

PHONELINESS: EXPLORING THE RELATIONSHIPS BETWEEN MOBILE
SOCIAL MEDIA, PERSONALITY AND LONELINESS

by

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DISSERTATION ABSTRACT

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The purpose of this dissertation is to explore the relationships between mobile social media use, personality and loneliness. Snapchat, Facebook, Instagram, Twitter and texting were studied. Undergraduate students ($N = 352$) were given a survey to assess how they use social media generally, loneliness and personality traits, as well as how they used social media in specific relationships in their life—with a strong, close tie, and with a more casual acquaintance. A state of “phoneliness” is proposed where an individual’s social media use contributes to feelings of loneliness, which then in turn affect social media use. Overall, this study finds evidence to suggest social media have some emotional benefit. The more platforms one uses, the less lonely he or she is likely to be. Each social media application had initial benefits wherein moderate use was associated with decreased loneliness. However, each platform also had a point of diminishing returns (ranging from 30 minutes/day to an hour/day) after which further use either had no effect or was associated with *increased* loneliness. Results are discussed in light of media multiplexity theory and social presence theory.

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TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
The Problem of Loneliness	3
<i>The Lonely Crowd</i> and an Other-Directed Society	6
II. LITERATURE REVIEW	10
A Brief History of Social Media	10
Social Media and Loneliness	18
Media Multiplexity Theory	21
Factors in Media Use	29
Personality and Media Use	36
III. METHODOLOGY	41
Survey	41
Participant recruitment	50
Measures	51
IV. RESULTS	54
General Social Media Use and Loneliness	56
Relational Media and Loneliness	61
Perceived Intimacy and Media Use	64
Personality and Media Use	67
Post-Hoc Analyses	72
V. DISCUSSION AND IMPLICATIONS	76
Social Media Use and Loneliness	77
Relational Media Use and Loneliness	81
Perceived Intimacy and Media Use	88
Personality and Social Media	91
VI. LIMITATIONS AND FUTURE RESEARCH	97
Social Media and Loneliness	98
Relational Media Use	99

Chapter	Page
Perceived Intimacy and Social Media.....	101
Conclusion	102
APPENDIX: SCALES.....	105
BFI 10-item Personality	105
UCLA Loneliness Scale.....	105
Tie Definition.....	105
Relational Media Use.....	106
Relational Parity.....	106
REFERENCES CITED.....	108

LIST OF FIGURES

1. Proposed Matrix for Media Properties.....	22
2. Tie Strength Media Matrix.....	35
3. Mediation Model for Frequency of Use, Perceived Intimacy, and Loneliness	36
4. Moderation Model for Personality Traits, Loneliness, and Social Media Use.....	39
5. Demographic Information.....	55
6. Tie and Friend Ratings.....	56
7. ANOVA Results of Loneliness by Number of Social Media Used.....	57
8. Relationship Between Texting Frequency and Loneliness	58
9. Frequency of Texting and Loneliness.....	59
10. T-test Results for Loneliness of Instagram Users Versus Non-users	59
11. T-test Results of Loneliness for Snapchat Users and Non-users	60
12. Regression Table for H4	62
13. Regression Table for RQ2	63
14. Regression Table for H5	64
15. Mean intimacy scores for each platform.....	65
16. Regression Table for H6.....	66
17. Relationships Among Personality Traits and Loneliness	67
18. Regression Table for H8.....	68
19. Regression Table for H8	69
20. Regression Table for H9.....	70
21. Correlations of Loneliness and Social Media Use.....	71
22. Interaction of Loneliness and Openness on Social Media Use.....	72
23. Facebook Use and Loneliness.....	73
24. Twitter Use and Loneliness	74
25. Instagram Use and Loneliness	74
26. Snapchat Use and Loneliness.....	75
27. Summary of Hypotheses and Research Question Results	77
28.Updated Tie Strength Media Matrix	80

LIST OF TABLES

1. Aspects of Social Media Platforms.....	18
2. Summary of Hypotheses and Analyses.....	39

CHAPTER I

INTRODUCTION

Human beings are thoroughly social creatures. Indeed, human survival in difficult physical environments seems to have selected for social group living...Human sociality is prominent even in contemporary individualistic societies. Almost 80% of our waking hours are spent with others, and on average, time spent with friends, relatives, spouse, children, and coworkers is rated more inherently rewarding than time spent alone.

(Hawkley & Cacioppo, 2010, p. 224).

Digital technologies continue to make communication channels and platforms more ubiquitous and effortless, human beings are more connected to each other today than ever before. But what does it mean to be “connected” in a digital society? Is it just the potential access at our fingertips, or do we feel the pressure to be available *all* the time? Most of us know we are connected to the world and others in some way but cannot articulate what that connection entails. For young adults and college students, this connectivity is most explicit in their use of social media. Platforms such as Facebook, Twitter, and Instagram have dramatically altered how individuals connect to each other and the world.

Are these platforms good or bad for us? Scholars have linked social media use to both positive and negative psychological well-being outcomes. Extant research has studied the potential for addictive or problematic social media use overall (Andreassen, Pallesen, & Griffiths, 2017; Błachnio, Przepiorka, Boruch, & Bałakier, 2016; Caplan, 2007; Larose, Lin, & Eastin, 2009; Song, LaRose, Eastin, & Lin, 2004) and linked Facebook use to negative subjective well-being (Kross et al., 2013). More specifically,

posting and viewing Facebook photos can stimulate narcissism (Alloway, Runac, Qureshi, & Kemp, 2014), certain platforms may induce jealousy (Utz, Muscanell, & Khalid, 2015), and individuals with low self-esteem have negative perceptions of social media (Keating, Hendy, & Can, 2016).

Other scholars have highlighted the various benefits of social media use such as facilitating greater self-disclosure (Ledbetter & Mazer, 2010; Ma, Hancock, & Naaman, 2016), cultivating social support (Vitak & Ellison, 2013) and decreased loneliness (Pittman & Reich, 2016). Clearly there is something gratifying about social media use that keeps billions of users coming back multiple times every day, but more scholarship exists on social media problems than their potential to contribute to emotional well-being. If social media are bringing people together, is there a corresponding increase in the emotional well-being that typically accompanies traditional, “offline” social support? There is not yet a consensus as to the emotional effects of social media.

Social media (often referred to as social networking sites, or SNS) can be broadly defined as the websites and applications that enable users to create and share content within networks (i.e., friends, followers, etc.) they construct for themselves. These forms of media have revolutionized how people interact with each other, and young adults are the most avid users. In a recent study, the Pew Research Center found that “fully 91% of smartphone owners ages 18-29 used social networking on their phone at least once over the course of the study period, compared with 55% of those 50 and older” (Pew Research Center, 2015, p. 35). Indeed, age is a strong determinant of the frequency and quality of an individual’s social media usage, and it is unsurprising that younger people are more comfortable with online communication than adults (Thayer & Ray, 2006). In terms of

platform popularity among young adults (18-29 years old) with Internet access, 87% use Facebook, 53% use Instagram, and 37% use Twitter (Pew Research Center, 2014).

This study will assess the potential of social media to either ameliorate or exacerbate loneliness in the lives of young adults who use them. It focuses on four areas of social media use: 1) social media use and loneliness, 2) relational media use, 3) intimacy and social media, and 4) personality and social media. How do college students use social media generally, and how do they use them in particular relationships? Do personality traits such as extraversion or neuroticism influence their use of social media? Finally, is there any evidence to suggest negative feedback loops where someone might get stuck in a state of “phoneliness”, where he or she is only using their smartphone in ways that maintain but never alleviate their state of loneliness? These are the sort of questions this study now tackles.

The Problem of Loneliness

Researchers from U.K. and U.S. national health services agree that loneliness is now a greater health risk than obesity (Connor, 2014; Olien, 2013) and comparable to that of smoking (J. Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Yet, despite the fact that most of us in developed countries spend a large amount of time connected to others in some way, studies show we are lonelier than ever. This study explores how various communication modalities, methods, and media might be affecting overall emotional health. If we better understand the role of mobile communication technology that people use every day, there would be significant implications for public policy, civic engagement, health communication, ethical marketing practices, and overall human flourishing.

The Oxford English dictionary defines loneliness as “sadness because one has no friends or company.” Scholars define loneliness as the emotional distress that results from perceived deficiencies in quality or quantity of one’s network of social relationships (Peplau, 1982; Perlman, Peplau, & Peplau, 1984). Regardless of how one defines it, loneliness is a serious problem in the United States (J. Holt-Lunstad et al., 2015) as it poses risks, not only to emotional and social health, but also to physical well-being. Loneliness carries the same mortality risk as smoking and twice the risk of obesity (Olien, 2013). College undergraduates—freshman in particular—are susceptible to loneliness due to the social, emotional, and intellectual changes they are experiencing. Levels of loneliness typically peak in adolescence and young adulthood, subsequently decrease through the middle adult years of an individual’s life, then increase again into old age (Pinquart & Sorensen, 2001).

Research has identified additional loneliness risk factors that are salient for young adults. Three groups at risk—people starting new jobs, students changing schools, or individuals cut off from existing social contacts (Perlman et al., 1984)—have a common theme of social change or disconnection, and they all may apply to college students that are going through emotional, intellectual, and geographical shifts. These changes often lead to social disconnectedness and perceptions of isolation, both of which have been independently linked to lower levels of self-rated physical health (Cornwell & Waite, 2009) due to loneliness.

Loneliness is sometimes conflated with social isolation. The two are different concepts though they may be sides of the same coin. Social isolation is the objective situation of being alone, but loneliness is the subjective emotional pain that often results

from feeling alone. It is possible to feel lonely even in a crowded room, or to be completely satisfied with spending an evening by oneself. Occasional isolation is not necessarily unhealthy, and depending on one's personality and preferences, may be a good thing. Loneliness is always negative.

Humans are social creatures and loneliness, like hunger and thirst, are meant to motivate our bodies to seek what they need (Adams, 2016). As an aversive state, loneliness has been described in children as young as five years old (Cassidy & Asher, 1992), and biologists think it might be genetic (Cole et al., 2007). Personality traits might mediate the relationship between social isolation and loneliness. For example, extraverts are less likely to be lonely (Cheng & Furnham, 2002), possibly because they actively seek out more social interaction. Because college students are not socially isolated, this study will focus more on loneliness and conceptualize it as distinct from social isolation.

There are a variety of ways in which individuals might respond to loneliness. Behavioral strategies for coping with chronic levels of loneliness (Rubenstein & Shaver, 1982) include *active solitude*, which include activities such as journaling or listening to music, in an effort to reflect on the experience of loneliness (Arpin, Mohr, & Brannan, 2015). Lonely individuals may also engage in *sad passivity behaviors*, which include abuse of self or substances, in an attempt to alleviate or forget feelings of loneliness (Heinrich & Gullone, 2006). Even mobile devices can be abused, and problematic cell phone use has been linked to FoMO (Fear of Missing Out) and anxiety (Elhai, Levine, Dvorak, & Hall, 2016; Przybylski, Murayama, DeHaan, & Gladwell, 2013), both of which can negatively impact social media engagement and satisfaction.

Loneliness will drive some individuals to socially withdraw (Cacioppo & Patrick, 2008), thus exacerbating the problem. Because loneliness is associated with increased sensitivity to social threat and fear of rejection (Rokach & Neto, 2000), lonely individuals may avoid social activity altogether, so loneliness becomes a condition of self-perpetuating negative feedback loops. These behavioral reactions to and consequences of loneliness interact with one's environment to maintain and even exacerbate loneliness over time (Cacioppo, 1998).

The Lonely Crowd and an Other-Directed Society

Perhaps the most appropriate perspective on loneliness, given the present study on its relationship with technology, might be the social condition described by Riesman, Glazer, and Denny (2001, revised ed.) in their 1950 sociological analysis *The Lonely Crowd*. Using interdisciplinary methods from philosophy, history, popular culture, psychoanalysis, and sociology, they identify three main cultural personality types: tradition-directed, inner-directed, and other-directed. For most of human history, societies were tradition-directed, so they moved in a direction that was influenced by previous generations. Then from the 15th to the 17th century the Renaissance and Reformation ushered in a new inner-directed type of society. These were cultures whose individuals could make decisions based not on the past, but on their own inner intellectual, social, and moral compass. Inner-directed people develop their attitudes and beliefs at a young age, are typically confident, and sometimes rigid.

With the success of industrialization and the rise of a middle-class in the 20th century, people began to break away from past traditions and become more malleable. An other-direction began to take over wherein social forces—how other people lived, what

they consumed, their political views, etc.—became the driving influence on individual lives. It goes beyond simply wanting the esteem of one's contemporaries: "While all people want and need to be liked by some people some of the time, it is only the modern other-directed types who make this their chief source of direction and chief area of sensitivity" (Riesman, Glazer, & Denney, 2001, p. 23).

In a society of other-directed individuals, therefore, the prevalence of loneliness would indicate that many people are not perceiving esteem from or adequate connection with others. This is consistent with the definition of loneliness as sadness resulting from lack of friends or company. One of the ostensible goals of social media is to connect people and thus mitigate loneliness. Therefore, Riesman et al.'s notion of an other-directed society—one in which everyone's chief source of direction is to be loved rather than esteemed—is an appropriate theoretical context in which to study social media and loneliness. Because most college students are still in the process of forming self-identity, they rely heavily on esteem, approval, and affirmation from their peers.

If social media exist and are widely used in an other-directed society, one might conclude that they are, at least on some level, successfully allowing individuals to transmit feelings of affection to and from one another. SNS such as Facebook allow users to connect with far more people than in traditional (pre-digital) social networks, so even if each digital tie affords less connective affect, the sum total of social support might be the same or greater than traditional social networks. Social support should mitigate loneliness, because "in a very general way, loneliness and social support can be seen as opposite concepts. Loneliness refers to the experience of deficits in social relations; social support refers to the availability of interpersonal resources" (Perlman et al., 1984,

p. 18). So with a greater availability of social support than ever before—albeit some or mostly mediated—why is loneliness still such a problem?

It is only in the last five or six years that scholars have begun to examine the relationship between social media and loneliness. Social media present an interesting challenge because of the many ways in which friends or connections may now interact digitally. Does online activity augment or replace the offline, face-to-face (FtF) time that is crucial for relationship maintenance? Moreover, because the need for human connection varies in degree from individual to individual, how might two friends with differing social appetites interact via social networks? As loneliness psychologist John Cacioppo notes, there exists the possibility that “one partner in a relationship has a higher need for connection than the other currently fulfills—perhaps than the other *can* fulfill” (Cacioppo & Patrick, 2008, p. 17). In a pre-digital era, if one’s friend or partner did not offer social fulfillment, it had to be sought elsewhere from other people. Now people can seek social fulfillment and support through social media that offer various forms of connection to others.

This chapter has introduced salient concepts for this study and framed them as important issues with consequences for societal and individual well-being. Chapter 2 will review the relevant literature and theoretical considerations for this project, and it will also contain the hypotheses and research questions. Chapter 3 explains the methods by which these hypotheses will be addressed. Chapter 4 presents the results of the study including whether each hypothesis was supported, as well as answers to the research questions. Chapter 5 discusses these results and considers the implications for communication and media theory. Finally, chapter 6 discusses the limitations of this

study and how future research should address these concerns, as well as offering a conclusion.

The next chapter will review what research has shown us about how individuals use social media to connect with one another and what the hypotheses and research questions are for this study.

CHAPTER II

LITERATURE REVIEW

Loneliness is the ultimate poverty.
-Pauline Philips

This study explores the relationships between social media, loneliness and personality. It seeks to understand how college students use social media to connect to each other and the world, and what effects that usage might have on their emotional well-being. Drawing on theories from mass communication, media effects, and social psychology, this study posits a negative feedback state dubbed “phoneliness” where individuals get stuck in patterns of unhelpful social media activity on their mobile devices. First, however, we must understand how contemporary social media came to be so important in the lives of college students.

A Brief History of Social Media

This study utilizes Carr and Hayes' (2015, p. 44) definition of social media as “internet-based, disentrained, and persistent channels of masspersonal communication facilitating perceptions of interactions among users, deriving value primarily from user-generated content.” In other words, social media are decentralized networks because the value derives from what users (not a corporate entity) create, and social media are both mass and interpersonal communication because you can “broadcast” a variety of content to the public, a range of users, or a single user.

Mobile devices had the capacity to receive texts or SMS (short message service) for twenty-five years, but because mobile phones didn't have keyboards at the time, they could not send meaningful content. The first text message was sent in 1992 from Neil

Papworth (via computer) to Richard Jarvis (Erickson, 2012). In 1997, Nokia manufactured the first mobile phone with a keypad, and sending and receiving text messages gradually became commonplace. In 2007, one year after Facebook and Twitter were publicly launched, Americans officially crossed a threshold by sending and receiving more texts per month than phone calls (Erickson, 2012). Since data plans are constantly shifting in price and options, text messaging remains a staple of most worldwide subscription plans because it requires very little data bandwidth (Burke, 2016). Mobile device users now send 18.7 billion texts every day, and that does not include communication on messaging-specific applications such as WhatsApp or Telegram. Because most texts are sent directly to the mobile device, bypassing applications and notifications, 95-98% of text messages are read within minutes of receipt (mobile marketing, 2015), making it a very efficient and personal mode of communication.

Many of the features and functionality of current social media were developed in the late 20th century as part of various platforms that eventually coalesced into what we now know as the internet. The first incarnation of a commercial internet service was CompuServe, developed in the late 1960's, which provided primitive forms of email. CompuServe was cost prohibitive for most users, with charges of six dollars per hour (plus long-distance fees) with users paying around thirty dollars per hour of service (Hendricks, 2013). Users joined discussion forums, shared files, and accessed news and events. It was originally branded as a business-oriented program and did not expand into the public consciousness until the 1980's. Though it did not invent email, CompuServe

was among the first to allow widespread access to it, giving users unprecedented interactivity.

In 1979, Tom Truscott and Jim Ellis conceived the idea of Usenet and launched it as a distributed discussion system one year later. Users could read news on forums of interest to them and send each other messages, and incidentally, Usenet eventually led to the first recorded use of the word “spam” to mean junk messages (Hiskey, 2010). Also in development in the late 1970’s were online meeting places orchestrated within a Bulletin Board System (BBS). BBSs let users communicate through a modem over a telephone line to a central hub where they could download files, play games, or talk to other users. The technology of the time “restricted the flexibility of these systems, and the end-user’s experience, to text-only exchanges of data that crawled along at glacial speed” (Digital Trends Staff, 2016, para. 5). However, these BBSs steadily grew in popularity throughout the 1980s and well into the 1990s when the internet finally exploded in popularity.

In 1986, LISTSERV was developed by engineering student Eric Thomas to automate management of multiple email lists. In 1988, Jarkko Oikarinen developed IRC (Internet Relay Chat), a multi-user chat system that connected servers around the world. Users joined chat rooms or channels that were used like virtual meeting halls (BBSnet, 2004). IRCs continued to be popular into the 1990s when home computers finally became affordable enough to be feasible for consumers. Computers of the 1990’s were also the first to possess audio and video conferencing capabilities powerful enough to make video and chat communication enjoyable.

Developed in 1997, Six Degrees was the first modern social network. It allowed users to create profiles and befriend other users. In 2000, it was purchased for \$125

million but was then shut down in 2001 (Hendricks, 2013). In 1999, LiveJournal was developed to be a social network build around online journal entries called blogs (web logs). The platform encouraged users to follow, engage, and create groups with one another. Building on the idea of Six Degrees, Canadian programmer Jonathan created Friendster (“friend” + Napster) in 2002 and it was the first social networking site to enjoy moderate success. Friendster let users create profiles, contact and befriend other members, as well as share content, events, music and photos. Friendster would soon be eclipsed by MySpace, a similar but more powerful—and importantly, more customizable—platform. MySpace was launched in 2003 and by 2006 it was the most popular social network in the world. LinkedIn, the first social network primarily devoted to business, was also launched in 2003 and remains popular today. At this point in social media history, a trend had emerged: as platforms aged and technology advanced, newer platforms were developed that assimilated all the functionality of the old, but with greater capabilities. This trend continues to some degree today, though some platforms have stood the test of time.

In 2004, Harvard University student Mark Zuckerberg developed Facebook as a platform originally just for college students. Quickly expanding beyond that Harvard community, it grew in popularity and was made available to other Boston area schools, and then all ivy League institutions. Finally, in September of 2006 it was made accessible to anyone over the age of thirteen with a valid email address. By 2007, one million new users were signing up every week (Hendricks, 2013). Facebook was the most powerful social media platform yet that incorporated functionality of all platforms that came before it. Users could friend others, create groups and events, send messages, set reminders,

share text and video with others or as a status update, upload photo albums and browse through others' albums, interact with other people's content by "liking", commenting, or sharing, and more.

Over the next few years Facebook would evolve its privacy terms, add advertising features, and endure criticism regarding prioritizing certain content (Beres, 2016). Yet none of this has had a permanent impact on its user base: today it remains the most popular social media platform in the world, with more than 1.71 billion users (Hendricks, 2013), adding 500,000 new users every day, or six profiles every second. On an average day, Facebook users are viewing eight billion videos and sending sixty billion messages to one of their 338 (user average) friends (Smith, 2016). Perhaps most importantly, because Facebook has become so popular, many other sites or platforms allow people to login *by using* their Facebook account.

A different social media platform, Twitter, was also created in 2006, a project created by Jack Dorsey, Noah Glass, Evan Williams and Biz Stone designed to be a SMS-type communication platform but without the direct (user-to-user) messaging component of Facebook. The 140-character limit of tweets (that still exists today) reflected the limit imposed by mobile carriers as part of SMS protocol at the time (Smith, 2016). Twitter grew in popularity over the next few years despite being relatively limited in functionality compared to Facebook. Twitter users "tweet" out messages (usually text, but can include photos or short videos), choose other accounts to follow, and one's Twitter feed is the result of all tweets, in chronological order, sent from accounts followed.

Twitter users were responsible for establishing many of the conventions for which Twitter is known today. Users were the first to put the @ symbol to denote another user's name within a tweet, they used the initials "RT" to indicate when they were re-tweeting someone, and they used a "#" as a hashtag before a word to make it searchable and connected to others using the same word. Today Twitter has 320 million active users that send more than 500 million tweets every day. Around twenty Fortune 500 companies engage with customers on Facebook, but 83% do so on Twitter (Smith, 2016), making the latter a much more popular and productive space for consumer/brand communication.

Instagram was created in October of 2010 by Kevin Systrom and Mike Krieger and within two months it had more than one million users. Instagram's functionality is similar to that of Twitter, with a vertically-scrolling feed that consists of posts from accounts one has chosen to follow. With Instagram, however, the posts were photos and videos, but they could still have captions with #hashtags that connected them to other similar content. It quickly became very popular, and instead of competing with the application, Facebook purchased Instagram for one billion dollars in 2013. It now has 400 million users that post more than 80 million photos every day (Smith, 2016). Ninety percent of Instagram users are younger than thirty-five years old, and 32% of U.S. teens say it is their favorite social network (Pew Research Center, 2017). Instagram lets users put a filter on photos and videos before posting, which can give the content a vintage, polaroid, or black-and-white aesthetic.

Snapchat was created in September of 2011 by Evan Spiegel, Bobby Murphy, and Reggie Brown. It is an application that lets users send each other photos and videos that are only visible for a few seconds and afterwards disappear. It has grown steadily over

the last few years and today has 161 million daily users that view seven billion videos and send 2.5 billion “snaps” every day (Smith, 2017). While Instagram and Twitter are structured with an accounts followed/following dynamic that allows for asymmetrical relationships (A can follow B without B following A back), Snapchat is like Facebook in that users must mutually “friend” each other in order to connect and see content.

 Snapchat functions as a sort of counter-point to Instagram: whereas Instagram posts are permanent and public, Snapchat’s snaps are ephemeral and private. The impermanence of the Snapchat environment encourages a more relaxed environment that perhaps better recreates the playfulness of face-to-face interaction (Smith, 2016).

 Snapchat has a “story” feature (which Instagram and Facebook have since duplicated) where users can post to their semi-public profile and the content stays visible for twenty-four hours.

 Instagram and Snapchat also mark a significant shift away from comprehensive social media *platforms* (such as Facebook or MySpace) and a move toward specialized, mobile *applications*. Most new applications do not try to be an all-purpose environment but focus on a specific kind of interaction with others—Instagram shares public photos, Snapchat shares private video, and geo-tracking applications such as Yik Yak and Tinder let users talk and date (respectively) with others that are a specified physical distance away. Therefore, instead of trying to be the main platform or portal through which users access the internet, new social media applications simply offer their specialized services as a single slice of one’s digital identity and activity (Digital Trends, 2016). The shift toward mobile is also literal: with Facebook and Twitter, users can post from their

desktop/laptop computers or from their mobile devices, but with Instagram and Snapchat, users can only post from mobile devices.

Social media have grown dramatically in number, specificity and scope over the last thirty years. In the 1980s and 1990s the trend was toward more comprehensive connectivity, and each new platform had more features than the one it eclipsed. This trend peaked in 2006 with Facebook and Twitter, and since then the trend has moved in the opposite direction, toward narrower functionality and specific features. This study will examine five main applications: Facebook, Twitter, Instagram, Snapchat, and Texting. These five social media are the most popular applications for college students; however, because metrics and demographics are constantly shifting, it is difficult to determine the exact proportion of college students that use any social media application. Pew Data sets are used when possible (Greenwood, Shannon; Perrin, Andrew; Duggan, 2016; Pew Research Center, 2014, 2015, 2017) and are supplemented with popular press and corporate statistics when necessary (Burke, 2016; Horrigan & Duggan, 2015; Lenhart, Purcell, Smith, & Zickuhr, 2010; MODO Lab Teams, 2016; C. Smith, 2017). Table 1 summarizes the salient communication aspects for each application, as well as an estimation of the proportion of college students that regularly use the platform:

Table 1: Aspects of social media platforms

Platform	Visibility	Modality	Permanence	Ties	% of college students that use it ¹
Facebook	Public	picture/video/text	Permanent	Symmetrical	88%
Twitter	Public	Text	Permanent	Asymmetrical	36%
Instagram	Public	Picture/video	Permanent	Asymmetrical	59%
Snapchat	Private	Picture/video	Ephemeral	Symmetrical	69%
Texting	Private	Text	Permanent	Symmetrical	95%

Social Media and Loneliness

As noted in Chapter 1, loneliness is a pervasive issue in our society, particularly among college students. Social media allow people to connect with others, but does this connection help people feel less lonely (Agrawal, 2016) or more lonely (Transforming Mental Health, 2017)? To address this, the following research question will be posed:

RQ1: Is there an association between number of social media application used and loneliness?

