

THE IMPACT OF MEDIATED SOCIAL INTERACTIONS ON SUBJECTIVE WELL-BEING:
AN EXAMINATION OF COMMUNICATION MECHANISMS

A Dissertation

Presented to the Faculty of the Graduate School

of Cornell University

in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

By

Yoon Hyung Choi

August 2017

© 2017 Yoon Hyung Choi

THE IMPACT OF MEDIATED SOCIAL INTERACTIONS ON SUBJECTIVE WELL-BEING: AN EXAMINATION OF COMMUNICATION MECHANISMS

Yoon Hyung Choi, Ph. D.

Cornell University 2017

The current dissertation reports the results of a study that investigated how social interactions conducted through information and communication technologies (ICTs) impact subjective well-being. Prior research has found conflicting evidence on the influences of ICT use on well-being, with findings pointing to both negative and positive outcomes. Drawing from a theoretical framework that combines self-determination theory and the interpersonal process model of intimacy, this study investigated how technological affordances present in different ICTs influence social interactions and well-being. The main findings of this study point to the importance of investigating specific communication processes that occur on ICTs, such as self-disclosure, perceived responsiveness, and satisfaction of psychological needs. By analyzing data from 5037 social interactions that were captured using an experience sampling method, this study found that different technological affordances were associated with changes in interaction processes, which had implications for levels of relatedness need satisfaction and consequent changes in affective well-being.

BIOGRAPHICAL SKETCH

Yoon Hyung “Yoon” Choi was born and raised in the suburbs of Seoul, South Korea, with a brief period of primary schooling in Surrey, England. After completing high school at Korean Minjok Leadership Academy in Hoengsung, South Korea, she moved to the United States to attend college at Northwestern University in Evanston, IL. At Northwestern University, Yoon cultivated a fascination for interpersonal communication and mediated communication under the mentorship of Professors Kathleen Galvin, Maria Mastronardi, and Eszter Hargittai. She received her B. A. in Communication Studies in 2010 with departmental distinction and *magna cum laude*. In 2011, Yoon joined the Ph.D. program in Communication at Cornell University and started research with her academic advisor Dr. Natalie Bazarova in the Cornell University Social Media Lab. During the 2016-17 academic year, Yoon worked as a full-time Instructor for the Department of Media Arts, Sciences, and Studies at the Roy. H. Park School of Communications of Ithaca College. In August 2017, she successfully defended her dissertation and received her Ph.D. degree in Communication from Cornell University.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my heartfelt thanks to my wonderful advisor Dr. Natalie Bazarova. I am extremely grateful for your patience, dedication, and hard work as an advisor. Our conversations and collaborations have helped me so much in developing my thinking as a researcher. You truly inspire your students by being an exemplary scholar and I was extremely lucky to have worked with you.

I would also like to thank Drs. Lee Humphreys, Dawn Schrader, and Dan Cosley for providing superb guidance and mentorship as members of my doctoral committee. Without your advice and feedback at critical points in my career, I would not have grown into the scholar I am today. Thank you for being such great role models.

My best friend Samuel Hardman Taylor, you deserve a separate paragraph for being a generally awesome human being. Memories of all the lunches we had together in the hub, the misery (and joy) we shared in our office, and our chats about affordances and interpersonal communication will remain fondly in my heart. Thank you so much for your friendship and your interest in fancy pens.

I would also like to thank members and friends of the Cornell University Social Media Lab, especially lab mom Jessie Taft, Dr. Pamara Chang, Shruti Sannon, Dr. Dave Markowitz, and Megan French for their friendship and intellectual banter during the past six years. Special thanks to my undergraduate research assistants Billy Murch Elliot and Emma Nagel for helping me run this study and collect data.

Finally, I would like to say a big thank you to my family; mom, dad, and Jay, thank you for all your encouragement and support during my graduate studies and everything else that I have accomplished. Eric, my love, thank you for giving me never-ending emotional support and

for helping me in all aspects of my life as I struggled to finish this dissertation. You are the best husband I have ever had.

TABLE OF CONTENTS

Chapter 1: Introduction	1
Chapter 2: Theories of Well-Being	5
Definitions of Well-Being	5
Perceptual and Behavioral Mechanisms of Well-Being	10
Chapter 3: The Role of Communication Technology in Well-Being	17
ICT Use and Well-Being	17
Interpersonal Processes of Well-Being on ICTs	24
Looking at Multiple Media: Technological Affordances of ICTs	26
Chapter 4: The Current Study	33
Hypotheses and Research Questions	34
Chapter 5: Method	38
Procedure	39
Participants	41
Measures	41
Analytical Approach	43
Chapter 6: Results	46
ICT Use	46
Baseline Measures of Well-Being	46
Hypothesis Tests	47
Chapter 7: Discussion	53
The Influence of Technological Affordances on Processes of Well-Being	55

Communication Patterns on Multiple ICTs	59
Future Directions	62
Limitations	63
Conclusion	65
References	66
Tables	78
Table 1: Affordances of ICTs and Descriptive Statistics of Use	78
Table 2: LS-Means and Standard Errors for Technological Affordances	79
Table 3: Summaries of Multilevel Statistical Models	80
Table 4: Summaries of Multilevel Statistical Models (Cont.)	81
Table 5: Estimates and Standard Errors of Mediation Models	82
Figures	83
Figure 1: Integrated Conceptual Framework for the Study	83
Appendices	84
Appendix A: Pre-ESM Survey Measures	84
Appendix B: Post-ESM Survey Measures	88
Appendix C: ESM Survey Questionnaire	90

CHAPTER 1

INTRODUCTION

In recent years, people have become increasingly concerned about how information and communication technologies (ICTs) are affecting their lives, especially due to the rapid increase and proliferation of technology use on a day-to-day basis. People use ICTs every day, including the internet, computers, mobile phones, or handheld electronics, and it has thus become a stable presence in many people's daily lives. In support of this claim, recent statistics show that 95% of adults own a cell phone, 88% use the Internet, and 69% of those who are online use social network sites (Pew Research Center, 2017). As a consequence, questions have arisen about how information and communication technology (ICT) use is positively or negatively affecting our lives, especially around issues of mental health and well-being.

In the mainstream media, we often hear reports of how Facebook is making us unhappy, and that mediated communication is decreasing the quality of social interactions (e.g., "Is Facebook Making Us Lonely?" published in *The Atlantic*; Marche, 2012). These reports often highlight how social media and communication technology are causing people harm, such as increased loneliness, jealousy, and even depression. However, these claims may not be uniformly based on sound evidence. While research has examined effects of technology use on well-being (Reinecke & Oliver, 2017), there are many unanswered questions that remain, with some studies showing positive effects (e.g., Dolev-Cohen & Barak, 2013; Valkenburg & Peter, 2007), while others pointing to negative or mixed effects (e.g., Davila et al., 2012; Kross et al., 2013) of ICT use on life satisfaction and well-being. The controversy stems partly from the large variety of ways in which ICTs can be used and a limited understanding of mechanisms underlying effects of social interactions on well-being.

