Unfriended: The Role of Computer-Mediated Communication in Maintaining Long-Distance Friendships

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Abstract

In recent years, social media has become a significant communication medium through which friends interact. As the ease of interaction increases, social network services, specifically Facebook, have come to facilitate friendships differently than in previous generations by making physical proximity less necessary for communication. However, proximity, or propinquity, is an important aspect of both communication and friendship because it promotes more face-to-face interaction. Face-to-face interaction is defined social presence theory as the most potent form of communication. In this study, I examine the role of face-to-face interaction in friendship maintenance, and how computer-mediated communication affects strength of friendship over time. I ask how important is the amount of face-to-face interaction, influenced by propinquity, to maintaining friendships? Furthermore, how effective is Facebook in maintaining the strength of friendships when propinquity declines? I administered a survey to college students to learn about their relationships with high school friends. I found that respondents who interact with these friends less frequently in person reported a greater decrease in friendship strength over time. Also, respondents who text these friends less frequently reported a similar decline in friendship strength. This questions the relevance of propinquity, face-to-face interaction, and social presence theory. However, I found more frequent Facebook interaction between friends to be strongly associated with a decrease in friendship, suggesting its inability to maintain friendship strength when propinquity is reduced.

Introduction

The power of Facebook, and the Internet in general, is hard to ignore. Communicating with people is now easier than it has ever been before. But, is computer-mediated communication effective enough to maintain the relative strength of a friendship when friends

become separated by increased geographic distance? My thesis seeks to examine the significance of face-to-face interaction in maintaining friendship strength, in a world where friends can connect and communicate with ease over the Internet. Is face-to-face interaction necessary for maintaining strong friendships, or do social networking websites like Facebook have the power to keep friendships strong when propinquity is reduced?

To answer these questions, friendship and its relative strength first need to be defined. Using Granovetter's (1973) theory of tie strength, I developed a working definition of friendship to test over time. I also draw from a concept outlined in the most detail by Amichai-Hamburger et al. (2013) called propinquity, or geographic distance. This definition of friendship includes measures of mutual confiding, mutual support, similarity, and, of course, propinquity. Short et al.'s (1976) social presence theory explains why face-to-face interaction is the richest form of communication. To answer the question of how important face-to-face interaction is to maintaining friendships, these aspects of friendship need to be put in the context of computer-mediated communication.

Computer-mediated communication has become part of everyday life over the last few decades. The advent of social networking services has risen out of this form of communication. Recently, Facebook has excelled to be the most widely used social networking service (Wilson et al. 2009), making it the best choice to study friendships. By assessing the relevance of computer-mediated communication in maintaining the strength of friendships over time, we can assess the significance of propinquity, face-to-face interaction, and social networking services.

How important is the amount of face-to-face interaction, influenced by propinquity, to maintaining friendships, and how effective is Facebook in maintaining the strength of friendships when propinquity declines? To answer these questions, I created a survey and administered it to

college students, many of whom may have recently experienced a sharp decrease in face-to-face interaction with their best friends from high school due to leaving for different colleges or the workforce. Analysis of the survey results shed much light on the importance of propinquity, face-to-face interaction, and computer-mediated communication in regards to maintaining friendships.

Literature Review

Digital technology is prevalent in almost every aspect of our lives, from the way we get around, to the way we interact with others. The ways we communicate with complete strangers and with the best of friends are constantly changing due to technological developments. One of the most influential technological advances, the Internet, provides many different means of correspondence, some of which have become so popular their use is integrated into everyday life (Lambert, 2013). One of the reasons internet communication is becoming so commonplace is that the ease of transferring information via text over the web reduces the time and effort that phone calls and face-to-face interaction demand, which is a major transition from the necessity of these forms of communication. Naturally, people that we interact with frequently, namely our friends, also interact with us over the computer. What is the impact of this kind of communication on friendships?

Friendship has been studied and described many ways and by many scholars over the decades. I build from these definitions to create a more synthetic definition of friendship. Granovetter's (1973) concept of tie strength forms the basis of my definition of friendship. Tie strength is a commonly used measure of friendship strength (Maxwell, 1985;Ishii, 2010). Previous research also notes the importance of propinquity, or geographic distance, which directly links the importance of face-to-face interaction to friendship strength. According to

Amichai-Hamburger et al. (2013), propinquity can dictate the amount of face-to-face communication that can occur. Aspects of the concepts of tie strength and propinquity constitute the definition of friendship used in my thesis.

I define the strength of friendship as being composed of four concepts: mutual confiding, mutual support, homophily (similarity), and propinquity. I believe the relative presence of these traits correlates directly with the strength, or closeness of friendship. In regards to maintaining closeness over time once a friendship is established, it is important that these traits remain at a similar level for the friendship to maintain its relative strength. Using Short et al.'s (1976) theory of social presence, which defines the strength of various forms of communication, I analyze the importance of propinquity to maintaining friendship strength. As the alternatives to face-to-face interaction increase with the advent of computer-mediated communication, the importance of face-to-face interaction for maintaining friendship strength is called into question.

I put computer-mediated communication's role in maintaining friendship in the context of Facebook, the largest social networking site in the world (Wilson et al., 2009). Facebook, created in 2004 by Mark Zuckerberg and associates, has become a social networking giant in years since. This website has become integrated into everyday life in several ways, such as romantic relationships being 'Facebook official', and social gatherings often being organized through 'events'. For many, Facebook has become as normal and frequent an interactive medium as phone calls or face-to-face contact. Much of this frequency is due to the ease of simply writing on somebody's 'wall' or shooting them a 'message'. Lambert (2013:1) argues, "Facebook offers amazing opportunities to enrich interpersonal life and generate intimacy". This claim, along with the sheer volume of its over one billion users, are the reasons why I am using Facebook in this study. The opportunities Lambert describes may exist, but how present are they in reality?

Amichai-Hamburger et al. also cite the influence of Facebook: "The advent of Facebook has been seen by many to have modified the definition of the word 'friend'" (2013:1). The use of social networking services, such as Facebook, reduces the necessity of in-person interaction because communicating online is so accessible. This means the potential, and therefore frequency, of face-to-face interaction can be easily overlooked as an integral part of maintaining a strong friendship, since computer-mediated communication has become so commonplace.

Like Allan (1979), I argue that without in-person interaction, friendships will typically degrade and fail. Lambert states that a lack of face-to-face interaction means that a friendship could be "less meaningful as those which are actively maintained" (2013:77). How important is computer-mediated communication, relative to other forms of communication, for effectively maintaining friendships? Short et al. (1976) argue that face-to-face interaction provides a certain richness unmatched by other forms of communication. This richness of communication is important because more cues, be they visual or auditory, equate to conveyance of more meaningful information. This is a significant enough concern in modern society that some go as far as to say computer-mediated communication as a substitute for face-to-face interaction is in fact making us lonely instead of increasing connection (Turkle, 2011). Using social presence theory, I will analyze the benefits of face-to-face interaction in regards to mutual confiding, mutual support, and similarity, and what the lack of this kind of interaction can do to the relative strength of friendship over time.

