur with stronger or weaker ties, existing relational closeness was included in the regressions. Furthermore, interaction effects between relational closeness and the relationship maintenance strategies were tested.

Immediate differences between this set of regressions and the previous set became apparent. The four relationship maintenance strategies positively predicted both outcomes, with Social Information Seeking emerging as the single strongest predictor among the four,

accounting for 30.1% of the variance in Facebook's impact on relational closeness and 16.5% of the variance in Facebook's impact on relational stability. The effect of the relationship maintenance strategies were above and beyond the effect of general Facebook communication frequency, which was also a significant predictor of the outcome variables in all models. However, unlike the general relational outcome models, more general measures of use, such as how frequently one checked Facebook or their overall network composition, were unrelated to the perceived impact of Facebook on their relationship with a specific Facebook Friend.

When looking at the models predicting the extent to which individuals saw Facebook as increasing how close they felt to a specific Facebook Friend, the existing level of relational closeness was initially a significant predictor; however, it became non-significant as soon as the Facebook variables were added and remained non-significant in all but one model. In other words, one's existing level of relational closeness with a specific Facebook Friend did not impact the extent to which they believed using the site made them feel like they knew that person better, understood that person better, and felt closer to that person. However, further analyses revealed an interaction between existing closeness and three relationship maintenance strategies—Supportive Communication, Shared Interests, and Passive Consumption. In each case, for individuals responding about a Friend they had rated as a weaker tie, increased engagement in the relationship maintenance strategy was associated with a significantly larger increase in perceptions of Facebook's impact on relational closeness than for those rating a stronger tie.

When looking at the models predicting relational stability, there were similar findings in terms of main and interaction effects, with the exception of a non-significant interaction for shared interests by existing relational closeness. In addition, several variables that were non-significant in the model predicting Facebook's impact on relational closeness significantly

predicted relational stability. For example, relational closeness negatively predicted relational stability such that individuals who rated their Facebook Friend as a closer tie were more likely to say that Facebook did *not* play an instrumental role in keeping the relationship in existence. Similar results were found for relational satisfaction, with Facebook being seen as less important in maintaining relationships rated as more satisfying. These findings are not surprising: among our closest connections, we are likely to be highly engaged through channels outside of Facebook—in fact, the high correlation between relational closeness and the traditional communication ($r=.75$) measure led to the latter’s removal from the second set of regressions due to multicollinearity concerns. Therefore, Facebook’s role in relationship maintenance—especially when considering relationship maintenance as “keeping a relationship in existence” (Dindia & Canary, 1993) is most likely of a much more limited nature for stronger ties than among weaker ties. There is also a problem of ceiling effects with one’s closest ties: information provided through Facebook is much less likely to make one feel like they know or understand their spouse better. This belief is reinforced through the significant interaction effects in these models, which highlight that the benefits gained from engaging in specific relationship maintenance strategies are associated with greater increases in perceived relational stability for weaker ties than for stronger ties.

The idea of media multiplexity (Haythornthwaite, 2005)—and specifically the idea that some ties may rely solely on Facebook to interact—drove a series of follow-up analyses focusing on a subset of the sample that reported engaging in both a relatively low frequency of traditional communication interactions with their selected Facebook Friend (scoring “Rarely” or below on the aggregate scale) and a relatively high frequency of Facebook communication with that Friend (scoring higher than “Sometimes” on the aggregate scale). This calculation identified 52

participants (12.8% of the sample) who fit the criteria and were subsequently labeled “Facebook as Primary Communication.” Compared to the rest of the sample, this group had significantly higher engagement in Supportive Communication, Passive Consumption, and Social Information Seeking, while controlling for relational closeness. One possible explanation for the non-significant differences for Shared Interests could be that some shared interests have an offline component; for example, for Facebook Friends who share a favorite band or play on a local sports team, offline interaction may be more likely as the Friends meet when the band comes through town or when they have games each weekend.

It is important to note that regression analyses employing cross-sectional data, such as those presented in this study, cannot establish causality. Therefore, while the relationship maintenance strategies “predict” perceptions of Facebook’s impact on relational outcomes, the causal path could instead be in the opposite direction. In other words, it could also be that Facebook Friends who see the site as playing a major role in keeping their relationship in existence are more likely to engage in the behaviors encapsulated in the Facebook relationship maintenance strategies than those who see the site as less important for maintaining their relationship. Likewise, individuals who see Facebook as positively impacting their relational intimacy with another person may engage in Facebook relationship maintenance behaviors in order to maintain that level of closeness. Subsequent analyses revealed this was especially important for specific relational types, and especially for those who primarily interacted through Facebook and those who lived at a great geographic distance from each other.

In both regressions, how far away the Facebook Friend lived significantly predicted how important a role Facebook played in participants’ perceptions of relational closeness and relational stability. However, the bimodal distribution of the variable suggested further analyses

should be conducted. Previous research examining differences in relationship maintenance strategies between geographically proximate and long-distance close friends found that while proximate friends engaged in a greater quantity of strategies, there were no significant differences in relational satisfaction between the two friend groups, suggesting that some strategies carry a greater weight in the relationship maintenance process than others (Johnson, 2001; Johnson et al., 2009). In conducting this research, Johnson (2001) also noted the shortcomings of the existing relationship maintenance strategies measures, which impacted the quantity of strategies long distance friends could perform.

While face-to-face interactions might be best for some kinds of relationships, research has consistently shown over the last decade that CMC serves a supplemental role in maintaining relationships, especially when other forms of communication are unavailable (e.g., Boneva et al., 2001; Hampton & Wellman, 2001; Valkenburg & Peter, 2009). This study goes a step further because it considers the entire spectrum of relationships individuals maintain through CMC rather than focusing solely on close-tie maintenance, as has been the focus of previous work (e.g., Johnson, 2001; Ledbetter, 2009; Miczo et al., 2011). First, looking at engagement in relationship maintenance strategies with Facebook Friends who are geographically proximate (i.e., live within 30 minutes of the rater) and those who are long distance (i.e., live at least a six-hour drive away), those further away used significantly more Supportive Communication, Passive Consumption, and Social Information Seeking, when controlling for existing relational closeness. Furthermore, those further away communicated more over Facebook in general. As these strategies are not limited to collocated behaviors in the same way that Stafford and Canary's (1991) measures were, there was little risk of that impacting engagement in these strategies, with the exception of Shared Interests; as with above, the physical proximity required for certain types

of shared interests may limit its effect size, although it is important to note that this strategy was not significant for geographically proximate Friends either.

These two categories—Facebook as Primary Communication and Geographic Distance—were also analyzed to determine whether differences emerged in perceptions of Facebook’s impact on relational closeness and stability. Again, we find that, regardless of one’s existing relational closeness, those who rely primarily on Facebook to interact with a specific Facebook Friend and those who live very far from that Friend see Facebook as playing a much more significant role in their relationship. For these Friends, Facebook may be the difference between a relationship in existence and the memory of that relationship. Because these people have chosen to rely on mediated channels to interact—whether because of a physical distance separating them, the convenience of quick updates and content browsing, or another reason—Facebook’s role has transformed from mere intermediary to (oftentimes) the sole source connecting these people. If we again return to Facebook’s affordances and the benefits of using the site for relationship maintenance rather than other forms of (mediated or non-mediated) communication, Facebook serves as a virtual, networked rolodex that auto-updates every time a user enters new information. Even if that user has not entered direct contact information such as an email address, as long as the technical connection between two Friends exists (i.e., they are Friends), communication can take place. This process is much more complicated without tools like Facebook, where the impetus is on the individual to update their files with new contact information when a friend moves, or gets married and changes her last name, or gets a new phone. Of course, if this information is needed but not available through Facebook, it can be requested—on channel or off—but the important takeaway here is that while our social contacts’ personal information is constantly changing over time, Facebook has reduced the effort

associated with organizing, editing, and updating that information to a single component: the Friend link. This argument has received additional support in previous empirical work by Steinfield et al. (2008), whose qualitative interviews with college students highlighted the instrumental role of Friending as a way to keep in touch with those contacts one might wish to interact with at some point in the future, and Ellison et al. (2007), who found that students' emotional connection to the site (i.e., "Facebook Intensity") positively predicted their use of the site to keep in touch with high school friends (i.e., "maintained social capital").