This dissertation was motivated by several gaps in the literature that needed to be filled. First of all, in the area of ICT use and how it affects well-being, there is a proliferation of definitions and operationalizations of well-being. This leads to sometimes conflicting results about the impact of ICTs, and does not allow researchers to make comparisons between different measures and indices of well-being. Next, there are not many investigations into specific communication processes that occur on ICTs, such as self-disclosure and perceived responsiveness. A distinction has been made in prior research between active vs. passive communication on ICTs, but there is still a need to examine specific processes in addition to that broad distinction. Finally, only a few studies examine the use of multiple ICTs, given that we live in a media landscape that is not dominated by only one or two forms of media. On a daily basis, people use many different ICTs, such as text messaging, instant messaging, social media, e-mail, etc. Currently, there is a lack of research that looks across all of these different types of media and their influences on well-being, thus not giving us a full picture of the impacts of ICT use on well-being.

Based on these issues, this dissertation will review several areas of research and will culminate in the presentation of results from an original empirical study that collected data using a week-long experience sampling method. This dissertation starts by reviewing past research on two different perspectives of well-being: hedonic vs. eudaimonic well-being. Hedonia emphasizes pleasure, enjoyment, and comfort, whereas eudaimonia aims to go a step beyond by emphasizing fully functioning and living up to one's potential (Ryan & Deci, 2001). More recently, the two perspectives are being considered to be not as distinct from each other as was originally thought (Huta & Waterman, 2014). One merit of the current dissertation is that it attempts to combine the two perspectives of well-being by using concepts and measures from

self-determination theory (SDT), which has roots in eudaimonic well-being, and subjective well-being (SWB), which is considered to be the main theory of hedonic well-being.

The theoretical model proposed in this dissertation combines theories of well-being (i.e., self-determination theory and subjective well-being) with theories of interpersonal and relational communication. Some of the strongest predictors of personal well-being are having high-quality relationships and social interactions. One of the crucial psychological needs that is outlined in SDT is the need to feel related to others, and only when this relatedness need is satisfied can people experience optimal well-being (Deci & Ryan, 2014). Research on close relationships and communication suggests that self-disclosure and perceived partner responsiveness within social interactions contribute to feelings of intimacy and relatedness, as outlined in the interpersonal process model of intimacy (Reis & Shaver, 1988). These communication mechanisms will be the main focus of this dissertation as a way of illuminating the effect that mediated social interactions have on well-being.

This dissertation also makes a contribution to the literature surrounding the framework of technological affordances by presenting a scheme to characterize frequently used forms of ICTs in terms of varying levels of affordances: cue availability, synchronicity, and audience reach. Thus, this study provides a way to investigate the influences of multiple ICTs on well-being that is derived from previous characterizations of affordances within multiple media (e.g., Choi & Toma, 2014; Gonzales, 2014; Jiang & Hancock, 2013). By envisioning technological affordances as working together with interaction processes and psychological need satisfaction to ultimately influence people's SWB, this study ties together the influence of technology on communication processes which lead to psychological need satisfaction, and in turn, cause changes in well-being.

Finally, the dissertation proposes and presents the results of an original empirical study that uses an experience sampling method (ESM) to gather daily data on well-being. ESM is especially suited to this type of research, since it can collect *in situ* data on moment-to-moment well-being and how it is influenced by everyday social interactions. This data is analyzed to test hypotheses that are proposed in Chapter 4, including mediational analyses that find the indirect effect of communication processes on SWB through the mediating influence of psychological need satisfaction.

The dissertation's next chapters will be structured as follows: Chapter 2 will lay out different theories and approaches to well-being, as well as introducing the communication mechanisms through which social interactions enhance well-being. Chapter 3 will apply those theories and mechanisms of well-being to communication on ICTs by using the technological affordances framework, while building up to specific hypotheses and research questions for the current study in Chapter 4. Chapters 5 and 6 will introduce the method and results of the study, and the dissertation will conclude with a general discussion of the study's results, limitations, and opportunities for future research in Chapter 7.

CHAPTER 2

THEORIES OF WELL-BEING

People have been fascinated by the idea of having good well-being and enhancing quality of life long before the introduction of ICTs. The topic of well-being is a broad one, and scholars have explored well-being from many different perspectives and have examined multiple aspects and definitions of well-being. Thus, before a full investigation of the effects of ICTs on well-being can occur, one must be careful in defining what it means ‘be well’ and must examine different concepts of well-being to see which of the many theories of well-being would be the most relevant or appropriate.

Definitions of Well-Being

In research related to ICT use and well-being, there is currently a proliferation of different conceptualizations of well-being, including but not limited to subjective well-being, emotional well-being, psychological well-being, loneliness, and mental health. Social and behavioral scientists often refer to a number of components as constituting well-being, including indicators of loneliness, self-esteem, psychological distress, and depression (Cotten, 2008). This may not inherently be bad, since the multifaceted nature of human well-being calls for multiple measures (Diener, Scollon, & Lucas, 2009). In fact, the way in which many different measures of well-being have been used in studies of ICTs may just be evidence of how complex the effects of ICT use on well-being are. However, researchers still need to take caution in choosing measures of well-being that are theoretically meaningful for their study as well as being reliable and valid. In the following sections, several main theories of well-being will be reviewed alongside the respective conceptualizations of well-being.

Hedonic vs. eudaimonic well-being. While there are many different types of well-being,

the main distinction to be made is between hedonic and eudaimonic well-being. As the name suggests, hedonic well-being, derived from the Greek term *hedonia*, is achieved through pleasure, enjoyment, and comfort. This can include the enjoyment of both physical and psychological pleasures, such as sensual stimulation, having fun, and enjoying social interactions (Huta & Ryan, 2010). Subjective well-being (SWB) is the main theory of well-being to follow this approach, as it is a theory that promotes maximizing positive affect and minimizing negative affect (i.e., maximizing happiness) in order to achieve well-being (Deci & Ryan, 2006).