Defining Friendship

Friendship seems to be one of the most basic constructs of human existence, but it is not easy to define. Many social scientists have attempted to delineate this concept, with several different views on which aspects are most integral. We all have friends, but what specifically

about these relationships makes some stronger than others, and what makes them last? Numerous terms have been used to define the strength of relationships. One of the most well known is tie strength, a concept developed by Mark Granovetter in the early 1970s.

Granovetter (1973:1361) describes the basic concept of tie strength between individuals 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". These traits are noted as being independent yet correlated, making them a good base for defining the relative strength of relationships. The type of relationship Granovetter examines in regards to tie strength is friendship. The influence of Granovetter's ideas can be seen through the years as numerous other scholars, such as Marsden and Campbell (1984) and Gilbert and Karahalios (2009), continue to cite tie strength as an important concept in defining friendship strength. Marsden & Campbell (1984) also note that greater tie strength translates to more frequent interaction, which Amichai-Hamburger et al. (2013) cite as a result of propinquity.

However, these are not the only factors that can be used to define the closeness of a friendship. For instance, Maxwell (1985:231) notes

> separation distress, disclosure, naturalness, similarity, sharing of attitudes and values and interests, following (in the sense of seeking out and spending time with), giving and receiving help and communicating about important issues are all areas of self-report behavior which seem to be associated with closeness.

Ishii (2010:366) posits, "Close relationships are characterized by high levels of psychological intimacy, attachment, self-disclosure, perceived similarity, and mutual support". The aforementioned definition of intimacy is described by Granovetter (1973) as mutual confiding and is cited by Ishii (2010) and Maxwell (1985) as disclosure. Granovetter mentions reciprocal

services, which is also noted by Marsden and Campbell, and defined by Ishii as mutual support. Granovetter also notes a correlation between similarity and friendship. The sharing of attitudes, values, and interests, or, as Ishii describes, perceived similarity, is defined by Amichai-Hamburger et al. (2013) as homophily. This concept is most easily understood as general similarity. It is clear that many definitions of these friendship dimensions overlap, but there are unique aspects to each. With that said, it is important to note it is difficult to objectively define friendship. Based on my review of friendship literature, I believe there are three facets of friendship strength stemming from Granovetter's concept of tie strength that are mentioned most often and therefore most integral: mutual confiding, mutual support, and homophily or perceived similarity.

Mutual confiding refers to the amount of detail friends share with each other about their lives. The more confided between one another, the stronger the friendship. For example, sensitive family problems are usually shared with only the closest of friends. Confiding delicate issues does not occur without a certain level of trust between the individuals that the information shared will not be divulged. Mutual support refers to friends being there for each other when needed. The more support there is in a friendship, the stronger it will be. Finally, homophily, or perceived similarity, refers to how similar friends feel they are to each other in regards to interests, personality, and background. Studies have found there is a positive relationship between the strength of a tie and the similarity between individuals, or friends (Granovetter, 1973). However, there is one other important concept that I, and others, believe can also affect the strength of friendship.

The Importance of Propinquity

In addition to homophily, Amichai-Hamburger et al. (2013) outline another important factor that leads to and sustains friendship: propinquity. Propinquity refers to the geographical distance between where two individuals live. The greater the relative propinquity, or the closer individuals live, the greater the opportunity for interaction, and potential for friendship. Some scholars, such as Ishii (2010), include propinquity in their definition of friendship, whereas others, such as Gilbert & Karahalios (2009) and Maxwell (1985) do not. This difference exemplifies the debate about the importance of geographic distance to friendship. For instance, you are much more likely to interact with somebody who lives on your street than with somebody who lives 50 miles away. In fact, Amichai-Hamburger et al. (2013) note that children tend to form friendships with those they are in close proximity with, whether that means at school or in their neighborhood. Propinquity influences the amount of face-to-face interaction individuals can have, which I, and others, cite as an important aspect of friendship

Going beyond friendship development, face-to-face interaction is also noted as integral for the maintenance of friendship (Fehr, 1995). However, some scholars question the importance of propinquity, arguing that friendships can be formed or maintained online and do not have to be initiated or sustained by frequent, if any, face-to-face interaction (McKenna et al., 2002). Marsden & Campbell (1984) and Granovetter (1973) have noted the relationship between tie strength and frequency of interaction, which can be attributed to the amount of propinquity between friends. I argue the amount of face-to-face interaction, influenced by propinquity, is not just essential for friendship formation, but also for the maintenance of friendship strength. Essentially, the more face-to-face interaction that occurs, the stronger a friendship will be. I don't believe propinquity has been considered as important to friendship over the last few decades since computer-mediated communication has been noted as a medium that facilitates

greater tie strength (Mesch and Talmud, 2006). It has even been said that friendships formed and maintained online can be just as strong as friendships formed and maintained in person (Chan and Cheng, 2004). I posit a decline in the importance of face-to-face interaction is correlated to the advent of the technology that promotes easy interaction without the necessity of face-to-face communication, specifically social networking sites. Before I discuss computer-mediated communication, social networking sites, and Facebook in greater detail, it is important to explain why the concept of propinquity, which facilitates more face-to-face interaction, is important to friendship.

Social Presence Theory: Defining the Strength of Communications

Social presence theory outlines the relative strength of communication by comparing face-to-face interaction to other forms of communication. As mentioned above, social presence theory is important in assessing the strength of friendships because propinquity allows for more face-to-face interaction to occur, but this form of communication is no longer a necessity for maintaining relationships due to technologies like computer-mediated communication (Lambert, 2013). Social presence theory explains why face-to-face interaction is in fact important. Short et al. define social presence as "a single dimension representing a cognitive synthesis of… facial expression, direction of looking, posture, dress and non-verbal vocal cues" and that different "communication mediums have different degrees of social presence" (1976:65).

The more cues available for interpretation, the more social presence exists. Naturally, some forms of communication do not allow information to be conveyed through all types of cues. Short et al. cite (1976) a study done by Snyder and Wiggins that rated the amount of social presence using three different communication mediums. Communication was monitored between 72 managerial civil servants in the form of face-to-face interaction, interaction through a TV

screen with audio, and just audio. Face-to-face interaction was found to have the highest rating of social presence, followed by TV screen with audio, and then just audio. What does this say about the amount of social presence available through computer-mediated communication?

Although computer-mediated communication did not exist at the time of this study, dress, verbal, and non-verbal cues are still important today. Short et al. note (1976:72) that communication methods with higher degrees of social presence are rated higher in terms of being warm, personal, sensitive, sociable and intimate. Social presence theory rates face-to-face interaction as the best kind of interaction in regards to a friendly social setting.

Based on its rating as the best kind of communication, face-to-face interaction would have a much higher social presence rating than computer-mediated communication. In a more recent study, Mesch & Talmud (2006:31) support this assertion:

> early conceptualizations, assuming technological determinism of the Internet, described the weakness of electronic media in supporting social ties. The 'reduced social cues perspective' is based on the observation that computer-mediated communication allows for the exchange of fewer cues than face-to-face environments and suggest that computer-mediated communication is less appropriate for the support of emotional exchanges and the delivery of complex information and a sense of social presence.