Finally, in both regressions predicting Facebook-specific relational outcomes, the sex of the participant was significant (or trended toward significance), such that men were more likely than women to say that Facebook had a positive impact on their relational closeness and stability. However, looking only at the gender of participants considers only half of the relational dyad; therefore, analyses looked for differences in engagement in the relationship maintenance strategies across sex dyads. Consistent with communication trends in other CMC channels (e.g., Boneva et al., 2001; Stafford et al., 1999) and regardless of existing levels of relational closeness, female-female dyads engaged in each of the relationship maintenance strategies to a significantly greater extent than male-male dyads. These findings reinforce general findings related to use of social network sites (e.g., Hampton et al., 2011a) and sex-based online communication trends (Boneva et al., 2001; Parks & Floyd, 1996).

Limitations

As noted above, the analyses provided in this study assess correlations between variables and cannot establish causality. While every effort was made in designing the instrument to assess the full range of relationship maintenance behaviors individuals may perform through the site, some behaviors may have inadvertently been omitted, thus leading to an incomplete set of

Facebook relationship maintenance strategies. These strategies should undergo further testing in future studies to assess their predictive and convergent validity, as well as be analyzed with other populations. While the sample in this study was generally representative of the population (see the Method section for the one-sample t-test comparisons between the sample and the full population of MSU staff), the population itself is not representative of Facebook users, especially in terms of education. Therefore, other populations' engagement in these strategies and their perceived impact on relational outcomes should be assessed to determine if similar results occur with different types of users. For example, research has identified that college students' network composition is substantively different from non-students in terms of the number of "actual friends" (see Ellison et al., 2011a and Ellison et al., 2011b). Likewise, this sample was highly skewed toward White users; however, Pew Internet data show that minorities are just as likely to use SNSs as Whites (Brenner, 2012) and are more likely to access SNSs through mobile devices (Smith, 2010), which could impact the strategies they employ.

Finally, while all scales met minimum reliability standards and all validated scales were confirmed through CFA, the relational satisfaction measure should be reassessed in future work, especially considering that while the concept has been historically linked to relationship maintenance (e.g., Canary & Stafford, 1992), the R^2 in the regressions predicting relational satisfaction were significantly lower than in all other models. It is important to have a valid and reliable measure for this construct that can be applied to non-close-tie relationships, and while this study strived toward that goal, additional steps can be taken in developing this measure.

CONCLUSION

Facebook's early popularity among college students was reflected in numerous academic studies on how, what, and with whom users communicated. As the site's userbase has expanded and users' networks have grown in size and diversity, it has become increasingly important to consider the potential role Facebook may serve in maintaining relationships with a variety of ties. When conducting these analyses, however, simply applying traditional measures and methodologies of relationship maintenance are insufficient, as they do not account for the unique features and affordances of Facebook and similar sites that may dramatically impact how and with whom we maintain relationships.

This dissertation addressed questions related to relationship maintenance in the Facebook age by first developing a set of relationship maintenance strategies that account for the site's affordances, including the persistence and visibility of content and connections. The dissertation then showed, through a series of analyses, the relationship between engagement in these strategies and a series of relational outcomes, both generally and specific to Facebook. Findings indicate that while relational closeness is positively correlated with engagement in relationship strategies, specific types of Friend dyads are more likely to use these strategies and, consequently, benefit from their engagement. In general, weaker ties, those who rely on Facebook as their primary communication channel, and those who live farther away both engage in these strategies to a greater extent and view Facebook as having a greater impact on their relational closeness and stability than stronger ties, those who communicate through other channels, and those who live close to each other.

These findings provide significant evidence for the supportive role Facebook plays in maintaining the wide range of weaker connections that comprise the majority of most users'

Friend networks. The site's features—most notably the straightforward nature through which a relationship is articulated, the simple presentation of content in reverse chronological order and the ease of communicating with other users through a wide range of behaviors representing various degrees of engagement and time commitment—have significantly impacted how we maintain relationships in the digital age. Even Robin Dunbar, the evolutionary psychologist best known for his work on “Dunbar’s number”—the cognitive threshold at which people can no longer maintain meaningful relationships—and a vocal critic of Facebook’s focus on large Friend networks, recently conceded: “I suspect that Facebook’s one great contribution has been to slow down that rate of relationship decay by allowing us to keep in touch with friends over long distances” (Dunbar, 2011, p. 83). The findings presented here provide initial empirical evidence to support Dunbar’s statement, and go even further by suggesting that individuals not only see the site as a repository to store contacts, but as an interactive forum that improves the quality of relationships, and specifically benefits weaker and more distant ties.

An important future direction for this research is to consider whether relationships that benefit in terms of improved relational closeness and stability subsequently have increases in the provision of various types of resources, as this would address a question social capital and SNS researchers have struggled with for several years (see, for example, Ellison et al., 2010). SNSs provide a series of tradeoffs: the technical features and social affordances allow for the creation of large social networks with whom users can easily share information and interact; however, privacy concerns may preclude participation and the nature of one-to-many communication may lead some to view it as less authentic than more personalized, one-on-one interactions (Vitak & Ellison, in press). Likewise, researchers such as Moira Burke and her colleagues at Facebook and Nicole Ellison and colleagues at Michigan State University have linked various aspects of

Facebook use to perceptions of social capital, but have been generally not established causal relationships between the variables. Finally, the widely used measures of social capital in these studies (Williams' 2006 Internet Social Capital Scales) are often criticized for not accurately reflecting the constructs. Therefore, a future study could test whether engagement in the Facebook relationship maintenance strategies leads to an increased likelihood to provide a Friend with various social and informational resources, which would provide initial evidence of a causal relationship between Facebook use and social capital outcomes, thus specifically extending recent work by Ellison et al. (2011b) and helping to clarify a longstanding discussion regarding whether social capital is a cause or an effect in CMC environments.

APPENDIX

Survey Launch Page—Informed Consent

Thank you for your interest in this research study. The goal of this study is to increase knowledge about how people use Facebook to maintain relationships with a variety of people.

Background Information and Procedures: You will complete a survey, which will take about 20 minutes to complete. You will be asked to log into Facebook and answer a series of questions about a specific Facebook Friend, as well as some basic demographic information. You must be at least 18 years old and have an active Facebook account to participate in this study.

Study Participation: There are no obvious physical, legal or economic risks associated with participating in this study. You do not have to answer any questions you do not wish to answer. Your participation is voluntary and you are free to discontinue your participation at any time. At the completion of the survey, you'll have the opportunity to submit your email address to be entered into a raffle for one of four \$25 Amazon gift cards. Your odds of winning a gift card are approximately 1 in 30.