However, some scholars argue that the mere pursuit of pleasure in daily life is not enough to achieve optimal well-being. The eudaimonic perspective of well-being derives from the Greek concept of *eudaimonia*, which refers to fully functioning and living up to one's potential (Deci & Ryan, 2006). This perspective suggests that pleasure and happiness is only one of many aspects of well-being, and people need to fulfill goals and higher objectives to flourish and live a truly rewarding life (Ryan & Deci, 2001). One of the most prominent operationalizations of the eudaimonic perspective of well-being is the theory of psychological well-being (PWB), which focuses on how elements other than mere happiness are needed for positive functioning (Ryff, 1989). Positive psychology is another branch of well-being that stems from the eudaimonic perspective. The theory of positive psychology suggests that in order to improve quality of life and flourish, people need to accrue positive experiences and traits, with well-being being one of the most important subjective experiences (Seligman & Csikszentmihalyi, 2014).

Psychological well-being. The main theory of well-being that originates from the eudaimonic perspective is the six-factor model of psychological well-being (Ryff, 1989). The six-factor model of PWB has six dimensions that capture optimal psychological functioning:

self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (Ryff, 1989). These six dimensions encompass elements of optimal functioning in daily life such as how people evaluate their own lives positively (self-acceptance), having good interpersonal relationships, being autonomous and independent, managing and controlling the environment (environmental mastery), having a sense of directedness in life, and developing and growing as an individual (Ryff, 1995).

PWB has been proven to be a robust measure of well-being that can be applied in many different areas across the lifespan and even in different cultural contexts. For instance, a test of PWB among Chinese adults found that the six factors of PWB are indeed distinct from each other with each representing a unique aspect of well-being (Cheng & Chan, 2005). Scales of PWB have also been consistently validated with data from nationally representative samples in the U. S., and have been reported to be stable over time in longitudinal studies (Ryff & Singer, 2008). Overall, PWB is a theory of well-being that is robust both in its theoretical underpinnings and its empirical applications.

Subjective well-being. The concept of subjective well-being (SWB) has many facets, but in general terms, it is defined as being composed of happiness and life satisfaction (Diener, 1984). As such, SWB can consist of an accumulation of moment-to-moment moods and emotions, but ultimately is an evaluation about one's entire life as a whole. Positive and negative affect (i.e., happiness) can measure moment-to-moment change in well-being, whereas life satisfaction provides a more stable measure of well-being. Taken together, positive and negative affect is often referred to as the affective well-being, whereas life satisfaction is considered a measure of cognitive well-being (Diener, 1984).

Diener (2009) suggests that whereas definitions of SWB have been numerous and

multifaceted, there are three elements that are core to the study of SWB: a) the subjectiveness of evaluations, b) the presence of positive factors as well as the absence of negative ones, and c) an overarching evaluation of one's life. A major element of SWB is that it is a subjective judgment on the part of the evaluator, and resides within the individual's subjective experiences and evaluations of their own life. Objective factors, such as health, socioeconomic status, or income, may influence SWB, but are not an integral part of its evaluation (Diener, 2009). Additionally, not only do measures of SWB investigate the absence of negative elements, but they must also take into account the presence of positive elements in life. Finally, Diener (2009) states that SWB must take into account a broad range of influences on and aspects of an individual's life, but that this does not restrict the time frame in which SWB measures are considered, which can range from days, weeks, to years. Overall, the concept of SWB provides a flexible way in which to provide a general assessment of the quality of people's lives, including but not limited to happiness and life satisfaction.

Overlapping areas. Whereas SWB has been mostly purported to originate from a hedonic perspective, it is a concept that can actually encompass both hedonic and eudaimonic well-being. SWB consists of two elements, affective and cognitive well-being, the latter of which cannot be said to be purely hedonic in nature. Since life satisfaction, a key element of SWB, is a cognitive index of well-being, there is room for the integration of SWB with more eudaimonic perspectives (Deci & Ryan, 2006). In effect, SWB as a measure of well-being is compatible with how other types of well-being are conceptualized, since it provides a reliable measure of certain overarching subjective elements in life, such as how happy and satisfied with life people are (Diener, 2009).

In addition, there has been evidence to suggest that hedonic and eudaimonic well-being

may have overlapping areas when it comes to getting the complete picture of an individual's well-being (Huta & Ryan, 2010), to the effect that the two types of well-being may not be mutually exclusive from each other. Huta and Ryan (2010) conducted four studies which examined the correlation between activities motivated by eudaimonic and hedonic pursuits and different types of well-being such as positive affect, negative affect, elevated experiences, meaningfulness, and life satisfaction. They found that there was a lot of overlap between how hedonic and eudaimonic activities were associated with different types of well-being. For instance, both types of activities were associated with increased vitality and life satisfaction. However, hedonic and eudaimonic activities also were associated with different outcomes in the bigger picture of personal well-being, such as the distinction between short term vs. long term well-being outcomes and affective vs. cognitive outcomes. Also, the life satisfaction component of SWB was related to both hedonic and eudaimonic activities, confirming the potential for SWB to encompass both perspectives of well-being (Huta & Ryan, 2010).

Furthermore, it has even been suggested that the two perspectives of well-being be combined into an overarching theory that combines the two perspectives into one integrated definition of well-being (Huta & Waterman, 2014). Eudaimonia and hedonia are not completely mutually exclusive, and both contribute to well-being in different ways. The concept of flourishing somewhat manages to accomplish this integration, since it incorporates the key elements of SWB and PWB, as well as an additional element of social well-being (Keyes, 2002). Keyes (2011) suggests that individuals who flourish have good mental health which stems from having high levels of emotional well-being (e.g., positive affect, life satisfaction, etc.), psychological well-being (e.g., self-acceptance, environmental mastery, etc.), and social well-being (e.g., social acceptance, social integration, etc.). By emphasizing positive feelings as well

as positive functioning, the theory of flourishing brings together the hedonic and eudaimonic perspectives to paint a bigger picture of well-being.

Overall, there are several definitions and conceptualizations of well-being, each with its own criteria for what it means to live well. However, some of these perspectives may not be entirely distinct from each other, since in essence, they are all measuring the extent to which people live a good life, are happy, and function optimally. Thus, to get a full picture of how people's daily well-being fluctuates, researchers need to be open to using a flexible definition of well-being or even to combining the different perspectives of hedonia and eudaimonia. One way in which daily well-being is largely affected is through social relationships, and a lot of attention has been paid in the past to how having good interpersonal relationships can benefit well-being. In the next section of this chapter, I will review the interpersonal and relational processes through which well-being is impacted.