Relating back to my argument, more propinquity therefore allows a greater degree of social presence. This means that less propinquity will reduce the amount of interaction rated by social presence theory as the most effective. This could lead to potential degradation of a relationship, even if a form of communication with less social presence, such as computer-mediated communication, remains or is even increased in use. In the next section, I describe computer-mediated communication and social networking services in greater detail.

Computer-Mediated Communication, Social Networking Services, and Friendship

It is almost shocking how quickly social media has been integrated into everyday life. These virtual communication pathways are found on the Internet, ushering in the term computer-mediated communication. Computer-mediated communication is widespread: found in the most formal (business transactions over email) and informal (sharing an amusing photo on Tumblr) settings. Computer-mediated communication is also broad in its degree of privacy, ranging from public forums that anybody can access to private Facebook 'messages'. One of the most common means of computer-mediated communication, social networking websites, can also be used for public and private communication. Facebook facilitates both public and private communication, making it a holistic medium to express relationships to an audience of 'friends', through 'wall-posts', 'comments', and 'liking', and interactions that only two people can see, such as 'messages'. Social networking websites can also provide extremely accessible interaction to anybody with a computer. Social networking services have gained a massive following due to their fun, uncomplicated means of communicating between friends. The name says it all, social networking in itself means organizing social connections.

Many of the connections on social networking websites are preexisting friendships or acquaintances, even though it is not unheard of to make friends online. As previously mentioned, there are several studies claiming that friendships established and maintained online through computer-mediated communication and social networking websites are equitable in strength to those formed in person (Chen & Cheng 2004:317; McKenna, 2002). This is important to mention because the formation of these online friendships can be used to exemplify one of the biggest draws to computer-mediated communication and social network services: the ease of connecting

with somebody by eliminating the necessity to speak with them on the phone or meet with them in person.

However, this creates a potential problem. If more interactions are occurring by means that are not as comprehensive as face-to-face interaction (Short et al. 1976), less information can be conveyed due to the lack of cues, and the strength of the relationship will suffer. Walther & Boyd (2002) argue for the strength of computer-mediated communication, stating it can benefit friendships because interactions are "arguably more deliberative and effective than one might manage offline." Elaborating on that statement, Walther and Boyd touch on the idea of computer-mediated communication allowing more communication clarity because you have time to think things through and edit communication before it is sent. They even go so far as to say that computer-mediated communication has the ability to hide differences that individuals may have, which they cite as a potentially good thing for friendship.

Even though there is the potential for more frequent interaction between friends near and far through computer-mediated communication (Hampton & Wellman, 2001), social presence theory defines these interactions as inferior to those in person, which propinquity promotes. It is easy for things to be lost in translation when communicating via the computer. This occurs because there are fewer social cues occurring. This means that according to social presence theory, computer-mediated communication is a less rich and effective means of communication, especially when juxtaposed with face-to-face interaction. Computer-mediated communication certainly allows effortless connections, but are friendships just as strong even if propinquity is removed?

The Proposed Strength of Facebook

Despite the lack of communication richness in computer-mediated communication, Facebook is specifically mentioned as a great means of maintaining relationships. Viswanath et al. (2009) note the more you interact with somebody on Facebook, the longer these interactions are likely to continue. In Lambert's (2013) interviews of Facebook users, many stated they would have had a poorer connection with distant friends if they did not use Facebook. More precisely, participants cited valuing Facebook as a means of connecting with people who have moved out of their immediate "life-worlds". When thinking in a broad sense, these conclusions make sense because Facebook does provide a certain amount of ease in interacting with others despite how far away they may be from each other geographically. Lambert argues that not only does Facebook provide connection and means for friendship maintenance, but that it also "intensifies dispositions which already exist" (2013:15). But friendships have been shown to fade when face-to-face interaction is removed (Allan, 1979). This makes Facebook the perfect medium to test the maintenance of friendship strength over time once propinquity, and therefore more frequent face-to-face interaction, is likely reduced.

Expectations on the Importance of Propinquity to Friendship Strength

I posit there is greater opportunity for friendship with more propinquity, which results in more face-to-face interaction. Computer-mediated communication and social network services may reduce the significance of face-to-face interaction to a certain degree. Social presence theory leads us to believe that computer-mediated communication's weakness is that it is not as potent a form of communication as speaking with somebody face-to-face. Communication is an undoubtedly important aspect of friendship, as it is the most basic concept of human relations; without communication, there would simply be no friendship. This is why I ask how important is the amount of face-to-face interaction, influenced by propinquity, to maintaining friendships?

Without strong communication, I believe that any sort of relationship will lose strength and eventually fail, including friendship. Lambert (2013) mentions that Facebook is often used to connect with people who no longer have an immediate relationship, which is often a result of distance. Amichai-Hamburger et al. (2013:12) elaborate on this by noting "it has been found that Facebook is used by college students to connect with high school friends and those that are distant physically". My survey targets undergraduates, most of whom have had much less face-to-face communication with their closest friends from high school. Like Gilbert & Karahalios (2009), I will also use Granovetter's (1973) concept of tie strength to measure friendship through social media. I expect many close high school friendships, most of them now being long-distance, to degrade over the years, despite many of these relationships having an online presence. This would show that computer-mediated communication is not a replacement for face-to-face interaction, and that propinquity is integral to friendship strength. In summation, Hampton and Wellman state that computer-mediated communication makes for easier local and long distance contact, but that it "should lessen, but not eliminate, the constraints of distance on maintaining personal communities." (2001:497). I seek to discover the accuracy of this statement.

Methods

To assess the relationship between propinquity and friendship strength, I administered an online survey to acquire quantitative data on perceived friendship strength over time, communication patterns, and Facebook usage. The survey asked participants to list their three best friends from the end of high school and rate the four components of friendship strength (mutual confiding, mutual support, similarity, propinquity) in the past and present. The survey then asked questions pertaining to their communication patterns with these specific friends, and

concludes with questions about the participants' Facebook use. As the most widely used social networking website in the world, Facebook is an ideal site for the focus of this study. I also collected basic demographic information about participants and their three friends. After data collection ended, I analyzed the data looking for relationships between demographic information, measures of friendship strength and Facebook usage, all in regards to face-to-face interaction. This data allowed me to draw conclusions about the importance of physical proximity and face-to-face interaction to friendship strength, and how this relates to Facebook use.

Recruitment

I recruited undergraduate students at the University of North Carolina at Chapel Hill, a large public university in the Southeast, for this study. An email (Appendix B) containing a link to an online survey (Appendix A) was sent to a random sample of undergraduate students to reach as many students as possible. To induce participation, respondents who completed the survey were entered into a raffle to win one of three $50 Amazon.com gift cards.

Participants

Participants' consent was confirmed once they submitted the survey upon its completion. If they did not wish to complete the survey for any reason, their responses were not recorded, and their name was not entered in the gift card raffle. The survey did not ask participants to answer any sensitive questions, but privacy was still a concern. In order to maintain confidentiality, participants' names, or any factors that could reveal their identity (besides their email) were not collected. The only link to participants' identity was their email, which was kept separately from responses only to notify the winners of the raffle. Data was further protected by password on my computer that I alone had access to. There was a short summary page at the

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beginning of the survey explaining the consent process, confidentiality of the data, and how the raffle process would work upon the completion of data collection.