Winners will be notified, via email, within two weeks of the survey closing.

Contact: This is a scientific study being conducted by Nicole Ellison and Jessica Vitak in the Department of Telecommunication, Information Studies, and Media at Michigan State University. If you have any questions about this study, please contact the researchers at 409 Communication Arts & Sciences Building, East Lansing, MI, 48824, email (nellison@msu.edu or vitakjes@msu.edu) or at 517-432-1667.

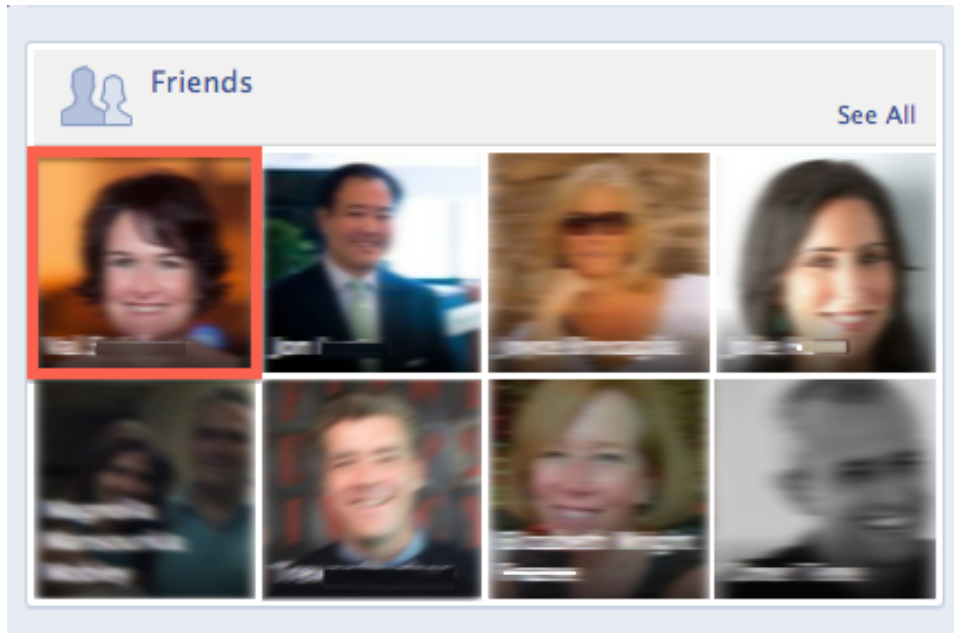
You indicate your voluntary agreement to participate in this research and have your answers included in the dataset by completing and submitting this survey.

Thank you!

Before we get to questions, we need to visit Facebook.

1. In a separate tab in your browser, log into your Facebook account and go to your profile page.
2. Scroll down a little and you should see the "Friends" box in the right column (which lists pictures & names of eight Facebook friends).
3. Select the top left person and enter their first name below.
4. Leave Facebook open as you will be asked to return to it in a few minutes.

Figure 10: Friend Selection Instructions Image From Participant Survey



Note: Images have been blurred to protect identity of individuals in the pictures.

Select top left Facebook Friend (as highlighted in red in the example above).

***Facebook Friend's First Name:** _____

Note: This is required because it affects question wording throughout the survey. You can enter a nickname or initials, but whatever you enter here will auto-fill throughout the survey for questions about this person.

[NEW PAGE]

First, a few questions about your relationship with (person's name).

(person's name) is:

- Male
- Female

Approximately how long have you known (person's name)?

- __Years
- __Months

How would you rate your level of emotional closeness with (person's name)?

Slide the bar left or right to the spot that best fits how close you feel to (person's name).

Not at all close -----|-----Very Close

Which category *best* represents your relationship with (person's name)?

- Family member
- Spouse/romantic partner
- Close Friend
- Current Coworker
- Former Coworker
- Someone in your field of work (but not a coworker)
- Current classmate
- Former classmate
- Hometown friend (non-classmate)
- Friend of a friend
- Other (please list) _____

About how far apart do you live from (person's name)?

(If unsure, make your best guess)

- Less than a 30-minute drive
- 30 minutes-1 hour drive
- 1-2 hour drive
- 2-4 hour drive
- 4-6 hour drive
- 6+ hour drive

Estimate the frequency with which you do the following with (person's name):

	Never	Rarely	Sometim es	Often	Very Often
In Person Talks					
Phone Calls					
Texting					

Email
Instant Messages
Video Chat (e.g., Skype)
Sending a Private Message through Facebook
Chatting (IMing) with them on Facebook
Communicating in a Private (Closed) Group
Posting on their Wall
“Liking” their Facebook posts/photos
Commenting on their Facebook posts/photos
Visiting their profile page
Browsing their photo albums
Reading their updates that appear in my News Feed

Estimate the frequency with which you think (person's name) does the following:

	Never	Rarely	Sometimes	Often	Very Often
Posts status updates, links, or video					
Posts photos or photo albums					
Sends you a Private Message through Facebook					
Posts on Your Wall					
“Likes” Your Facebook posts/photos					
Comments on your Facebook posts/photos					

[NEW PAGE]

For the next series of questions, think about your overall relationship with (person's name) not just on Facebook--when responding.

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
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I can depend on (person's name) to help me if I really need it.

If something went wrong, (person's name) would not come to my assistance.

I can't depend on (person's name) for aid if I really need it.

I can count on (person's name) in an emergency.

I would not turn to (person's name) for guidance in times of stress.

I can talk to (person's name) about important decisions in my life.

I could ask (person's name) for advice if I were having problems.

I would not feel comfortable talking about problems with (person's name).

My relationship with this person is close.

When we are apart, I miss (person's name) a great deal.

(Person's name) and I disclose important personal things to each other.

(Person's name) and I have a strong connection.

(Person's name) and I want to spend time together.

I'm sure of my relationship with (person's name).

(Person's name) is a priority in my life.

I think about (person's name) a lot.

My relationship with (person's name) is important in my life.

I consider (person's name) when making important decisions.

Now think about what you and (person's name) put into and get out of this relationship. Assess the extent to which the following words describe how you feel about your relationship with (person's name).

	Not at all	A little	Somewhat	Moderately	Very Much
Guilty					
Happy					
Angry					
Satisfied					
Disappointed					
Content					

[NEW PAGE]

The following items tap into a wide range of ways you might use Facebook to interact with (person's name). Your responses should reflect the extent to which you actually engage in these behaviors, not the extent to which you would like to engage in them or what you think you would do if there were more opportunities for you to interact with (person's name).

Note: Statements about "liking" content refer to clicking the "Like" button on a status update or photo.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Compared with my other Facebook Friends, (person's name) is more likely to "like" an update I post.					
I keep up to date on (person's name)'s day-to-day activities through Facebook.					
(Person's name) and I use Facebook to coordinate events related to a shared interest, sport, and/or hobby.					
When I see something online that I think (person's name) would find interesting, I'll send him/her a note about it on Facebook.					
I browse through (person's name)'s profile page to see what he/she's been doing.					
Compared with my other Facebook Friends, (person's name) is more likely to comment on an update I post.					
I won't post something if I think it would upset (person's name).					
I browse photo albums posted in (person's name)'s profile.					

I congratulate (person's name) when he/she shares news on Facebook about something big happening in his/her life.

I share news about my life with (person's name) through Facebook.

There are many pictures of (person's name) and me together on Facebook.

If I see (person's name) post about having a bad day, I'll send him/her a note (e.g., comment, wall post, private message).