SMS texting is still the simplest and most immediate platform for communication between two individuals with capable cell phones. While the term “social media” does not always include SMS texting, as a relational communication method it is nonetheless important for a study on the different ways a college student can use his or her phone in connecting with others. Reid and Reid (2007) found that lonely individuals rated texting as less intimate than voice calls, individuals rating higher in anxiety were more likely to actually prefer texting. Texting is more deliberate and allows users greater control in drafting and revising responses. Similarly, Jin and Park (2010) found that, because lonely

¹ (Greenwood, Shannon; Perrin, Andrew; Duggan, 2016; Pew Research Center, 2017)

individuals were less likely to engage in face-to-face interactions, they developed fewer relationships and thus had less occasion to use their mobile phones for interpersonal purposes, including texting. It is presumed that all college students with mobile devices will have texting capabilities and at least occasionally use it as a mode of communication. Thus, this study will not search for differences between those who text and those who do not. Instead, it is expected that those who frequently text others will be less lonely:

H1: Texting frequency is negatively associated with loneliness

Early research on social media and loneliness focused on the distinction between on and offline activity. Before Facebook became the social media giant it is today, Caplan (2007) found that loneliness itself was not a motivation for online social interaction, but that social anxiety confounded the relationship and was a stronger predictor of preference for online interaction. Kim, LaRose, and Peng (2009) found that lonely individuals were more likely to let their online social interaction become problematic, in way that maintained their loneliness instead of alleviating it. Around 2010 Facebook surpassed MySpace in terms of popularity (Lenhart et al., 2010), and by 2012 it was ubiquitous enough that lonely individuals were more likely to use it to compensate for their lack of offline relationships (Skues, Williams, & Wise, 2012).

Yet with the advent of more specific social media, the relationship between Facebook use and loneliness has changed. As older adults joined Facebook, millennials began to use newer social media platforms that focused on specific modalities. Twitter (2006), Instagram (2010), Pinterest (2010), and Snapchat (2011) round out the top five social media platforms for Millennials aged 18-34 years old. Young adults didn't leave Facebook altogether, but its function in their lives changed. Many social media

applications now let new users sign up and log in through their Facebook accounts instead of having to create a new user name and password. This maintains young adults' connection to Facebook, at least in a peripheral way, even as they are trying out and adopting new applications.

Pittman (2015) found that, regardless of how one used the platform, use of Twitter and Instagram was related to lower self-reported loneliness than use of Facebook. Similarly, scholars found that users still share photos on Facebook to gratify needs of affection, attention seeking, habit and information sharing (Malik, Dhir, & Nieminen, 2016), and that Facebook use in general is related to self-promotion (Błachnio et al., 2016). However, Pittman and Reich (2016) also found that the negative correlation between loneliness and social media was stronger for platforms that deal with *just* images (Snapchat, Instagram) than for Facebook, which deals with images and text. They also analyzed open-ended responses and found that image-based platforms prompted words such as friend, picture, share, and life, whereas text-based social media prompted words such as news, sports, information, and boredom. Similarly, Sheldon and Bryant (2016) found that interpersonal interaction (along with narcissism) were the common theme among motivations for Instagram use. So while Twitter has become more of a personalized news feed with a utilitarian function, Instagram's use of images allows it to communicate along more relational or emotional lines. Thus, among public social media, while Twitter use is not anticipated to demonstrate a relationship with loneliness, Instagram is:

H2: Instagram users are less lonely than non-users of Instagram

Research on Snapchat is limited due to its relative infancy as a social media platform. Unlike other social media that were permanent, Snapchat lets users send pictures and video that only last 24 hours, and so early on it received attention mostly for its potential for sexting (Poltash, 2012). Perhaps because of this intimate nature—you can send personal, direct messages as well as post to your public “story”—Snapchat has also been found to elicit more romantic jealousy than Facebook (Utz, Muscanell, & Khalid, 2015b), and participants report using it with greater intensity than Facebook or Twitter (Alhabash & Ma, 2017). However, it is now generally utilized for silly or common moments deemed too mundane for permanent social media. Piwek and Joinson (2016) determined that it was mostly used for private communication and content sharing via selfies (self-portrait images of the user) and doodles (images with basic scribbling or text superimposed). Piwek and Joinson (2016) also determined Snapchat was more useful for bonding rather than bridging of social capital because it primarily takes place between strong ties. Similarly, Phua, Jin and Kim (2017) found that Snapchat users had more bonding capital than those of Facebook, Instagram, or twitter. Therefore:

H3: Snapchat users are less lonely than non-users of Snapchat

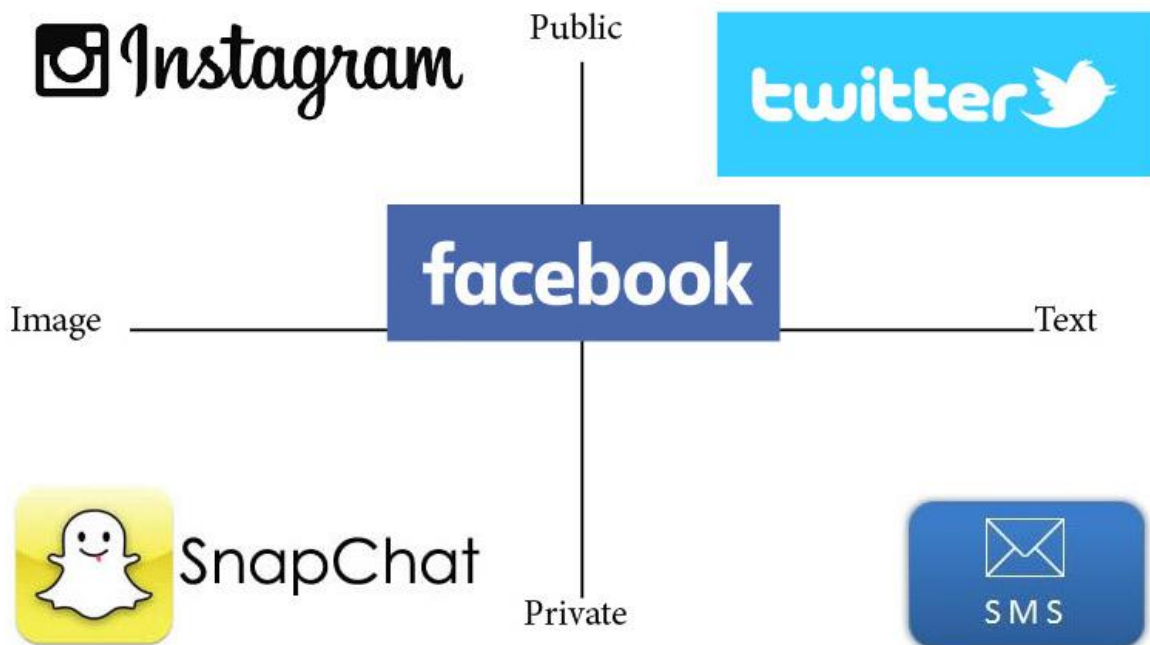
Yet it currently remains unclear how lonely and non-lonely individuals use these specific social media in connecting with others. It is likely that this question might be answered by Media Multiplexity Theory, to which we now turn.

Media Multiplexity Theory

Media Multiplexity Theory (MMT) is situated within, and generally overlaps with, the theoretical perspective of Computer-Mediated Communication (CMC) CMC can be defined as “any human communication achieved through, or with the help of,

computer technology” (Thurlow, Lengel, & Tomic, 2004, p. 15). CMC generally focuses on certain aspects of communicative activity such as synchronicity, permanence, and privacy, all of which are factors in various social media. For instance, Twitter and Instagram are similar but opposite (in terms of modality): both are asynchronous, public, and permanent, but Twitter is text-based while Instagram is image-based. Furthermore, while all five platforms might be used asynchronously, only Facebook (messaging), SMS (messaging), and Snapchat (live video) have the capability for real-time back-and-forth communication. The following figure illustrates how the five platforms examined in this study fit into a proposed media matrix:

Figure 1: Proposed Matrix for Media Properties



MMT focuses on these aspects of communication but within the more specific context of interpersonal relationships and media choices. Media in this sense is simply the plural of medium, which may be understood as a single communication channel or platform. MMT attempts to explain how the strength of an interpersonal relationship is

associated with the number of platforms used to maintain that relationship. Specifically, "the theory asserts that dyads with stronger ties use more media to maintain their relationships and, simultaneously, employing more media in relationships may strengthen relational ties" (Ledbetter, 2015). MMT is generally credited to Haythornthwaite (2002, 2005) and posits that those with strong ties (romantic partners, good friends, immediate family) will use more media to communicate than those with weak ties (colleagues, distant family). While bidirectional causality is assumed (tie strength and media use are mutually constructive), MMT scholars typically test and research in the direction of tie strength causing media use, not the other way around. Furthermore, enjoyment of a social media platform has been found to moderate its effectiveness on cultivating relational closeness (Ledbetter, Taylor, & Mazer, 2016). While it is a relatively novel theory, MMT is an appropriate framework for the present study, as it not only considers but theoretically connects the individuals striving to ameliorate loneliness and the technology they use to that end.

Undergirding MMT is concept of social network analysis, specifically the notion of strong, weak, and latent ties. Granovetter's (1973) *The Strength of Weak Ties* is canonical in this field, having been cited to date over 37,000 times. Granovetter defines a tie (and the strength of that tie) as a "combination of the amount of time, the emotional intensity, the intimacy, and the reciprocal services which characterize the tie" (Granovetter, 1973, p. 1361). The stronger the tie that connects two individuals, the more similar they are likely to be. Conversely, weaker ties are more likely to have less in common. One of Granovetter's original claims is that, although strong ties have been traditionally studied and valued, weak ties actually enable some communicative activity

more efficiently, particularly the dissemination of new information or ideas. Because strong ties are typically close knit groups, strong ties generally lead to closed-off clusters of redundant networks, and thus weak ties are more valuable for diffusion and overall integration.

Ties of different strength are associated with different kinds of social capital. Social capital can be defined as “the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (Bourdieu & Wacquant, 1992, p. 14). Robert Putnam (2000) distinguishes between bridging capital (weak ties) and bonding capital (strong ties). Weak ties are loose connections between individuals (such as coworkers or distant family) that may not provide each other with emotional support (Granovetter, 1982) but nonetheless typically provide novel perspectives or useful information to one another. Bonding social capital, on the other hand, is more exclusive and typically found between individuals in emotionally close, tightly knit relationships such as close friends and family (Ellison, Steinfield, & Lampe, 2007; Sheehan, 2015).

Therefore, MMT builds upon and extends this notion of ties to include the media utilized in their relational maintenance. Each medium or communication channel utilized in a relationship says something about the nature of that relationship. As Ledbetter (2015) quips, anyone who has ever been fired via email or dumped via text can attest to the importance of what these a communication channel can convey. The same “Thank you” message might be received differently as a handwritten note than it would as an email. The media choices made in relational communication convey information about the

relationship themselves (Sitkin, Sim B., Kathleen M. Sutcliffe, 1992). Similarly, certain norms exist for relationships: a college student is more likely to use email than telephone in communicating with a professor; for a stronger tie such as a parent or close friend, that student might communicate via telephone *and* email. This is another key assumption of MMT, that stronger ties are expected to demonstrate greater varieties of interaction and exchange, particularly so if emotional support is offered (Haythornthwaite, 2002).

Tie strength is typically assessed by looking at a combination of interrelated factors such as frequency of contact, duration of association, intimacy of tie, reciprocity of tie, and kinship (Marsden & Campbell, 1984). Studies generally find that ties reporting weaker or more casual relationships, such as acquaintances or coworkers, “engage in fewer, less intimate exchanges and share fewer types of information and support than those who report stronger relationships. More strongly tied pairs include in their exchanges a higher level of intimacy, more self- disclosure, emotional as well as instrumental exchanges, reciprocity in exchanges, and more frequent interaction” (Haythornthwaite, 2002, p. 386). The stronger the tie, the more media each communicator will use in connecting with the other, and it is likely that these different media multiply and overlap with one another. For example, for a strong tie such as a marriage, one spouse might email the other a restaurant’s website for review, then voice call to discuss its viability as a date night venue, and then send a follow-up text confirming time and address. This study will ask participants to identify a strong and weak tie in their life and ask questions about the relationship with each.

On the other hand, because weakly tied pairs use fewer media (or maybe only one medium) to communicate with one another, their platform of choice tends to be the

established, standard platform (Haythornthwaite, 2002). As previously stated, Facebook has now achieved that status of industry standard for many social groups, including college students. Given enough time, it is possible to overcome a lack of face-to-face (FtF) time and establish a relationship (Susan Sprecher & Hampton, 2016), but weaker ties are still likely to communicate with less frequency.

Another consideration is bidirectional strength of influence. A professor is likely to influence a student more so than the inverse, so while there *is* influence, that tie is weak. Two close friends, on the other hand, are likely to mutually depend on and be influenced by one another. A relationship like this with high media multiplexity—partners communicate with multiple media—is more prone to mutual influence because the greater number of media channels afford time, coordination, and overall relationship maintenance (Ledbetter, 2010). Again, these reciprocal exchanges are both more frequent and more intimate (Haythornthwaite, 2002), with Granovetter (1973) defining intimacy as mutual confiding. Thus, consistent with MMT, it is assumed that, when communicating with their strong tie, individuals will use more media (Ruppel, Burke, & Cherney, 2017), communicate more frequently (Dienlin, Masur, & Trepte, 2017), and have greater relational closeness (Phua, Jin, & Kim, 2017) than with their weak tie. Building on those assumptions, this study will propose to test MMT with the following hypothesis and research question:

H4: With a strong tie, increased communication frequency and number of media used to interact both predict a decrease in loneliness

RQ2: With a weak tie, do any aspects of the relationship have a significant relationship with loneliness?

Loneliness is like hunger or thirst in that it is a natural human urge compelling us toward that which we need (Cacioppo & Patrick, 2008). Yet loneliness is more complicated: a hungry person can go to the pantry to get food, and a thirsty person can pour a glass of water, but where can a lonely person seek social support? An emotionally healthy person will seek enough time with their strong tie(s) to give them the human connection necessary to stave off loneliness. On the other hand, a person trapped in a state of “phoneliness” might not seek out close time with a strong tie and instead may approach all their relationships as if they were weak ties.

Close relationships that communicate regularly are part of emotional well-being, and social media can play a large role in these relationships. In a longitudinal study, Dienlin, Masur, and Trepte (2017) found that communication over social media at one point in time positively influenced FtF communication six months later. Similarly, Ruppel, Burke and Cherney (2017) found that for closer relationships, both text messaging and phone calls were used in a complimentary manner, where frequency of use for one channel positively influenced frequency of use for the other. If indeed there are elements of one’s strong tie (H4) and weak tie (RQ1) relationships that reduce loneliness, then comparing the two may yield additional insights into how relationships can contribute to our well-being.

To further explicate this phenomenon and examine the potential effect on loneliness, a Tie Differential Media Score (TDMS) composite will be constructed. Strong ties provide emotional and social support (Miczo, Mariani, & Donahue, 2011), so communicating with them more frequently is likely to reduce one’s loneliness. If weak ties communicate infrequently (Granovetter, 1981; Haythornthwaite, 2002), and strong

ties communicate frequently (Haythornthwaite, 2005; Miczo et al., 2011), then emotionally healthy individuals (non-lonely) should communicate with their strong ties more frequently than with their weak ties. However, if an individual is *not* communicating with his or her strong tie any more than with casual acquaintances, there is a risk of not receiving adequate social support.

TDMS is simply the difference between how frequently one communicates with their strong and weak ties. For example, if one talks to a strong tie ten times per week, and to a weak tie once per week, the TDMS would be nine (ten minus one). On the other hand, a lonely person may only talk to their strong tie twice per week, and a weak tie once per week, for a TDMS of one (two minus one). Thus, while a high TDMS indicates much greater communication frequency with one's strong tie low, a low TDMS indicates roughly equivalent communication frequency with one's strong and weak ties. Lonely individuals are not receiving the desired social support and this may happen because they have entered a state of phoneliness where all ties approached as if they were weak. Literature has not yet compared communication with strong and weak ties, particularly in the context of loneliness. Thus a hypothesis related to tie strength is:

H5: An increase in TDMS predicts a decrease in loneliness

For relationships among college students, other MMT constructs such as geographic distance (Ledbetter, 2009; Miczo et al., 2011) and control mutuality (Stafford, Dainton, & Haas, 2000) are not likely to be factors because most of their friends are other college students (so the relationship is more or less even and mutual) who attend the same school (so physical distance is irrelevant). Strength of tie, frequency of communication, and intimacy of communication are likely to be salient factors for

college students' relationships, particularly for students who might be lonely. However, for a further exploration of how individuals use specific kinds of social media, we must turn to specific facets of CMC.

Factors in Media Use

As previously stated, CMC focuses on certain aspects of communicative activity such as synchronicity, permanence, and privacy (or visibility), all of which have been briefly mentioned regarding MMT theory (Ledbetter, 2009; Thurlow et al., 2004). Clark and Brennan (1991) outline the various properties CMC may offer: copresence (Adam and Betty share the same environment, visibility/audibility (Adam and Betty can see/hear each other), synchronicity (Betty receives at roughly the same time as Adam presents), reviewability (Betty can review Adam's messages), and revisability (Betty can revise messages for Adam) (IJsselsteijn, Baren, & Lanen, 2003).

Synchronicity—communicating at the same time, or not—might be the biggest departure from traditional FtF interactions. From the advent of writing up to modern smartphones, humans have only been able to receive messages sent at an earlier time. It is through digital technologies, however, that we can now send and receive so many kinds of messages in so many kinds of ways, including real time interaction.

For instance, Ledbetter and Mazer (2013) found that four distinct factors of media use from a survey of college students: asynchronous public communication (blogs), asynchronous private communication (email), social networking communication (Facebook), and synchronous offline communication (FtF). All of those factors except asynchronous private communication predicted friendship interdependence or mutuality, which as previously stated is associated with strong ties (Ledbetter, 2010).

Synchronicity of social media today is a bit unclear as a conceptual divide. Before digital media, communication was clearly either asynchronous (faxes, voicemails, handwritten letter) or synchronous (FtF, phone call). Now with digital technology almost all media have the potential for *nearly* synchronous interaction. For example, responses on Facebook messenger and texting might take place within a few seconds of each other, whereas Snapchat, Instagram and Twitter are probably more asynchronous, since communication is not direct and thus not simultaneous or co-temporal. Asynchronous communication media are “typically employed when the sender and receiver are not physically proximate, although the parties may be a few feet away in separate cubicles, or many miles away in separate countries” (Carlson & George, 2004).

Comparing literature on synchronous and asynchronous e-learning (online classes), Hrastinski (2008) determined that asynchronous communication is preferable for more difficult or abstract concepts in class, because immediate responses are not expected and thus the students have time to reflect. Students in asynchronous online classes identified frequency of interaction, responsiveness, and non-verbal communication channels to mediated the perception of presence for others in the class (Russo & Campbell, 2004). Whether in classes or relationships, synchronous communication is not always convenient or possible for both parties at the same time (IJsselsteijn et al., 2003).

Yet, it seems counterintuitive that asynchronous media might contribute to strong ties or more intimate relationships. Certainly this was not the case before the advent of Web 2.0’s proliferation of social media platforms (Matook, Cummings, & Bala, 2015; Stafford et al., 2000). How can messages sent and received at different times—perhaps

days or even weeks apart—make people feel closer? How does asynchronous communication lead to intimacy?

This may be partially explained by Walther's (1996) hyperpersonal communication theory, which posits that “due to the reduction in contextual, visual, and auditory cues, typical for computer-mediated communication, individuals in online interactions, such as active forms of Facebook use (e.g., instant messaging, status updating, etc.), become less concerned about how others perceive them and feel fewer inhibitions in disclosing themselves” (Frison & Eggermont, 2015, p. 155). Compared to traditional FtF communication, online communication actually becomes more intimate or hyperpersonal, because users feel less inhibited. Thus a message received by B long after A sent it could still strengthen the relationship because, perhaps, A disclosed more personal information than in a FtF interaction.

Similarly, Reid and Reid (2007) found that despite rating text communication as less intimate than voice calls, anxious individuals considered texting a better medium for expressive and intimate contact. For individuals who feel the pressure of—and guilt of not responding with—mobile devices which grant so much access into our lives (Hall & Baym, 2012), asynchronous media might be preferable because they give time to reflect and revise messages.

Texting was also found to significantly reduce the influence of loneliness, further solidifying the relationship between strong ties, mutuality, and online social connection (Ledbetter & Mazer, 2010). Even when used for ostensibly unimportant purposes, mobile phone such as texting (asynchronous) or voice calls (synchronous) serve as a form of “mundane relational maintenance” (J. Katz & Aakhus, 2002; Ling & Yttri, 2002) that

serves to remind the partners of their connectedness and stave off loneliness.

Furthermore, while loneliness does not directly relate to mobile phone use, it does decrease the likelihood of FtF (synchronous offline) interactions (Jin & Park, 2010), which in turn gives one less reason to use the phone for purposes of relationship maintenance.

Media in general facilitate asynchronous communication, but because digital technologies afford such immediate interaction, social media can also be used synchronously. For example, on Facebook you can post a video on the wall of a friend for her to access tomorrow, or chat with her now in real time. Thus, while synchronicity of communication will not be a focal point of this study, each platform's immediacy (synchronous or not) will be important to examine.

Intimacy is another important factor in how media maintain relationships. Again, Granovetter (1973) defined intimacy as mutual confiding or disclosure, where both parties can safely disclose information about themselves. Recall the mutual feedback loops of loneliness with avoidance of social contact (Cacioppo, 1998), and sensitivity to social threat and avoidance of social activity (Rokach & Neto, 2000). A positive version of those loops is described by Caplan (2007), where self-presentational theory dictates that social anxiety diminishes as one gains confidence in self-presentation via communication.

On the other hand, lonely individuals often struggle with disclosing information about themselves. Loneliness has been linked to diminished self-disclosure generally (Bell & Daly, 1985), and diminished self-disclosure to opposite-sex partners but too *much* disclosure to same-sex partners (Solano, Batten, & Parish, 1982). Research has also

found that partners of lonely participants have a harder time getting to know the individual than partners of non-lonely participants (Jones, Hobbs, & Hockenbury, 1982), concluding that lonely people are more focused on themselves. Being too self-focused might hinder friendship interdependence (Ledbetter & Mazer, 2013), because for that mutuality is associated with strong ties, which are in turn associated with emotional support of the other and relational maintenance (Ledbetter, 2010). Thus, while lonely individuals are assumed to have less intimate ties than non-lonely individuals, their perception of the perceived intimacy of social media will be examined:

H6: Loneliness predicts lower perceived intimacy of social media

Media Richness is a concept related to intimacy in that it addresses the capacity of a medium to cultivate intimacy between receiver and sender. Originally developed by Daft and Lengel (1986) as a management theory, Media Richness posits that performance improves when a group uses “richer” (as opposed to “leaner”) media for tasks. Media are rich when they afford its users more cues, intimacy, and immediacy. For example, live video conferencing is the richest mediated form of communication because it reproduces many of the visual and auditory cues of actual face-to-face (FtF) communication. A telephone call is slightly leaner than live video, because it allows for all the audio cues but none of the visual. Synchronous text communication (real time SMS) would be leaner than a telephone call, with asynchronous text communication (email) being among the leanest media available for communication between individuals.

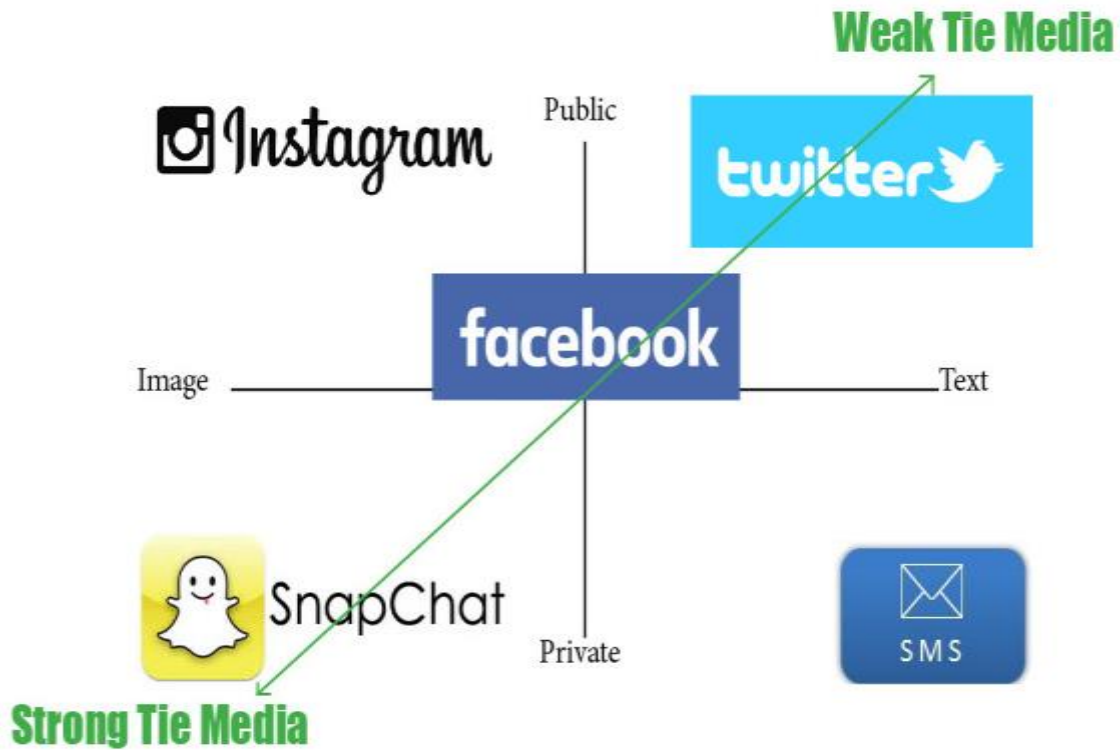
Researchers found conflicting results in terms of matching media with task performance (Dennis & Kinney, 1998; Suh, 1999), but that was before the era of social media. It remains unclear how media richness translates into the world of social media,

where so many more users are communicating (and with more platforms) than the theory originally envisioned. Furthermore, while MMT has found that strong ties use more media, it is not clear how—or even if—richer media facilitate more intimacy among ties.