The desired sample size for completed surveys was 200 participants. After the survey was closed, I was left with 398 usable responses. Participants' demographics could be guessed before the survey by looking at the University's demographics as a whole[1]. UNC-Chapel Hill has 18,503 undergraduate students, most of which are between ages 18 and 22 and are 58% female and 42% male. The racial makeup of UNC-Chapel Hill undergraduates is mostly white, with each minority subgroup (Asian, African American, Hispanic) making up about 8%-9% of the population.

The university's larger female population materialized in my sample, as over three quarters of my respondents were female. Difference in gender proportions from the University demographics to the participants' demographics is important to remember when interpreting the results. Just like the University demographics, the average age of the participants was 20 years old, with age distributed evenly. Participants aged 19, 20, and 21 each make up about 24% of the distribution. I removed 25 respondents who were older than 23 from the sample to control for excessive amounts of time between high school and college. The survey yielded greater percentage of White students than the University as a whole. Consequently, there are a lower percentage of Black and Hispanic respondents. Demographic statistics can be seen in Table 1A below:

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[1] University of North Carolina at Chapel Hill student demographics can be found at
http://www.collegeportraits.org/NC/UNC-Chapel-Hill/print

Table 1A: Participant Demographics

Characteristic	Number	Percent
Gender*		
Male	94	23.6%
Female	303	76.1%
Race		
White	303	76.3%
Black	23	6.3%
Asian	35	8.8%
Hispanic	21	5.3%
Other/Multiracial	15	3.8%
Age		
18	74	18.6%
19	95	23.9%
20	92	23.1%
21	100	25.1%
22	37	9.3%
Year in school		
First-Year	116	29.2%
Sophomore	77	19.4%
Junior	108	27.2%
Senior	96	24.2%
Graduating year of High School		
2009	5	1.3%
2010	91	23.3%
2011	102	26.2%
2012	77	19.7%
2013	115	29.5%

*=Excludes one response of "other"

There are some potential weaknesses with the sample that can be attributed to demographics of college undergraduates and the way the survey is being administered. The participants attend a highly regarded university, which could underrepresent certain racial and social class demographics. Sampling through email did not cause any problems in regards to under sampling, which was a possibility due to low interest or the email containing the survey being deleted before it was read. Although my survey is fairly detailed, an interview would be able to yield more comprehensive results, but would have drastically lowered my sample size.

Measures

The measures of the survey consist of basic demographic information such gender, race, age, current year in school, and graduating year of high school. Demographic information about the participant and about their three best friends from the end of high school was obtained. Detailed information about specific friendships was obtained by asking the participants to name their three best friends from the end of high school and answer questions about factors that defined the strength of their friendship at the end of high school and at the present time. Friendship strength was measured on a five-point Likert scale for each trait: mutual confiding, mutual support, and similarity. A difference measure was created by recording the change in each of the 3 variables when measuring for the end of high school and for the present. These friendship change measures serve as dependent variables in my statistical analysis.

In the survey, I used Granovetter's tie strength definition of intimacy, which is defined as the amount of mutual confiding between friends. Mutual confiding is the phrase the survey used to pose questions about intimacy to avoid confusion on this potentially vague term. Granovetter's concept of reciprocal services was captured as mutual support in the survey. Homophily, or similarity, describes the relative similarity of friends' interests, traits, and background. Similarity was measured in my survey the same way as mutual confiding and mutual support, but with a separate question for interests, traits, and background. Propinquity is defined as the geographic distance between where two friends live. Greater propinquity means a greater potential for face-to-face interaction, and therefore more meaningful interactions, as described by Short et al.'s (1976) social presence theory. Propinquity was measured as the travel time to the friend's house by the most frequently used means of transportation.

Sample friendship questions include: How much did you and ____ confide in each other? On a scale of 1-5, with one meaning "didn't share anything personal" and 5 meaning "shared the most intimate details about each others' lives", How much mutual support was in your relationship with ____? On a scale of 1-5, with 1 meaning "none" and 5 meaning "could always count on them for support no matter what" (#), and How similar were your and ____'s interests? On a scale of 1-5, with 1 meaning "not similar" and 5 meaning "very similar" (#) How similar were your and ____'s personalities? On a scale of 1-5, 1 meaning "not similar" and 5 meaning "very similar" (#)

I then asked questions about Facebook usage. These questions focus on the general frequency and use of the website by the participant.

I asked questions about Facebook interactions between the participant and their three friends. Questions about Facebook and frequency of interaction will have more specific answer choices regarding frequency of use and interaction. Participants were asked to cite the frequency of different types of Facebook interaction, such as 'liking', commenting, wall-posts, and private messages. Answers to these questions form a more comprehensive understanding of how the participants use Facebook in general, and with their three best friends from high school.

Sample Question: How often do you interact with ____ on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never) see Appendix A

The differences in propinquity at the end of high school and in the present are compared to the strength of other friendship traits to see if they remain the same, degrade, or improve over time. Propinquity and other friendship trait strength differences are also compared to the amount

of Facebook usage to determine a correlation between the computer-mediated communication use and the strength of friendship over time.

Results

I present bivariate and multivariate analyses to examine the relationships between the frequency of Facebook, phone, and face-to-face interaction, and a change in the friendship strength variables (mutual confiding, mutual support, and similarity) between the end of high school and the present. My first research question is: how important is the amount of face-to-face interaction, influenced by propinquity, to maintaining friendships? Looking at correlations between the frequency of face-to-face interaction and a change in the friendship strength variables revealed a strong positive relationship: a decrease in the frequency of face-to-face interaction is associated with a decrease in friendship strength over time. Linear regressions with the three friendship change measures as dependents variable revealed a similar relationship when controlling for demographic variables. This relationship remained present when controlling for other forms of communication, exemplifying the importance of face-to-face interaction to maintaining friendship.

Next, the relationship between Facebook and friendship strength is analyzed. Facebook results are also similar to what I expected, as there is no positive relationships between the frequency of its use and the three friendship strength variables. In fact, correlations revealed a negative relationship with the frequency of every form of Facebook interaction and a change in each form of friendship strength, suggesting that Facebook does not facilitate the maintenance of friendships. This relationship also exists between general Facebook use and friendship variables when using linear regressions, controlling for demographic variables. With these results I am

able to speculate and draw more informed conclusions about propinquity, face-to-face communication, and Facebook's role in maintaining friendship strength over time.