I share links with (person's name) on Facebook.

I use Facebook to find friends (person's name) and I have in common.

(Person's name) and I use Facebook to share links or videos about a shared interest, sport, and/or hobby.

I look at photos (person's name) posts to Facebook.

I use Facebook just to say hi to (person's name).

I rarely communicate with (person's name) through Facebook.

I share photos with (person's name) on Facebook.

I read comments other people post on (person's name)'s updates.

(Person's name) and I use Facebook to talk about a shared interest, sport, and/or hobby.

I interact with (person's name)'s friends through Facebook comments.

(Person's name) and I have a lot of the same friends on Facebook.

I read (person's name)'s comments on mutual friends' posts or photos.

I've posted links or videos to Facebook with (person's name) specifically in mind.

My Facebook interactions with (person's name) are generally positive.

(person's name) and I use Facebook to share links or videos about a celebrity or TV show we like.

I read (person's name)'s updates but don't comment on them.

When I post about something good going on in my life, (person's name) will "like" it.

I offer (person's name) advice when he/she asks for it on Facebook.

(Person's name)'s updates make me smile.

I use Facebook to find out things (person's name) and I have in common.

I learn about big news in (person's name)'s life from Facebook.

If I am feeling down, (person's name) will send me a note (wall post, link, photo, etc.).

When I see (person's name) sharing good news on Facebook, I'll "like" his/her update.

I usually know a lot of the people who comment on (person's name)'s updates.

Through Facebook, I learn more about (person's name)'s friends.

I use Facebook to get to know (person's name) better.

(Person's name) and I gossip about things going on in our lives on Facebook

(Person's name) always wishes me "happy birthday" on Facebook.

(Person's name) and I play games together on Facebook.

(Person's name) is upbeat when we interact through Facebook.

(Person's name) posts updates to Facebook about his/her day-to-day activities.

(Person's name) and I interact through a Facebook Group for a shared interest, sport, and/or hobby.

I share funny stories from my day with (person's name) over Facebook.

(Person's name) and I talk about mutual friends on Facebook.

I've had arguments with (person's name) on Facebook.

(Person's name) has posted content that made me angry.

I make sure to send (person's name) a note (wall post, comment, private message, etc.)

on his/her birthday.

[NEW PAGE]

For this series of questions, think about all the ways you use Facebook to stay in touch with (person's name), both directly, such as through comments, likes, and messages, and indirectly, such as when you view photos or updates from (person's name) without interacting.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Facebook makes me feel closer to (person's name).					
Facebook has caused tension in my relationship with (person's name).					
Facebook has positively impacted my relationship with (person's name).					
Facebook helps me understand (person's name) better.					
Interacting with (person's name) through Facebook makes me feel like I know him/her better.					
Facebook has had a negative impact on my relationship with (person's name).					
Being Facebook Friends with (person's name) has improved our relationship.					
Facebook keeps me connected to (person's name).					
I don't think Facebook helps me maintain my relationship with (person's name).					
Without Facebook, (person's name) and I would fall out of touch.					
Facebook is the only way I stay in touch with (person's name).					
Overall, Facebook isn't very important in maintaining my relationship with (person's name).					
Facebook is a convenient way to stay in touch with (person's name).					
Facebook plays an important role in maintaining my relationship with					

(person's name).

Without Facebook, I would communicate with (person's name) less.

Facebook keeps me up to date on (person's name)'s life.

Because of Facebook, I feel like I know what's going on in (person's name)'s life.

Facebook makes it easy for me to keep in touch with (person's name).

Because of Facebook, I feel like I know what (person's name) has been up to, even when we haven't interacted in a while.

The following questions relate to your privacy settings and how you use them specifically to enable (person's name) to see your posts or to hide content from (person's name). Please indicate if any of the following statements are true to your knowledge.

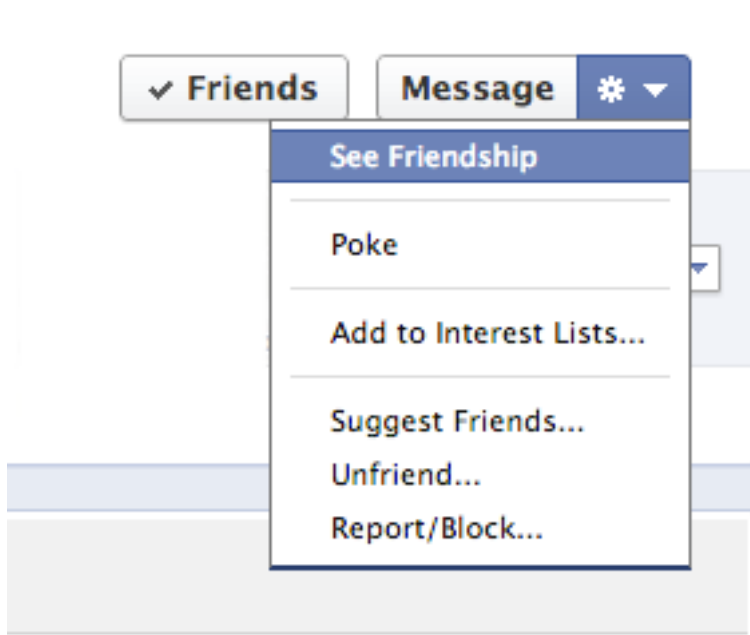
	Yes	No	Not Sure
I've used privacy settings to block (person's name) from seeing one of my photos or photo albums.			
(Person's name) can see everything I post to Facebook.			
I've used privacy settings to block (person's name) from seeing one of my status updates.			
I hide specific types of updates from (person's name) so I don't see them in my News Feed.			
I've hidden (person's name) from my News Feed so I don't see his/her updates.			
(Person's name)'s updates show up in my News Feed.			

[NEW PAGE]

Now let's return to Facebook for a couple quick questions.

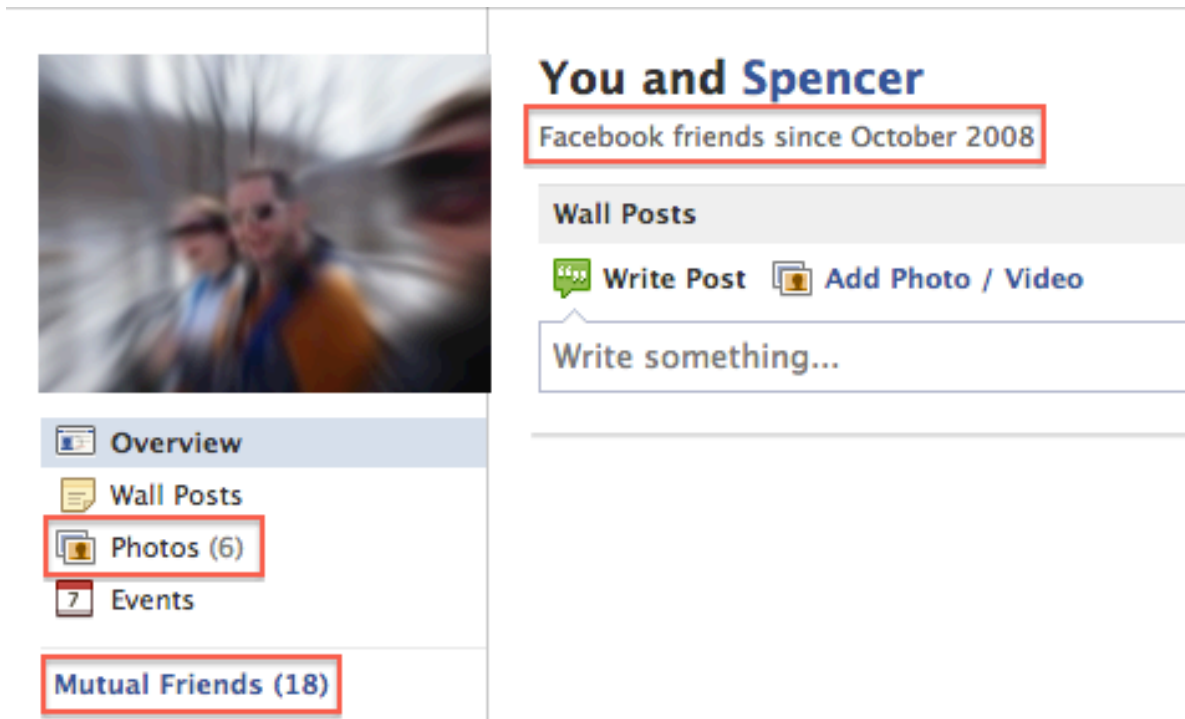
Click on (person's name)'s picture to go to his/her profile page. On the right side of (person's name)'s profile, next to the "Message" button, click on the wheel icon and select "See Friendship." See the picture below to see what it will look like.