Robert and Dennis (2005) identified a paradox of choice when it comes to rich media: richer media require more attention and effort, which in turn reduces the ability to process information; lean media, on the other hand, offer little in the way of social presence, but leave the receiver with more cognitive resources for processing information. The amount of effort required for rich media is part of the reason they are utilized mostly for communication with strong ties. Most people do not want to commit sustained, undivided attention for someone with whom they only have a weak tie.

This study therefore conceptualizes “Strong Tie Media” (STM) and “Weak Tie Media” (WTM) as the preferred media for communicating with strong and weak ties, respectively. STM are likely to be rich, image-based media for private, synchronous use. Snapchat would be an example of STM, and it has the ability to facilitate live video—the richest of all media—between users. WTM are likely to be lean, text-based media for public, asynchronous use. Twitter would be the leanest of all social media. Figure 2 illustrates STM and WTM:

Figure 2: Tie Strength Media Matrix



STM are rich and more likely to be perceived as intimate, which in turn makes people more likely to use them with strong ties, which should decrease loneliness. Thus it is proposed that frequency of social media use has an indirect effect on loneliness as mediated through perceived intimacy (see Figure 3 below). This relationship is summed up as:

H7: Perceived intimacy mediates the effect of social media use on loneliness

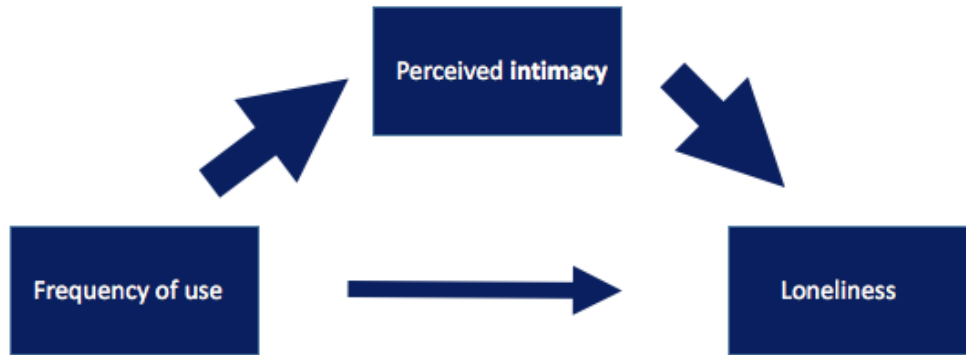


Figure 3: Proposed mediation model for frequency of use, perceived intimacy, and loneliness

Personality and Media Use

Personality is the final set of factors that might determine media use in this study. This study utilizes the Big Five (Goldberg, 1990) inventory BFI 10-item scale (B Rammstedt & John, 2007) that assesses openness, conscientiousness, extraversion, agreeableness, and neuroticism. Although the Big Five model is not without criticism, it is generally accepted as the standard measure of parsimonious personality inventory (Hughes, Rowe, Batey, & Lee, 2012).

Many studies have undertaken research into the relationship between loneliness and personality (Perlman & Peplau, 1981; Perlman, Peplau, Gillmour, & Duck, 1981) with certain traits such as neuroticism and introversion being consistently associated with greater loneliness. Research has linked loneliness to shyness (Jones et al., 1982), introversion (DW Russell, 1996), and higher anxiety (Jones et al., 1982) or nervousness about social situations (Horowitz & French, 1979). Similarly, Cacioppo and Ernst (2000) found that extremely non-lonely (bottom quintile) individuals are lower in neuroticism and higher on extraversion, conscientiousness, and agreeableness than extremely lonely (top quintile) individuals.

Neuroticism is defined as a measure control over one's affect and emotions. Low levels of neuroticism suggest good control over emotions and stability, whereas individuals with high levels may be somewhat sensitive and nervous with a propensity to worry (Costa & McCrae, 1992). Early opinions suggested that those high in neuroticism were likely to avoid the internet, but research failed to support this thinking, and it is now understood that those high in neuroticism use the internet frequently (Hughes et al., 2012), mostly to avoid loneliness (Amichai-Hamburger & Ben-Artzi, 2003). Indeed, positive correlations have been found with the amount of time spent on Facebook (Ryan & Xenos, 2011), so it stands to reason that neuroticism would still be associated with use of public social media such as Facebook, Twitter, and Instagram.

H8: Higher levels of neuroticism predict increased Facebook use

Extraverts are usually adventurous, sociable, and talkative, whereas introverts are typically quiet and shy (Costa & McCrae, 1992). Extraversion has been shown to correlate with the use of texting (Correa, Hinsley, & de Zúñiga, 2010), and within Facebook, those high in extraversion are active in more groups and have significantly more 'friends' (Hughes et al., 2012). Yet these relationships were not initiated online; instead, extroverts are more likely to make the friend offline and then use online communication for relational maintenance (Ross et al., 2009). Ryan and Xenos (2011) found that Facebook users were more extroverted and non-lonely than individuals who did not use Facebook.

Openness-to-experience, or simply openness, are individuals with broad interests who prefer novelty to familiarity and convention (McCrae & Costa, 1987). Openness has been correlated with use of instant messaging (Correa et al., 2010) and a use of more

Facebook features (Amichai-Hamburger & Vinitzky, 2010). Moreover, Hughes et al. (2012) theorize openness to correlate with social and informational uses of social media. However, openness is not generally regarded as predicting any kind of loneliness.

Agreeableness is a general measure of how friendly or easygoing people are. Individuals high in agreeableness are considered sympathetic, warm, and kind (Costa & McCrae, 1992). Yet in the digital age of online friendships, Ross et al. (2009) posit the ability for even non-agreeable individuals to construct at least weak ties. So, while agreeable individuals are likely to have more ties overall (both strong and weak) and feel less lonely, there is reason to suspect they may use more social media as well.

H9: Increased levels of extraversion, openness, and agreeableness all predict increased overall social media use

Conscientiousness refers to a person's work ethic, orderliness and thoroughness (Costa & McCrae, 1992). Butt and Phillips (2008) posit that conscientious individuals are reluctant to engage in SNS as they are perceived as a distraction from more important activities. Initially researchers failed to find a relationship between conscientiousness and use of SNS (Ross et al., 2009), but a few years later Ryan and Xenos (2011) found a negative correlation ($r = .14$). So while conscientious individuals might use social media, it is unlikely they will use them too much or for too long, as they are more likely to feel guilty or unproductive while doing so.

H10: Increased conscientiousness predicts decreased overall social media use

Finally, a second research question will more thoroughly probe the potential influence of personality on the relationship between loneliness and media use:

RQ3: Will any of the big 5 personality traits moderate the relationship between loneliness and social media use?

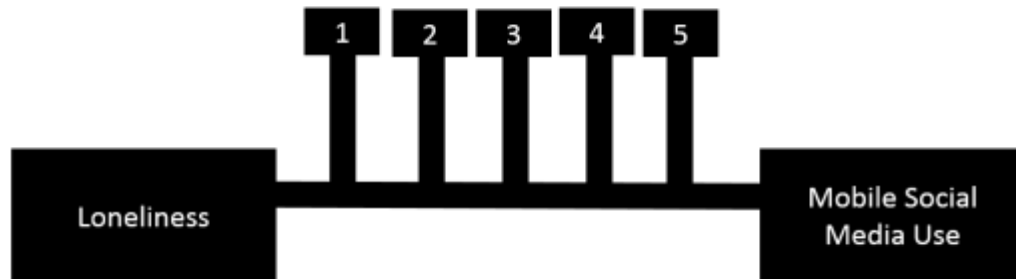


Figure 4: Proposed moderation model for personality traits, loneliness, and social media use

All these factors will be assessed to help determine their overall role in how college students’ loneliness might influence—or be influenced by—their use of particular social media. Table 2 is a summary of all hypotheses and questions:

Table 2: Summary of Hypotheses and Analyses

RQ1	Association between loneliness and number of social media applications used?	ANOVA
H1	Texting frequency is negatively associated with loneliness	Correlation
H2	Instagram users are less lonely than non-users	t-test
H3	Snapchat users are less lonely than non-users	t-test
H4	Increased communication frequency and number of media used with strong tie predict a decrease in loneliness	Multiple Regression
RQ2	Do any aspects of weak tie relationship have a significant relationship with loneliness?	Multiple Regression
H5	An increase in TDMS predicts a decrease in loneliness	Regression
H6	Loneliness predicts lower perceived	Regression

	intimacy of social media	
H7	Perceived intimacy mediates the effect of social media use on loneliness	Mediation (PROCESS)
H8	Neuroticism predicts increased Facebook use	Regression
H9	Extraversion, openness, and agreeableness predict increased overall social media use	Multiple Regression
H10	Conscientiousness predicts decreased overall social media use	Regression
RQ3	Will any of the big 5 personality traits moderate the relationship between loneliness and social media use?	Moderation (PROCESS)

The relationship between loneliness and human communication is a complicated one, particularly in our digital age where communication channels vary so greatly. Mobile phones are powerful tools that, if used properly, might help connect human beings and reduce loneliness. However, a state of phoneness might also exist for a lonely person who fails to maximize the potential connective power of their mobile device. This chapter reviewed the salient literature for the present study and proposed ten hypotheses and three research questions. The next chapter will explain the research methods utilized to test these hypotheses and answer these questions.

CHAPTER III

METHODOLOGY

All the lonely people, where do they all come from?
All the lonely people, where do they all belong?
-Paul McCartney and John Lennon

This study explores the relationships between social media, loneliness and personality. The previous chapter reviewed salient literature and to situate the hypotheses and research questions of the present study. This chapter will outline the methods used in this study: first, the survey design is proposed, acknowledging its advantages and drawbacks. Next, participant recruitment procedures are outlined. Finally, the measures and scales used in the survey design are explained and justified.

Previous studies of CMC and MTT research—as well as studies on loneliness—have all utilized questionnaires and surveys as data collection devices. One major strength of surveys is that they “obtain information that can be quantified and analyzed statistically and thus can reach a degree of precision about the group being studied that other forms of research cannot duplicate.” (Berger, 2016, p. 296). This study uses a survey design to collect data and search for possible predictive conclusions about how social media use might lead to emotional health. This section justifies the use of a survey instrument, explains the participant recruitment process, and elaborates upon the instruments and measures used.

Survey

Surveys and questionnaires have long been used by researchers in many disciplines to produce a social scientific snapshot of a population (Dillman, 2000; Wimmer & Dominick, 2006). An online survey is the most appropriate method for this

study for a variety of reasons including convenience, speed of data acquisition, relatively low cost, ease of access to participants, and the fact that all participants have access to online technology. Indeed, online surveys have become quite common in recent years in social science research, as studies have shown that results from online research produce results comparable to those produced in a laboratory setting (Krupnikov & Levine, 2014; McIlwraith, 1998; Thalmayer, 2011). Furthermore, data can be quickly collected and analyzed immediately upon completion of the survey using statistical software such as SPSS, with no coding, collation, or compiling necessary, as would be the case with mail- or telephone-based data collection.

While constructing a survey, Dillman (2000) suggests several ways to increase its validity and reliability. He advocates making the first few questions easy and quick to increase respondents' trust and comfort, using language that is appropriate for your subject population to increase internal and external validity, and using words or symbols to indicate progress to decrease fatigue and acquiescence. This last point is especially salient for a survey with college students, as their shorter attention spans might lead to restlessness and distraction while taking the survey, thus decreasing data quality.

Additionally, Shuman and Presser (1981) advocate a careful attention to question order, word choice, and even answer selection when considering how participants will respond. Psychometrically speaking, changing any of these options might influence how the typical user will read and respond to the study. For example, "check all that apply" type questions are discouraged because it has been found to increase acquiescence (selecting a lot of the same semantic difference because it lets you finish the survey

faster) and satisficing (moving on without completely answering a question because your response is “good enough”).

There are additional drawbacks to online survey data collection that should be acknowledged. While self-reported data are used in much social scientific and empirical research, there is no guarantee they will be completely accurate. There is also a risk of participants taking the survey multiple times, but online survey programs can only allow one response from each computer. Also, because online participants are ultimately self-selected (as discussed subsequently in participant recruitment), samples are not truly random, which may call into question the generalizability of a study’s findings because particular demographic populations might be less inclined to respond (Launer, Wind, & Deeg, 1994). Fortunately extant research has also demonstrated that self-selection bias is minimal (Søgaard, Selmer, Bjertness, & Thelle, 2004), and the topics of this study—social media, one’s personality, and well-being—are interesting enough to warrant willing participation by young adults for whom those issues are salient.

The survey consisted of three main parts: demographics (including personality and loneliness), social media use and relational media use (including naming a strong and weak tie, as well as use of social media in each of those relationships).

Loneliness. The first part of the survey assessed loneliness using the most widely used loneliness measure today: UCLA Loneliness Scale Version 3 (DW Russell, 1996). It is a 20-item scale designed to measure one’s subjective feelings of loneliness as well as feelings of social isolation. It is a unidimensional Likert-type measure that focuses on the quality of the respondent’s perceived relationship with others. For example, some statements are “I feel as though people are around me, but not with me” and “I feel as

though there is no one I can turn to.” Participants rate each item on a scale from 1 (Never) to 4 (Often). This measure is revised from previous versions of the original UCLA Loneliness Scale and its initial revised version. The first revision was done to reverse-score ten of the twenty original items, and the second revision was done to simplify the scale (in terms of language) for increased comprehension among less-educated populations, cultures, etc. A respondent’s loneliness score is therefore the average of his or her responses to the twenty statements, ranging from 1 (never lonely) to 4 (always lonely).

The UCLA Loneliness scale is not the result of a single theory but rather “based on statements written by 20 psychologists who were asked to describe the experience of loneliness” (Robinson, 1991, p. 250). Despite general agreement over its definition, loneliness can be conceived in several ways. One theory of loneliness holds that deficiencies in specific parts of social relationships contribute to specific types of lonely feelings. For instance, lack of engagement in a social network is associated with feelings of social loneliness such as aimlessness, boredom, and exclusion. On the other hand, absence of a reliable, intimate person in one’s life (e.g., spouse or close friend) is associated with feelings of emotional loneliness such as anxiety (Cutrona, 1982), desolation (Peplau, 1982), and insecurity (Cornwell & Waite, 2009).

Scholars have debated whether these two types of loneliness—social and emotional—should be conflated into one measure. Both may contribute either to state loneliness (a momentary emotional reaction) or to trait loneliness (a more permanent and stable level of emotion) and there are scales that attempt to discriminate between the two (Russell & Cutrona, 1984; Schmidt & Sermat, 1983). Additionally, personality research

has shown that loneliness is associated with shyness, neuroticism, and depressive symptoms, as well as low self-esteem, pessimism, low conscientiousness, and disagreeableness. Associations among these characteristics have sometimes led to conceptual confusion between loneliness and depression, poor social support, introversion, and/or neuroticism. Yet, as discussed earlier, the existing scale had made efforts to achieve discriminant validity against these other emotional states, and is generally regarded as the gold standard in social science research where surveys are used to address loneliness.

Personality. The first part of the survey also assessed personality measurements using the Big Five Inventory or BFI-10 item questionnaire (B Rammstedt & John, 2007). It is a more parsimonious version of the original 44-item BFI (John, Donahue, & Kentle, 1991) which was developed to be an efficient and noncommercial research measure of the Big Five. It is a Likert-type measure that focuses on how individuals see themselves: “open to new ideas”, “dependable and self-disciplined”, etc. Participants rate each item on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Because it is only 10 items (two per each personality trait), it requires a minimum of participation time, yet has been found to be “at least as predictively capable as the standard 44-item BFI” (Thalmayer, 2011, p. 1008). A respondent has five personality scores in Extraversion, Openness, Agreeableness, Neuroticism, and Conscientiousness, with each ranging from 1 (low) to 7 (high).

While some question the brevity of scales such as BFI-10, short measures such as the BFI-10 “may be appropriate in research setting where participants’ propensity for boredom, fatigue, or disinterest may be relatively high because longer measures may

increase the rate of careless or random responding to individual items, thereby artificially decreasing or increasing observed criterion validities” (Credé & Harms, 2012, p. 885).

One benefit of evolving research, like with the 3-item loneliness measure, is the availability and validity of shorter measures. Decades of psychometric testing in an array of disciplines have yielded a measure suitable for college students, whose attention spans might be a factor in longer surveys. The benefit of parsimony “is particularly appropriate now that the Big-Five framework has been well established; the focus of personality research is now free to shift from the psychometric and structural properties of the Big Five to focus on relations between the Big-Five dimensions and other constructs and outcomes” (Gosling, Rentfrow, & Swann, 2003, p. 524).

Media research has come a long way since the “magic bullet” or “hypodermic needle” theories of the early 20th century, and looking for universal correlations between any media and all people of a demographic is no longer sufficient. In this study, asking respondents about their personality will contribute to a more nuanced understand of media use today. It will also facilitate the detection of indirect effects of certain variables on one another. Hayes (2009) advocates that even when a direct effect or correlation is not found, one should test for indirect effects via mediation or moderation. For example, if strong ties do indeed communicate more frequently, but the effect is stronger for extroverts. Or maybe the influence of tie strength on frequency of communication only exists when both partners consider the relationship equitable and intimate. This will conclude the first part of the survey.

The second part of the survey asks participants about their social media use overall. Texting was assumed as communication practice. Previous studies have

confirmed the prevalence of texting and reported little variance in proportion of college students that text, from 99% (Lepp, Barkley, & Karpinski, 2014), to 98% (Drouin & Landgraff, 2012), to 92% that *text during class* (Tindell & Bohlander, 2012). Thus, as previously stated, this study conservatively assumed at least 95% of participants would regularly text. In addition to texting, participants were asked whether they regularly use Facebook, Twitter, Instagram and Snapchat, the four most popular social media applications for college students (Kircher, 2016; MODO Lab Teams, 2016; Pew Research Center, 2017; K. Smith, 2016). They responded to the following measures for texting and each platform they reported using.

Perceived Intimacy. For perceived intimacy, the participants selected from 1 (strongly disagree) to 7 (strongly agree) Likert scale for three statements: “<social media application> is a good way to stay in touch with people,” “Using <social media application> helps me feel more connected to others,” and “When I use <social media application> I feel close to people.” These statements were adapted from Pittman and Reich’s (2016) study that used Social Presence theory (Gunawardena, 1995) to examine perceived intimacy in social media. The scores for these three statements are averaged to give each respondent a perceived intimacy score for each platform ranging from 1 (not intimate) to 7 (very intimate).

Frequency of Use. For frequency of use, a single measure was used that prompted users: “In average week, how much time do you spend on your smartphone using _____?” Responses ranged from 1 (fewer than 5 minutes per day, or fewer than 30 minutes per week) to 8 (more than 2 hours per day, or more than 14 hours total for the

week). Finally, an open-ended response question was asked for each platform: “What is the primary reason you use _____?”

Relational Media Use. The third and final part of the survey asked the participants to identify one strong tie (“Write down the initials of someone who you consider a close or good friend,” and one weak tie (“Write down the initials of someone you met recently, a new friend or acquaintance”). Then were then asked how long they have known the person, and how close they consider them to be (1=casual, 2=close, 3=best). It is assumed, and will serve as an internal validity check, that participants will rate strong ties as two or three and weak ties as one (Haythornthwaite, 2002; Miczo et al., 2011).

To assess relational media use, a scale was adapted from Baym, Zhang, Kunkel, Ledbetter, and Lin's (2007) research. It is a frequency Likert scale, where for each of the eight communication media (face-to-face, telephone, text, email, Facebook, Twitter, Instagram, Snapchat) the participant will indicate on a scale of 1 (never) to 7 (several times per day) how often they communicate with their strong/weak tie using that method.

Relational Parity. To assess the mutuality or equity of the relationships, a 3-item measure was adapted from Ledbetter, Stassen-Ferrara, and Dowd's (2013) study (see appendix). The first item (Hatfield, Traupmann, & Walster, 1979) asks, “Considering how much you and the other person put into your relationship, and how much you and the other person get out of it...”, with responses obtained via a seven-point Likert-type scale ranging from 1 (“I am getting a much better deal than the other person”) to 7 (“The other person is getting a much better deal than me”) with a midpoint of 4 (“Neutral/Balanced”).

The second item (Sprecher, 1986) provides a similar prompt: “Consider all the times when your relationship has become unbalanced and one person has contributed more for a time. When this happens, who is more likely to contribute more?”, with responses obtained via a seven-point Likert-type scale ranging from 1 (“The other person is much more likely to be the one to contribute more”) to 7 (“I am much more likely to be the one to contribute more”) with a midpoint of 4 (“Neutral/Balanced”). Thus, for each item, responses at the midpoint of the scale (i.e., 4) indicate equity, whereas low scores indicate the participant is “overbenefiting” (i.e., getting more than the other person) and high scores indicate “underbenefiting.”

The third and final item in this measure is the Inclusion of Other in Self (IOS) scale (Aron, Aron, & Smollan, 1992). Essentially, IOS taps a somewhat different schema for interdependence (specifically, the extent to which the relationship is communal) than do some other measures of relational quality. The prompt is “please describe the picture below which best describes your relationship”, and each picture has two circles labelled “self” and “other”. In a spectrum of overlapping circles, from 1 (two circles not touching at all) to 7 (two circles that mostly overlap), the images represent various levels of intimacy or mutuality, which will serve to confirm an earlier measure of relational intimacy.

Finally, although Media Multiplexity Theory (MMT) predicts that multimodality is significantly associated with tie strength—stronger ties use more media to communicate—the causal direction is less clear (Ledbetter & Mazer, 2013). Because of this lack of causal direction, it is still unclear whether tie strength contributes to media use or vice versa. It is likely that tie strength and media use create mutual feedback loop

(Haythornthwaite, 2005; Ledbetter, 2015) with each being responsible for at least some causality of the other. This survey will follow other research (Baym & Ledbetter, 2009) that assesses use frequency and preference across multiple media and then submits the media variables into correlation and regression analyses. While this may not establish causality, it should provide predictive power in understanding the dynamic relationship between media use, relationships, and loneliness.

Participant Recruitment

Participants in this study were undergraduates (N = 352) at a large state institution in the Pacific Northwest. After Institutional Review Board approval was obtained (IRB protocol number = 08092016.009), participants were recruited from four large classes in The School of Journalism and Communication the fall of 2016. Because college students are the subject of study, recruiting participants from an undergraduate course allows for an appropriate sample of the population. The students were informed of the nature of the research and offered an option to receive either extra credit or candy as compensation. It was anticipated that some students would choose not to participate in the study, which is why multiple classes were recruited.

The initial goal was 400 participants, with expectation of some incomplete data and responses. The sufficient sample size allows for multiple statistical tests to be run on the data. For correlations or regression, VanVoorhis and Morgan (2007) estimate at least 80 participants, with an additional eight for each independent variable present. Having a greater sample size allows for an increase in power. Power is the estimated probability of correctly rejecting a null hypothesis, and there are two ways to increase power: increase sample size and increase effect size (VanVooris & Morgan, 2007). Because effect size is

more difficult to increase (most scales are already standardized), increasing sample size is the easier route to increasing power.

There are always four possible outcomes when any scholar is attempting to prove his or her hypothesis: proving one is right when one is actually wrong (Type 1 error), proving one is wrong when one is actually right (Type 2 error), proving one is wrong when one is *indeed* wrong (correct), and finally, what every scholar strives for, proving one is right when one *is indeed* right. If a hypothesis is, say, that use of Snapchat is negatively correlated with loneliness, then increasing sample size increases power and gives the best chance of correctly proving the hypotheses by ensuring that enough participants use Snapchat to be able to respond to those questions.

During a five-minute recruitment announcement in each of the classes, participants were told they would receive an email that evening with a link to the survey. That evening an email was sent out with a link to the survey, which was hosted by Qualtrics, a popular survey and data recruitment platform. Participants took an average of thirteen minutes and fifteen seconds to complete the survey. Data was analyzed with IBM SPSS Statistics Version 24 and JASP (open-source program) Version .8 BETA 5.

Measures

Happiness. Lyubomirsky and Lepper's (1999) four-item subjective happiness scale was used to measure chronic happiness (e.g., "In general, I consider myself... [1 = not a very happy person, 7 = a very happy person]; $\alpha = .806$).

Loneliness. Russell's (1996) 20-item revision of the UCLA loneliness scale was used to measure chronic loneliness (e.g., "How often do you feel that you lack companionship?" [1 = Never, 4 = Always]; $\alpha = .626$).

Perceived Intimacy of Social Media. Pittman and Reich's (2016) three-item scale was used to measure perceived loneliness of each platform (e.g., When I use Instagram I feel close to people." [1 = Strongly Disagree, 7 = Strongly Agree]; α (Twitter) = .895, α (Instagram) = .879, α (Snapchat) = .864, α (Texting) = .886, α (Facebook) = .862).

Relational Media Use. Participants were asked how frequently they communicated with a strong (weak) tie via Face to Face, Phone call, Facetime/Skype, e-mail, texting, Facebook, Twitter, Instagram, and Snapchat (1 = never, 7 = several times per day). Tie frequency was simply the average of all communication methods, and number of media was the total of how many platforms they used in communicating.

Relational Closeness. Relational closeness was a single item measure ("Which image best describes your relationships? [1 = "self" and "other" not overlapping at all, 7 = "self" and "other" overlapping a lot]). See appendix.