Dependent and Independent Variables

I use frequency measures of different forms of communication as independent variables to test the dependent friendship variables. Frequency of face-to-face interaction is measured on a 6-point Likert scale, with 'daily' as the maximum value and 'less than several times a year' as the minimum. Frequency of phone calling and texting is measured on the same scale. Texting is the most frequently used method of communication out of the three, followed by face-to-face interaction, and finally phone calling[2]. Frequency of Facebook use is measured on an 8-point Likert scale, with 'several times a day' as the maximum value and 'never' as the minimum[3]. Travel time represents the amount of time it takes for the respondent to get to their friend's house, serving as a measure of propinquity. Travel time is measured on an 8-point Likert scale, with 'more than 12 hours of travel' as the maximum value and 'less than 15 minutes of travel' as the minimum. Descriptive statistics for both independent and dependent variables can be seen in Table 1B below:

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[2] Frequency of face-to-face, phone calling, and texting measure come from the GSS first used in Hoellinger,Franz Haller,Max "Kinship and Social Networks in Modern Societies: A Cross-cultural Comparison Among Seven Nations",European Sociological Review, Volume(9,1990) , 103-124

[3] Multiple choice options for Facebook questions come from the PEW Internet Research Center

Table 1B: Independent and Dependent Variables

Independent Variables	Mean	Standard Deviation	Min. Value	Max. Value
Frequency of…				
Face-to-Face interaction	1.45	1.39	0	5
Phone calling	1.31	1.36	0	5
Texting	2.38	1.65	0	5
Facebook use	3.35	1.32	0	7
Travel time	4.33	2.29	1	8
Dependent Variables				
Change in…				
Mutual confiding	-.84	1.32	-4	3
Mutual support	-.65	1.18	-4	3
Similarity	-.40	.80	-4	2

Moving on from the independent variables, I clarify the relationship between the dependent friendship variables: mutual confiding, mutual support, and similarity. I present correlations between the reported differences in friendship strength from the past to the present and each form of communication. Taking the 5-point Likert scale responses of each friendship variable in the past and present and subtracting the former from the latter, a measure of friendship change is calculated. The distribution of these values ranges from -4 (a drastic decrease in friendship strength) to 2 (a significant increase in friendship strength). There is also a strong positive correlation between each dependent friendship variable, significant at the .01 level. The strong relationships between these variables confirm their significance as defining aspects of friendship.

The Importance of Face-to-Face Interaction to Friendship

Correlations

After compiling and analyzing demographic and friendship data, I address the first

research question that motivates this study: how important is the amount of face-to-face

interaction, dictated by propinquity, to maintaining friendships?

First, I isolate the relationship between physical distance between friends and the change

in their friendship strength over time using correlations. There is a strong negative correlation of

-.596 at the .01 level between the time it takes to get to a friends house, which serves as my

measure of geographic distance, and the frequency of face-to-face interaction between those two

friends. This means the less time it takes to get to where a friend lives, face-to-face interaction

occurs more frequently. After establishing this link, I go on to analyze the relationship between

face-to-face interaction and change in friendship strength. Consequently, Table 2A indicates a

strong, positive correlation between frequency of face-to-face interaction and the three friendship

change variables. It is important to note that race is recoded into a dichotomous variable with

'White' as 1 and 'Non-White' as 0 because of the small number of minority participants.

Table 2A: Face-to-Face & Phone Interaction and Friendship Change

Variables	Mutual Confiding Change	Mutual Support Change	Similarity Change
Face-to-face frequency	.434*	.415*	.310*
Video/phone call frequency	.412*	.403*	.309*
Texting frequency	.595*	.561*	.424*
Gender	-.083*	-.069	-.060
Race	-.025	-.042	-.043
Age	-.098*	-.088*	-.131*

*=Significant at .01

Table 2A indicates a strong, positive correlation between how frequently friends see each

other in person and all friendship variables (mutual confiding, mutual support, and similarity).

Just as frequency of face-to-face interaction is correlated with the friendship variables, frequency of video or phone calls and texting are also strongly correlated. In fact, frequency of texting is correlated more strongly with each friendship variable than frequency of face-to-face interaction. I revisit this surprising finding below using linear regression models (Table 3B). A few demographic variables are also strongly correlated with several of the friendship variables. There is a negative correlation between gender and a change in mutual confiding, meaning that being female is more strongly correlated with a decline in mutual confiding than being male. There is also a strong negative correlation between age and all three friendship variables. This means that friendships have declined more among older students, and suggesting a decline in friendship could be caused by elapsed time after going to college and moving further away from each friend.

Regressions

To better understand the relationship between face-to-face interaction and friendship strength, I use linear regressions to further analyze relationships I found using correlations. Each of the three friendship variables (mutual confiding, mutual support, similarity) is used as a dependent variable, with frequency of face-to-face interaction as the independent. Gender, age, and race are added as controls for the relationship between frequency of face-to-face interaction and friendship strength Finally, the amount of time it takes to get to the friends' residence from the participants' is added as another control, representing propinquity.

Table 3A: Face-to-Face & Demographics Regressions

Variables	Dependent: Mutual Confiding Change		Dependent: Mutual Support Change		Dependent: Similarity Change	
Independent Variables:	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)
Face-to-face frequency	.555***	(.035)	.473***	(.032)	.238***	(.024)
Travel time	.146***	(.022)	.128***	(.019)	.066***	(.014)
Gender	-.129	(.087)	-.076	(.070)	-.046	(.054)
Race	.122	(.102)	.047	(.083)	-.016	(.071)
Age	-.031	(.030)	-.023	(.024)	-.053**	(.020)
Intercept	-1.591*	(.616)	-1.379**	(.498)	.066	(.410)
R-squared	.233		.213		.128	

Two-tailed test, ***= significant at .001, **=significant at .01, *=significant at .05

Frequency of face-to-face interaction is found to have a strong, positive association with mutual confiding of .555, mutual support of .473, and similarity of .236, all significant at the .001 level. This means a decrease in frequency of face-to-face interaction is associated with a decrease in each friendship change variable, again confirming the importance of face-to-face interaction in maintaining friendship strength. Age is the only demographic variable to have a significant relationship with any of the dependent variables, in this case similarity. But interestingly enough, there is a strong positive association between the amount of time it takes to travel to a friends' residence and each friendship variable. This means that greater amount of travel time is associated with stronger friendship, and is counterintuitive to my theory. However, these findings support the hypothesis that a decrease in face-to-face interaction, results in a decrease in friendship strength over time.

Table 3B: Face-to-Face & Phone Interaction Regressions

Variables	Dependent: Mutual Confiding Change		Dependent: Mutual Support Change		Dependent: Similarity Change	
Independent Variables:	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)
Face-to-face frequency	.199***	(.042)	.182***	(.036)	.092***	(.025)
Call frequency	-.024	(.029)	.001	(.026)	.006	(.020)
Text frequency	.420***	(.035)	.330***	(.030)	.161***	(.022)
Travel time	.072***	(.021)	.067***	(.018)	.036**	(.014)
Gender	-.177**	(.078)	-.113	(.067)	-.066	(.054)
Race	.216*	(.100)	.125	(.083)	.023	(.070)
Age	.042	(.030)	.036	(.023)	-.023	(.021)
Intercept	-3.139***	(.605)	-2.640***	(.484)	-.582	(.417)
R-squared	.378		.334		.193	

Two-tailed test, ***= significant at .001, **=significant at .01, *=significant at .05

Looking at the change of frequency of other non-Facebook forms of interaction that are positively correlated with change in friendship strength, face-to-face interaction is joined by another significant variable: texting (Table 3B). In fact, frequency of texting appears to have a stronger association with the friendship change variables than frequency of face-to-face interaction. For example, texting has a positive association of .420, significant at the .001 level with mutual confiding, but the association with the same dependent variable and frequency of face-to-face interaction is only .199, still at the .001 level. This suggests that the change in frequency of texting is more closely related to a change in friendship strength compared to face-to-face interaction. The positive association between travel time and each friendship variable remains. There is also a strong positive relationship between race and mutual confiding, meaning that minorities report a smaller decrease in friendship than white respondents. Also, just like the correlations in Table 2A, there is a strong negative association between gender and mutual confiding, meaning women show more of a decrease in mutual confiding than men.