Perceptual and Behavioral Mechanisms of Well-Being

It has been generally established in prior research that experiencing good social interactions and interpersonal communication will have beneficial effects on well-being. However, even though research findings about the effects of relationships on well-being are robust and well-documented, there is still a need for theoretical and empirical work that illuminates the mechanisms that mediate the beneficial effects of social ties on mental health and well-being. Especially since having relationships and engaging in interpersonal communication are such broad areas of life, there is a need to look at specific processes of communication that lead to enhanced well-being. Relationships and social interactions are founded on communication, and in order to fully understand the effects of personal relationships on well-being, one needs to understand the communicative mechanisms through which the effects occur.

The following review proposes three theoretical mechanisms through which well-being can be enhanced within relationships and through social interactions: satisfaction of psychological needs, self-disclosure, and perceived partner responsiveness, which give rise to feelings of relational intimacy.

Psychological need satisfaction. Self-determination theory (SDT) posits that there are three fundamental psychological needs that need to be satisfied in people's daily lives in order for them to be able to function optimally (Ryan & Deci, 2000). The three needs are autonomy, competence, and relatedness. SDT suggests that when these needs are satisfied, it will lead to enhanced mental health and well-being. SDT assumes that people will be intrinsically motivated to act in a way that makes them feel autonomous and having free choice, feel competent in everyday actions, and feel related to other people, the actions of which result in beneficial psychological outcomes (Deci & Ryan, 2000). The theory also suggests that there are two ways in which people fulfill these needs: through internal motivation and through extrinsic environmental factors (Deci & Ryan, 2008). For instance, when individuals are surrounded by people who are supportive and respectful of their autonomy, they are thought to be in interpersonal relationships that offer autonomy support. Of course, the need to feel related to others is seldom satisfied without the involvement of other people, and the relatedness need is best satisfied within high-quality relationships (Deci & Ryan, 2008). Taken overall, SDT offers an eudaimonic approach to well-being, and it focuses on many of the same aspects as PWB, such as a sense of autonomy, feelings of belongingness, and competence. Ryan and Deci (2000) suggest that all three basic needs must be satisfied for people to experience eudaimonia and thrive.

There has been plenty of empirical evidence to support the role of the three needs in

promoting optimal well-being. A study conducted to investigate how psychological need satisfaction contributes to daily changes in well-being found that the three needs of autonomy, competence, and relatedness wielded independent influences on daily well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Furthermore, the study found that specific types of social interactions were the most beneficial in increasing feelings of relatedness, such as engaging in meaningful conversations and feeling understood by the interaction partner (Reis et al., 2000). SDT has also been empirically applied to many areas of society, including but not limited to education, health promotion, and psychotherapy (see for a review, Deci & Ryan, 2012).

Relationships motivation theory is a sub-theory of SDT that suggests that the fulfillment of the relatedness need is essential for human well-being, and when people have increased satisfaction of the relatedness need, they will have higher levels of well-being (Deci & Ryan, 2014). However, the theory also suggests that not all kinds of relationships and social interactions will satisfy the relatedness need in the same way. In fact, the relationships which are the most beneficial for well-being can facilitate the satisfaction of autonomy and competence needs as well as the relatedness need, suggesting that the three needs are interrelated with one another when it comes to well-being enhancement through relationships (Deci & Ryan, 2014). This theory suggests an interesting perspective in that it presents high-quality social relationships as the driving force for satisfaction of all three core psychological needs and optimal well-being. This is not a novel idea in the study of well-being, since there has been plenty of evidence to suggest a strong link between good relationships and well-being.

Relational intimacy. Interpersonal communication and social interactions are a large part of people's daily lives, since people live embedded in social relationships and communicate regularly with others. Since people are inherently social, their sense of well-being is closely tied

to the nature and quality of their personal relationships. As such, personal relationships have long been considered as some of the most important predictors of well-being (Argyle, 1987). More specifically, it has been established that the communication that occurs within those relationships will have beneficial effects on well-being (Saphire-Bernstein & Taylor, 2013).

Social networks and interpersonal relationships generally promote a sense of well-being and belonging, and evidence shows that receiving support from family, friends, or a significant other is associated with reports of greater SWB (Walen & Lachman, 2000). Moreover, perceived social support from a social network has positive effects on adjustment to stressful life events and well-being, and these perceptions mediate the influence of actual received support in dealing with stressful events (Wethington & Kessler, 1986). Ishii-Kuntz (1990), in her study of a nationally representative sample of Japanese adults, found that the effect of social interaction, as measured by satisfaction with family life and friendships, was positively related to well-being in adults of all age groups. The quality of interaction and communication with family members is another important determinant of SWB. The relationship between family interactions and mental health has been a popular topic of research, and recent advances in interdisciplinary work have suggested that there is a relationship between the nature of people's family relationships and their level of well-being (Segrin, 2006).

Past literature has pointed to self-disclosure as a key process in the development and management of close relationships. According to the interpersonal process model of intimacy (IPMI), self-disclosure and the perceived responsiveness of the communication partner within an interaction contribute to feelings of intimacy (Reis & Shaver, 1988). According to the model, people feel intimacy within relationships only when they express or reveal feelings and information to their interaction partner and the partner responds appropriately, leading to the

initial discloser feeling understood, validated, or cared for (Reis & Shaver, 1988). This process is thought to be a transactional exchange, since intimacy exists within reciprocal relationships and is influenced by how one party interprets the other party's responses to their initial communication. When intimacy is achieved within relationships through this process, it directly affects processes of well-being, since relational intimacy benefits psychological health by promoting self-esteem, emotional integration, and identity development (Reis & Shaver, 1988). Empirical research has also shown that perceived responsiveness is a pathway between self-disclosure and intimacy within people's social relationships. In a study that used a diary method to track participants' social interactions over the course of two weeks, it was found that perceived partner responsiveness mediated the relationship between self-disclosure and relational intimacy, and the type of self-disclosure that contributed the most to feelings of intimacy when adequately responded to was the disclosure of emotions rather than facts (Laurenceau, Barrett, & Pietromonaco, 1998).

Thus, past work has pointed to several important functions within social interactions and interpersonal communication that enhance well-being, namely self-disclosure (Reis & Shaver, 1988; Saphire-Bernstein & Taylor, 2013), perceived partner responsiveness (Reis, 2012), and satisfaction of the psychological need to be connected to others, also known as the relatedness need, as per SDT (Ryan & Deci, 2000).