Figure 11: See Friendship Instructions From Participant Survey, Part 1



The See Friendship page contains all shared content between you and (person's name) has been posted on Facebook since you've been "friends" on the site. See the sample below and fill in the information where prompted.

Figure 12: See Friendship Instructions From Participant Survey, Part 2



Note: Image has been blurred to protect identity of individuals in the picture.

When did you and (person's name) become Facebook Friends?

(Please enter date in MM/YY format. For example, October 2008 would be 10/08).

Notes: If just a month is listed, that means you became Facebook friends this year (2012). For family relationships (spouses, cousins, etc.), the date is not always listed. In that case, please estimate when you became Facebook Friends.

How many photos are you and (person's name) tagged in together?

Enter the number in parentheses next to "Photos" on the left side of the screen. Note: If "Photos" is not listed, then you should enter "0."

How many mutual friends do you and (person's name) have?

Enter the number in parentheses next to "Mutual Friends" on the left side of the screen.

[NEW PAGE]

Finally, I have some questions about you.

You are:

Male

Female

Prefer not to answer

How old are you?

_____ years old

What is the last grade or class you completed in school?

Less than high school

High school grad

Technical, trade, or vocational school after high school

Some college, no 4-year degree

College graduate

Post-graduate training/professional school after college

I don't want to disclose

What is your ethnicity?

Caucasian/White

African American

Native American

Asian

Pacific Islander

Hispanic/Latino

Multiracial

I don't want to disclose

Other, Please Specify _____

On what devices do you access Facebook from? Please check ALL that apply.

Personal computer (desktop or laptop)

Personal cellphone

Work computer

Work cellphone

Tablet (e.g., iPad, Samsung Galaxy)

eReader (e.g., Kindle, Nook)

Public Computer

Other _____

In the past week, on average, approximately how many minutes PER DAY have you spent actively using Facebook?

_____ minutes

How many times per day do you check Facebook, on average (including via the computer and mobile devices)?

- Less than once per day
- 1-3 times per day
- 4-8 times per day
- 9-15 times per day
- More than 15 times per day

Approximately how many TOTAL Facebook friends do you have? _____ (open end)

Approximately how many of your TOTAL Facebook friends do you consider to be actual friends? _____ (open end)

Do any of your Facebook Friends fall into the following categories? (CHECK ALL THAT APPLY)

- Spouse/romantic partner
- Family members (not including spouse/romantic partner)
- High school classmates
- Undergraduate classmates
- Previous coworkers
- Current coworkers
- People in your industry/field who you haven't ever worked with
- Childhood (pre-high school) friends
- Members from a religious organization or church
- Members of a group or organization you belong to (non-religious)
- Graduate school classmates (if attended)
- Friends of friends
- Other (please list) _____

Indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Losing access to Facebook would not change my social life at all.					
Facebook is not an important part of my social life.					
If I couldn't communicate through Facebook, I would feel "out of the loop" with my friends.					
Without Facebook, my social life would be drastically different.					
I would communicate less with my friends if I couldn't talk with them over Facebook.					
If I lost access to Facebook, I think I would					

probably lose contact with many of my friends.

What statement *best* describes your current privacy settings on Facebook?

- I use advanced privacy settings so only some of my Facebook Friends can view my profile
- All of my Facebook Friends can view my profile
- My Facebook Friends and friends of friends can view my profile
- My profile is set to public so anyone can view it
- I don't know
- Other _____

Have you created "Friend Lists" so you can post updates just to a subset of your Facebook Friends?

- Yes
- No
- I don't know

If yes: How often do you use this feature?

Never—Very Rarely—Rarely—Sometimes—Often—Very Often

Indicate your level of concern about the following things that might happen when you use Facebook.

	Not at all Concerned	A Little Concerned	Somewhat Concerned	Moderately Concerned	Very Concerned
Receiving inappropriate messages from another user.					
Your account information being compromised (e.g., your email and password get posted online).					
Your personal information (e.g., phone number, address, etc.) becoming publicly visible.					
Your picture being used in a Facebook ad.					
Being tagged in a photo you don't want linked to your account.					
Your account being hacked (i.e., someone takes control of your account and you can no longer access it).					
Private messages becoming publicly visible.					
Unwanted contact from another user.					

Your employer viewing content (text or photos) that might negatively impact your job.

A Facebook “friend” posting a mean, unflattering, or factually incorrect update about you.

Your personal information being sold to other companies for marketing purposes.

Being tagged in an update that identifies your current physical location.

[NEW PAGE]

If you wish to be entered into a drawing for a \$25 Amazon gift card, please enter your email below. You will not be contacted unless you are one of the raffle winners.

[NEW PAGE]

Thank you for participating in this study. Your participation is very important to us. If you have any questions about the study, you may contact the study coordinator, Jessica Vitak, at vitakjes@msu.edu.

All raffle winners will be notified via email within two weeks of the survey closing.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Altman, I., & Taylor, D. (1973). *Social penetration: The development of interpersonal relationships*. New York: Holt.
- Arbuckle, J. L. (2011). Amos (Version 20.0) [Computer Program]. Chicago: SPSS.
- Aron, A., & Fraley, B. (1999). Relationship closeness as including the other in the self: Cognitive underpinnings and measures. *Social Cognition, 17*, 140-160.
- Austin, W. G. (1974). *Studies in "equity with the world": A new application of equity theory*. Doctoral dissertation, University of Wisconsin.
- Ayres, J. (1983). Strategies to maintain relationships: Their identification and perceived usage. *Communication Quarterly, 31*, 62-67.
- Baxter, L. A., & Bullis, C. (1986). Turning points in developing romantic relationships. *Human Communication Research, 12*, 469-493.
- Baym, N. K., Zhang Y. B., Kunkel, A., Ledbetter, A., & Lin M. (2007). Relational quality and media use in interpersonal relationships. *New Media Society, 9*, 735-752.
- Baym, N. K., Zhang, Y. B., & Lin, M.-C. (2004). Interpersonal communication on the internet, telephone and face-to-face. *New Media & Society, 6*, 299-318.
- Berger, C.R., & Bradac, J. J. (1982). *Language and social knowledge: Uncertainty in interpersonal relations*. London: Arnold.
- Berger C. R., & Calabrese R. J. (1975). Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. *Human Communication Research, 1*, 99-112.
- Bland, J. M., & Altman, D. G. (1995). Multiple significance tests: the Bonferroni method. *British Medical Journal, 310*, 170.
- Bohrnstedt, G. W., & Carter, T. M. (1971). Robustness in regression analysis. In G. W. Bohrnstedt & E. F. Borgatta (Eds.), *Sociological Methodology* (pp. 118-146). San Francisco: Jossey-Bass
- Boneva, B., Kraut, R., & Frohlich, D. (2001). Using e-mail for personal relationships: The difference gender makes. *American Behavioral Scientist, 45*, 530-549.
- Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). New York: Greenwood.