Facebook's role in maintaining friendship

This part of the results sections focuses on my second research question: How effective is Facebook in maintaining the strength of friendship when propinquity declines? Most participants' best friends from high school do not also attend the University of North Carolina at Chapel Hill, creating a response group that uses Facebook to interact with friends they are not as physically close to as they used to be. This gives me the means to analyze how Facebook affects friendship maintenance when a change in propinquity occurs. Also, 71% of respondents use Facebook more than any other social networking service, indicating it as a good choice for this study. Those that used other websites more are left out of my analysis because I am primarily concerned with the connection between Facebook use and friendship.

Correlations

When analyzing correlations between a change in friendship strength and forms of Facebook activity, I found strong relationships, but the variables were correlated negatively, in the opposite direction of the relationships seen in table 2A. This means certain forms of Facebook interaction are correlated with measures of friendship strength, and that an increase in interaction is correlated with a decrease in strength. As seen in Table 2B, there is a negative correlation between each type of Facebook activity and a change in friendship strength. Each form of Facebook activity is correlated with each friendship variable at a very similar level to its counterparts. This strong negative relationship between every variable suggests Facebook's lack of influence in maintaining friendship strength.

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Table 2B: Facebook Interaction and Friendship Change

Variables	Mutual Confiding Change	Mutual Support Change	Similarity Change
Facebook interaction frequency	-.271*	-.260*	-.239*
'Liking' frequency	-.332*	-.347*	-.297*
Commenting frequency	-.352*	-.348*	-.293*
Wall-post frequency	-.309*	-.318*	-.261*
Messaging frequency	-.262*	-.230*	-.230*
Gender	-.083*	-.069	-.060
Race	-.025	-.042	-.043
Age	-.098*	-.088*	-.131*

*=Significant at .01

Regressions

To further test Facebook's role in maintaining friendship, I run similar regressions to the ones that quantified face-to-face interaction's role in friendship change. First, mutual confiding, mutual support, and similarity are used as dependent variables, with frequency of Facebook interaction as the independent variable while controlling for demographic variables (Table 4A). A strong negative relationship is present between each friendship change variable and frequency of Facebook interaction in the regressions, with -.258 for mutual confiding, -.218 for mutual support, and -.137 for similarity, all significant at the .001 level. This is consistent with correlations seen in Table 2B indicating that more Facebook use is associated with a decrease in friendship. A few demographic variables are significant to friendship variables in Table 4A, most notably gender. There is a strong negative association between gender and mutual confiding, consistent with Table 3B, but in 4A the negative association also exists between mutual support and similarity. Age is negatively associated with similarity, as it is in Table 3A. Travel time is

strongly associated with mutual confiding and mutual support, but now negatively, meaning

longer travel time is associated with a decrease in friendship.

Table 4A: Facebook & Demographics Regressions

Variables	Dependent: Mutual Confiding Change		Dependent: Mutual Support Change		Dependent: Similarity Change	
Independent Variables:	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)
Facebook interaction frequency	-.258***	(.043)	-.218***	(.041)	-.137***	(.026)
Travel time	-.061**	(.021)	-.041*	(.019)	-.012	(.013)
Gender	-.302**	(.100)	-.187*	(.092)	-.139*	(.067)
Race	-.069	(.117)	-.195	(.101)	-.123	(.087)
Age	-.059	(.038)	-.063	(.033)	-.066**	(.025)
Intercept	1.784*	(.768)	1.733**	(.666)	1.580**	(.499)
R-squared	.099		.085		.078	

  Two-tailed test, ***= significant at .001, **=significant at .01, *=significant at .05

Table 4B: Comprehensive Communication & Demographics Regression

Variables	Dependent: Mutual Confiding Change		Dependent: Mutual Support Change		Dependent: Similarity Change	
Independent Variables:	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)	Unstandardized coefficient	(S.E.)
Facebook interaction frequency	-.073**	(.028)	-.066*	(.030)	-.064**	(.021)
Text frequency	.375***	(.034)	.299***	(.034)	.128***	(.021)
Face-to-face frequency	.185***	(.047)	.163***	(.044)	.126***	(.032)
Travel time	.060*	(.025)	.061**	(.022)	.053**	(.016)
Gender	-.242**	(.093)	-.136	(.087)	-.103	(.068)
Race	.251*	(.120)	.065	(.100)	.007	(.083)
Age	.051	(.036)	.027	(.030)	-.018	(.024)
Intercept	-2.809***	(.751)	-2.028**	(.649)	-.431	(.513)
R-squared	.378		.313		.205	

  Two-tailed test, ***= significant at .001, **=significant at .01, *=significant at .05

Next, I analyze the relationship between Facebook interaction controlling for other forms of interaction that are significant in both the correlations and regressions: texting and face-to-face communication. Travel time between respondents' and friends' residences, representing propinquity, is also included in Table 4B. The strong positive relationship between frequency of texting and all three friendship change variables remains as it is in table 3B. The same is true for face-to-face interaction. The negative association seen between frequency of Facebook interaction and the friendship change variables remains present with -.073 and -.064 for mutual confiding and similarity at the .01 level and -.066 for mutual support at the .05 level. This confirms the importance of both texting and face-to-face interaction in maintaining friendship strength, and the lack-there-of for Facebook. Finally, Table 4B indicates another negative association between gender and mutual confiding of -.242 at the .01 level, and the strong associations between travel times and each friendship variable are once again positive.

Discussion

Summary, Strengths & Weaknesses

My results are compelling along the lines of frequency of face-to-face interaction's relationship to friendship strength. The unexpectedly strong relationship between frequency of texting and friendship is also intriguing. Positive associations were found between both face-to-face interaction and texting, and each friendship change variable. In fact, the relationship between a change in friendship and texting is stronger than that and face-to-face interaction. Facebook's relationship with friendship also yielded significant results, namely the negative associations between friendship and Facebook interaction.

Out of the friendship variables I measured, mutual confiding and mutual support are always associated closely, with similarity at a slightly lower level. This reinforces the validity of

these three indicators of friendship strength, and shows why they were noted by Granovetter (1973), Maxwell (1985), and more recently Ishii (2010) and Amichai-Hamburger et al. (2013). Since the relevance of these three variables has been established, the significance of propinquity as the final friendship variable is called into question by my results.