Self-disclosure. Self-disclosure is a particular form of interpersonal communication that serves as a key process in the development and management of relationships. It is an act of revealing personal information, which supports relationship maintenance, as it is often positively associated with relationship quality, such as satisfaction, love, and commitment (Berndt, 2002; Sprecher & Hendrick, 2004). In early literature, social penetration theory outlined how self-

disclosure is used to develop relational intimacy through the gradual revealing of more intimate information about the self as the relationship progresses (Altman & Taylor, 1973). In turn, satisfaction with the quality of relationships leads to increases in well-being (Ishii-Kuntz, 1990). Prior work on interpersonal communication and SWB has also identified the importance of self-disclosure in enhancing the quality of relationships, which is again directly associated with SWB (Saphire-Bernstein & Taylor, 2013). Research on the sharing and expression of emotions has also found that communicating about and disclosing emotions related to deeply personal issues, such as traumatic events and loss, have effects on health (both physical and mental) and well-being (Pennebaker, Zech, & Rimé, 2001). For example, talking about upsetting experiences with others can reduce negative affect in the short term, and help improve long-term outcomes of psychological well-being (Rimé, Finkenauer, Luminet, Zech, & Philippot, 1998). Conversely, when an important emotion is not shared with others, it leads to lower psychological well-being and lower life satisfaction, including perceptions of the self and current life situation (Finkenauer & Rimé, 1998). Taken together, prior research evidence suggests a link between self-disclosure and well-being through enhanced perceptions of social integration, social capital, social support, and better quality relationships.

Perceived responsiveness. Perceived partner responsiveness, defined as the extent to which people feel interaction partners are reacting in a supportive manner within an interaction (Reis, 2012), is another important communication process related to subjective well-being. People have a need for their communication partner to be responsive, and interpersonal involvement and feedback directly influence levels of well-being (Reis, Clarke, & Holmes, 2004). Moreover, perceived responsiveness has been proposed as a concept that ties together the study of relationships and well-being (Reis, 2012). Not all social interactions in life provide

benefits to well-being, and there has been a need to identify the characteristics of higher-quality interactions which contribute to enhancements in well-being. How responsive the relationship partner is perceived to be is one characteristic of such relationships, and research has shown that feeling appreciated and understood by the communication partner leads to the highest amounts of well-being outcomes (Reis, 2009). Empirical research on the relatedness need of SDT also suggests that perceived responsiveness is essential for need satisfaction and well-being. One of the best predictors of the relatedness need satisfaction was when people felt appreciated and understood by interaction partners, which is largely associated with how responsive the interaction partner is perceived to be (Reis et al., 2000).

To sum up, this chapter reviewed the main two perspectives of well-being by drawing from theories of hedonic and eudaimonic well-being. The review outlined similarities and differences between the two perspectives, and concluded that hedonic and eudaimonic well-being play similar yet distinct roles in people's daily lives. Furthermore, research conducted on well-being has put forth interpersonal relationships, communication, and social interactions as the strongest predictors of well-being. Drawing from theories of well-being as well as interpersonal communication, self-disclosure and perceived responsiveness are presented as key communicative mechanisms through which personal well-being is enhanced.

CHAPTER 3

THE ROLE OF COMMUNICATION TECHNOLOGY IN WELL-BEING

In the previous chapter, I discuss the different definitions of well-being and relevant theories of well-being that are central in explicating the mechanisms of interpersonal communication and well-being. Enhancing this process, the Internet and other ICTs can also provide people with an environment that provides easy access to social support and affiliation, especially for stigmatized individuals (Amichai-Hamburger & Barak, 2009). However, it can also enable people to experience harmful factors such as exposure to conflict, addiction, and dependency on the Internet for communication. Thus, there is a need for research that explicates how to maximize the positive impact of ICTs while reducing the harmful aspects (Amichai-Hamburger, 2009). In terms of achieving optimal well-being, technology can be a fascinating venue through which people can communicate with their social network to achieve feelings of relatedness and belongingness. On the other hand, ICTs can alter the communication processes that occur within social interactions by providing people with different types of features and capabilities. Consequently, this chapter will provide a review of current research on how different ICTs influence well-being, and how the framework of technological affordances can help us understand the role technology plays in this process.

ICT Use and Well-Being

Subjective well-being has been of growing interest to media and technology scholars who have studied both the role of media consumption and media exposure (Brown & Bobkowski, 2011; Rieger, Reinecke, Frischlich, & Bente, 2014) and more recently, relational and interpersonal aspects of mediated communication and well-being (e.g., Choi & Toma, 2014; Dienlin, Masur, & Trepte, 2017; Valkenburg & Peter, 2007). By looking across different types of

ICTs, including e-mail, instant messaging (IM), and social network sites (SNSs), research has accumulated mixed evidence about ICT use's effects on well-being, ranging from negative to beneficial effects on well-being.

Research on the negative outcomes of ICT use, Internet use, and online communication dates back to the Internet's household introduction in the mid-1990s, especially through research on a phenomenon dubbed the "Internet paradox" (Kraut et al., 1998). In a longitudinal study of Internet use, Kraut and colleagues (1998) found that when the Internet is used for purposes of interpersonal communication, it actually decreases face-to-face communication with family members at home. Moreover, higher amounts of Internet use were found to cause harm to people's well-being, with people being less socially involved, feeling lonelier, and feeling more depressed as a result of increased Internet use. However, these findings have been qualified over time, with a later study on the same sample reporting that these negative effects did not continue to occur after a year had passed, and were dependent on personality characteristics (Kraut et al., 2002).

More recent studies have focused on specific elements of communication on the Internet, such as the use of e-mail, instant messaging (IM), and social network sites (SNSs). One study, for example, reported that increased use of IM over a six-month period was associated with adolescents feeling more depressed, whereas other uses of the Internet such as e-mail and chatrooms did not have a significant effect on feelings of depression (van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). There is also evidence to suggest that other modes of online communication, namely SNS use, can lead to increases in loneliness. Song and colleagues' (2014) meta-analysis of research that has studied the association between Facebook use and loneliness showed a positive relationship between Facebook use and loneliness, with support for

the directional hypothesis of Facebook use causing higher levels of loneliness. A more direct examination of Facebook use and SWB over a two-week period also found that more Facebook use was associated with people feeling more negative affect and less life satisfaction (Kross et al., 2013). The study examined both the affective and cognitive elements of SWB, using an experience sampling method to record moment-to-moment feelings after Facebook use, and shifts in life satisfaction over a two-week long period. Interestingly, direct communication with other people through face-to-face or phone channels was associated with people feeling more positive affect, and did not have an effect on life satisfaction (Kross et al., 2013). Overall, the study concludes that Facebook use may be undermining people's SWB.

On the other hand, in direct contrast to what the above studies have found, prior research also suggests that ICT use can lead to positive outcomes for well-being. In Morgan and Cotten's (2003) study, increased use of the Internet for communicative purposes (e.g., IM, e-mail, and chatrooms) was actually associated with decreased depressive symptoms in college students. IM has been suggested to provide emotional relief and a place for adolescents to receive social support and advice from friends, which can increase their well-being. Indeed, after chatting on IM, adolescents were found to have a significant decrease in emotional distress, and consequent improvement of emotional state (Dolev-Cohen & Barak, 2013). Similarly, a study of online communication among adolescents found that communicating with existing friends via IM positively predicted well-being through enhanced quality of friendships and time spent together (Valkenburg & Peter, 2007).