- boyd, d. (2008). *Taken out of context: American teen sociality in networked publics*. Doctoral dissertation, University of California, Berkeley.
- boyd, d. (2010). Social network sites as networked publics: Affordances, dynamics, and implications. In Z. Papacharissi (Ed.), *A networked self* (pp. 39-58). New York: Routledge.
- boyd, d., & Marwick, A. (2011, September). *Social privacy in networked publics: Teens' attitudes, practices, and strategies*. Paper presented at A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society, Oxford Internet Institute, Oxford, UK.
- Brandtzaeg, P. B. (2012). Social networking sites: Their users and social implications—a longitudinal study. *Journal of Computer-Mediated Communication*, 17, 467-488.
- Brenner, J. (2012, November 13). Pew Internet: Social Networking (full detail). Washington, DC: Pew Internet Project. Available at: <http://pewinternet.org/Commentary/2012/March/Pew-Internet-Social-Networking-full-detail.aspx>
- Burke, M., & Kraut, R. (2013). Using Facebook after losing a job: Differential benefits of strong and weak ties. In *Proceedings of the 16th ACM Conference on Computer Supported Cooperative Work and Social Computing* (pp. forthcoming). New York: ACM.
- Burke, M., Kraut, R., & Marlow, C. (2011). Social capital on Facebook: Differentiating uses and users. In *Proceedings of the 29th International Conference on Human Factors in Computing Systems* (pp. 571-580). New York: ACM.
- Burke, M., Marlow, C., & Lento, T. (2010). Social network activity and social well-being. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems* (pp. 1909-1912). New York: ACM.
- Burt R.S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford: Oxford University Press.
- Cabin, R. J., & Mitchell, R. J. (2000). To Bonferroni or not to Bonferroni: when and how are the questions. *Bulletin of the Ecological Society of America*, 81, 246-248.
- Canary, D. J., & Stafford, L. (1992). Relational maintenance strategies and equity in marriage. *Communication Monographs*, 59, 243-267.
- Canary, D., Stafford, L., Hause, K., & Wallace, I. (1993). An inductive analysis of relational maintenance strategies: A comparison among young lovers, relatives, friends, and others. *Communication Research Reports*, 10, 5-14.
- Carpenter, C. J. (2012). Narcissism on Facebook: Self-promotional and anti-social behavior.

Personality and Individual Differences, 52, 482-486.

- Cate, R. M., Lloyd, S. A., Henton, J. M., & Larson, J. H. (1982). Fairness and reward level as predictors of relationship satisfaction. *Social Psychology Quarterly*, 45, 177-181.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245-276.
- Costello A. B., & Osborne J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, 10(7), 1-9.
- Cutrona, C. E. (1982). Transition to college: Loneliness and the process of social adjustment. In L. A. Peplau and D. Perlman (Eds.), *Loneliness: A sourcebook of current research, theory, and therapy* (pp. 291-309). New York: Wiley Interscience.
- Cutrona, C. E. (1984). Social support and stress in the transition to parenthood. *Journal of Abnormal Psychology*, 93, 378-390.
- Cutrona, C. E., & Russell, D. (1987). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in personal relationships, Vol. 1* (pp. 37-67). Greenwich, CT: JAI Press.
- Culnan, M. J., & Markus, M. L. (1987). Information technologies. In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of organizational communication: An interdisciplinary perspective* (pp. 420-443). Newbury Park, CA: Sage Publications.
- Cummings, J., Lee, J., & Kraut, R. (2006). Communication technology and friends during the transition from high school to college. In R. Kraut, M. Brynin, & S. Kiesler (Eds.), *Computers, phones, and the Internet: Domesticating information technology* (pp. 265-278). New York: Oxford University Press.
- Dainton, M. (2000). Maintenance behaviors, expectations for maintenance, and satisfaction: Linking comparison levels to relational maintenance strategies. *Journal of Social and Personal Relationships*, 17, 827-842.
- Dainton, M., & Stafford, L. (1993). Routine maintenance behaviors: A comparison of relationship type, partner similarity and sex differences. *Journal of Social and Personal Relationships*, 10, 255-271.
- Dibble, J. L., Levine, T. R., & Park, H. S. (2012). The unidimensional relationship closeness scale (URCS): Reliability and validity evidence for a new measure of relationship closeness. *Psychological Assessment*, 24, 565-572.
- Dindia, K. (2003). Definitions and perspectives on relational maintenance communication. In D. J. Canary & M. Dainton (Eds.), *Maintaining relationships through communication:*

- Relational, contextual, and cultural variations* (pp. 51-77). Mahwah, NJ: Lawrence Erlbaum.
- Dindia, K., & Baxter, L. A. (1987). Strategies for maintaining and repairing marital relationships. *Journal of Social and Personal Relationships, 4*, 143-158.
- Dindia, K., & Canary, D. J. (1993). Definitions and theoretical perspectives on relational maintenance. *Journal of Social and Personal Relationships, 10*, 163-173.
- Dindia, K. (2003). Definitions and perspectives on relational maintenance communication. In D. J. Canary & M. Dainton (Eds.), *Maintaining relationships through communication: Relational, contextual, and cultural variations* (pp. 51-77). Mahwah, NJ: Lawrence Erlbaum.
- Donath, J. S. (2007). Signals in social supernets. *Journal of Computer-Mediated Communication, 13*, 231-251.
- Donath, J. S., & boyd, d. (2004). Public displays of connection. *BT Technology Journal, 22*(4), 71-82.
- Duck, S. (1986). *Human relationships*. London: Sage.
- Duck, S. (1988). *Relating to others*. Milton Keynes, UK: Open University Press.
- Duck, S. (1991). *Understanding relationships*. New York: Guilford Press.
- Duck, S. (1994). *Meaningful relationships: Talking, sense, and relating*. Thousand Oaks, CA: Sage Publications.
- Dunbar, R. I. M. (2011, June). How many “friends” can you really have? *IEEE Spectrum, 81*, 83.
- Dunbar, R. I. M. (2012). Social cognition on the Internet: testing constraints on social network size. *Philosophical Transactions of the Royal Society B Biological Sciences, 367*, 2192-2201.
- Dunn, O.J. (1961). Multiple comparisons among means. *Journal of the American Statistical Association, 56*, 52-64.
- Ellison, N. B. & boyd, d. (in press). Sociality through Social Network Sites. In Dutton, W. H. (Ed.), *The Oxford handbook of internet studies* (pp. forthcoming). Oxford: Oxford University Press.
- Ellison, N., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook “friends”: Exploring the relationship between college students’ use of online social networks and social capital. *Journal of Computer-Mediated Communication, 12*, 1143-1168.