The most notable strengths of my study are the size of my sample, and the detail and breadth of my survey questions. The extensive amount of data I gathered about different types of communication such as face-to-face interaction, video/phone calls, texting, and Facebook interaction provide data beyond the scope of my research questions. Weaknesses are also present, one of which is the retrospective nature of questions that ask participants to recall certain levels of friendship strength from high school, which could be as long as four years ago. Another limitation to keep in mind is the sample is from a single University. It is possible that a small private college, or a school located in a different geographic region could yield different results. Although a survey allowed a large number of responses, an actual dialogue would have the potential to form a more comprehensive story about how specific friendships progressed and Facebook habits in regards to those friendships. Sampling several Universities and including an interview aspect to alleviate some retrospective bias and to more comprehensively understand the dynamics of friendships and Facebook usage could improve future studies on this topic.

The Importance of Propinquity

The definition of propinquity is the amount of geographic distance between two individuals. This concept is important to friendship because the relative closeness of two friends can influence the frequency they can see each other in person (Amichai-Hamburger et. al, 2013). This is shown in my results by a strong, negative correlation between the time it takes to travel between friends' houses and frequency of face-to-face interaction. Face-to-face interaction is

deemed important by Short et al.'s (1976) social presence theory, which states that it is the richest form of communication. This is shown in my results by both correlations and regressions describing the significance of face-to-face interaction to other friendship variables originated from Granovetter's (1973) tie strength. The relevance of propinquity to friendship certainly does seem to exist.

I test and confirm the significance of the relationship between frequency of face-to-face interaction and friendship strength with correlations and linear regression analysis, making my results consistent with Amichai-Hamburger et al.'s (2013) assertions. Although the relationship between travel time and friendship strength varies in my results, less face-to-face interaction is consistently associated with a decrease in friendship strength over time. The importance of face-to-face interaction in maintaining friendships is a big takeaway from this project, but the significance of another form of communication also needs to be addressed. The associations between frequency of face-to-face interaction and the three friendship strength variables provide evidence of the significance of this relationship, but texting is more strongly correlated with the friendship variables than face-to-face interaction. This relationship remains constant when running regressions using both forms of communication and friendship change measures as dependent variables. The fact that texting becomes very strongly associated with a change in friendship strength while face-to-face interaction becomes less significant is certainly noteworthy. If texting is a better indicator of friendship strength than face-to-face interaction, is it possible that non-face-to-face forms of communication are becoming more relevant in regards to maintaining friendship strength?

Texting is a relatively new technology but it is more strongly correlated and associated with each friendship variable than face-to-face interaction and video/phone calls. If the

frequency of face-to-face interaction is less correlated with friendship change than the frequency of texting, Amichai-Hamburger et al.'s (2013) proposed importance of propinquity, and the conclusions I draw from Short et al.'s (1976) social presence theory are both questioned. If propinquity is a defining factor of friendship strength, then why is it less associated with friendship strength than texting, a communication medium that ranks much lower on the social presence theory scale?

This could possibly be explained by the completely voluntary nature of texting friends. Actively texting a friend requires a consistent drive to communicate, and it is very easy to ignore a text, or forget to pick up a phone and use it. An ignored or missed text can easily be chalked up to 'being busy' or a number of other reasons. These factors suggest the friends somebody texts the most are important or close enough to instill a desire to actively communicate. These results point away from face-to-face interaction being the most important means of communication between friends, calling both social presence theory and the integrality of propinquity to friendship into question. As another lower ranking form of communication, how does computer-mediated communication through social networking services, specifically Facebook, play a role in maintaining friendship over time when propinquity declines?

Maintaining Friendship through Facebook

Now that the relationships between basic forms of interaction (face-to-face, video/phone calling, texting) are better understood, how does Facebook come into the picture as a means of maintaining relative friendship strength over time? At the correlation stage of my results, Facebook interaction does seem to be related to friendship strength, but not in the same way as face-to-face and phone communication. All forms of Facebook activity are negatively correlated with a change in friendship strength over time, meaning a greater frequency of each kind of

Facebook interaction ('liking', commenting, wall-posts, messages) is correlated with a decrease in friendship. What does this mean in terms of how and why people are using Facebook, and its relevance in maintaining friendship strength?

The negative correlation between frequency of Facebook interaction and friendship strength makes me question how Facebook is being used. Facebook as keeping people connected (Lambert, 2013), but those connections appear to by dying ones. My results indicate inconsistencies with Lambert's findings. It seems that Facebook is being used more frequently with declining relationships. This could mean Facebook is used to maintain already weak connection, and could even mean Facebook is the last form of consistent communication before a friendship fails altogether. The ease of Facebook interaction seems to make maintaining connections almost effortless, but its non-intimate nature, as defined by social presence theory, would make it a great medium for phasing out friendships. The same would be thought about texting in relation to friendship, but my results showed the opposite, as texting is in fact the best indicator of friendship strength. Facebook appears to lack something that both face-to-face communication and texting possess in terms of maintaining friendship.

Facebook is so widely and easily used that it seems like a great way to maintain friendship strength, but the data from my correlations and regression indicate otherwise. More research needs to be done to find out why social networking services are being used with declining friendships, but my results have made one thing certain: frequency Facebook interaction is negatively associated with change in friendship strength over time.

Conclusion

How important is amount of face-to-face interaction, influenced by propinquity, to maintaining friendships? How effective is Facebook in maintaining the strength of friendships

when propinquity declines? I set out to answer these questions and was not left empty-handed. Granovetter (1973) defines tie strength and Short et al. (1976) showcase the richness and of face-to-face interaction; scholars like Fehr (1995) bring these concepts together by noting the importance of face-to-face interaction to maintaining a friendship. Next enters propinquity (geographic distance), a concept outlined by Amichai-Hamburger et al. (2013) as an important aspect of friendship. The closer the friends are geographically, more frequent face-to-face interaction occurs.

But many believe face-to-face interaction is not integral to maintaining the strength of a friendship. Amichai-Hamburger et al. (2013) also state the Internet allows interaction with others without regard for the constraints of physical distance. Others (McKenna et al., 2002) take this further, stating friendships can be maintained online, and that face-to-face interaction is not necessary. Online interaction between friends frequently occurs on social networking sites, the most widely used of these being Facebook. This made it the perfect choice to analyze friendship strength to discover if propinquity and face-to-face interaction really are that important.

Building on concepts from Granovetter's tie strength, I created a definition of friendship borrowing from several scholars such as Marsden & Campbell (1984), Ishii (2010), and others, to test my research questions using an original survey. Administered to nearly 400 college undergraduates who had recently moved away from most of their high school friends (exemplifying a change in propinquity), my results yielded significant findings.

I found that frequency of face-to-face interaction is consistently very strongly associated with a change in friendship strength, meaning interacting with a friend less frequently in person is linked to a decrease in friendship strength. This solidifies the positive relationship between in-person interaction and friendship. Going beyond that, I discovered another form of

communication more strongly associated with friendship strength than face-to-face interaction: texting. As a form of communication that is not contingent on propinquity, texting raises questions about the validity of social presence theory and propinquity's role in maintaining friendship strength. Although frequency of face-to-face interaction is shown to be a good indicator of a change in friendship strength, the advent of texting and technology's relationship to friendship cannot be ignored.