Moreover, a study that looked into SNS use found that when people were directed to post more status updates on Facebook, they experienced reduced loneliness and increases in feelings of connectedness with others (Deters & Mehl, 2013). This effect was not influenced by

the amount of responses people received from their friends. Similarly, people who posted more status updates on Facebook reported that they received more emotional support, which could lead to increases in social well-being (Hampton, Goulet, Marlow, & Rainie, 2012). A recent study also found an association between receiving targeted, composed communication from strong ties on Facebook and improvements in well-being, whereas there was no impact on well-being from viewing broadcasted posts from Facebook friends or receiving one-click feedback (Burke & Kraut, 2016). Furthermore, the phenomenon of “Facebook depression,” which suggested that adolescents feel more depressed after using Facebook, was also disputed when researchers found no association between Facebook use and depression (Jelenchick, Eickhoff, & Moreno, 2013).

Additionally, the number of Facebook friends was associated with increased life satisfaction, the effect of which was mediated by increased perceptions of social support and decreased stress (Nabi, Prestin, & So, 2013). The positive association between Facebook friends and life satisfaction persisted even when the size of people’s interpersonal social networks was controlled for. Likewise, people who received and accepted more friend requests on Facebook reported that they received more social support from friends both online and offline (Hampton et al., 2012). Lee, Noh, and Koo (2013) also found that people who were lonelier resorted to more self-disclosure on SNSs, which led to increased social support, which in turn caused increases in life satisfaction. Likewise, bloggers who self-disclosed more perceived more social integration, bonding social capital, and bridging social capital, all of which were associated with positive increases in SWB (Ko & Kuo, 2009).

Dienlin, Masur, and Trepte (2017) conducted a six-month longitudinal study in which they looked at the effects of three different channels of communication, namely SNSs, IMs, and

face-to-face interaction, on loneliness and life satisfaction. This study examined the contrasting views presented in the reinforcement vs. displacement hypotheses of mediated communication which suggests that ICT communication will either increase or decrease face-to-face communication. The results showed that over a period of six months, face-to-face, SNS, and IM communication did not have an effect on loneliness, and face-to-face and IM communication did not have an effect on life satisfaction. Only SNSs communication was found to lead to a slight increase in life satisfaction six months later (Dienlin et al., 2017).

Taken as a whole, the literature suggests that ICT use can indeed have effects on well-being, but with both positive and negative outcomes. One approach proposed by Cotten (2008) to make sense of these conflicting findings is that researchers need to delve more into the specific types of ICT use rather than looking at it in general, since examining specific features of ICT use may shed more light into the processes through which it impacts well-being. Technology use is not a universal influence, and it is multifaceted to the effect that different types of use can lead to different outcomes (e.g., Burke & Kraut, 2016). Furthermore, changes in well-being after ICT use are associated to an extent with what happens on the ICT itself, such as what content is shared (Choi & Toma, 2014) and the quality of interactions and feedback (Cotten, 2008; Davila et al., 2012; Valkenburg, Peter, & Schouten, 2006). This points to the need to understand the role of ICTs in the social-psychological and communication underpinnings of well-being. For instance, in a week-long study of how people shared emotions through various media, Choi and Toma (2014) found that the effects of emotional sharing through media depended on the type of emotion shared; throughout various ICTs such as phone calls, text messages, and Facebook, sharing positive content led to people experiencing more positive affect, and sharing negative content led to more negative affect.

Moreover, only specific activities on Facebook, such as directed communication with friends, were associated with increases in bonding social capital and decreases in loneliness; people who used Facebook for passive consumption of content were more likely to have reduced social capital and increased loneliness (Burke, Marlow, & Lento, 2010). Experimental evidence also suggests that when people were encouraged to passively browse Facebook, as opposed to active use, people reported reduced affective well-being at the end of the day, but not reduced life satisfaction (Verduyn et al., 2015). Likewise, a longitudinal survey on Internet use and depression also found that active forms of Internet use, such as communicating with friends and family online, significantly reduced depression; however, when the Internet was used to meet new people, people showed signs of increased depression (Bessière, Kiesler, Kraut, & Boneva, 2008). These effects also depended on individuals' perceived social support, in that people with more perceived support had larger increases in depression as a consequence of communicating with strangers and weak ties online, whereas people with the least perceived support even showed a decline in depression after using the Internet to meet new people (Bessière et al., 2008). In addition, Wang, Jackson, Gaskin, and Wang (2014) found that social uses of SNSs, such as posting status updates and writing comments, significantly increased well-being and the quality of friendships, whereas entertainment uses of SNSs, such as browsing others' profiles and playing games, did not have a significant relationship with well-being. Finally, a study of mobile phone use found similar results, with voice and online communication being positively related to SWB, and non-communicative uses, such as passing time, playing games, and information seeking, decreased positive affect and increased negative affect (Chan, 2015).

Davila and colleagues (2012) also stress the importance of communication processes on SNSs. In a survey, they asked participants not only to record the time spent per day on each

medium but also to think about the quality of interactions they had on social media, such as their positivity and negativity, as well as how they felt after interacting on social media. They found that depressive symptoms in young adults were not associated with the time spent on SNSs; rather, they were significantly correlated with the quality of interactions, in that more negative interactions on SNSs increased depressive symptoms, and depressive rumination strengthened this relationship (Davila et al., 2012). Another study of adolescents showed similar results, with the frequency of SNS use only having an indirect effect on social self-esteem and well-being (Valkenburg et al., 2006). Frequency of use was associated with more friend relationships on the site and the amount of feedback received, both of which influenced the tone of feedback. Whether the tone of feedback was positive or negative was the only factor that directly influenced social self-esteem; positive reactions increased self-esteem, which led to increases in well-being (Valkenburg et al., 2006).

In a similar vein, individuals with low self-esteem received fewer social benefits from self-disclosing on Facebook due to the content they shared being more negative than that of people with high self-esteem (Forest & Wood, 2012). By asking coders to rate the positivity or negativity of participants' 10 most recent status updates from Facebook and the liking for the author of each post, Forest and Wood (2012) found that even though people with low self-esteem thought that Facebook was a good venue for self-disclosure and social interaction, they posted more negative status updates on Facebook, which made them less likable. On the other hand, negative posts were associated with more social rewards (e.g., likes, comments) for people with high self-esteem, but not for people with low self-esteem. This study shows that interactions on SNSs may be judged in light of the initiator's personality traits, and that negative posts on Facebook may sometimes fail to garner the expected social rewards.