- Ellison, N. B., Steinfield, C. & Lampe, C. (2011a). Connection strategies: Social capital implications of Facebook-enabled communication practices. *New Media & Society, 13*, 873-892.
- Ellison, N., Lampe, C., Steinfield, C., & Vitak, J. (2010). With a little help from my Friends: Social network sites and social capital. In Z. Papacharissi (Ed.), *The networked self: Identity, community and culture on social network sites* (pp. 124-145). New York: Routledge.
- Ellison, N., Vitak, J., Lampe, C., Gray, R., & Brooks, B. (2011b, September). *Cultivating social resources: The relationship between bridging social capital and Facebook use among adults*. Paper presented at A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society, Oxford Internet Institute, Oxford, UK.
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*, 272-299.
- Facebook. (2012). Facebook News Room. Retrieved from <http://newsroom.fb.com/Key-Facts>
- Facebook Data Team. (2009, March 9). *Maintained relationships on Facebook*. Retrieved from <http://www.facebook.com/notes/facebook-data-team/maintained-relationships-on-facebook/55257228858>
- Granovetter, M. S. (1974). *Getting a job: A study of contacts and careers*. Cambridge, MA: Harvard University Press.
- Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *Sociological Theory, 1*, 201-233.
- Guerrero, L. K., & Chavez, A. M. (2005). Relational maintenance in cross-sex friendships characterized by different types of romantic intent: An exploratory study. *Western Journal of Communication, 69*, 339-358.
- Gunn, D. O., & Gunn, C. W. (2000, October). *Electronic relationship maintenance processes*. Paper presented at the annual meeting of the Association of Internet Researchers, Lawrence, KS.
- Hampton, K., Goulet, L. S., Rainie, L., & Purcell, K. (2011a). *Social networking sites and our lives*. Washington, DC: Pew Internet & American Life Project.
- Hampton, K. N., Lee, C. J., & Her, E. J. (2011b). How new media affords network diversity: Direct and mediated access to social capital through participation in local social settings. *New Media & Society, 13*, 1031-1049.
- Hampton, K., & Wellman, B. (2001). Long distance community in the network society:

- Contact and support beyond Netville. *American Behavioral Scientist*, 45, 476-495.
- Hatfield, E. (1983). Equity theory and research: An overview. In H. H. Blumberg, A. P. Hare, V. Kent, & M. Davies (Eds.), *Small groups and social interaction*, Vol. 2 (pp. 401-412). Chichester, England: John Wiley.
- Hatfield, E., Utne, M. K., & Traupmann, J. (1979). Equity theory and intimate relationships. In R. Burgess and R. L. Huston (Eds.), *Social exchange in developing relationships* (pp. 99-133). New York: Academic Press.
- Haythornthwaite, C. (2005). Social networks and Internet connectivity effects *Information, Communication & Society*, 8, 125-147.
- Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, 6, 65-70.
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 32, 179-185.
- Johnson, A. J. (2001). Examining the maintenance of friendships: Are there differences between geographically close and long-distance friends? *Communication Quarterly*, 49, 424-435.
- Johnson, A. J., Haigh, M. M., Becker, J. A. H., Craig, E. A., & Wigley, S. (2008). College students' use of relational management strategies in email in long-distance and geographically close relationships. *Journal of Computer-Mediated Communication*, 13, 381-404.
- Johnson, A. J., Becker, J., Craig, E., Gilchrist, E., & Haigh, M. (2009). Changes in friendship commitment: Comparing geographically close and long-distance young-adult friendships. *Communication Quarterly*, 57, 395-415.
- Joinson, A.N. (2008). "Looking at", "looking up," or "keeping up with" people? Motives and uses of Facebook. In *Proceedings of the 26th International Conference on Human Factors in Computing Systems* (pp. 1027-1036). New York: ACM.
- Kiesler, S. (1986, January-February). The hidden messages in computer networks. *Harvard Business Review*, 46-54, 58-60.
- Knapp, M. L., & Vangelisti, A. L. (2005). *Interpersonal communication and human relationships* (5th Ed.). Boston: Pearson.
- Korzenny, F. (1978). A theory of electronic propinquity: Mediated communications in organizations. *Communication Research*, 5, 3-24.
- Lampe, C., Ellison, N., & Steinfield, C. (2006). A Face(book) in the crowd: Social searching vs.

- social browsing. In *Proceedings of the 20th Anniversary Conference on Computer Supported Cooperative Work* (pp. 167–170). New York: ACM Press.
- Lampe, C., Vitak, J., Gray, R., & Ellison, N. (2012). Perceptions of Facebook's value as an information source. In *Proceedings of the 30th International Conference on Human Factors in Computing Systems* (pp. 3195-3204). New York: ACM.
- Lampe, C., Ellison, N., & Steinfield, C. (2007). A familiar face(book): Profile elements as Signals in an online social network. In *Proceedings of the 25th International Conference on Human Factors in Computing Systems* (pp. 435–444). New York: ACM.
- Ledbetter, A. M. (2008). Media use and relational closeness in long-term friendships: interpreting patterns of multimodality. *New Media & Society, 10*, 547-564.
- Ledbetter, A. M. (2009). Measuring online communication attitude: Instrument development and validation. *Communication Monographs, 76*, 463-486.
- Ledbetter, A. (2010). Assessing the measurement invariance of relational maintenance behavior when face-to-face and online. *Communication Research Reports, 27*, 30-37.
- Ledbetter, A. M., Mazer, J. P., DeGroot, J. M., Meyer, K. R., Mao, Y., & Swafford, B. (2011). Attitudes toward online social connection and self-disclosure as predictors of Facebook communication and relational closeness. *Communication Research, 38*, 27-53.
- Lenhart, A. (2009). *Adults and social network websites*. Washington, DC: Pew Internet & American Life Project.
- Madden, M. & Zickhur, K. (2011). *65% of online adults use social networking sites*. Washington, DC: Pew Internet Project.
- Marsden, P. V., & Campbell, K. E. (1984). Measuring tie strength. *Social Forces, 63*, 482-501.
- Meier, L. L. (2008). IRSE. Interactions in Multiple Linear Regression with SPSS and Excel (Version 1.6) [Computer software and manual]. Retrieved November 24, 2012 from <http://www.urenz.ch/irse>
- Metzger, M. J., Wilson, C., Pure, R. A., & Zhao, B. Y. (2012). Invisible interactions: What latent social interaction can tell us about social relationships in social network sites. In D. Comunello (Ed.), *Networked sociability and individualism: Technology for personal and professional relationships* (pp. 79-103). Hershey, PA: IGI Global.
- Miczo, N., Mariani, T., & Donahue, C. (2011). The strength of strong ties: Media multiplexity, communication motives, and the maintenance of geographically close friendships. *Communication Reports, 24*, 12-24.