Another form of technology, computer-mediated communication (specifically Facebook), did have strong associations with a change in friendship strength, but not in a positive way. I found frequency of Facebook interaction had a consistently strong, negative association with a change in friendship strength, meaning that interacting with a friend more often on Facebook is linked to a decrease in friendship strength. This indicates Facebook is not in fact a good medium for maintaining friendships.

My main findings are compelling, but limitations are always present. Most notably, retrospective bias can be present when recalling details about different friendships from years ago. Sampling a single University also limits the responses to a certain academic demographic and region of the country. If this project were to be repeated or elaborated on in the future, these limitations should be kept in mind and possibly adjust for.

The implications of my research are important to both friendship and social networking service studies. Face-to-face interaction is shown to be closely linked to friendship strength, which in turn raises questions about the abilities of technologies that can be used instead, namely computer-mediated communication. Yet texting is also shown to be strongly associated with friendship strength, similarly to face-to-face interaction. Technology seems to be changing the way friendships are maintained, but perhaps not in the way we would think.

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Appendix A: Survey

Individual demographics

What is your gender?: (M/F)

How old are you?: (#)

What is your race? Choose all that apply: (White, African-American/Black, Asian, other)

Are you of Hispanic/Latino/Spanish origin? (Yes/No)

What is your current year in college?: (First-year, Sophomore, Junior, Senior)

What was your graduating year of high school?: (#)

Friendship questions

Think of your 3 best friends at the end of high school that you saw on a regular basis and write their initials here:

____

____

____

Wherever there is a blank, Qualtrics will fill it in with the initials of whichever friend is being asked about. These questions will be repeated for each of the other two friends.

Questions about ____ (first initials written):

Demographics

What is _____'s gender?: (M/F)

What is _____'s age?: (##)

What is _____'s race?: Choose all that apply: (White, African-American/Black, Asian, other)

Is _____ of Hispanic/Latino/Spanish origin? (Yes/No)

What is _____'s current year in school?: (Still in high school, First-year, Sophomore, Junior, Senior, post-graduate, not in school/in workforce),

What is _____'s graduating year of high school?: (####, or N/A)

Friendship

Think about your relationship with _____ **at the end of high school** and answer the following set of questions:

How much did you and _____ confide in each other? On a scale of 1-5, with one meaning "didn't share anything personal" and 5 meaning "shared the most intimate details about each others' lives" (#)

How much mutual support was in your relationship with _____? On a scale of 1-5, with 1 meaning "none" and 5 meaning "could always count on them for support no matter what" (#)

How similar were your and _____'s interests? On a scale of 1-5, with 1 meaning "not similar" and 5 meaning "very similar" (#)

How similar were your and _____'s personalities? On a scale of 1-5, 1 meaning "not similar" and 5 meaning "very similar" (#)

How similar were your and _____'s backgrounds (e.g., cultural, economic)? On a scale of 1-5, with 1 meaning "not similar" and 5 meaning "very similar" (#)

Approximately how many miles did you live from _____? Feel free to use Google maps to get a relative distance. (#)

About how long would it typically take you to get to where _____ lives? (less than 15 min., 15 min.-30 min., 30min.-1 hour, 1-2 hours, 2-3 hours, 3-5 hours, 5-12 hours, more than 12 hours)

What kind of transportation did you typically use to get to _____'s house? (walk, bike, car, public transportation, train, airplane)

Now, think about your relationship with _____ **in the present** and answer the following set of questions**:**

How much do you and _____ confide in each other? On a scale of 1-5, with one meaning "don't share anything personal" and 5 meaning "share the most intimate details about each others' lives" (#)

How much mutual support is in your relationship with _____? On a scale of 1-5, with 1 meaning "none" and 5 meaning "can always count on them for support no matter what" (#)

How similar are your and _____'s interests? On a scale of 1-5, with 1 meaning "not similar" and 5 meaning "very similar" (#)

How similar are your and _____'s personalities? On a scale of 1-5, 1 meaning "not similar" and 5 meaning "very similar" (#)

Approximately how many miles do you live from one another? Where they live means where they are the majority of the year (college). Feel free to use Google maps to get a relative distance. (#)

About how long would it typically take you to get to where ____ lives (where they spend the majority of their year, i.e. college)? (less than 15 min., 15 min.-30 min., 30min.-1 hour, 1-2 hours, 2-3 hours, 3-5 hours, 5-12 hours, more than 12 hours)

What kind of transportation do you typically use to get to their house (walk, bike, car, public transportation, train, airplane)

Have you and ____ had any major conflicts resulting in a falling out between the end of high school and the present? (Yes/No)

Interactions with ____ at the end of high school.

How often did you see ____ in person?: (Daily, several times a week, once a week, once a month, several times a year, less often)

How often did you video or phone call with ____?: (Daily, several times a week, once a week, once a month, several times a year, less often)

How often did you text ____?: (Daily, several times a week, once a week, once a month, several times a year, less often)

Interactions with ____ in the present.

How often do you see ____ in person?: (Daily, several times a week, once a week, once a month, several times a year, less often)

How often do you video or phone call with ____?: (Daily, several times a week, once a week, once a month, several times a year, less often)

How often do you text ____?: (Daily, several times a week, once a week, once a month, several times a year, less often)

Repeat for friends ____ and ____, with the subsequent initials now filling the blanks. Once this is completed for all three friends, participants will continue to the Facebook question section.

Facebook questions

These questions refer to your Facebook activity

Do you have a Facebook account that is currently activated? (No/Yes) (If no, submit results)

Is there another social networking website you use more than Facebook to communicate with friends (No/Yes, please specify _____ and submit results)

How often do you use Facebook? (several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often or never)

How often, if ever, do you click the 'like' button next to other people's status, wall, or links on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you comment on other people's photos on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you comment on other people's status, wall, or links on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you send private Facebook messages? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

Are you friends with ____ Facebook? (if no or ____ does not have a facebook, click here to skip to friend____)

If you are not friends with ____, ____, or ____ on Facebook, submit results.

How often do you interact with ____ on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you click the 'like' button next on ____'s status, wall, or links on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you comment on ____'s photos on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you comment on ____'s status, wall, or links on Facebook? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

How often, if ever, do you send ____ private Facebook messages? (Several times a day, about once a day, 3-5 days a week, 1-2 days a week, every few weeks, less often, never)

Repeat for friends ___ and ___. The blanks will be filled with each friend's initials as they were in the friendship section above.

Appendix B: Recruitment Email

Dear UNC Undergrad,

Hello! My name is Zach Stamper. I am a senior Sociology and Anthropology major writing an honors thesis in Sociology about relationships and social media. You have been randomly selected to take a short survey about your relationships and social media usage. Don't worry, if you don't frequently use social media your responses will be just as useful. The survey will take approximately 15 minutes, participation is voluntary, and all answers will be completely confidential. If you decide to participate in the survey, once you have submitted the completed survey your email will be entered into a raffle for the chance to win one of three $50 Amazon.com gift cards! Your participation will be extremely beneficial to my study and the completion of my thesis.

If you are interested in participating in this survey, please click on the link below:

Thank you in advance for you participation!

Zach Stamper
Sociology/Anthropology
UNC-Chapel Hill '14