Relational Parity. A two-item measure was used to measure relational parity ("Considering how much effort you and your friend put into your friendship, and how much you both get out of it?" [1 = "I am getting a much better deal", 7 = "My friend is getting a much better deal"]; α (Strong Tie) = .456, α (Weak Tie) = .188 and "Consider all the times when your friendship has become unbalanced (maybe someone gets busy or grows distant) and one partner puts in more effort for a time. When this happens, who is more likely to contribute more?" [1 = "My friend is much likely to contribute more", 7 = "I am much more likely to contribute more"].

The issues stemming from intersections of emotional well-being, relationships and media use are important for individual and societal well-being. This chapter has outlined the research methods and measures that were used in this study that addresses

these issues. The next chapter presents the results obtained and a picture of the relationship between media use and loneliness begins to come into focus.

CHAPTER IV

RESULTS

No man is an island, entire of itself; every human is a piece of the continent.
-John Donne

This study explores the relationships between social media, loneliness and personality. The previous chapters addressed the social impact of loneliness and emotional well-being, the literature and theoretical foundations for the research questions and hypotheses of this study, and the methods and measures used in obtaining data. This chapter presents the results of this study, and the next chapter discusses the implications of these results.

A total of three hundred and seventy-three responses were collected from across five classes in the University of Oregon School of Journalism and Communication. Some responses ($N = 19$) were discarded for being incomplete (their mean completion rate of 14.8%) and/or because the participant's native language was not English (as determined by a demographic question: "What is your native language?"). Three incomplete responses were kept in the study (survey completion rates of 75%, 72%, and 93%) because the participant failed only to answer questions for relational media use, but still provided data for personality and general social media use. Thus the remaining responses were analyzed with a final sample size of three hundred and fifty-two students ($N = 352$, $M_{age} = 20.78$, $SD_{age} = 1.50$; 75.4% female, 266 Caucasians). See Figure 5 for full demographic information:

Demographic information

	Total	% of total
Gender		
Male	88	25%

Demographic information

	Total	% of total
Female	263	75%
Other	0	0%

Ethnicity

Asian/Pacific	45	12.8%
Black	13	3.7%
Caucasian	266	75.8%
Hispanic	24	6.7%
Native American	0	0%
other	3	.8%

Age

18	9	.9%
19	45	12.8%
20	92	26.2%
21	154	43.9%
22	31	8.8%
23	14	4.0%
24	9	2.6%
25	5	1.4%
32	1	.002%

Figure 5: Demographic information

Validity checks were conducted. First, no outliers were detected via examination of leverage values and Q-Q plots of expected versus predicted values. Second, as previously mentioned, when rating identifying strong and weak ties, it was expected that participants would rate strong ties as “best” and “close” friends and rate weak ties as “casual” friends. Results indicate strong ties were heavily rated as best and close friends, and weak ties were ranked as casual and close. Figure 6 summarizes the results. Strong tie findings are consistent with expectations, but an unusual number of participants rated their weak tie as a best friend, which may increase noise surrounding weak tie data analysis.

STRONG TIE	Frequency	Percent	WEAK TIE	Frequency	Percent
Casual friend	6	1.7%	Casual Friend	154	43.8%
Close friend	98	27.8%	Close Friend	130	36.9%
Best Friend	247	70.2%	Best Friend	67	19%

Figure 6: Tie and friend ratings

General Social Media Use and Loneliness

The first research question (RQ1) asked whether there was an overall relationship between loneliness and number of social media applications used. A bivariate correlation was run on loneliness and total number of applications used, and there was a correlation between the two variables, $r = -.238$, $n = 351$, $p < .001$. To verify this relationship, a one-way between subjects ANOVA was conducted to compare the influence of number of applications used on loneliness in zero, one, two, three and four applications used. There was a significant effect of number of applications used on loneliness for the five conditions [$F(4, 347) = 5.85$, $p < .001$]. In other words, there is a significant decrease in

loneliness for each additional platform used, indicating a clear relationship between social media platforms and loneliness. The following figure illustrates these results.

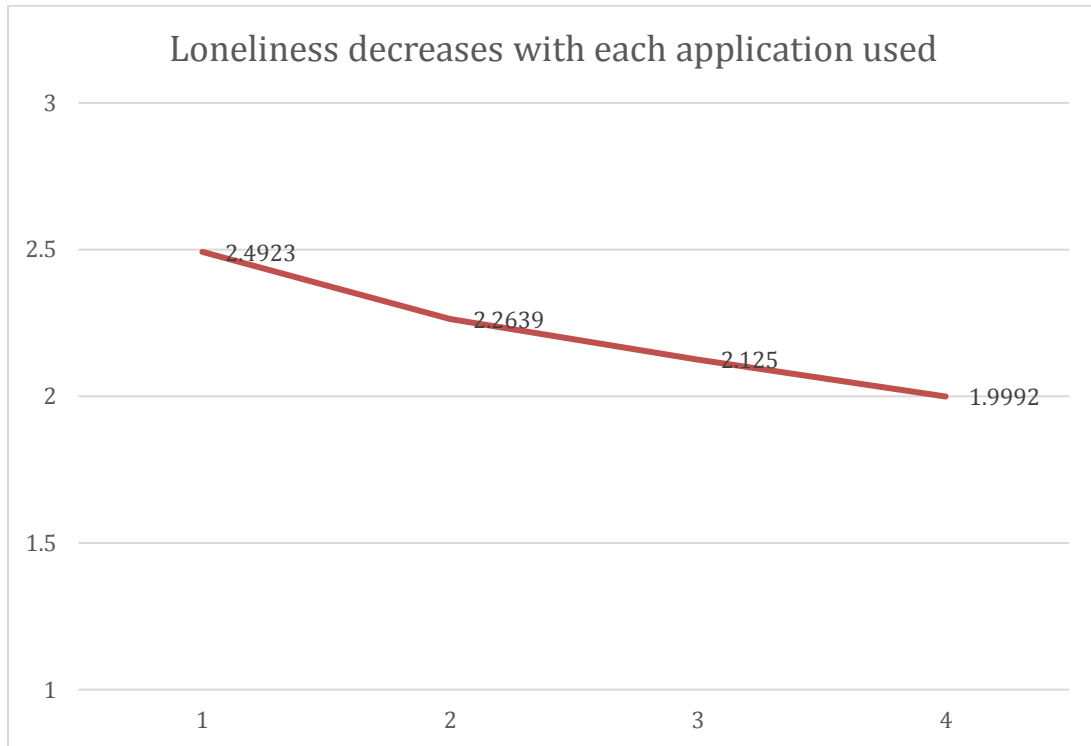


Figure 7: ANOVA results of loneliness by number of social media used

Interestingly, individuals who use no social media at all (not picture in Figure 7) reported roughly the same loneliness as two-platform users. Yet the small sample size of the zero-platform group ($N = 4$) makes it difficult to draw many conclusions about how their non-use affects their loneliness. Perhaps they are luddites with strong offline social ties, or perhaps they simply lied in the survey to avoid spending too much time completing it.

Recall that the first set of hypotheses (H1, H2, and H3) center around the relationships between specific social media use and loneliness. H1 stated that texting frequency would be associated with decreased loneliness. A bivariate correlation was run

on the frequency of texting and loneliness, and there was a correlation between the two variables, $r = -.181$, $n = 352$, $p = .001$. The following figure illustrates this correlation:

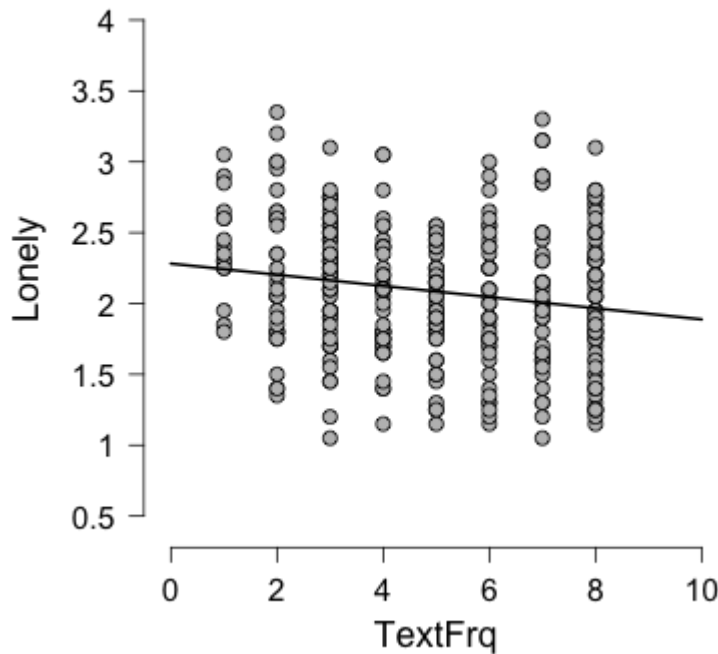


Figure 8: Relationship between texting frequency and loneliness

Because the correlation was significant ($p < .001$) but low ($r = -.181$), an additional one-way between subjects ANOVA was conducted to compare the influence of number of texting frequency on loneliness at all eight frequency intervals (1=fewer than five min of texting per day, 8= more than two hours of texting per day). There was a significant effect of number of applications used on loneliness for the eight conditions [$F(7, 344) = 2.95$, $p = .005$]. However, Tukey post-hoc comparisons were used to determine that texting interval one's loneliness was statistically significant with interval five ($p = .027$) and marginal with interval six ($p = .055$) and interval five ($p = .053$). In other

words, texting appears to reduce loneliness up to a certain point. The following figure illustrates these results:

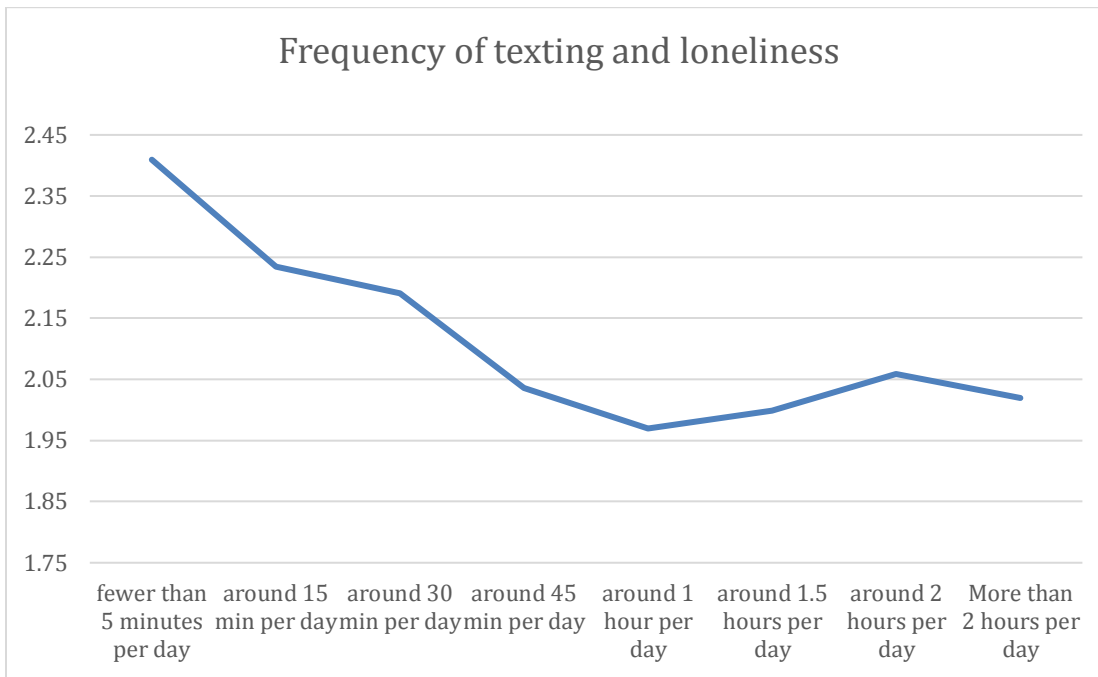


Figure 9: Frequency of texting and loneliness

H2 stated that Instagram users would be less lonely than individuals who did not use the platform. An independent-samples t-test was conducted to compare loneliness of Instagram non-users ($N = 36$) and Instagram users ($N = 316$). There was a significant difference in the scores for Instagram non-users ($M = 2.36, SD = .53$) and Instagram users ($M = 2.05, SD = .46$) conditions; $t(350) = 3.71, p < .001$. Specifically, Instagram users are less lonely than non-users. The following table illustrates these results:

Independent Samples T-Test

	t	df	p	Mean Difference	SE Difference	Cohen's d
Lonely	3.714	350.0	< .001	0.304	0.092	0.653

Note. Student's T-Test.

Note. For all tests, the alternative hypothesis specifies that group 0 is greater than group 1.

Figure 10: t-test results for loneliness of Instagram users versus non-users

H3 stated that Snapchat users would be less lonely than individuals who did not use the platform. An independent-samples t-test was conducted to compare loneliness of Snapchat non-users ($N = 48$) and Snapchat users ($N = 304$). There was a significant difference in the scores for Snapchat non-users ($M = 2.30, SD = .37$) and Snapchat users ($M = 2.05, SD = .48$) conditions; $t(350) = 3.41, p = .001$. Specifically, Snapchat users are less lonely than non-users. The following figure illustrates these results:

Independent Samples T-Test

	t	df	p	Mean Difference	SE Difference	Cohen's d
Lonely	3.417	350.0	< .001 ^a	0.248	0.061	0.531

Note. Student's T-Test.

Note. For all tests, the alternative hypothesis specifies that group 0 is greater than group 1.

It should be noted that there was also a significant difference in the scores for Twitter non-users ($N = 132, M = 2.37, SD = .37$) and users ($N = 220, M = 2.07, SD = .47$) conditions; $t(350) = 2.52, p < .015$, as well as a significant difference for Facebook non-users ($N = 15, M = 2.17, SD = .47$) and users ($N = 337, M = 2.04, SD = .46$) conditions; $t(350) = 2.43, p = .015$. Recall that these t-values for Twitter (2.5) and Facebook (2.4) are lower than those for Instagram (3.7) and Snapchat (3.4) indicating a stronger decrease in loneliness for users of Instagram and Snapchat. Thus the results of the first set of hypotheses are as follows:

Figure 11: t-test results of loneliness for Snapchat users and non-users

RQ1	Relationship between loneliness and number of social media applications used?	Yes, negative relationship
H1	Texting frequency negatively associated with loneliness	Supported
H2	Instagram users are less lonely	Supported
H3	Snapchat users are less lonely	Supported

Relational Media and Loneliness

Recall that the second set of hypotheses center around tie strength, media use and loneliness. As expected, participants reported communicating with their strong tie more frequently ($M_{StrFrq} = 2.56$, $SD_{StrFrq} = 1.01$) and using a broader range of social media applications ($M_{StrMed} = 6.25$, $SD_{StrMed} = 1.70$) than with their weak tie ($M_{WkFrq} = 1.76$, $SD_{WkFrq} = 1.02$; $M_{WkMed} = 5.40$, $SD_{WkMed} = 1.93$).

H4 stated that an increase in frequency and media used with a strong tie would predict a decrease in loneliness. For this and all analyses demographic variables were controlled for, and because no significant results were found, they were removed. A multiple linear regression was calculated to predict loneliness based on frequency and media use in communication with a strong tie. A significant regression equation was found ($F(2, 348) = 17.875$, $p < .001$), with an R^2 of .093. Participants predicted loneliness (measured from one to four) is equal to $2.476 - .008(\text{StrMed}) - .134(\text{StrFrq})$, where StrMed is coded one through nine (possible communication channels), and StrFrq is one through seven (intervals of frequency). Participants loneliness decreased by .134 for interval increase in frequency, and decreased by .008 for each additional platform used to communicate. Only communication frequency was a significant predictor ($p = .000$) of loneliness. Number of media used with strong tie ($p = .719$) did not contribute to the multiple regression model. The following figure illustrates these results:

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.305	0.093	0.088	0.453

ANOVA

Model	Sum of Squares	df	Mean Square	F	p
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ANOVA

Model		Sum of Squares	df	Mean Square	F	p
1	Regression	7.320	2	3.660	17.88	< .001
	Residual	71.257	348	0.205		
	Total	78.578	350			

Coefficients

Model		Unstandardized	S. E.	Standardized	t	p
1	intercept	2.476	0.092		26.860	< .001
	STRfreq	-0.134	0.036	-0.284	-3.750	< .001
	STRmedia	-0.008	0.021	-0.027	-0.360	0.719

Figure 12: Regression table for H4

RQ2 asked whether any aspect of weak tie communication (frequency, number of media used, relational closeness, relational parity) were significant predictors of loneliness. An initial correlation and subsequent stepwise multiple linear regression revealed that only relational parity could predict (a decrease in) loneliness. The two-item measure of relational parity was coded so that relational disparity (where one partner puts in more effort) = 0, and perfect relational parity = 4. A significant regression equation was found ($F(1, 349) = 4.368, p = .037$), with an R^2 of .012. Participants' predicted loneliness is equal to $2.331 - .073(\text{WkParity})$. Loneliness decreased by .073 for each incremental increase in relational parity with one's weak tie. By comparison, loneliness decreased by .108 for each incremental increase with relational parity with one's *strong* tie, making it the stronger and more significant ($p = .004$) predictor. The following figure illustrates these results:

Linear Regression

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.111	0.012	0.010	0.472

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
1	Regression	0.973	1	0.973	4.368	0.037
	Residual	77.719	349	0.223		
	Total	78.692	350			

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
1	intercept	2.331	0.121		19.333	< .001
	WkPar	-0.073	0.035	-0.111	-2.090	0.037

Figure 13: Regression table for RQ2

Recall that H5 had to do with the difference in communication frequency between one's strong tie and weak tie. An increase in TDMS (Tie Differential Media Score) was hypothesized to predict a decrease in loneliness because it suggests one is communicating much more frequently with his or her strong tie (and thus perceives more social support from that tie). Participants' TDMS ($M_{TDMS} = .803$, $SD_{TDMS} = 1.02$) range from $MIN_{TDMS} = -.233$ to $MAX_{TDMS} = 3.78$, with a negative TDMS indicating that the participant communicates with their weak tie more frequently than their strong tie.

A simple linear regression was calculated to predict loneliness based on TDMS (how much more frequently one communicates with their strong tie compared to their weak). A significant regression equation was found ($F(1, 348) = 21.094$, $p = .000$), with an R^2 of .057. Participants' predicted loneliness is equal to $2.174 - .110$ (TDMS). Participants' loneliness decreased by .110 for each TDMS interval increase. The following figure illustrates these results:

Linear Regression

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.239	0.057	0.054	0.461

ANOVA

Model	Sum of Squares	df	Mean Square	F	p
-------	----------------	----	-------------	---	---

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	Regression		4.489	1
	Residual		74.055	348
	Total		78.544	349

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
1	intercept	2.174	0.031		69.613	< .001
	TDMS	-0.110	0.024	-0.239	-4.593	< .001

Figure 14: Regression table for H5

Thus, for the second set of hypotheses:

H4	Increased communication frequency and number of media used with strong tie predict a decrease in loneliness	Partially Supported (only frequency)
RQ2	Do any aspects of weak tie relationship have a significant relationship with loneliness?	Only relational parity
H5	An increase in TDMS predicts a decrease in loneliness	Supported

Perceived Intimacy and Media Use

Recall that hypotheses six and seven had to do with the relationships between loneliness and perceive intimacy of social media. First, the perceived intimacy score for each social media application was examined. A one-way repeated-measures ANOVA was conducted on individual intimacy ratings for Twitter, Instagram, Snapchat, Facebook and texting. There was a statistically significant difference between perceived intimacy (ranging from one to seven) for each platform, Wilks' Lambda = .341, $F(4, 191) = 92.163$, $p = .001$. Texting was perceived as the most intimate communication platform ($M = 5.92$, $SD = 1.01$), followed by Snapchat ($M = 5.35$, $SD = 1.22$), Facebook ($M = 5.02$, $SD = 1.26$), Instagram ($M = 4.58$, $SD = 1.41$) and Twitter ($M = 3.85$, $SD = 1.52$). The fact that texting was rated by participants as the most intimate of social media is congruent

with the results of H1 that texting frequency is associated with decreased loneliness. The following figure illustrates these results:

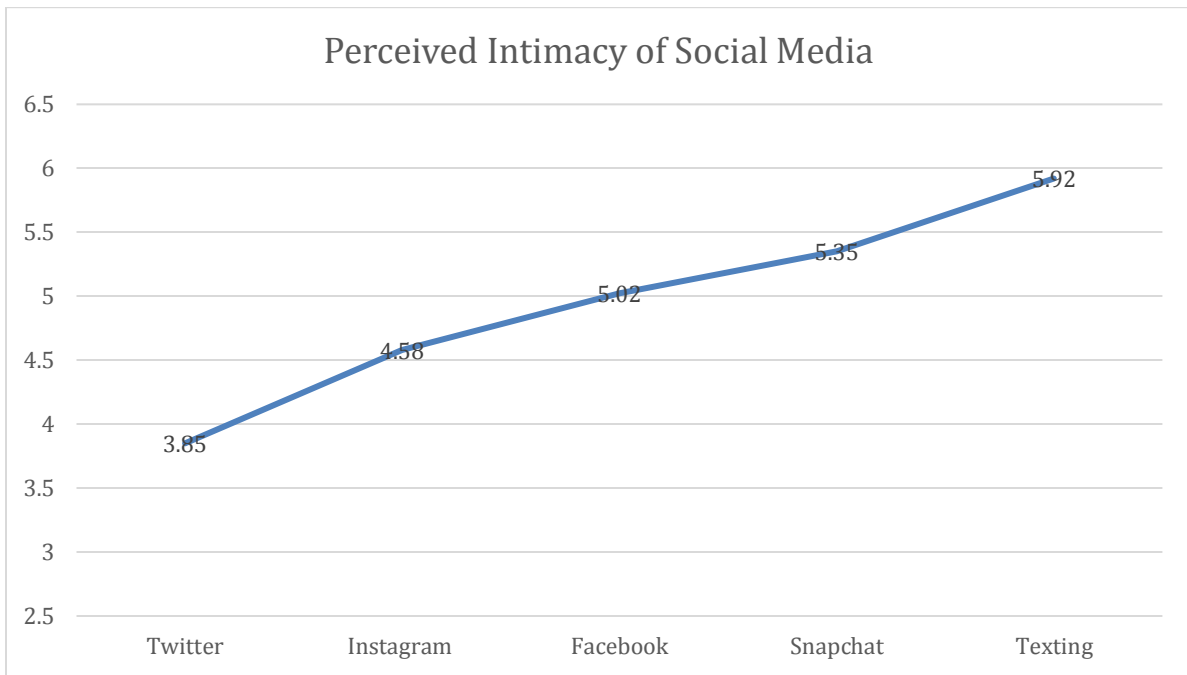


Figure 15: Mean intimacy scores for each platform

H6 states that loneliness would predict a decrease in perceived intimacy for all social media. Perceived intimacy of social media overall ($M_{SMint} = 4.94$, $SD_{SMint} = .923$) was the average of a participant's perceived intimacy score for each platform (1 = not very intimate and 7 = very intimate). A simple linear regression was calculated to predict loneliness based on perceived intimacy of social media. A significant regression equation was found ($F(1, 193) = 16.03$, $p = .001$, with an R^2 of .077. Participants' predicted loneliness is equal to $2.685 - .139 (SMint)$. Loneliness decreased .139 for each interval on the SMint scale (1 to 7). In other words, as perceived intimacy of social media goes up, one's loneliness decreases. The following figure illustrates these results:

Linear Regression Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.277	0.077	0.072	0.445

ANOVA						
Model		Sum of Squares	df	Mean Square	F	p
1	Regression	3.175	1	3.175	16.03	< .001
	Residual	38.227	193	0.198		
	Total	41.402	194			

Coefficients						
Model		Unstandardized	Standard Error	Standardized	t	p
1	intercept	2.685	0.174		15.414	< .001
	SMtotINT	-0.028	0.007	-0.277	-4.004	< .001

Figure 16: Regression table for H6

H7 states that perceived intimacy mediates the effect of social media use on loneliness. Social media use ($M_{SMuse} = 3.95$, $SD_{SMuse} = .1.51$) is the average of how frequently used each platform (1 = fewer than 5 min/day, 8 = more than 2 hours/day). Regression analysis was used to investigate the hypothesis that perceived intimacy mediates the mitigating effects of social media use on loneliness. Results indicated that social media use was a significant predictor of perceived intimacy (of social media), $b = .192$, $SE = .032$, $p < .001$, and that perceived intimacy was a significant predictor of loneliness, $b = -.145$, $SE = .027$, $p < .001$. These results support the mediational hypothesis. Social media use was no longer a significant predictor of loneliness after controlling for the mediator, perceived intimacy, $b = -.007$, $SE = .017$, $p = .672$, consistent with full mediation. Approximately 9% of the variance in loneliness was accounted for by the predictors ($R^2 = .086$). The indirect effect was tested using a bootstrap estimation approach with 1000 samples² (Shrout & Bolger, 2002). These results indicated the indirect coefficient was significant, $b = .028$, $SE = .007$, $CI = -.045, -.017$. Increased frequency of social media use was associated with approximately .03 points

² Also run with 5000 samples with the same analysis.

lower on the loneliness scale (which runs from 1 to 4) as mediated by perceived intimacy.

Thus, for these set of hypotheses:

H6	Loneliness predicts lower perceived intimacy of social media	Supported
H7	Perceived intimacy mediates the effect of social media use on loneliness	Supported

Personality and Media Use

The final set of hypotheses had to do with personality and social media use.

An initial examination of the personality data confirmed assumptions and existing literature about how traits are associated with one another and with loneliness.