- Moon, T. K. (1996). The expectation-maximization algorithm. *Signal Processing Magazine*, 13(6), 47-60.
- Moran, M. D. (2003). Arguments for rejecting the sequential Bonferroni in ecological studies. *Oikos*, 100, 403-405.
- Morris, M. R., Teevan, J., & Panovich, K. (2010). What do people ask their social networks, and why?: A survey study of status message Q&A behavior. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems* (pp. 393-404). New York: ACM.
- Nakagawa, S. (2004). A farewell to Bonferroni: the problems of low statistical power and publication bias. *Behavioral Ecology*, 15, 1044-1045.
- O'Connor, B. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, & Computers*, 32, 396-402.
- Parks, M. R., & Floyd, K. (1996). Making friends in cyberspace. *Journal of Communication*, 46, 80-97.
- Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *British Medical Journal*, 316, 1236-1238.
- Preacher, K. J., & MacCallum, R. C. (2003). Repairing Tom Swift's electric factor analysis machine. *Understanding Statistics*, 2(1), 13-43.
- Rabby, M. K. (2007). Relational maintenance and the influence of commitment in online and offline relationships. *Communication Studies*, 58, 315-337.
- Ragsdale, J. D. (1996). Gender, satisfaction level, and the use of relational maintenance strategies in marriage. *Communication Monographs*, 63, 354-369.
- Rainie, L., Purcell, K., & Smith, A. (2011). *The social side of the Internet*. Washington, DC: Pew Internet Project.
- Ramirez, A., & Broneck, K. (2009). 'IM me': Instant messaging as relational maintenance and everyday communication. *Journal of Social and Personal Relationships*, 26, 291-314.
- Ramirez, A. J., Walther, J. B., Burgoon, J. K., & Sunnafrank, M. (2002). Information-seeking strategies, uncertainty, and computer-mediated communication. *Human Communication Research*, 28, 213-228.
- Rheingold, H. (1993). *The virtual community: Homesteading on the electronic frontier*. Cambridge, MA: MIT Press.

- Rice, W. R. (1989). Analyzing tables of statistical tests. *Evolution*, 43, 223-225.
- Rothman, K. J. (1990). No adjustments are needed for multiple comparisons. *Epidemiology*, 43-46.
- Rubin, Z. (1973). *Liking and loving*. New York: Holt, Rinehart & Winston.
- Rusbult, C. E. (1983). A longitudinal test of the investment model: The development (and deterioration) of satisfaction and commitment in heterosexual involvements. *Journal of Personality and Social Psychology*, 45, 101-117.
- Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology*, 57, 1-10.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London: Wiley.
- Smith, A. (2010). *Mobile access 2010*. Washington, DC: Pew Internet Project.
- Sproull, L., & Kiesler, S. (1986). Reducing social context clues: Electronic mail in organizational communication. *Management Science*, 32, 1492-1512.
- Stafford, L. (2010). Measuring relationship maintenance behaviors: Critique and development of the revised relationship maintenance behavior scale. *Journal of Social and Personal Relationships*, 28, 278-303.
- Stafford, L., & Canary, D. J. (1991). Maintenance strategies and romantic relationship type, gender, and relational characteristics. *Journal of Social and Personal Relationships*, 8, 217-242.
- Stafford, L., Dainton, M., & Haas, S. (2000). Measuring routine and strategic relational maintenance: Scale revision, sex versus gender roles, and the prediction of relational characteristics. *Communication Monographs*, 67, 306-323.
- Stafford, L., Kline, S. L., & Dimmick, J. (1999). Home e-mail: Relational maintenance and gratification opportunities. *Journal of Broadcasting and Electronic Media*, 43, 659-669.
- Steinfeld, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology*, 29, 434-445.
- Steinfeld, C., Ellison, N., Lampe, C., & Vitak, J. (2012). Online social network sites and the concept of social capital. In F. L. F. Lee, L. Leung, J. L. Qui, & D. S. C. Chu (Eds.), *Frontiers in new media research* (pp. 115-131). New York: Routledge.
- Tabachnick, L. S. (2007). *Using multivariate statistics (5th ed.)*. Upper Saddle

- River, NJ: Pearson Allyn & Bacon.
- Tabachnick, G. G., and Fidell, L. S. (2007). *Experimental designs using ANOVA*. Belmont, CA: Duxbury.
- Thelwall, M. & Wilkinson, D. (2010). Public dialogs in social network sites: What is their purpose? *Journal of the American Society for Information Science and Technology*, 61, 392-404.
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York: Wiley.
- Tong, S., & Walther, J. B. (2011). Relational maintenance and CMC. In K. B. Wright and L. M. Webb (Eds.), *Computer-mediated communication in personal relationships* (pp. 98-118). New York: Peter Lang Publishing.
- Treem, J. W., & Leonardi, P. M. (2012). Social media use in organizations: Exploring the affordances of visibility, persistence, editability, and association. *Communication Yearbook*, 36, 143-189.
- Utne, M. K., Hatfield, E., Traupmann, J., & Greenberger, D. (1984). Equity, marital satisfaction, and stability. *Journal of Social and Personal Relationships*, 1, 323-332.
- Valkenburg, P. M., & Peter, J. (2009). The effects of instant messaging on the quality of adolescents' existing friendships: A longitudinal study. *Journal of Communication*, 59, 79-97.
- Viswanath, B., Mislove, A., Cha, M., & Gummadi, K. P. (2009). On the evolution of user interaction in Facebook. In *Proceedings of the 2nd ACM workshop on online social networks* (pp. 37-42). New York: ACM.
- Vitak, J. (2012). The impact of context collapse and privacy on social network site disclosures. *Journal of Broadcasting and Electronic Media*, 56, 451-470.
- Vitak, J., & Ellison, N. (in press). "There's a network out there you might as well tap": Exploring the benefits of and barriers to exchanging informational and support-based resources on Facebook. *New Media & Society*.
- Vitak, J., Ellison, N., & Steinfield, C. (2011). The ties that bond: Re-examining the relationship between Facebook use and bonding social capital. In *Proceedings of the 44th Annual Hawaii International Conference on System Sciences*. Computer Society Press.
- Walther, J.B. (1992a). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research*, 19, 52-90.
- Walther, J. B. (1992b). Longitudinal experiment on relational tone in computer-mediated and face to face interaction. *Proceedings of the Twenty-Fifth Hawaii International*

Conference on System Sciences, 4, 220-231.

- Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, 23, 3-43.
- Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior*, 23, 2538–2557.
- Walther, J. B., & Parks, M. R. (2002). Cues filtered out, cues filtered in: Computer-mediated communication and relationships. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of interpersonal communication*, 3rd ed. (pp. 529-563). Thousand Oaks, CA: Sage.
- Walther, J. B., & Ramirez, A., Jr. (2009). New technologies and new directions in online relating. In S.W. Smith & S. R. Wilson (Eds.) *New directions in interpersonal communication research* (pp. 264-284). Thousand Oaks, CA: Sage.
- Weiss, R. S. (1974). The provisions of social relationships. In Z. Rubin (Ed.), *Doing Unto Others* (pp. 17-26). Englewood Cliffs, NJ, Prentice-Hall.
- Wellman, B., & Wortley, S. (1990). Different strokes from different folks: Community ties and social support. *American Journal of Sociology*, 96, 558-588.
- Westfall, P. H., & Young, S. S. (1993.) *Resampling-based multiple testing*. New York: John Wiley & Sons.
- Williams, D. (2006). On and off the ‘Net: Scales for social capital in an online era. *Journal of Computer-Mediated Communication*, 11, 593-628.
- Wortham, J. (2011, December 16). Your life on Facebook, in total recall. *The New York Times*. Retrieved from <http://www.nytimes.com/2011/12/16/technology/facebook-brings-back-the-past-with-new-design.html>
- Wright, K.B. (2004). Online maintenance strategies and perceptions of partners within exclusively Internet-based and primarily Internet-based relationships. *Communication Studies*, 55, 239-253.
- Yoccoz, N. G. (1991). Use, overuse, and misuse of significance tests in evolutionary biology and ecology. *Bulletin of the Ecological Society of America*, 72, 106-111.