Interestingly enough, there has been recent evidence to suggest that even active uses of Facebook, such as interacting with friends' posts or updating one's own status, have detrimental effects on mental health and well-being. Shakya and Christakis (2016) conducted a longitudinal study which examined three years' worth of survey data from a nationally representative sample. The authors measured different aspects of Facebook use such as the number of Facebook friends, number of status updates posted, and number of links clicked on Facebook, and associated these factors with measures of physical health, mental health, and well-being. Their results consistently suggested that Facebook use was associated with decreases in physical health, mental health, and life satisfaction, whereas offline interaction with friends was consistently associated with increases in the well-being measures (Shakya & Christakis, 2016).

Overall, there does not seem to be a clear picture of how ICTs influence SWB, other than active communication having beneficial effects on SWB while passive consumption detracts from SWB. This points to the need for an overarching theoretical perspective that can incorporate specific theoretical mechanisms of mediated social interactions and its impacts on well-being. As such, I will now theorize how the effects of ICTs on well-being may be influenced by the communicative processes that occur within an interaction as well as being moderated by the types of ICTs in which they occur through the lens of the technological affordance approach.

Interpersonal Processes of Well-Being on ICTs

In the previous chapter, I reviewed research on how self-disclosure, perceived responsiveness of partners, and psychological need satisfaction are the mechanisms through which interpersonal communication enhances well-being. These mechanisms are even more relevant for social interactions that are conducted over ICTs, since the processes through which

people communicate on ICTs have a heavy influence on the outcomes, as discussed in the previous section of this chapter.

Research on ICT use and SWB has found that the extent of self-disclosure in an ICT interaction had direct positive influences on perceptions of social integration and social capital, which results in increased SWB (Ko & Kuo, 2009). Also, self-disclosure was found to lead to increased social support on SNSs, which then leads to increased well-being (Lee, Noh, & Koo, 2013). The Internet-enhanced self-disclosure hypothesis also proposes that higher amounts of online self-disclosure lead to better quality relationships, and in turn, improved well-being in adolescents, depending on the type of technology used (Valkenburg & Peter, 2009). In support of this hypothesis, self-disclosure was found to be the mediating influence between online communication and the quality of relationships (Valkenburg & Peter, 2009). Self-disclosure has also been touted as a main mechanism through which online communication enhances well-being, since the online environment provides opportunities for more open and increased amounts of self-disclosure, which then can increase mutual trust between relational partners and strengthen ties (Amichai-Hamburger & Barak, 2009). Indeed, one study found that the self-disclosure of stressful life events on Facebook was related to increased amounts of social support from a person's network, which increased perceived social support and life satisfaction on the part of the discloser (Zhang, 2017).

The perceived responsiveness of interaction partners is also an important mechanism through which social interactions enhanced well-being. Not many studies have been conducted in the area of ICT that examine perceived responsiveness within mediated interactions. However, one study conceptualized perceived responsiveness of the interaction partner as being a key element in social support on social media, since supportive responses are a crucial part of how

people receive social support from others online (Zhang, 2017).

Prior work has also found that people use interpersonal ICTs, such as Facebook, to fulfill the relatedness need of SDT. For instance, one study found that people were driven to use Facebook when they felt decreases in feelings of being disconnected from others (Sheldon, Abad, & Hinsch, 2011). This study found that Facebook use was correlated with increases in both satisfaction and dissatisfaction of the relatedness need. In other words, people who used Facebook simultaneously felt more connected to and disconnected from other people (Sheldon et al., 2011). However, when the initial findings were looked into further, results from an additional study found that the specific processes of increases and decreases in relatedness were driving Facebook use, and not the other way around (i.e., Facebook use driving increases or decreases in relatedness).

Looking at Multiple Media: Technological Affordances of ICTs

Most of the work that was reviewed in the previous section of this chapter examines the relationship between well-being and the use of one or two ICTs at the most except for a few that looked across multiple communication media. However, on a daily basis, most people use more than one or two ICTs per day, which is one of the reasons why it is important to understand how ICTs work in concert. Boase (2008) coined the term “personal communication system” (p. 492) to refer to how people use multiple forms of communication media in addition to face-to-face communication in order to interact with their social networks. His argument suggests that there is a need to look at a media landscape within which many different forms of ICT influence people’s day to day lives, and in effect, their well-being. Being mindful of how people use multiple platforms for different purposes and to access different networks, researchers also have suggested a “social media ecology” in which people utilize a range of different social media sites

for meeting their diverse communication needs (Zhao, Lampe, & Ellison, 2016). Earlier investigations of digital media use and personal well-being have also suggested that it is unreasonable to treat digital media use as a single entity, emphasizing the need to differentiate between channels (Baym, Zhang, & Lin, 2004). A more recent study also looked at the frequency of digital media use such as text messaging, e-mail, general Internet use, and social media use and found that these ICTs played different roles in enhancing or detracting from psychological well-being (Hampton, Lu, & Shin, 2015). It is especially important to consider the influences of a wide range of ICTs on well-being since the behaviors and mechanisms of communication can differ based on which ICT is used. For instance, a study that compared self-disclosure behaviors, such as goals, motivations, and characteristics, on Facebook and Twitter found that people were motivated to self-disclose on each platform for different reasons, which contributed to the characteristics of the disclosure message itself, such as its intimacy (Choi & Bazarova, 2015). However, theorizing the study of multiple media can be a tricky process, since the effects of many different ICTs can be confusing to parse. To this end, the framework of technological affordances offers an organizing principle that allows researchers to systematically investigate different elements of ICTs and understand their effects.

The technological affordances that are present in an ICT allow a user to perform certain communicative actions on the platform. The concept of affordances originates from ecological psychology, and refers to how objects provide different possibilities of use depending on how a user perceives the object's properties to be (Gibson, 1979). However, scholars of information and communication technology have adapted this concept to how technologies may suggest ways of interaction to users, and it has proven to be especially useful for designing ICTs and even for characterizing different forms of media by their affordances (Gaver, 1991). The concept of

technological affordances in ICTs stem from a combination two things: the features available to use in the medium and how people perceive actual possibilities for use (Treem & Leonardi, 2012). This is the basis for a relational approach to technological affordances in which both the features and affordances in an ICT interact with how people use it to communicate with others. This approach emphasizes both the affordances that are present in the technology itself as an element of design, as well as how the user perceives certain features to be available for use. However, there is a debate within the affordances literature that suggests that affordances exist within ICTs independently of people's perceptions. The original concept of affordances referred to possibilities for action that are inherent in the object and which do not change with people's perceptions, and sometimes the perceptions of affordances can be so instinctive that people do not even perceive that they are using a particular affordance (Rice et al., 2017).