Specifically, loneliness is negatively associated with extraversion ($r = -.442, p < .001$), agreeableness ($r = -.325, p < .001$) and conscientiousness ($r = -.225, p < .001$), positively associated neuroticism ($r = .285, p < .001$), and not associated with openness ($r = -.065, p = .222$). The following figure illustrates the correlations between personality traits and loneliness:

Relationships among personality traits and loneliness

		Extra	Agree	Consc	Neuro	Open	Lonely
Extra	Pearson's r	—	0.156 **	0.210 ***	-0.211 ***	0.157 **	-0.442 ***
	p-value	—	0.003	< .001	< .001	0.003	< .001
Agree	Pearson's r		—	0.321 ***	-0.182 ***	0.030	-0.325 ***
	p-value		—	< .001	< .001	0.574	< .001
Consc	Pearson's r			—	-0.110 *	0.178 ***	-0.225 ***
	p-value			—	0.040	< .001	< .001
Neuro	Pearson's r				—	-0.105 *	0.285 ***
	p-value				—	0.049	< .001
Open	Pearson's r					—	-0.065
	p-value					—	0.222
Lonely	Pearson's r						—
	p-value						—

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 17: Relationships among personality traits and loneliness

H8 stated that neuroticism would predict increased Facebook usage. Linear regression analysis was used to test if neuroticism significantly predicted participants' average weekly Facebook use. A non-significant regression equation was found ($F(1, 335) = .005, p = .944$), with an R^2 of .000. Participants' Facebook use is equal to 3.59 - .006 intervals in their Neuroticism score which ranges from one to seven. The only marginal decrease for each step in neuroticism indicates it is not a good predictor of Facebook use. The following figure illustrates these results:

Linear Regression

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.004	0.000	-0.003	1.934

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
1	Regression	0.019	1	0.019	0.005	0.944
	Residual	1252.860	335	3.740		
	Total	1252.878	336			

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
1	intercept	3.586	0.328		10.924	< .001
	Neuro	-0.006	0.079	-0.004	-0.071	0.944

Figure 18: Regression table for H8

H9 stated that extraversion, openness, and agreeableness all predict an increase in overall social media use, which was a composite score that was the average of how often the participant used each platform (0 = never, 8 = hours per day). A stepwise multiple linear regression was calculated to predict overall social media usage based on extraversion, openness and agreeableness. Agreeableness was not found to be a significant predictor of social media use. A significant regression equation was found ($F(2, 349) = 6.346, p = .002$), with an R^2 of .035. Participants' predicted average weekly social media use is equal to $3.223 + .200$ (extraversion) $- .148$ (openness) where

extraversion and openness are coded as intervals ranging from one (minimum personality trait value) to seven (maximum). Average social media use increased .200 for each interval of extraversion and *decreased* .148 for each interval of openness. Both extraversion and openness were significant predictors of social media use, however, openness had the opposite (negative) effect than what was predicted. The following figure illustrates these results:

Linear Regression

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.205	0.042	0.034	1.504

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
1	Regression	34.66	3	11.555	5.109	0.002
	Residual	787.08	348	2.262		
	Total	821.74	351			

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
1	intercept	2.614	0.556		4.705	< .001
	Agree	0.135	0.084	0.085	1.605	0.109
	Extra	0.184	0.064	0.155	2.886	0.004
	Open	-0.149	0.070	-0.113	-2.132	0.034

Figure 19: Regression table for H8

H10 predicted that conscientiousness would predict a decrease in overall social media usage. Linear regression analysis was used to test if conscientiousness significantly predicted a decrease in participants' average weekly social media use. A non-significant regression equation was found ($F(1, 350) = 1.44, p = .234$), with an R^2 of .004.

Participants' Facebook use is equal to $2.98 + .096$ intervals in their conscientiousness score which ranges from one to seven. The only marginal increase for each step in conscientiousness means it is not a good predictor of social media use. The following figure illustrates these results:

Linear Regression

Model Summary

Model	R	R ²	Adjusted R ²	RMSE
1	0.064	0.004	0.001	1.529

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
1	Regression	3.366	1	3.366	1.440	0.231
	Residual	818.373	350	2.338		
	Total	821.739	351			

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
1	intercept	2.982	0.400		7.451	< .001
	Consc	0.096	0.080	0.064	1.200	0.231

Figure 20: Regression table for H9

Finally, recall that the third and final research question asked if any personality traits moderate the effect of loneliness on mobile social media use. On its own—and consistent with the first set of hypotheses—loneliness corresponds with a decrease in social media use ($r = -.203, n = 352, p < .001$). Additionally, personality traits were also found to be associated with social media use in a manner consistent with results thus far. Specifically, consistent with H9, there was a correlation between social media use and extraversion ($r = .151, n = 352, p = .005$) and agreeableness ($r = .106, n = 352, p = .047$). The following figure represents these relationships between loneliness and use of each platform:

Pearson Correlations

		Lonely	Face	Twit	Insta	Snap	Text
Lonely	Pearson's r	—	-0.113 *	-0.130 *	-0.123 *	-0.164 **	-0.181 ***
	p-value	—	0.034	0.015	0.021	0.002	< .001
Face	Pearson's r		—	0.092	0.373 ***	0.445 ***	0.323 ***
	p-value		—	0.086	< .001	< .001	< .001
Twit	Pearson's r			—	0.327 ***	0.384 ***	0.236 ***
	p-value			—	< .001	< .001	< .001
Insta	Pearson's r				—	0.583 ***	0.419 ***
	p-value				—	< .001	< .001

Pearson Correlations

		Lonely	Face	Twit	Insta	Snap	Text
Snap	Pearson's r					—	0.438***
	p-value					—	< .001
Text	Pearson's r						—
	p-value						—

* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 21: Correlations of loneliness and social media use

These personality traits were examined as moderators of the relation between loneliness and social media use. Loneliness and each personality trait were entered in the first step of the regression analysis. In the second step of the regression analysis, the interaction term between loneliness and the personality trait was entered, with none of the results being significant.

Only openness was close to explaining a significant increase in variance in social media use, $\Delta R^2 = .008$, $F(1, 348) = 3.080$, $p < .080$. Openness did have a significant effect at certain levels. Specifically, when openness was low, at one standard deviation below the mean (3.47 out of 7), its effect was small (-.341) and not significant ($p = .182$). However, at higher levels of openness, the mean and one standard deviation above the mean, respectively (4.63/5.80), its effect was stronger (-.652/-.962) and significant ($p = .001/p = .000$). In other words, loneliness normally predicts decreased social media use, and at average and high levels of openness that media use is predicted to be even less frequent.

Cohen, Cohen, West, and Aiken (1983) suggest plotting three values of the moderator: the mean, the value one standard deviation below the mean, and the value one standard deviation above the mean. Plotting this interaction at these levels of openness ($M = 4.63$, $SD = 1.17$) results in Figure 16. From this visualization, it becomes clear how

openness is close to overall statistical significance in how it influences (by exacerbating) the already negative association between loneliness and social media use.

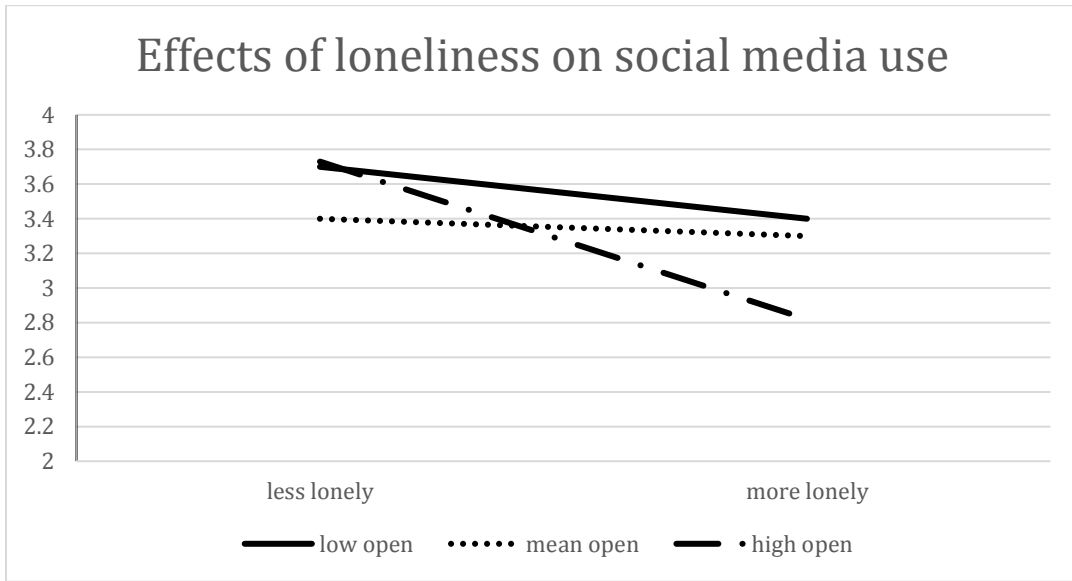


Figure 22: Interaction of loneliness and openness on social media use

Thus, for the final set of hypotheses:

H8	Neuroticism predicts increased Facebook use	Not supported
H9	H5b: Extraversion, Openness, and Agreeableness all predict increased overall social media use	Partially supported (extraversion predicts increase but openness predicts decrease)
H10	Conscientiousness predicts decreased overall social media use	Not Supported
RQ3	Will any of the big 5 personality traits moderate the relationship between loneliness and social media use?	No, but openness significantly moderates at certain levels

Post-Hoc Analyses

As part of H1, additional analysis was performed into the apparent influence of text frequency on loneliness. Recall that texting frequency seemed to have a positive

influence in reducing loneliness, but only up to a certain point: at the fifth (out of eight) interval, which was “about an hour per day.” However, more texting than that (intervals six, seven and eight) was associated with more loneliness.

Because of this point of diminishing returns with texting, the similar ANOVA and Tukey HSD post hoc tests were performed on the other four social media applications. Similar results were detected between use of other social media and loneliness, and diminishing returns (in terms of apparent effect on loneliness) appear to occur after a certain point of use. For Facebook, the point of diminishing returns came after the fourth interval (“around 45 minutes per day”); for Twitter, the sixth interval (“about 1.5 hours per day”); for Instagram, the sixth interval; and for Snapchat, the third interval (“around 30 minutes per day”). However only in Snapchat was this interval significantly different than others, making it similar to texting in this regard. The following figures illustrate these results:

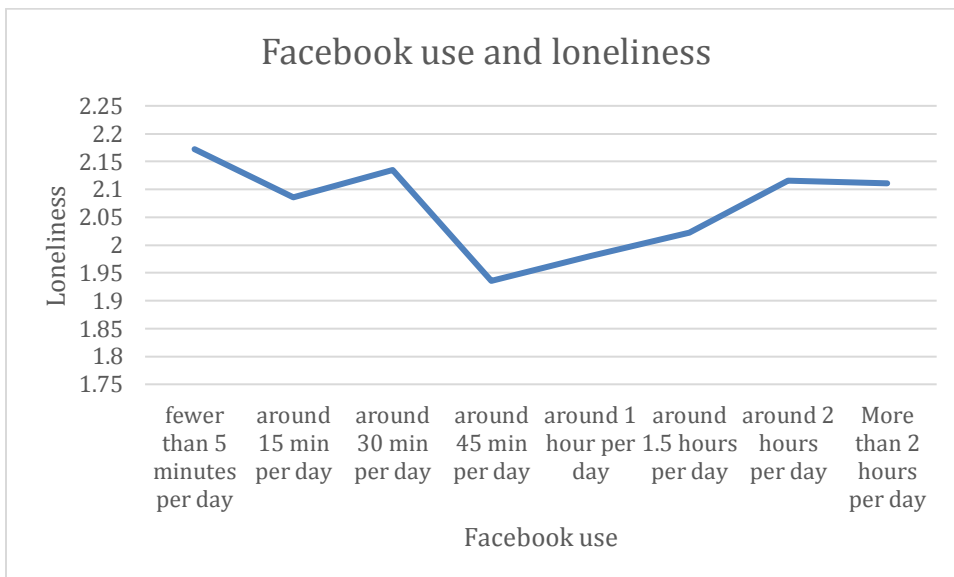


Figure 23: Facebook use and loneliness

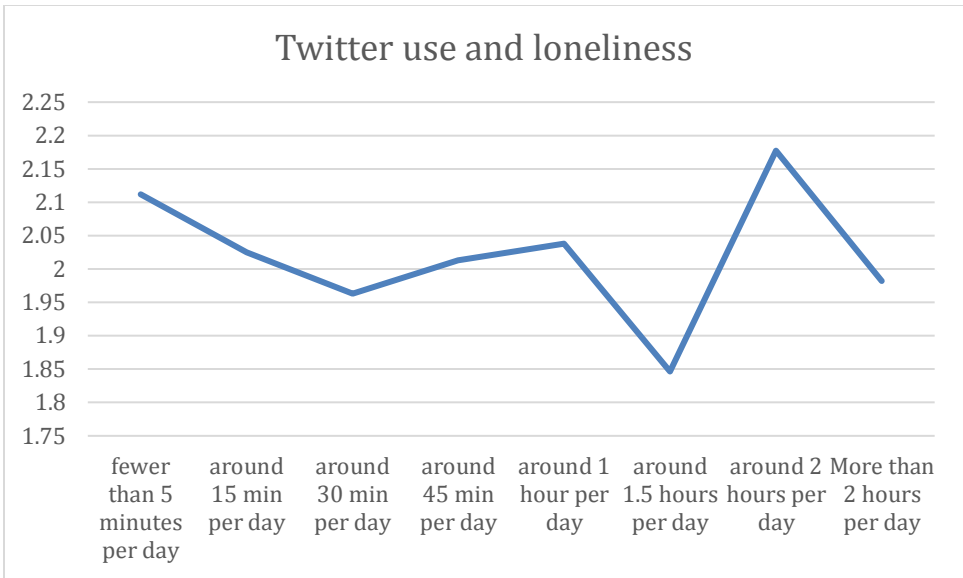


Figure 24: Twitter use and loneliness

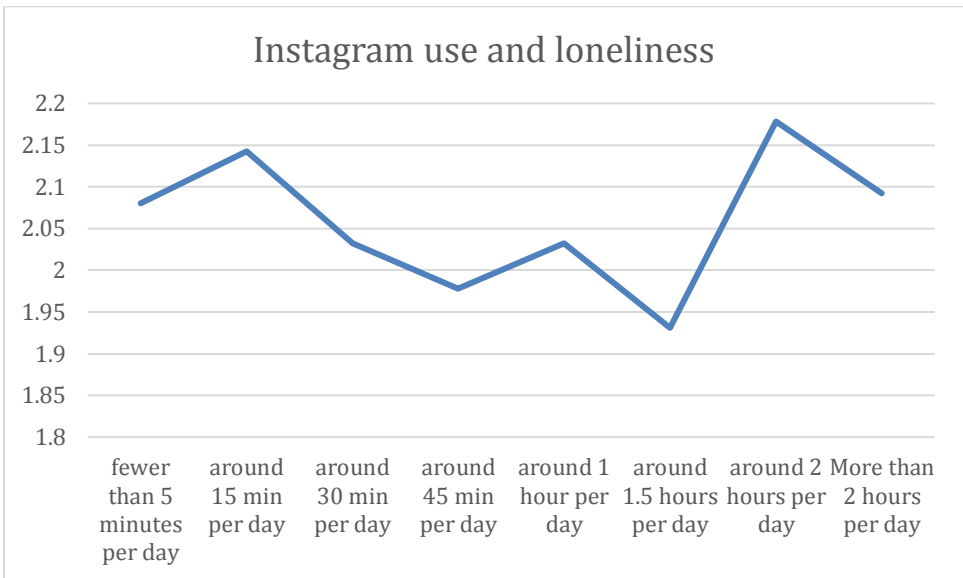


Figure 25: Instagram use and loneliness

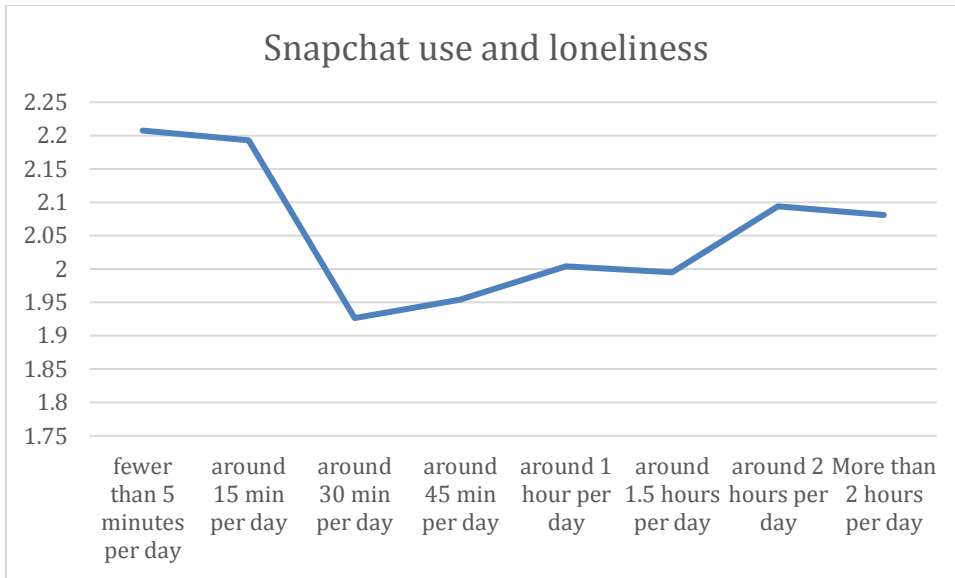


Figure 26: Snapchat use and loneliness

This chapter presented the results for this study. Specifically, there were four clusters of hypotheses that were tested: social media use and loneliness, relational social media and loneliness, perceived intimacy and social media, and personality and social media. While most hypotheses were supported, some were not, and the exploratory research questions may help illuminate these results. The next chapter discusses the results of the study and their theoretical implications.

CHAPTER V

DISCUSSION & IMPLICATIONS

Since you cannot do good to all, you are to pay special attention to those who, by the accidents of time, or place, or circumstances, are brought into closer connection with you.
-St. Augustine of Hippo

This purpose of this study was to better understand how loneliness and social media use might influence one another, as well as examine the role individual personality traits might play in affecting those relationships. In doing so, this study proposes a state of phoneliness where a lonely individual might only be using their mobile device in ways that continue or exacerbate their loneliness instead of reducing it. Through digital social media, smartphones today can connect to almost anyone at any time, yet not all individuals take advantage of this connectivity. The previous chapter presented the results of this study, including which hypotheses were supported, which were not, and the answers to three research questions. This chapter discusses those results and their implications to communication theory and literature.

In attempting to clarify the relationships between loneliness, personality and social media use, several conclusions can be drawn from this study. First and foremost, this study provides evidence to support the idea that social media may be beneficial. In terms of emotional well-being, the moderate use of social media as part of one's everyday habits and activities can be considered not only normal but healthy. The following figure summarizes the results of this study:

<i>Hypotheses & Research Questions</i>		<i>Conclusion</i>
RQ1	Is loneliness associated with number of social media used?	Yes

H1	Frequent texting corresponds with decreased loneliness	Yes
H2	Instagram users are less lonely than non-users	Yes
H3	Snapchat users are less lonely than non-users	Yes
H4	With a strong tie, communication frequency and number of media used both predict decreased loneliness	Partially (only communication frequency)
RQ2	Do any aspects of relationships with weak tie predict decrease in loneliness?	Partially (only relational parity)
H5	TDMS (the measure of difference in communication frequency with strong and weak tie) predicts decreased loneliness	Yes
H6	Loneliness predicts decrease in perceived intimacy of social media	Yes
H7	Perceived intimacy mediates effects of social media use on loneliness	Yes (complete mediation)
H8	Neuroticism predicts increased Facebook use	No
H9	Extraversion, openness, and agreeableness all predict increased social media use	Partial (extraversion predicts increase; openness predicts decrease)
H10	Conscientiousness predicts decreased social media use	No
RQ3	Do any personality traits moderate effect of loneliness on social media use?	Only openness moderates, but only at mean and high levels

Figure 27: Summary of hypotheses and research question results

Social Media Use and Loneliness

Recall that the first research question (RQ1) confirmed a relationship between loneliness and number of applications used. Specifically, there is a significant decrease in loneliness for each additional platform used, suggesting a relationship between social

media and loneliness. In terms of increasing application use, an upper limit surely exists—using thirty social media platforms every day is probably not healthy—but results support the idea that social media use may still contribute to reduced loneliness thus a reduction in the many physical ills that go along with it (Cacioppo & Patrick, 2008; Connor, 2014; Julianne Holt-Lunstad, Smith, & Layton, 2010).

Interestingly, individuals who use no social media at all reported roughly the same loneliness as two-application users. However, the small sample size of the zero-platform group ($N = 4$) makes it difficult to draw many conclusions about how their non-use affects their loneliness. Recall that texting was a presumed communication medium for all participants, so it is possible they achieve all their communication needs through text alone. It is also possible the participants simply lied in the survey to avoid spending too much time completing it.

The first cluster of hypotheses had to do specifically with strong tie media, or media most likely to be used with strong ties and thus have the greatest potential for reducing loneliness. Because texting is a basic function of all mobile devices today, it was not possible to test for users and non-users of texting functionality, but it was possible to test for texting frequency. Texting frequency was shown to be associated with a decrease in loneliness (H1). This result is unsurprising: people who text more are less lonely: it is intuitive that individuals with greater offline social support or more dense friend networks would also be likely to spend more time texting because they have simply more friends *with which to communicate*.

SMS texting is private and direct. This means that, unlike the other four platforms studied, each text message is necessarily sent to a specific person and is not a post for the

public or one's followers. Although text-based communication is typically a lean medium that is not perceived as intimate, there is clearly something about texting others that mitigates loneliness. Perhaps privacy is a factor that contributes to intimacy, and the same message that is not intimate or special in public becomes more intimate when communicated in private.

In this way, this study may contradict existing research where texting is deemed not intimate and suitable only for mundane conversations as part of relational maintenance (Eden & Veksler, 2016; McEwan & Horn, 2016). In fact, participants in this study rated texting the most intimate of all platforms studied. This is congruent with Yang, Brown and Braun's (2014) finding that college student relationships typically begin with a general platform like Facebook, and only move to mobile phone texting once the relationship progresses past a certain point.

Users of Instagram (H2) and Snapchat (H3) are less lonely than non-users, which confirms that there is something about using image-based social media that effectively reduces loneliness. Pittman and Reich (2016) posit that image-based platforms are more "social" than text-based platforms because images are more intimate and thus facilitate something that is perceived as social support. Snapchat is used by individuals to communicate within their tight social networks (Piwek & Joinson, 2016) so social support and reduction of loneliness are natural consequences of its use.

Furthermore, Sundar's (2008) MAIN model posits Modality (along with Agency, Interactivity, and Navigability) as one of the primary sets of gratifications afforded by new media. There is a double-sided advantage of images over text: textual information requires more cognitive effort to process than images (S. Sundar, 2000), and our brain

trusts visual images more than text (Sundar & Limperos, 2013). The MAIN model argues that images trigger a “realism heuristic” wherein seeing is quickly believing—if something is photographed, we think it must be real. Our brains process the images in Instagram and Snapchat quickly and easily and they appear to be effective platforms for conveying emotions and “authentic” connection with others.

While Twitter and Facebook had similar tendencies, where non-users were loneliness than users, the results were more pronounced for Snapchat and Instagram, indicating a stronger decrease in loneliness for users of the latter, strong-tie, image-based platforms. These results, along with the results of each platform’s intimacy scores might also suggest a modification to the tie strength media matrix, with less weight on images and more emphasis on private, direct communication. For the most part, these private applications are one-to-one whereas public applications are one-to-many. The following figures represent the original and modified tie strength media matrix:

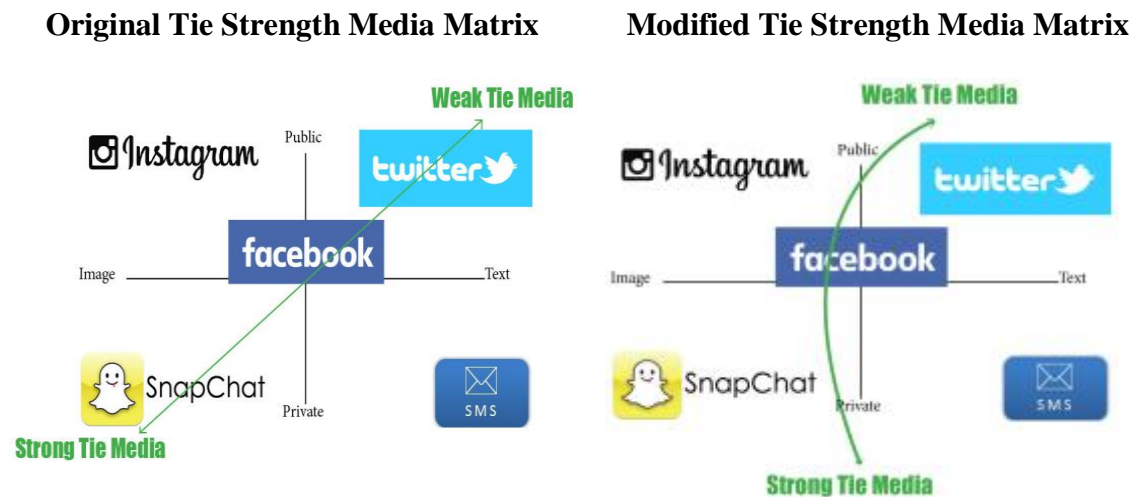


Figure 28: Updated tie strength media matrix

Finally, recall that initial binary use/non-use t-tests revealed that, for each application, users were less lonely than non-users. However, the correlations between

each platform's use and decreased loneliness were either small or not significant. Thus post hoc analyses of relationships between loneliness and specific usage intervals for each application. Each application appeared to have a point of diminishing returns, though only texting and Snapchat (private, strong tie media) had significant differences within the intervals. These results explain how correlations of loneliness and social media use may not have been detected for each application: as intervals of use went up, loneliness appeared to decrease, *to a point*, but then increased again as usage approached the maximum interval of two hours per day. This suggests a condition or caveat of the benefits of social media—most social media do appear to have potential for reducing loneliness, but only when use is light to moderate. This likely varies by individual and platform, but still provides an additional nuance to existing literature on social media and loneliness (Park et al., 2015; Pittman, 2015; Pittman & Reich, 2016).

Relational Media Use and Loneliness

This updated matrix has implications for CMC theory (Walther & Burgoon, 1992), particularly because various aspects of social media platforms such as synchronicity and modality did not seem to be as significant as whether the channel was public or private. This is congruous with research that found texting reduced loneliness (Hall & Baym, 2012; Ledbetter, 2015). Although the content of text messages may be of little consequence, the fact that those conversations are special or unique to two individuals seems to somehow make it feel more intimate than Snapchat. It may be that Snapchat consists of a combination of individual snaps (sent to and from one person) and public snapping (posting for all one's followers to see), whereas most text message conversations take place privately between two individuals. Groups chat messages are

common, though, and future research should explore their contribute to perceived social support relative to one-on-one text conversations.

This highlights an important complication of studying modality effects in digital social media today. Most applications today allow for a range of expression: one can snap a friend just nothing but text, or send a photo via SMS texting. It is unlikely that users are only expressing themselves with one mode of communication per platform. Rather, users are probably gradually rotating through several social media that complement each other (Ruppel et al., 2017) in order to achieve whatever relational or emotional goals they have. This study has highlighted the power of private communication, be it with images or text (Snapchat and texting are likely a blend of both), in contributing to emotional well-being.

An additional component of texting is that, of all the social media listed, it is the only mode of communication that first requires an offline preexisting relationship. It is possible to “meet” someone on other social media; indeed, couples have gotten married that initially met on various platforms (Klein, 2014; A. Smith, 2016). On the other hand, one must have another individual’s cell number before sending a text message, and college students do not move to the texting phase until the relationship is past its infancy (Yang et al., 2014). Indeed, in this study supports this idea: all but twelve participants report texting with their strong tie, and on average strong ties were texted much more frequently than weak ties. The direct and private nature of texting afford a level of intimacy not usually found with other text-based communication, and the more people text, the less likely they are to be lonely.

Recall that the second set of hypotheses had to do with relational social media use. When thinking about how social media might contribute to or mitigate loneliness, it

is important to consider how individuals use social media to maintain existing relationships. It is through human relationships that we receive the social support that is vital for emotional health, and it is in the absence of perceived social support that loneliness creeps in and eventually festers.

In staving off loneliness, communication with even one strong tie (H4) might provide the necessary social support to keep an individual emotionally healthy. This study attempted to extend Media Multiplexity Theory (Haythornthwaite, 2002; Ledbetter, 2015) which posits that tie strength is related to number of media channels and frequency of communication. Specifically, strong ties communicate more frequently and over more channels than weak ties.

This study did confirm that individuals communicate more frequently with their strong tie than their weak tie. This is perhaps unsurprising but important to establish: as communication theories move into our digital age, scholars must continually test and extend them to ensure their validity holds up in a technological society that is likely much different than the one in which they were first conceived. Even in a digital age where there exists greater access to media and information than ever before, people are still communicating frequently with those individuals that are important to them.

Excluding romantic relationships, and the additional variability that comes with them—duration, seriousness, relational history, etc.—to focus only on platonic relationships as strong ties was a deliberate direction of this study. Many studies exist on the use of social media in romantic relationships (Baym et al., 2007; McEwan & Horn, 2016; Stafford, Canary, & Dainton, 2003; Utz et al., 2015), but fewer studies have examined their use in platonic friendships, particularly with a focus on modality effects.

Because participants were specifically asked to identify a strong tie that was not a romantic partner, these strong tie results should be understood independent of romantic feelings, which might have further clouded the relationship between participant, tie, media use, and loneliness. While this study did not control for whether the participant was in a romantic relationship, the results on the power of platonic friendship in mitigating loneliness have clear implications for individual emotional well-being.

Unlike what MMT would predict, this study did not confirm that individuals use more channels in communicating with their strong tie. As discussed in the limitations section, it is possible—indeed, it is likely—that this study did not include an exhaustive list of all communication media that college students use to talk to one another. It is often now the case that users can import friends or friend lists from one platform to another, particularly when a single account like Facebook is used to log in. Regardless, given the results here that, there is no significant difference in the number of social media used with one’s strong and weak tie—some conclusions may still be drawn. First, because media choices communicate our feelings about the relationships they maintain (Sitkin, Sim B., Kathleen M. Sutcliffe, 1992), then perhaps a few number of media channels, used properly, may be adequate to maintain a strong tie relationship. If those few channels used are considered valuable or intimate channels by the participants, then the channels themselves might be an additional source of bonding capital which strengthens the relationship.

For example, Facebook is unlikely to be a “special” platform reserved for strong tie communication, but Snapchat, because it is more specialized, is more likely to be used between close friends to share mundane moments of their day (Bayer, Ellison,

Schoenebeck, & Falk, 2016). Yet the simple scarcity of Snapchat interactions—maybe an individual has hundreds of friends on Facebook, but only follows ten accounts on Snapchat—makes them more valuable, and users would derive more pleasure and social support from them. Thus, in terms of intimacy, communication via a single strong tie platform like Snapchat may be equal or greater than communication on several weak tie platforms, particularly if the participants consider that platform to be suitable for offering one another emotional support (Haythornthwaite, 2002; Haythornthwaite, 2005). Moving forward, MMT will need to account for how radically different communication media are now compartmented to when the theory was first conceived.

Second, it is also possible that in an attention-deficit economy, people find one communication method that is efficient and then heavily utilize it in communicating with their strong tie. In other words, they make up for lack of number of media channels by increasing communication frequency. So, instead of texting, tweeting, Facebook messaging, and Snapchatting one's best friend throughout the day, one simply texts and Snapchats them *a lot*. The previous part of H4 confirmed that participants do indeed communicate more frequently with their strong tie, so this increased frequency may be adequate for relational maintenance, rendering multiple channels unnecessary.

The second research question asked whether any aspects of the weak tie relationship might contribute to a decrease in loneliness. Clearly strong ties can offer emotional support, but can individuals gain any similar support from a weak tie, even if to a lesser degree? While no significant association was found for media used, relational closeness, and communication frequency, this study did find that relational parity did influence a decrease in loneliness. Relational parity is the measure to which a relationship

is perceived as equal—it was the average of two items that assessed if someone in the relationship was “getting a better deal” or “putting in more effort” than the other. Even with a weak tie, greater parity predicted decreased loneliness. It may be that disparity in a weak tie relationship feels like an emotional drain on an individual (if he or she is putting in more effort) or leads to guilt (if he or she is getting the better deal), either of which may contribute to feelings of loneliness. On the other hand, if a weak tie is perceived to be roughly equal, perhaps the relationship is deemed satisfactory enough to mitigate loneliness just a small amount, even though significant social support is not being offered. The implication here is that if people can choose acquaintances with whom they think they can maintain an even relationship, then even if those acquaintances never progress to strong friends they may still contribute to perceived social support and mitigate loneliness.

Interestingly, this result—relational parity predicting a decrease in loneliness—was not found with participants’ strong tie. This lack of finding may indicate that relational parity is not as important for strong ties. Perhaps when we have a good deal of bonding capital with someone else and feel a kinship with them, we don’t mind putting in extra effort for a while or emotionally supporting them when they feel down. Perhaps if the tie is strong enough, people don’t even keep track of how much time or effort they invest, and investing in one’s close friend is an emotional reward in and of itself. Or perhaps we unconsciously believe they will reciprocate at some time in the future since the tie is strong and likely to endure. This would actually be consistent with MMT that strong ties are more resilient and can thus endure changes (such as loss of media channel

or temporary silence) that would otherwise eliminate a weak tie (Baym, Zhang, Kunkel, Ledbetter, & Lin, 2007; Haythornthwaite, 2002; Ledbetter, 2015).

The final hypotheses of the relational media use section found that an increase in Tie Differential Media Score (TDMS), the measure of the difference in communication frequency with one's strong and weak ties, predicted a decrease in loneliness. One of the core concepts in this study is the idea that media use and loneliness are inextricably woven together in a cycle of cause and effect. This is the core tenet of the state of phoneliness: loneliness affects how people use social media, and that media use in turn influences their loneliness.

This hypothesis (H5) was an attempt to explicate part of that relationship: the idea that lonely people might be lonely in part because they are treating their strong ties just like their weak ties. In other words, they are not engaging their strong ties in a way that derives any perceived social support. Perhaps because of emotional fatigue or depression, or because chronic loneliness has lowered relational expectations, they simply treat all relationships in weak-tie manner, as though there is no social support or intimacy to be gained.

So, as this result demonstrates, there is indeed a significant relationship between TDMS and loneliness. The more one treats close friends like acquaintances (in terms of communication frequency), the lonelier one is likely to be. A "phonely" individual would use their mobile device to communicate every tie like it was a weak tie. However, if one is communicating with strong ties much more frequently than with weak ties, then one is less likely to be lonely. This is congruent with H4 wherein strong tie communication frequency (but not number of channels) was found to influence loneliness. Together, the

results in this section illuminate a picture of close friends communicating regularly as a successful way to give and receive social support and contribute to one's emotional well-being.

Perceived Intimacy and Media Use

The hypotheses in this section build on the previous one in that, similar to the mutual feedback loop of loneliness and relational media use, loneliness is also likely to have a negative feedback loop with expectations or perceptions of the media themselves. Recall Cacioppo's (Cacioppo & Ernst, 2000; Cacioppo & Hawkley, 2003; Cacioppo & Patrick, 2008) definition of loneliness as the emotional distress that arises from the difference between *ideal* social support and *perceived* social support. If an individual—perhaps an extreme introvert—desires little social support, then having low actual social support would not be a problem because the difference between the two (ideal/actual) is small.

On the other hand, an individual who is more extroverted is likely to desire higher levels of social support, in which case having low actual social support would be a problem. For this extrovert, the discrepancy between ideal and actual support is large and thus so is the emotional distress which results in loneliness. One's ideal or desired levels of social support are likely the result of complex factors beyond the scope of this study such as personality, adult attachment styles (Brennan, Clark, & Shaver, 1998) and the influence of mass media including portrayals of the lives of college students and use of social media.

However, this study did examine was the other half of the loneliness equation: how much perceived social support are individuals getting from their relationships and

media use? This is where the negative feedback loops have harmful potential. If a lonely individual is using social media with the expectation they will increase social support, but no such increase is perceived, then he or she is likely to lose faith in social media, perhaps concluding that they cannot actually connect humans in a meaningful way. Yet as this study has shown, that is not the case: social media do have the potential to connect individuals in an emotionally meaningful way.

Even though some people benefit from social media, an individual's belief that social media are not intimate would likely result in little benefit for him or her. The support of H6 (loneliness predicts decreased in perceived intimacy of social media) confirms this power of belief. People who use social media and feel meaningful connection with others (low loneliness) perceive that social media are intimate and thus a good way to stay in touch; people who use social media and do not feel meaningful connection with others (high loneliness) perceive that social media are not intimate and perhaps part of their problem. They would then be less likely to use social media which, as this study has shown, do have the potential to ameliorate loneliness. This may be similar to the feedback loops scholars have found with avoidance of social contact and loneliness (Cacioppo, 1998) perception of social threats (Rokach & Neto, 2000). Once someone believes social media are not a good way to connect with others, it appears as though that belief becomes a self-fulfilling prophecy. The cycle of loneliness continues.

H7 further explicated this relationship and the complete mediation detected demonstrates that perceived intimacy is a better predictor of loneliness than social media use itself. Initially, increased frequency of social media use significantly predicts an increase in perceived intimacy, and each of those significantly predicts a decrease in

loneliness. However, as mediation confirmed, once perceived intimacy was entered as a mediator (M) between social media use (X) and loneliness (Y), social media use no longer had a direct effect on loneliness. Instead, social media use now only has an indirect effect on loneliness through perceived intimacy. Specifically, the more frequently one uses social media, the more intimacy one perceives while using it, which in turn reduces loneliness. Conversely, when social media use is rare, it is also unlikely to be perceived as intimate, which in turn does not offer any emotional support to stave off loneliness.

The power of perception here is paramount and contribute to what this study has dubbed phoneliness. Loneliness is already linked to many problematic factors—such as inhibition in self-disclosure (Solano et al., 1982) and hindering development of social skills (Jones et al., 1982)—that inhibit one’s ability to fight it. Social media use in the form of phoneliness should be explored as an additional entry into this cluster of sociological factors tethered to emotional well-being that make loneliness a difficult cage from which to break free.

Social media use in the context of phoneliness may also be considered a modern behavioral coping strategy (Rubenstein & Shaver, 1982). Many activities such as journaling or listening to music now occur on some kind of social platform (e.g., Wordpress or Spotify) where one’s content or playlists are increasingly other-directed (Riesman et al., 2001) in that other users’ preferences, playlists, etc. are displayed, possibly as a “trending now” or “what your friends are listening to” part of the user interface. In other words, in an effort to reflect on the experience of loneliness (Arpin et al., 2015) or just think about life in general, it may now be difficult to use a digital

platform in a way that is truly isolated from outside influences. Future research should examine the role of isolation versus these “secondary” social (as opposed to primarily social) media in contributing to emotional well-being.

Personality and Social Media

The final set of hypotheses revolved around personality traits and social media use. Examining individual traits is a way to probe deeper into the relationships between social media use and loneliness and establish a more nuanced approach than a simple A leads to B relationship for all people.

First, this study confirmed existing literature on the relationships between loneliness and personality (Perlman & Peplau, 1981; Perlman et al., 1981), including loneliness being associated with introversion (DW Russell, 1996), higher anxiety (Jones et al., 1982), and extraversion, conscientiousness, and agreeableness (Cacioppo & Ernst, 2000). While these results are important because they confirmed the validity of the measures used in this study, particularly the loneliness (Russell, 1996) and personality (B Rammstedt & John, 2007) scales, they are also somewhat intuitive. One would expect that extroverts would be less lonely, that lonely people would be more neurotic, etc. In fact, loneliness was significantly associated with every personality trait except openness.

What is not intuitive, however, is the relationship between these personality traits and social media use. H8 was not supported, and so neuroticism appears to have no relationship with Facebook use. It was suggested high levels of neuroticism, which measures how much control one has over emotions, would lead to increased Facebook use since it is such a broad platform that allows one to keep tabs on other people, news, and trending stories. The lack of support for this hypothesis indicates that highly neurotic

participants do not necessarily use social media more in a (perhaps unconscious) attempt to calm their nerves. There may be other coping mechanisms for neurotic behavior, but this study indicates that increasing social media use is not one of them. This is congruent with research indicating no association between neuroticism and Facebook use (Nithya & Julius, 2007) but contradicts more recent work that has linked the two (Ryan & Xenos, 2011). Additionally, the present study found no link between neuroticism and use of Snapchat, Instagram, Twitter, or texting.

The results of H9 (extraversion, openness, and agreeableness all predict increased social media use) were particularly interesting. Extraversion was found to be a positive predictor of social use, which supported the hypothesis. Extraversion has been linked to texting (Correa et al., 2010) and extroverts have more social media connections (Hughes et al., 2012), so it is unsurprising that extraversion would predict increased social media use. Extraverts are likely to have more relationships offline and would thus need to spend more time maintaining them online.

Agreeableness, a general measure of how friendly or easygoing people are, was not a significant predictor of social media use. It was hypothesized that, because agreeable individuals are sympathetic, warm, and kind (Costa & McCrae, 1992), that this “niceness” might translate into more social media use. This study’s data did not support this idea, which leads to several possible conclusions. Perhaps being agreeable is too general, and not a personality trait as explicitly related to social media use as is extraversion. Someone could be very agreeable and be a luddite, or be equally agreeable and use social media ten hours every day. It may be the case that being nice on social media doesn’t necessarily mean frequent communication, but perhaps could entail

sending a kind message every now and then or just generally being encouraging with others.

The only platform with which agreeableness was associated was texting ($r = .143$, $p = .007$), which perhaps indicates a polite or respectful approach to maintaining relationships. While expectations vary by age and relationship, it is generally considered good form to respond to a text message within a relatively short time frame. Perhaps agreeable people are texting a lot as a form of relational maintenance (Eden & Veksler, 2016; Ledbetter, 2013) that reduces uncertainty and keeps the relationship moving forward.

Openness was found to influence social media use but in the opposite direction as predicted. This study found openness to be a negative predictor of social media use. Because open people have broad interests and generally seek novel experiences (McCrae & Costa, 1987), perhaps it is the case that they are too busy doing other activities and thus have less time for social media. Recall that openness is positively associated with extraversion and conscientiousness, so if a thoughtful person with many social ties is constantly seeking out new experiences, it is not difficult to see how he or she would probably spend less time on a mobile device and more time engaging others and the world.

This finding contradicts previous work that linked openness with instant messaging (Correa et al., 2010) and Facebook use (Amichai-Hamburger & Vinitzky, 2010). Maybe Hughes et al. (2012) suggestion that openness correlates with social media use is not wrong, but requires more nuance: perhaps open individuals are more likely to

be early adopters and use novel platforms, but then taper off their use once those platforms become popular or routine.

H10 was not supported, indicating no link between conscientiousness and social media use. While it was predicted that the trait would predict decreased social media use, it appears that disciplined, thorough and orderly people might use social media just as much as everyone else. While this finding contradicts earlier research that found conscientious individuals were reluctant to use social media (Butt & Phillips, 2008; Ryan & Xenos, 2011), perhaps the development and ubiquity of social media platforms in the years between that work and this study has led to a normalization where they are no longer considered novel distractions but simply a part of everyday life.

This may be linked to the concept of the hedonic treadmill (Diener, Lucas, & Scollon, 2006; Mancini, Bonanno, & Clark, 2011) wherein, given enough time, individuals return to a base level of subjective well-being even after positive or negative life-altering events. When social media were novel—recall the platforms examined in this study were created in the years from 2006 to 2010—perhaps conscientious people would have used them more sparingly, since they would have been cognizant of the platforms’ impact on their lives. In 2017, however, these platforms are no longer new, and might be considered a normal part of everyday life by college students. Even if a new mobile device or platform makes a hedonic or emotional splash upon impacting an individual’s life, over time it may move into the role of utility.

Finally, the third research question (RQ3) asked whether any personality traits would moderate the effect of loneliness on social media use. It has been established that lonely people use fewer social media and check them less frequently than those with

adequate social support. It has not yet been established how personality traits might interact with or otherwise affect the relationship between loneliness and social media use.

This study did not find any significant moderation with any of the personality traits, however openness was the closest to significance ($p = .080$). As openness increases, the negative affect loneliness has on social media uses increases as well, but the result was only significant when openness was at mean or higher levels. It may be that as loneliness increases, the trait of openness flares up and drives one on a frantic quest for novel or interesting experiences that might provide some semblance of social support. This causes the individual to seek even more offline activities, which in turn leaves less time for social media use which, as this study has demonstrated, does have some ability to alleviate loneliness. Finally, the following is a summary of all hypotheses and findings:

	<i>Hypotheses & Research Questions</i>	<i>Conclusion</i>
RQ1	Is loneliness associated with number of social media used?	Yes
H1	Frequent texting corresponds with decreased loneliness	Yes
H2	Instagram users are less lonely than non-users	Yes
H3	Snapchat users are less lonely than non-users	Yes
H4	With a strong tie, communication frequency and number of media used both predict decreased loneliness	Partially (only communication frequency)
RQ2	Do any aspects of relationships with weak tie predict decrease in loneliness?	Partially (only relational parity)
H5	TDMS (the measure of difference in communication frequency with strong and weak tie) predicts decreased loneliness	Yes

H6	Loneliness predicts decrease in perceived intimacy of social media	Yes
H7	Perceived intimacy mediates effects of social media use on loneliness	Yes (complete mediation)
H8	Neuroticism predicts increased Facebook use	No
H9	Extraversion, openness, and agreeableness all predict increased social media use	Partial (extraversion predicts increase; openness predicts <i>decrease</i>)
H10	Conscientiousness predicts decreased social media use	No
RQ3	Do any personality traits moderate effect of loneliness on social media use?	Only openness moderates, but only at mean and high levels

While not all of these relationships were decisively resolved in this study, there are enough results to support the claim that personality traits have complex relationships with emotional well-being and social media use. Loneliness may be a negative feedback state where personality and social media use influence each other to keep the user from receiving any social support. The tools to fight loneliness are on our mobile devices, but for those who are suffering from loneliness, those tools may remain either unacknowledged or misused. The potential for social media to contribute to individual well-being and social cohesion is great and these areas warrant further study. This chapter has discussed the findings of this study in light of current literature, and the next chapter concludes with the limitations of this study and directions for future research.

CHAPTER VI

LIMITATIONS AND FUTURE RESEARCH

All human beings are alone. No other person will completely feel like we do, think like we do, act like we do. Each of us is unique, and our aloneness is the other side of our uniqueness. The question is whether we let our aloneness become loneliness or whether we allow it to lead us into solitude. Loneliness is painful; solitude is peaceful. Loneliness makes us cling to others in desperation; solitude allows us to respect others in their uniqueness and create community.

-Henri Nouwen

The purpose of this study was to explore the relationships between social media use, personality traits and loneliness. Results indicate that there is some emotional benefit to be gained from using social media, but those benefits have limits and conditions. The limits appear to be that most social media have a point of diminishing returns, after which no more social support is gained. The conditions of the benefits of social media appear to be that one must perceive them to be intimate to receive significant social support. The previous chapter discussed these findings in the context of current literature, and this final chapter explains the limitations of this study and outlines avenues for future research.

First, because these data were collected from a survey, certain limitations exist. Social science researchers have noted potential measurement problems with self-reported data regarding usage and frequency of media engagement (Baranowski, 1988; Butt & Phillips, 2008; Nadalin, Bentvelsen, & Kreiger, 2004; Sallis, Buono, & Roby, 1993; Sobell, Maisto, Sobell, & Cooper, 1979). Participants simply may not be aware of how much time they spend using various media. This failure to accurately account for one's own activity may be due to failures of self-monitoring or self-regulation (Koriat, 2016), or perhaps a blind spot in one's self-perception (Gallrein, Weßels, Carlson, & Leising, 2016) leads to thinking along the lines of, "I'm not one of those people who is addicted to

their phones...” However, memory decay and lack of motivation (Baranowski, 1988) mean that even individuals who desire honesty and authenticity may not always be able to accurately self-report their own activity.

Of course with using any brief measure such as the BFI-10 item personality measure used in this study (Beatrice Rammstedt & John, 2007), there is a risk of increasing the likelihood of Type I or Type II errors (Credé & Harms, 2012), because a single question answered incorrectly is responsible for a greater variance. With greater funding, or if this study was examining older adults, the incentive might be present where longer and more reliable measures might be administered.

Future research on social media use should seek methodology that accurately measures the frequency and duration of individual social media use, and compare those findings with self-reported data. Such findings might benefit not only media effects research but all social sciences that rely upon self-reported data.

Social Media and Loneliness

Future studies should find a point of diminishing returns for social media use, both in terms of platforms used and frequency of use. This study found participants who used all four (five including texting) platforms were less lonely than participants who only used one or two. At what point does this trend discontinue? If an individual is juggling between, say, using ten or fifteen programs every day, can those platforms still contribute to perceived social support?

Similarly, scholars should construct a rough equivalency of social media use in terms of frequency and duration. Not all social media are created equal. If texting decreases loneliness, how many text messages of what length does it take to make a

significant contribution to perceived social support? And how many text messages does it take to equal a five-second snap from one's friend? Also, as previously mentioned, group chat messages may be less intimate (because they are less private) and thus offer less social support. Future research should confirm these relationships and seek to determine how they might influence individual well-being.

One important finding of this study was the power of privacy in conveying social support. There is great complexity and thus potential in this area: in terms of affordances, each social media application examined in this study lets users send a message to another single user or to a group. Additionally, except for texting, the other four social media let users post messages to a "public" feed of some sort, either to pre-approved list of followers or to anyone on the internet. How do these layers of privacy—private, semi-private, semi-public, and public—affect the messages we send and the amount of social support we receive from them? How is the exact same message—say, a heart emoji with an inspirational friendship quote—differ if sent directly to the friend via text, via Snapchat, or posted publically on Facebook? Future research should consider these questions.

Relational Media Use

This study examined five common social media platforms, but there are more specialized social media designed for relational use. For example, Voxer is a walkie-talkie style voice app where a recorded message can be sent directly to another person. There are also dozens of apps designed for couples—such as Avocado and Fix-a-Fight—that could have a substantial impact on one's emotional state, particularly if the relationship is serious. Other apps like WhatsApp and Telegram specialize in forms of

message delivery and all come with various icons, emojis, functions, etc. that might influence social connectivity.

One important finding of this study that contradicts a core MMT tenet is that strong ties do not necessarily use more media than weak ties. This should be further explicated, by addressing specifically how good friends maintain their relationship in today's social media landscape. Is it possible that the dynamic of strong ties is changing given the glut of communication technologies available? The factors that have traditionally defined strong ties are contact frequency, duration of association, intimacy, reciprocity, and kinship (Haythornthwaite, 2002; Marsden & Campbell, 1984). Yet perhaps the power, range, and multi-modal nature of social media today means that one or two platforms can do what it took five or six to do in the past.

Another interesting finding was that for one's strong tie, relational disparity did not directly influence loneliness. It seems that, when one is invested in a close relationship, one does not keep track of (or at least does not mind) the times when the relationship is uneven. Future studies should explore how and when relational parity might be important for consequential social support, and how media use is affected during those times.

Weak tie relationships should also be explored for their emotional support potential. This study found that weak tie relational parity was associated with reduced loneliness. What is it about disparity with people who are only acquaintances that makes us feel lonely? Is it guilt over not being closer, anxiety of relational uncertainty, or frustration over some other relational aspect that makes us feel alone? Most people have

far more weak ties than strong, so if research could illuminate ways to get more out of our weak tie relationships, the social benefit would be great.

Perceived Intimacy and Social Media

Results of this study found strong effects regarding the power of perceived intimacy on loneliness and social media use. However, the construct of perceived intimacy was uniform across all platforms studied. Each social media platform has a unique function and may be used for a variety of reasons such as killing time, seeking information, and maintaining relationships (E. Katz, Blumler, & Gurevitch, 1973; S. S. Sundar & Limperos, 2013; Wang, Tchernev, & Solloway, 2012). Future research should examine how media choice is affected when individuals are deliberately seeking gratifications related to intimacy, such as self-disclosure (Ledbetter & Mazer, 2010), deepening one's romantic relationship (Stafford et al., 2003), or deciding when to call versus text one's friend (Hall & Baym, 2012).

Recall the definition of loneliness that relies upon two constructs: perceived social support and ideal social support. While this study primarily examined the former, media psychology scholars should explore what elements factor into one's ideal of social support. What influences our social expectations? Surely personality and lifestyle have some influence, but how do social media contribute to our friendship ideals? This study searched for ways in which people can bump up their levels of perceived social support, even in small increments.

However, if loneliness is the emotional pain that results from the discrepancy between this perceived social support and *ideal* social support, then scholars need to address what affects their friends (low ideal), does that mean they are less likely to be

lonely? Conversely, if someone has romantic notions about friendship and expects several extremely close relationships to last a whole lifetime (high ideal), it that likely to lead to greater loneliness?

Finally, this study found that synchronicity is not as important as intimacy when it comes to loneliness and social media. How is it that a lean medium like text, which provides very of the cues present in FtF interaction, can be perceived as so intimate? When used in relational maintenance, what other rich media complement texting, and why aren't they used more frequently? The answers may lie within the paradox of media richness (Robert & Dennis, 2005): because rich media require more attention and effort they reduce our ability to process information. Because texting is a lean platform, it requires little cognitive effort and can be utilized almost anywhere at any time. So perhaps texting hits a sweet spot of intimacy: it is lean enough to be undertaken anywhere with little effort, but it is versatile and direct enough to still accomplish whatever goal (coordination, information seeking, etc.) one has in mind. Future research should explore these paradoxes that surround social media use.

Conclusion

Are social media good for us or not (Wallace, 2014)? This subject has come up in countless discussions amongst journalists, comedians, fictional characters in TV and film, popular songs and podcasts, and even and especially with our friends and family. It seems like every week the popular press publishes are article either extolling the virtues of social media (Agrawal, 2016; McSpadden, 2015) or lamenting their vices (Peluchette & Karl, 2009; Transforming Mental Health, 2017). The question of social media as helpful or harmful is typically asked in response to the epidemic of loneliness that plagues highly

connected technological societies. This study attempted to answer a simple question: in terms of emotional well-being, are social media good for us? The overall findings of this research offer a simple answer: yes.

The answer is not really that simple, though, and social media are becoming as variegated and powerful as the people who use them. How we use social media may just be an extension of our offline selves into the digital realm. Extroverts spend more time around people in the “real world”, so it makes sense they would spend more time communicating with people in the digital world. Yet, as this study found, some of our stable, offline personality traits do not have clear effects on our use of digital media. Of course, as technology becomes more intertwined into our everyday routines and the Internet of Things becomes a reality, the distinctions between offline/online and real self/digital self are becoming increasingly blurry.

What this study makes clear, however, is that there is something about social media that is real enough to the people that use them to have a meaningful impact on their emotional well-being. People who use more social media are less lonely. People who communicate frequently with their close ties are less lonely. People who use social media more often are more likely to benefit from the intimate connection it offers to others, which makes them less lonely. As social creatures, we humans need this connection to others, and there are physical dangers to being emotionally unhealthy (Cacioppo & Patrick, 2008; Heinrich & Gullone, 2006; Olien, 2013; Peplau, 1982). Mobile devices may carry unspoken promises of unlimited connectivity to others and the world, but if we misuse them, those promises remain unfulfilled and we could get stuck in phoneliness. Social media are offering us more social connectivity than ever before,

and we need to continue to seek out the best ways to benefit from their advantages while avoiding their potential dangers.

APPENDIX

SCALES

BFI 10-item personality

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

I see myself as:

1. ____ Extraverted, enthusiastic.
2. ____ Critical, quarrelsome.
3. ____ Dependable, self-disciplined.
4. ____ Anxious, easily upset.
5. ____ Open to new experiences, complex.
6. ____ Reserved, quiet.
7. ____ Sympathetic, warm.
8. ____ Disorganized, careless.
9. ____ Calm, emotionally stable.
10. ____ Conventional, uncreative.

TIPI scale scoring ("R" denotes reverse-scored items): Extraversion: 1, 6R; Agreeableness: 2R, 7; Conscientiousness: 3, 8R; Emotional Stability: 4R, 9; Openness to Experiences: 5, 10R.

UCLA loneliness scale

Statement	Never	Rarely	Sometimes	Often
*1. How often do you feel that you are "in tune" with the people around you?	1	2	3	4
2. How often do you feel that you lack companionship?	1	2	3	4
3. How often do you feel that there is no one you can turn to?	1	2	3	4
4. How often do you feel alone?	1	2	3	4
*5. How often do you feel part of a group of friends?	1	2	3	4
*6. How often do you feel that you have a lot in common with the people around you?	1	2	3	4
7. How often do you feel that you are no longer close to anyone?	1	2	3	4
8. How often do you feel that your interests and ideas are not shared by those around you?	1	2	3	4
*9. How often do you feel outgoing and friendly?	1	2	3	4
*10. How often do you feel close to people?	1	2	3	4
11. How often do you feel left out?	1	2	3	4
12. How often do you feel that your relationships with others are not meaningful?	1	2	3	4
13. How often do you feel that no one really knows you well?	1	2	3	4
14. How often do you feel isolated from others?	1	2	3	4
*15. How often do you feel you can find companionship when you want it?	1	2	3	4
*16. How often do you feel that there are people who really understand you?	1	2	3	4
17. How often do you feel shy?	1	2	3	4
18. How often do you feel that people are around you but not with you?	1	2	3	4
*19. How often do you feel that there are people you can talk to?	1	2	3	4
*20. How often do you feel that there are people you can turn to?	1	2	3	4

Tie definition

Directions (weak tie): For the next section of this survey, we want you to think of a friend or acquaintance with whom you communicate occasionally, but aren't particularly close. **This can be any person you would not also consider a romantic or sexual partner.**

Directions (strong tie): For the next section of this survey, we want you to think of a friend with whom you believe you have a strong, close relationship. **This can be any friend whom you would not also consider a romantic or sexual partner.**

1. What are the initials of this friend's name? _____
2. How old is this friend? _____
3. How long have you known this friend? _____
4. How would you describe your friendship with this person? (Circle one.)
 - 1 Casual friend
 - 2 Close friend
 - 3 Best friend

THIS SCALE ADOPTED FROM Taylor, S. H., & Ledbetter, A. M. (in press). Extending media multiplexity theory to the extended family: Communication satisfaction and tie strength as moderators of violations of media use expectations. *New Media & Society*.

Relational media use

Directions: Please indicate how often you communicate **with your friend** using each of the media listed below.

Never	Once a year	Once a month	Once per week	Several times per week	Once per day	Several times per day
0	1	2	3	4	5	6

1. Face to face	0	1	2	3	4	5	6
2. Phone call	0	1	2	3	4	5	6
3. E-mail	0	1	2	3	4	5	6
4. SMS texting (texting their phone)	0	1	2	3	4	5	6
5. Facebook	0	1	2	3	4	5	6
6. Twitter	0	1	2	3	4	5	6
7. Instagram	0	1	2	3	4	5	6
8. Snapchat	0	1	2	3	4	5	6

Relational Parity

Directions: Please answer the following questions:

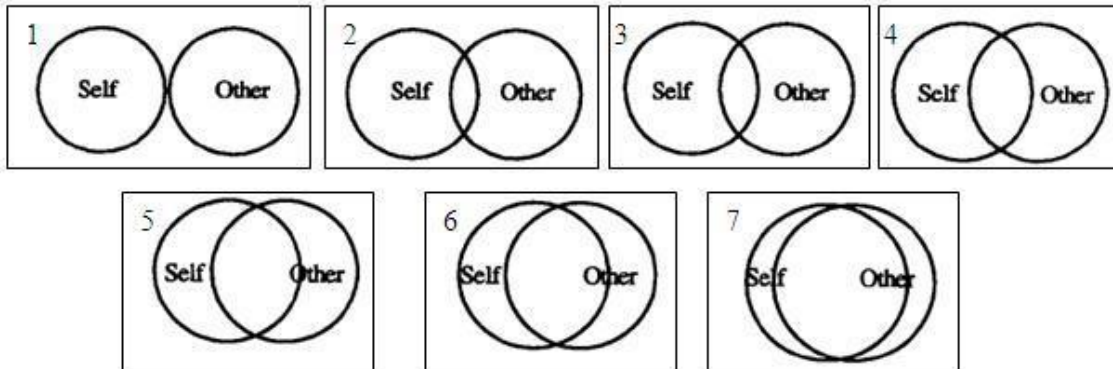
1. Considering how much you and your friend put into your friendship, and how much you and your friend get out of it: (circle one number below)

I am getting a much better deal than my friend.						My friend is getting a much better deal.
1	2	3	4	5	6	7

2. Consider all the times when your friendship has become unbalanced and one partner has contributed more for a time. When this happens, who is more likely to contribute more? (circle one number below)

My friend is much more likely to be the one to contribute more.						I am much more likely to be the one to contribute more.
1	2	3	4	5	6	7

Directions: Please choose the picture below which best describes your relationship. In the diagrams below, you are 'self' and the other person is 'other.'"



REFERENCES CITED

- Adams, T. (2016). John Cacioppo: “Loneliness is like an iceberg – it goes deeper than we can see” | Science | The Guardian. Retrieved April 25, 2017, from <https://www.theguardian.com/science/2016/feb/28/loneliness-is-like-an-iceberg-john-cacioppo-social-neuroscience-interview>
- Al Agrawal. (2016). It’s Not All Bad: The Social Good Of Social Media. Retrieved March 29, 2017, from <https://www.forbes.com/sites/ajagrawal/2016/03/18/its-not-all-bad-the-social-good-of-social-media/#67fd8a0c756f>
- Alhabash, S., & Ma, M. (2017). A Tale of Four Platforms: Motivations and Uses of Facebook, Twitter, Instagram, and Snapchat Among College Students? *Social Media + Society*, 3(1), 205630511769154. <http://doi.org/10.1177/2056305117691544>
- Alloway, T., Runac, R., Qureshi, M., & Kemp, G. (2014). Is Facebook Linked to Selfishness? Investigating the Relationships among Social Media Use, Empathy, and Narcissism. *Social Networking*, 3(3), 150–158. <http://doi.org/10.4236/sn.2014.33020>
- Amichai-Hamburger, Y., & Ben-Artzi, E. (2003). Loneliness and Internet use. *Computers in Human Behavior*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0747563202000146>
- Amichai-Hamburger, Y., & Vinitzky, G. (2010). Social network use and personality. *Computers in Human Behavior*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0747563210000580>
- Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behaviors*, 64, 287–293. <http://doi.org/10.1016/j.addbeh.2016.03.006>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63(4).
- Arpin, S., Mohr, C., & Brannan, D. (2015). Having Friends and Feeling Lonely A Daily Process Examination of Transient Loneliness, Socialization, and Drinking Behavior. *Personality and Social ...*. Retrieved from <http://psp.sagepub.com/content/early/2015/02/12/0146167215569722.abstract>
- Baranowski, T. (1988). Validity and Reliability of Self Report Measures of Physical Activity: An Information-Processing Perspective. *Research Quarterly for Exercise and Sport*, 59(4), 314–327. <http://doi.org/10.1080/02701367.1988.10609379>
- Bayer, J. B., Ellison, N. B., Schoenebeck, S. Y., & Falk, E. B. (2016). Sharing the small moments: ephemeral social interaction on Snapchat. *Information, Communication & Society*, 19(7), 956–977. <http://doi.org/10.1080/1369118X.2015.1084349>
- Baym, N. K., Zhang, Y. B., Kunkel, A., Ledbetter, A., & Lin, M.-C. (2007a). Relational

- quality and media use in interpersonal relationships. *New Media & Society*, 9(5), 735–752. <http://doi.org/10.1177/1461444807080339>
- Baym, N. K., Zhang, Y. B., Kunkel, A., Ledbetter, A., & Lin, M.-C. (2007b). Relational quality and media use in interpersonal relationships. *New Media & Society*, 9(5), 735–752. <http://doi.org/10.1177/1461444807080339>
- Baym, N., & Ledbetter, A. (2009). Tunes that bind? Predicting friendship strength in a music-based social network. *Information, Communication & Society*. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/13691180802635430>
- BBSnet. (n.d.). The History of IRC. Retrieved April 11, 2017, from <http://bbsnet.thebbs.org/administration/history.html>
- Bell, R., & Daly, J. (1985). Some communicator correlates of loneliness. *Southern Journal of Communication*. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/10417948509372627>
- Beres, D. (2016). The Facebook News Scandal Explained | The Huffington Post. Retrieved April 12, 2017, from http://www.huffingtonpost.com/entry/facebook-trending-news-curators_us_5730c2c8e4b096e9f092103c
- Berger, A. (2016). *Media and communication research methods: An introduction to qualitative and quantitative approaches* (fourth). Sage Publications. Retrieved from https://books.google.com/books?hl=en&lr=&id=5AEeBIPhr0EC&oi=fnd&pg=PR1&dq=media+and+communication+research+methods+berger&ots=D8eheC6gZz&sig=d9L88B2dkBtTKem3_WieDxAPhSw
- Błachnio, A., Przepiorka, A., Boruch, W., & Bałakier, E. (2016). Self-presentation styles, privacy, and loneliness as predictors of Facebook use in young people. *Personality and Individual Differences*, 94, 26–31. <http://doi.org/10.1016/j.paid.2015.12.051>
- Bourdieu, P., & Wacquant, L. (1992). *An invitation to reflexive sociology*. Retrieved from [https://books.google.com/books?hl=en&lr=&id=rs4fEHa0ijAC&oi=fnd&pg=PR7&dq=Bourdieu,+P.,+%26+Wacquant,+L.+\(1992\).+An+Invitation+to+Reflexive+Sociology.+Chicago:+University+of+Chicago+Press.&ots=dvM74GkTNJ&sig=VvtBlEiaKZh4rHbp_oMkWj3cFLs](https://books.google.com/books?hl=en&lr=&id=rs4fEHa0ijAC&oi=fnd&pg=PR7&dq=Bourdieu,+P.,+%26+Wacquant,+L.+(1992).+An+Invitation+to+Reflexive+Sociology.+Chicago:+University+of+Chicago+Press.&ots=dvM74GkTNJ&sig=VvtBlEiaKZh4rHbp_oMkWj3cFLs)
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). *Self-report measurement of adult attachment: An integrative overview*. Guilford Press. Retrieved from <http://psycnet.apa.org/psycinfo/1997-36873-002>
- Burke, K. (2016). 63 Texting Statistics That Answer All Your Questions. Retrieved April 13, 2017, from <https://www.textrequest.com/blog/texting-statistics-answer-questions/>
- Butt, S., & Phillips, J. (2008). Personality and self reported mobile phone use. *Computers in Human Behavior*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0747563207000295>
- Cacioppo, J. (1998). Autonomic, neuroendocrine, and immune responses to psychological stress: The reactivity hypothesis. *Annals of the New York Academy of Sciences*. Retrieved

- from <http://onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.1998.tb09605.x/full>
- Cacioppo, J., & Ernst, J. (2000). Lonely traits and concomitant physiological processes: the MacArthur social neuroscience studies. *International Journal of ...*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0167876099000495>
- Cacioppo, J., & Hawkley, L. (2003). Social isolation and health, with an emphasis on underlying mechanisms. *Perspectives in Biology and Medicine*. Retrieved from http://muse.jhu.edu/journals/perspectives_in_biology_and_medicine/v046/46.3xcacioppo.html
- Cacioppo, J., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection*. Retrieved from <https://books.google.com/books?hl=en&lr=&id=w8pWZ2AGI4MC&oi=fnd&pg=PR9&dq=cacioppo+and+patrick+2008&ots=IEcI4AqaZY&sig=NuoKcVsqjOzjiZO2cO15vjgKuKo>
- Cacioppo, J. T., & Patrick, W. (2008). *Loneliness: Human Nature and the Need for Social Connection*. W. W. Norton. Retrieved from <https://books.google.com/books?hl=en&lr=&id=w8pWZ2AGI4MC&pgis=1>
- Caplan, S. E. (2007). Relations among loneliness, social anxiety, and problematic Internet use. *Cyberpsychology & Behavior : The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, 10(2), 234–42. <http://doi.org/10.1089/cpb.2006.9963>
- Carlson, J., & George, J. (2004). Media appropriateness in the conduct and discovery of deceptive communication: The relative influence of richness and synchronicity. *Group Decision and Negotiation*. Retrieved from <http://link.springer.com/article/10.1023/B:GRUP.0000021841.01346.35>
- Carr, C. T., & Hayes, R. A. (2015). Social Media: Defining, Developing, and Divining. *Atlantic Journal of Communication*, 23(1), 46–65. <http://doi.org/10.1080/15456870.2015.972282>
- Cassidy, J., & Asher, S. (1992). Loneliness and peer relations in young children. *Child Development*. Retrieved from <http://www.jstor.org/stable/1131484>
- CHENG, H., & FURNHAM, A. (2002). Personality, peer relations, and self-confidence as predictors of happiness and loneliness. *Journal of Adolescence*, 25(3), 327–339. <http://doi.org/10.1006/jado.2002.0475>
- Clark, H., & Brennan, S. (1991). Grounding in communication. *Perspectives on Socially Shared Cognition*. Retrieved from <http://www.cs.cmu.edu/~illah/CLASSDOCS/Clark91.pdf>
- Cohen, J., Cohen, P., West, S., & Aiken, L. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*. Retrieved from [https://books.google.com/books?hl=en&lr=&id=gkalyqTMXNEC&oi=fnd&pg=PP1&dq=Cohen+%26+Cohen+\(1983\).+Applied+Multiple+Regression/Correlation+&ots=tQKQ05p7bj&sig=Xn08KXgz0cHDLVb96uWBbTr9zSQ](https://books.google.com/books?hl=en&lr=&id=gkalyqTMXNEC&oi=fnd&pg=PP1&dq=Cohen+%26+Cohen+(1983).+Applied+Multiple+Regression/Correlation+&ots=tQKQ05p7bj&sig=Xn08KXgz0cHDLVb96uWBbTr9zSQ)

- Cole, S. W., Hawkey, L. C., Arevalo, J. M., Sung, C. Y., Rose, R. M., & Cacioppo, J. T. (2007). Social regulation of gene expression in human leukocytes. *Genome Biology*, 8(9), R189. <http://doi.org/10.1186/gb-2007-8-9-r189>
- Connor, S. (2014). Extreme loneliness worse for health than obesity and can lead to an early grave, scientists say | Science | News | The Independent. Retrieved April 22, 2016, from <http://www.independent.co.uk/news/science/extreme-loneliness-worse-for-health-than-obesity-9132031.html>
- Cornwell, E. Y., & Waite, L. J. (2009). Social Disconnectedness, Perceived Isolation, and Health among Older Adults. *Journal of Health and Social Behavior*, 50(1), 31–48. <http://doi.org/10.1177/002214650905000103>
- Correa, T., Hinsley, A. W., & de Zúñiga, H. G. (2010). Who interacts on the Web?: The intersection of users' personality and social media use. *Computers in Human Behavior*, 26(2), 247–253. <http://doi.org/10.1016/j.chb.2009.09.003>
- Costa, P., & McCrae, R. (1992). Neo PI-R professional manual. Retrieved from https://scholar.google.com/scholar?q=Costa%2C+P.+T.%2C+%26+McCrae%2C+R.+R.+%281992%29.+NEO+PI-R+professional+manual.+Odessa%2C+Florida%3A+Psychological+Assessment+Resources.&btnG=&hl=en&as_sdt=0%2C38#0
- Credé, M., & Harms, P. (2012). An evaluation of the consequences of using short measures of the Big Five personality traits. *Journal of Personality* Retrieved from <http://psycnet.apa.org/journals/psp/102/4/874/>
- Cutrona, C. (1982). Transition to college: Loneliness and the process of social adjustment. *Loneliness: A Sourcebook of Current Theory, Research*, Retrieved from https://scholar.google.com/scholar?q=cutrona+1982&btnG=&hl=en&as_sdt=0%2C38#0
- Daft, R., & Lengel, R. (1986). Organizational information requirements, media richness and structural design. *Management Science*. Retrieved from <http://pubsonline.informs.org/doi/abs/10.1287/mnsc.32.5.554>
- Dennis, A. R., & Kinney, S. T. (1998). Testing Media Richness Theory in the New Media: The Effects of Cues, Feedback, and Task Equivocality. *Information Systems Research*. Retrieved from <http://pubsonline.informs.org/doi/abs/10.1287/isre.9.3.256>
- Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist*, 61(4), 305–314. <http://doi.org/10.1037/0003-066X.61.4.305>
- Dienlin, T., Masur, P. K., & Trepte, S. (2017). Reinforcement or Displacement? The Reciprocity of FtF, IM, and SNS Communication and Their Effects on Loneliness and Life Satisfaction. *Journal of Computer-Mediated Communication*, 22(2), 71–87. <http://doi.org/10.1111/jcc4.12183>
- Digital Trends Staff. (2016). The History of Social Media. Retrieved April 11, 2017,

from <http://www.digitaltrends.com/features/the-history-of-social-networking/>

Drouin, M., & Landgraff, C. (2012). Texting, sexting, and attachment in college students' romantic relationships. *Computers in Human Behavior*, 28(2), 444–449. <http://doi.org/10.1016/j.chb.2011.10.015>

Eden, J., & Veksler, A. E. (2016). Relational Maintenance in the Digital Age: Implicit Rules and Multiple Modalities. *Communication Quarterly*, 64(2), 119–144. <http://doi.org/10.1080/01463373.2015.1103279>

Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2016). Fear of missing out, need for touch, anxiety and depression are related to problematic smartphone use. *Computers in Human Behavior*, 63, 509–516. <http://doi.org/10.1016/j.chb.2016.05.079>

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The Benefits of Facebook “Friends:” Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*, 12(4), 1143–1168. <http://doi.org/10.1111/j.1083-6101.2007.00367.x>

Erickson, C. (2012). A Brief History of Text Messaging. Retrieved April 13, 2017, from <http://mashable.com/2012/09/21/text-messaging-history/#Msr32ATS1Zqh>

Frison, E., & Eggermont, S. (2015). Exploring the relationships between different types of Facebook use, perceived online social support, and adolescents' depressed mood. *Social Science Computer Review*. Retrieved from <http://ssc.sagepub.com/content/early/2015/01/21/0894439314567449.abstract>

Gallrein, A.-M. B., Weßels, N. M., Carlson, E. N., & Leising, D. (2016). I still cannot see it – A replication of blind spots in self-perception. *Journal of Research in Personality*, 60, 1–7. <http://doi.org/10.1016/j.jrp.2015.10.002>

Goldberg, L. (1990). An alternative “description of personality”: the big-five factor structure. *Journal of Personality and Social Psychology*. Retrieved from <http://psycnet.apa.org/psycinfo/1991-09869-001>

Gosling, S., Rentfrow, P., & Swann, W. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0092656603000461>

Granovetter, M. (1981). *The strength of weak ties: A network theory revisited*. Retrieved from <http://www.jstor.org/stable/pdf/202051.pdf>

Granovetter, M. (1982). Social structure and network analysis. *Social Structures* Retrieved from https://scholar.google.com/scholar?q=granovetter+1982&btnG=&hl=en&as_sdt=0%2C38#0

Granovetter, M. S. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78(6), 1360–1380. <http://doi.org/10.1086/225469>

Greenwood, Shannon; Perrin, Andrew; Duggan, M. (2016). Demographics of Social

Media Users in 2016 | Pew Research Center. Retrieved March 7, 2017, from <http://www.pewinternet.org/2016/11/11/social-media-update-2016/>

- Gunawardena, C. (1995). Social presence theory and implications for interaction and collaborative learning in computer conferences. *International Journal of Educational*. Retrieved from https://www.editlib.org/index.cfm/files/paper_15156.pdf?fuseaction=Reader.DownloadFullText&paper_id=15156
- Hall, J., & Baym, N. (2012). Calling and texting (too much): Mobile maintenance expectations,(over) dependence, entrapment, and friendship satisfaction. *New Media & Society*. Retrieved from <http://nms.sagepub.com/content/14/2/316.short>
- Hatfield, E., Traupmann, J., & Walster, W. (1979). Equity and extramarital sex. ... *An International Conference*. Retrieved from [https://books.google.com/books?hl=en&lr=&id=rfRFBQAAQBAJ&oi=fnd&pg=PA309&dq=Hatfield,+E.,+Traupmann,+J.,+%26+Walster,+W.+\(1979\).+Equity+and+extramarital+sex.+In+M.+Cook+%26+G.+Wilson+\(Eds.\),+Love+and+attraction:+An+international+conference+\(pp.+309-321\).+Oxford:+Pergamon.&ots=8thPi8QqZF&sig=i-09K3jrRJ9cu7xMYp5Lxw-VLjA](https://books.google.com/books?hl=en&lr=&id=rfRFBQAAQBAJ&oi=fnd&pg=PA309&dq=Hatfield,+E.,+Traupmann,+J.,+%26+Walster,+W.+(1979).+Equity+and+extramarital+sex.+In+M.+Cook+%26+G.+Wilson+(Eds.),+Love+and+attraction:+An+international+conference+(pp.+309-321).+Oxford:+Pergamon.&ots=8thPi8QqZF&sig=i-09K3jrRJ9cu7xMYp5Lxw-VLjA)
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium. *Communication Monographs*, 76(4), 408–420. <http://doi.org/10.1080/03637750903310360>
- Haythornthwaite, C. (2002). Strong, Weak, and Latent Ties and the Impact of New Media. *The Information Society*, 18(5), 385–401. <http://doi.org/10.1080/01972240290108195>
- Haythornthwaite, C. (2005). Social networks and Internet connectivity effects. *Information, Communication & Society*, 8(2), 125–147. <http://doi.org/10.1080/13691180500146185>
- Heinrich, L., & Gullone, E. (2006). The clinical significance of loneliness: A literature review. *Clinical Psychology Review*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0272735806000444>
- Hendricks, D. (2013). The Complete History of Social Media: Then And Now. Retrieved April 11, 2017, from <https://smallbiztrends.com/2013/05/the-complete-history-of-social-media-infographic.html>
- Hiskey, D. (2010). How the Word “Spam” Came to Mean “Junk Message.” Retrieved April 11, 2017, from <http://www.todayifoundout.com/index.php/2010/09/how-the-word-spam-came-to-mean-junk-message/>
- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and Social Isolation as Risk Factors for Mortality: A Meta-Analytic Review. *Perspectives on Psychological Science*, 10(2), 227–237. <http://doi.org/10.1177/1745691614568352>

- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: a meta-analytic review. *PLoS Medicine*, 7(7), e1000316. <http://doi.org/10.1371/journal.pmed.1000316>
- Horowitz, L., & French, R. de S. (1979). Interpersonal problems of people who describe themselves as lonely. *Journal of Consulting and ...* Retrieved from <http://psycnet.apa.org/journals/ccp/47/4/762/>
- Horrigan, J., & Duggan, M. (2015). *Home Broadband 2015*.
- Hrastinski, S. (2008). Asynchronous and synchronous e-learning. *Educause Quarterly*. Retrieved from <http://er.educause.edu/articles/2008/11/asynchronous-and-synchronous-elearning>
- Hughes, D. J., Rowe, M., Batey, M., & Lee, A. (2012). A tale of two sites: Twitter vs. Facebook and the personality predictors of social media usage. *Computers in Human Behavior*, 28(2), 561–569. <http://doi.org/10.1016/j.chb.2011.11.001>
- IJsselsteijn, W., Baren, J. van, & Lanen, F. van. (2003). Staying in touch: Social presence and connectedness through synchronous and asynchronous communication media. *Human-Computer Interaction: ...* Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.137.3313&rep=rep1&type=pdf>
- Jin, B., & Park, N. (2010). In-person contact begets calling and texting: Interpersonal motives for cell phone use, face-to-face interaction, and loneliness. *Cyberpsychology, Behavior, and Social ...* Retrieved from <http://online.liebertpub.com/doi/abs/10.1089/cyber.2009.0314>
- John, O., Donahue, E., & Kentle, R. (1991). 'The Big Five. *Inventory—version 4a and*. Retrieved from http://thenetworktufh.org/wp-content/uploads/2015/10/Newsletter2004-02_0.pdf#page=25
- Jones, W., Hobbs, S., & Hockenbury, D. (1982). Loneliness and social skill deficits. *Journal of Personality and ...* Retrieved from <http://psycnet.apa.org/journals/psp/42/4/682/>
- Katz, E., Blumler, J., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly*. Retrieved from <http://www.jstor.org/stable/2747854>
- Katz, J., & Aakhus, M. (2002). *Perpetual contact: Mobile communication, private talk, public performance*. Retrieved from <https://books.google.com/books?hl=en&lr=&id=Wt5AsHEgUh0C&oi=fnd&pg=PR9&dq=katz+aakhus+2002&ots=YT2s1hNygG&sig=TIiPOWnJzmtOWuG0ciMcNAbuPg>
- Keating, R. T., Hendy, H. M., & Can, S. H. (2016). Demographic and psychosocial variables associated with good and bad perceptions of social media use. *Computers in Human Behavior*, 57, 93–98. <http://doi.org/10.1016/j.chb.2015.12.002>
- Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the cause and the effect of problematic Internet use: the relationship between Internet use and psychological

well-being. *Cyberpsychology & Behavior : The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, 12(4), 451–5.
<http://doi.org/10.1089/cpb.2008.0327>

- kircher, M. (2016). Top apps for college students - Business Insider. Retrieved April 14, 2017, from <http://www.businessinsider.com/top-apps-for-college-students-2016-3/#14-shazam-lets-you-use-your-phone-to-identify-any-song-thats-playing-if-youre-an-iphone-user-you-can-skip-this-one-siri-is-already-shazam-enabled-to-identify-music-3>
- Klein, K. (2014). These Picture-Perfect Couples Found Love On Instagram | The Huffington Post. Retrieved April 8, 2017, from http://www.huffingtonpost.com/2014/02/23/love-on-instagram_n_4784605.html
- Koriat, A. (2016). Processes in Self-monitoring and Self-regulation. *The Wiley Blackwell Handbook of Judgment and ...*. Retrieved from <https://books.google.com/books?hl=en&lr=&id=XwjsCgAAQBAJ&oi=fnd&pg=PA356&dq=self-monitoring+time&ots=ZF26J4jb7B&sig=jyEGv8aTJjGIUdF49RNWC9FOiGU>
- Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., ... Ybarra, O. (2013). Facebook Use Predicts Declines in Subjective Well-Being in Young Adults. *PLoS ONE*, 8(8), e69841. <http://doi.org/10.1371/journal.pone.0069841>
- Krupnikov, Y., & Levine, A. S. (2014). Cross-Sample Comparisons and External Validity. *Journal of Experimental Political Science*, 1, 59–80.
<http://doi.org/10.1017/xps.2014.7>
- Larose, R., Lin, C. A., & Eastin, M. S. (2009). Unregulated Internet Usage : Addiction , Habit , or Deficient Self-Regulation ?, (March 2014), 37–41.
<http://doi.org/10.1207/S1532785XMEP0503>
- Launer, L. J., Wind, A. W., & Deeg, D. J. H. (1994). Nonresponse Pattern and Bias in a Community-based Cross-sectional Study of Cognitive Functioning among the Elderly. *Am. J. Epidemiol.*, 139(8), 803–812. Retrieved from <http://aje.oxfordjournals.org/content/139/8/803.short>
- Ledbetter. (2015). Media multiplexity theory: Technology use and interpersonal tie strength. In D. O. B. & P. Schrodt (Ed.), *Engaging Theories in Interpersonal Communication (2nd ed.)* (2nd Editio, pp. 357–370). Thousand Oaks, CA: Sage.
- Ledbetter, A. (2009). Patterns of media use and multiplexity: Associations with sex, geographic distance and friendship interdependence. *New Media & Society*. Retrieved from <http://nms.sagepub.com/content/11/7/1187.short>
- Ledbetter, A. (2010). Content-and medium-specific decomposition of friendship relational maintenance: Integrating equity and media multiplexity approaches. *Journal of Social and Personal Relationships*. Retrieved from <http://spr.sagepub.com/content/27/7/938.short>
- Ledbetter, A. (2013). Comparing equity and self-expansion theory approaches to

relational maintenance. *Personal ...* Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1475-6811.2012.01395.x/full>

- LEDBETTER, A. M., STASSEN-FERRARA, H. M., & DOWD, M. M. (2013). Comparing equity and self-expansion theory approaches to relational maintenance. *Personal Relationships*, 20(1), 38–51. <http://doi.org/10.1111/j.1475-6811.2012.01395.x>
- Ledbetter, A., & Mazer, J. (2010). Attitudes toward online social connection and self-disclosure as predictors of Facebook communication and relational closeness. *Communication ...* Retrieved from <http://crx.sagepub.com/content/early/2010/09/09/0093650210365537.abstract>
- Ledbetter, A., & Mazer, J. (2013). Do online communication attitudes mitigate the association between Facebook use and relational interdependence? An extension of media multiplexity theory. *New Media & Society*. Retrieved from <http://nms.sagepub.com/content/early/2013/07/03/1461444813495159.abstract>
- Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social Media & Mobile Internet Use among Teens and Young Adults. Millennials. *Pew Internet & American Life Project*. Retrieved from <http://eric.ed.gov/?id=ED525056>
- Lepp, A., Barkley, J. E., & Karpinski, A. C. (2014). The relationship between cell phone use, academic performance, anxiety, and Satisfaction with Life in college students. *Computers in Human Behavior*, 31, 343–350. <http://doi.org/10.1016/j.chb.2013.10.049>
- Ling, R., & Yttri, B. (2002). 10 Hyper--coordination via mobile phones in Norway. *Perpetual Contact: Mobile Communication, Private ...* Retrieved from <https://books.google.com/books?hl=en&lr=&id=Wt5AsHEgUh0C&oi=fnd&pg=PA139&dq=Ling+and+Yttri,+2002&ots=YT2s1hOpjJ&sig=e3kTRIfkAUPrw8NsPjtr2w18QpY>
- Ma, X., Hancock, J., & Naaman, M. (2016). Anonymity, Intimacy and Self-Disclosure in Social Media. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (pp. 3857–3869). New York, New York, USA: ACM Press. <http://doi.org/10.1145/2858036.2858414>
- Malik, A., Dhir, A., & Nieminen, M. (2016). Uses and Gratifications of digital photo sharing on Facebook. *Telematics and Informatics*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0736585315000696>
- Mancini, A. D., Bonanno, G. A., & Clark, A. E. (2011). Stepping Off the Hedonic Treadmill. *Journal of Individual Differences*, 32(3), 144–152. <http://doi.org/10.1027/1614-0001/a000047>
- Marsden, P., & Campbell, K. (1984). Measuring tie strength. *Social Forces*. Retrieved from <http://sf.oxfordjournals.org/content/63/2/482.short>
- Matook, S., Cummings, J., & Bala, H. (2015). Are You Feeling Lonely? The Impact of Relationship Characteristics and Online Social Network Features on Loneliness.

- Journal of Management* Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/07421222.2014.1001282>
- McCrae, R., & Costa, P. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social* Retrieved from <http://psycnet.apa.org/journals/psp/52/1/81/>
- McEwan, B., & Horn, D. (2016). ILY & Can U Pick Up Some Milk: Effects of Relational Maintenance via Text Messaging on Relational Satisfaction and Closeness in Dating Partners. *Southern Communication Journal*, 81(3), 168–181. <http://doi.org/10.1080/1041794X.2016.1165728>
- McIlwraith, R. D. (1998). “I’m addicted to television”: The personality, imagination, and TV watching patterns of self-identified TV addicts. *Journal of Broadcasting & Electronic Media*, 42(3), 371–386. <http://doi.org/10.1080/08838159809364456>
- McSpadden, K. (2015). New Social Networking Platform Calms Depression and Anxiety | Time.com. Retrieved March 29, 2017, from <http://time.com/3764869/panoply-social-networks-mental-health-health-depression/>
- 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*. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/08934215.2011.555322>
- mobile marketing. (2015). 2015 SMS Marketing Statistics and Trends - MobileMarketing.com. Retrieved April 13, 2017, from <https://mobilemarketing.com/advertising/stats/2015-sms-marketing-statistics-trends>
- Modo Lab Teams. (2016). Social Media Use Among College Students and Teens: What’s In, What’s Out, and Why. Retrieved April 11, 2017, from <https://www.modolabs.com/blog-post/social-media-use-among-college-students-and-teens-whats-in-whats-out-and-why/>
- Nadalín, V., Bentvelsen, K., & Kreiger, N. (2004). Reliability of self-reports. *Victoria*. Retrieved from <http://www.phac-aspc.gc.ca/publicat/cdic-mcc/25-2/e-eng.php>
- Nithya, H. M., & Julius, S. (2007). Extroversion, neuroticism and self-concept: their impact on internet users in India. *Computers in Human Behavior*, 23(3), 1322–1328. <http://doi.org/10.1016/j.chb.2004.12.009>
- Olien, J. (2013). Dangers of loneliness: Social isolation is deadlier than obesity. Retrieved November 10, 2015, from http://www.slate.com/articles/health_and_science/medical_examiner/2013/08/dangers_of_loneliness_social_isolation_is_deadlier_than_obesity.html
- Park, S., Kim, I., Lee, S. W., Yoo, J., Jeong, B., & Cha, M. (2015). Manifestation of Depression and Loneliness on Social Networks. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing - CSCW '15* (pp. 557–570). New York, New York, USA: ACM Press. <http://doi.org/10.1145/2675133.2675139>

- Peluchette, J., & Karl, K. (2009). Examining Students' Intended Image on Facebook: "What Were They Thinking?!" *Journal of Education for Business*, 85(1), 30–37. <http://doi.org/10.1080/08832320903217606>
- Peplau, L. (1982). Loneliness: A sourcebook of current theory, research, and therapy. Retrieved from https://scholar.google.com/scholar?hl=en&q=peplau+perlman+1982&btnG=&as_sdt=1%2C38&as_sdt=#1
- Perlman, D., & Peplau, L. (1981). Toward a social psychology of loneliness. *Personal Relationships*. Retrieved from [http://www.peplaulab.ucla.edu/Peplau_Lab/Publications_files/Perlman %26 Peplau 81.pdf](http://www.peplaulab.ucla.edu/Peplau_Lab/Publications_files/Perlman%20Peplau81.pdf)
- Perlman, D., Peplau, L., Gillmour, R., & Duck, S. (1981). Personal relationships 3: Personal relationships in disorder. Retrieved from https://scholar.google.com/scholar?q=perlman+peplau+1981&btnG=&hl=en&as_sdt=0%2C38#1
- Perlman, D., Peplau, L., & Peplau, L. (1984). Loneliness research: A survey of empirical findings. ... *and Persistent Loneliness*. Retrieved from [http://www.peplaulab.ucla.edu/Peplau_Lab/Publications_files/Perlman %26 Peplau 84.pdf](http://www.peplaulab.ucla.edu/Peplau_Lab/Publications_files/Perlman%20Peplau84.pdf)
- Pew Research Center. (2014). Social Media Site Usage 2014 | Pew Research Center. Retrieved November 10, 2015, from <http://www.pewinternet.org/2015/01/09/social-media-update-2014/>
- Pew Research Center. (2015). The Smartphone Difference. Retrieved from http://www.pewinternet.org/files/2015/03/PI_Smartphones_0401151.pdf
- Pew Research Center. (2017). Demographics of Social Media Users and Adoption in the United States | Pew Research Center. Retrieved April 11, 2017, from <http://www.pewinternet.org/fact-sheet/social-media/>
- Phua, J., Jin, S. V., & Kim, J. (Jay). (2017a). Uses and gratifications of social networking sites for bridging and bonding social capital: A comparison of Facebook, Twitter, Instagram, and Snapchat. *Computers in Human Behavior*, 72, 115–122. <http://doi.org/10.1016/j.chb.2017.02.041>
- Phua, J., Jin, S. V., & Kim, J. (Jay). (2017b). Uses and gratifications of social networking sites for bridging and bonding social capital: A comparison of Facebook, Twitter, Instagram, and Snapchat. *Computers in Human Behavior*, 72, 115–122. <http://doi.org/10.1016/j.chb.2017.02.041>
- Pinquart, M., & Sorensen, S. (2001). Influences on loneliness in older adults: A meta-analysis. *Basic and Applied Social Psychology*. Retrieved from http://www.tandfonline.com/doi/abs/10.1207/S15324834BASP2304_2
- Pittman, M. (2015). Creating, Consuming, and Connecting: Examining the Relationship Between Social Media Engagement and Loneliness. *The Journal of Social Media in*

Society. Retrieved from
<http://www.thejsms.org/tsmri/index.php/TSMRI/article/view/92>

- Pittman, M., & Reich, B. (2016). Social media and loneliness: Why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior*, 62, 155–167. <http://doi.org/10.1016/j.chb.2016.03.084>
- Piwek, L., & Joinson, A. (2016). “What do they snapchat about?” Patterns of use in time-limited instant messaging service. *Computers in Human Behavior*, 54, 358–367. <http://doi.org/10.1016/j.chb.2015.08.026>
- Poltash, N. (2012). Snapchat and sexting: A snapshot of baring your bare essentials. *Rich. JL & Tech*. Retrieved from http://heinonlinebackup.com/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/jolt19§ion=19
- Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29(4), 1841–1848. <http://doi.org/10.1016/j.chb.2013.02.014>
- Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. (S. A. Schuster, Ed.) *Book* (Vol. 115). Simon & Schuster. <http://doi.org/10.1145/358916.361990>
- Rammstedt, B., & John, O. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0092656606000195>
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German We wish to thank the Center for Survey Research and Methodologies (ZUMA) for making possible a guest professorship in Mannheim for. *Journal of Research in Personality*, 41(41), 203–212. <http://doi.org/10.1016/j.jrp.2006.02.001>
- Reid, D., & Reid, F. (2007). Text or talk? Social anxiety, loneliness, and divergent preferences for cell phone use. *CyberPsychology & Behavior*. Retrieved from <http://online.liebertpub.com/doi/abs/10.1089/cpb.2006.9936>
- Riesman, D., Glazer, N., & Denney, R. (2001). *The Lonely Crowd*. Yale University Press. Retrieved from <https://books.google.com/books?hl=en&lr=&id=W8uAbnKnguAC&pgis=1>
- Robert, L., & Dennis, A. (2005). Paradox of richness: A cognitive model of media choice. *Professional Communication, IEEE* Retrieved from http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1397904
- Robinson, J. (1991). Measures of depression and loneliness. *Measures of* Retrieved from https://scholar.google.com/scholar?q=robinson+1991+loneliness&btnG=&hl=en&as_sdt=0%2C38#0
- Rokach, A., & Neto, F. (2000). Coping with loneliness in adolescence: A cross-cultural

study. *Social Behavior and Personality: An ...* Retrieved from <http://www.ingentaconnect.com/content/sbp/sbp/2000/00000028/00000004/art00003>

- Ross, C., Orr, E. S., Sisic, M., Arseneault, J. M., Simmering, M. G., & Orr, R. R. (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior, 25*(2), 578–586. <http://doi.org/10.1016/j.chb.2008.12.024>
- Rubenstein, C., & Shaver, P. (1982). The experience of loneliness. *Loneliness: A Sourcebook of Current Theory, Research ...* Retrieved from https://scholar.google.com/scholar?q=rubenstein+and+shaver+1982&btnG=&hl=en&as_sdt=0%2C38#0
- Ruppel, E. K., Burke, T. J., & Cherney, M. R. (2017). Channel complementarity and multiplexity in long-distance friends' patterns of communication technology use. *New Media & Society, 14*6144481769999. <http://doi.org/10.1177/1461444817699995>
- Russell, D. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*. Retrieved from http://www.tandfonline.com/doi/abs/10.1207/s15327752jpa6601_2
- Russell, D., & Cutrona, C. (1984). Social and emotional loneliness: an examination of Weiss's typology of loneliness. *Journal of Personality and ...* Retrieved from <http://psycnet.apa.org/psycinfo/1984-28730-001>
- Russo, T., & Campbell, S. (2004). Perceptions of mediated presence in an asynchronous online course: Interplay of communication behaviors and medium. *Distance Education*. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/0158791042000262139>
- Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage. *Computers in Human Behavior, 27*(5), 1658–1664. <http://doi.org/10.1016/j.chb.2011.02.004>
- Sallis, J., Buono, M., & Roby, J. (1993). Seven-day recall and other physical activity self-reports in children and adolescents. *Medicine and Science ...* Retrieved from <http://europepmc.org/abstract/med/8423762>
- Schmidt, N., & Sermat, V. (1983). Measuring loneliness in different relationships. *Journal of Personality and Social ...* Retrieved from <http://psycnet.apa.org/psycinfo/1984-00238-001>
- Sheehan, K. (2015, May 6). A change in the climate: Online social capital and the spiral of silence. *First Monday*. Retrieved from <http://uncommonculture.org/ojs/index.php/fm/article/view/5414/4468>
- Sheldon, P., & Bryant, K. (2016). Instagram: Motives for its use and relationship to narcissism and contextual age. *Computers in Human Behavior*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0747563215303307>

- Shrout, P., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*. Retrieved from <https://pdfs.semanticscholar.org/e930/616bee242ec451b76f9998d81778042ad449.pdf>
- Sitkin, Sim B., Kathleen M. Sutcliffe, and J. R. B. (1992). A dual-capacity model of communication media choice in organizations. *Human ...*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-2958.1992.tb00572.x/abstract>
- Skues, J., Williams, B., & Wise, L. (2012). The effects of personality traits, self-esteem, loneliness, and narcissism on Facebook use among university students. *Computers in Human Behavior*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0747563212002129>
- Smith, A. (2016). These Are the Couples Who Met and Fell in Love on Social Media. Retrieved April 8, 2017, from <https://www.theknot.com/content/couples-fell-in-love-social-media>
- Smith, C. (2017). 121 Amazing Snapchat Statistics and Facts (February 2017). Retrieved April 13, 2017, from <http://expandedramblings.com/index.php/snapchat-statistics/>
- Smith, K. (2016). 96 Amazing Social Media Statistics and Facts. Retrieved April 11, 2017, from <https://www.brandwatch.com/blog/96-amazing-social-media-statistics-and-facts-for-2016/>
- Sobell, L., Maisto, S., Sobell, M., & Cooper, A. (1979). Reliability of alcohol abusers' self-reports of drinking behavior. *Behaviour Research and ...*. Retrieved from <http://www.sciencedirect.com/science/article/pii/0005796779900251>
- Søgaard, A. J., Selmer, R., Bjertness, E., & Thelle, D. (2004). The Oslo Health Study: The impact of self-selection in a large, population-based survey. *International Journal for Equity in Health*, 3(1), 3. <http://doi.org/10.1186/1475-9276-3-3>
- Solano, C., Batten, P., & Parish, E. (1982). Loneliness and patterns of self-disclosure. *Journal of Personality and ...*. Retrieved from <http://psycnet.apa.org/journals/psp/43/3/524/>
- Song, I., LaRose, R., Eastin, M. S., & Lin, C. a. (2004). Internet gratifications and internet addiction: on the uses and abuses of new media. *Cyberpsychology & Behavior : The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, 7(4), 384–394. <http://doi.org/10.1089/cpb.2004.7.384>
- Sprecher, S. (1986). The relation between inequity and emotions in close relationships. *Social Psychology Quarterly*. Retrieved from <http://www.jstor.org/stable/2786770>
- Sprecher, S., & Hampton, A. J. (2016). Liking and Other Reactions After a Get-Acquainted Interaction: A Comparison of Continuous Face-to-Face Interaction versus Interaction that Progresses from Text Messages to Face-to-Face. *Communication Quarterly*, 1–21. <http://doi.org/10.1080/01463373.2016.1256334>
- Stafford, L., Canary, D., & Dainton, M. (2003). Maintaining romantic relationships: A summary and analysis of one research program. *Maintaining Relationships ...*

Retrieved from

https://books.google.com/books?hl=en&lr=&id=8LCRAgAAQBAJ&oi=fnd&pg=PA51&dq=stafford+2003+maintaining+romantic&ots=wCo9te9GUE&sig=KBso6zNuh7ASU2QNtA_WVOn5PEM

- 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. *Communications Monographs*. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/03637750009376512>
- Suh, K. S. (1999). Impact of communication medium on task performance and satisfaction: an examination of media-richness theory. *Information & Management*, 35(5), 295–312. [http://doi.org/10.1016/S0378-7206\(98\)00097-4](http://doi.org/10.1016/S0378-7206(98)00097-4)
- Sundar, S. (2000). Multimedia effects on processing and perception of online news: A study of picture, audio, and video downloads. *Journalism & Mass Communication Quarterly*. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/107769900007700302>
- Sundar, S. (2008). The MAIN model: A heuristic approach to understanding technology effects on credibility. *Digital Media, Youth, and Credibility*. Retrieved from <https://pdfs.semanticscholar.org/de80/aa094f380342a632eadb0ee8d4221e8920ba.pdf>
- Sundar, S. S., & Limperos, A. M. (2013). Uses and Grats 2.0: New Gratifications for New Media. *Journal of Broadcasting & Electronic Media*, 57(4), 504–525. <http://doi.org/10.1080/08838151.2013.845827>
- Thalmayer, A. (2011). Comparative validity of brief to medium-length Big Five and Big Six Personality Questionnaires. *Psychological Assessment*. Retrieved from <http://psycnet.apa.org/journals/pas/23/4/995/>
- Thayer, S. E., & Ray, S. (2006). Online Communication Preferences across Age, Gender, and Duration of Internet Use. Retrieved from <http://online.liebertpub.com/doi/abs/10.1089/cpb.2006.9.432>
- Thurlow, C., Lengel, L., & Tomic, A. (2004). *Computer mediated communication*. Retrieved from <https://books.google.com/books?hl=en&lr=&id=ED5Htazhr38C&oi=fnd&pg=PP2&dq=computer+mediated+communication&ots=xxahgzzIjQ&sig=N2ue6YDPgkp7Hn0ybIDxUUw9ZZc>
- Tindell, D. R., & Bohlander, R. W. (2012). The Use and Abuse of Cell Phones and Text Messaging in the Classroom: A Survey of College Students. *College Teaching*, 60(1), 1–9. <http://doi.org/10.1080/87567555.2011.604802>
- Transforming Mental Health. (2017). Is social media bad for young people's mental health? | Mental health research matters | The Guardian. Retrieved March 29, 2017, from <https://www.theguardian.com/mental-health-research-matters/2017/jan/20/is-social-media-bad-for-young-peoples-mental-health>

- Utz, S., Muscanell, N., & Khalid, C. (2015a). Snapchat Elicits More Jealousy than Facebook: A Comparison of Snapchat and Facebook Use. *Cyberpsychology, Behavior, and Social Networking*, *18*(3), 141–146. <http://doi.org/10.1089/cyber.2014.0479>
- Utz, S., Muscanell, N., & Khalid, C. (2015b). Snapchat elicits more jealousy than Facebook: a comparison of Snapchat and Facebook use. *Cyberpsychology, Behavior and Social Networking*, *18*(3), 141–6. <http://doi.org/10.1089/cyber.2014.0479>
- VanVoorhis, C., & Morgan, B. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods for* Retrieved from <http://mail.tqmp.org/RegularArticles/vol03-2/p043/p043.pdf>
- Vitak, J., & Ellison, N. B. (2013). “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*, *15*(2), 243–259. <http://doi.org/10.1177/1461444812451566>
- Wallace, K. (2014). Social media positive for teens? Maybe! - CNN.com. Retrieved March 31, 2017, from <http://www.cnn.com/2013/11/21/living/social-media-positives-teens-parents/>
- Walther, J. (1996). Computer-mediated communication impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*. Retrieved from <http://crx.sagepub.com/content/23/1/3.short>
- Walther, J., & Burgoon, J. (1992). Relational communication in computer-mediated interaction. *Human Communication Research*. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-2958.1992.tb00295.x/full>
- Wang, Z., Tchernev, J. M., & Solloway, T. (2012). A dynamic longitudinal examination of social media use, needs, and gratifications among college students. *Computers in Human Behavior*, *28*(5), 1829–1839. <http://doi.org/10.1016/j.chb.2012.05.001>
- Yang, C., Brown, B. B., & Braun, M. T. (2014). From Facebook to cell calls: Layers of electronic intimacy in college students’ interpersonal relationships. *New Media & Society*, *16*(1), 5–23. <http://doi.org/10.1177/1461444812472486>