Moreover, there is a recent need in affordances research to build a shared foundation of research that consolidate the way we talk about affordances as scholars, (Evans, Pearce, Vitak, & Treem, 2017). Many prior studies have employed the approach of researchers characterizing ICTs into varying types and levels of affordances rather than directly measuring people's perceptions of affordances (e.g., Choi & Toma, 2014; Gonzales, 2014; Jiang & Hancock, 2013). For instance, a particular medium, such as text messaging, will be characterized as having low levels of the cues affordance, medium levels of the synchronicity affordance, and etc. Taking a similar approach, this review will now identify key technological affordances that facilitate processes of social interaction and well-being on ICTs that have been emphasized in prior work, as well as outlining different levels of affordances that are associated with various ICTs.

The aforementioned concept of technological affordances of ICTs has been used in research to identify which elements of ICTs may influence different communication processes

within a mediated social interaction. Prior research has investigated the role of technological affordances in how people self-disclose to others and how that process affects relationships and well-being (e.g., Choi & Toma, 2014; Gonzales, 2014; Ruppel, 2015), and have identified three main technological affordances – cue availability, synchronicity, and audience reach – that contribute to different aspects of well-being.

Cue availability. The number of cues that are available in an ICT has been regularly considered as an important factor in predicting outcomes for relationships and well-being. The cues present in an ICT can range from visual cues which allow one communication partner to see the other, auditory cues that allow people to hear speech, and textual cues in the form of typed messages. Some ICTs that have the highest levels of cues available include face-to-face communication and video calls (e.g., Skype, Facetime, etc.). On the other hand, other ICTs have lower levels of cues present in that they allow for voice communication only, such as phone calls, or even textual communication only, such as e-mails and instant messaging.

Many studies have investigated the affordance of cue availability in social interactions by characterizing the extent to which each ICT has many or fewer cues. For instance, Gonzales (2014) found that whereas there were no differences in the amount of meaningful social interactions between low- and high-cue channels, only the meaningful interactions that occurred in text-based communication had a positive effect on self-esteem. This process was facilitated by the increased self-disclosure within text-based ICTs. In addition, Choi and Toma (2014) found that the cues available within a channel influenced the type of emotion that was shared with others, with more negative events being shared in ICTs with higher amounts of cues available. Within romantic relationships, the number of cues present within a communication channel influenced how people adapted their communication behavior, such as self-disclosure, between

geographically close and long-distance relationships (Jiang & Hancock, 2013). When long-distance romantic partners communicated in a low-cue channel, they tended to engage in greater amounts of self-disclosure compared to geographically close couples.

Synchronicity. Another key affordance is synchronicity, or how ICTs allow for spontaneous responses and back-and-forth interactions. Asynchronous ICTs, such as e-mail and social media, lack immediate responses to initiated social interactions, and the interaction partner is left to respond in his or her own time. This affordance has also been termed intrusiveness, or the availability of immediate feedback, in that media that are more intrusive, such as phone calls and text messages, will “intrude” into people’s lives and demand a timelier response (Choi & Toma, 2014). Feelings of perceived partner responsiveness have been found to be impacted by different levels of synchronicity in an ICT, in that lower synchronicity led to more behavioral adaptation to compensate for reduced levels of perceived partner responsiveness within long-distance romantic relationships (Jiang & Hancock, 2013). Therefore, ICTs that are higher in synchronicity, such as phone calls and video calls, are expected to increase perceived partner responsiveness, since the communication partner can respond instantly to messages. On the other hand, ICTs with lower levels of synchronicity, such as text messaging, IM, e-mail, and social media have the opposite effect on perceived responsiveness.

Audience reach. Mobility, or the ability to easily access ICTs from different locations, has been identified as an important technological affordance in previous studies that have investigated people’s use of multiple ICTs (Jiang & Hancock, 2013; Choi & Toma, 2014). However, in the age where smartphone penetration is high (77% of U.S. adults own a smartphone; Pew Research Center, 2017), mobility is a lesser constraining factor for accessing different forms of communication. For instance, in the past, e-mail, IM, video calls, and social

media had to be accessed through a computer, which lowered the mobility of these ICTs. Laptop computers increased the mobility, but not to the extent of the smartphone, which has opened access to these ICTs in an unprecedented manner. Whereas mobility is still an important affordance that affects connectivity with both strong and weak social ties (Campbell, 2015), it is less of a differentiating factor when it comes to distinguishing between types of mediated interactions (e.g., email, video calls, social media) that can be accessed through smartphones.

However, a relevant technological affordance associated with communication on social media, such as SNSs, is that such forms of media allow for one-to-many communication with a broad audience. As such, communication on social media allows people to reach broad audiences that consist of diverse groups of people. Engaging in such communication (e.g., Facebook status updates) only allows for public interaction between communication partners, which can lead to decreased feelings of perceived responsiveness. For example, people perceived broadcasted self-disclosures as being less intimate and less appropriate when shared publicly versus privately on Facebook, which, in turn, reduced their liking for the discloser (Bazarova, 2012). Also, sending to and receiving Facebook status updates from wider and undifferentiated audiences were behaviors that were associated with decreases in tie strength (Burke & Kraut, 2014).

To conclude, this chapter reviewed existing research on how communication on ICTs can affect well-being, as well as research on different communication mechanisms on ICT, and how researchers can understand the effects of multiple ICTs using the framework of technological affordances. Whereas there have been many studies on the topic of ICT use and well-being, no definite conclusions have been drawn about whether the effects are beneficial or harmful. This might be due to the fact that there is a relative lack of research that has conducted a thorough investigation of the communication processes that are present in ICT social interactions.

To this end, the next chapter will propose an empirical study in which theories of well-being, communication processes, and technological affordances are tied together to create an integrated theoretical framework that will be tested by gathering data on people's daily social interactions through ICTs and their effects on well-being.

CHAPTER 4

THE CURRENT STUDY

According to the research reviewed in previous chapters, there has not yet been a consensus of how SWB is impacted by the use of ICTs, or by social interactions through ICTs. This may be due to several reasons, including different conceptualizations of well-being, the relative lack of investigation in communication processes, a focus on one specific medium rather than many different kinds of ICT, and the lack of longitudinal studies that investigate causal relationships between ICT use and well-being. Many of the studies that have been reviewed are cross-sectional in nature, and only measure SWB at a single point in time to correlate it with overall levels of media use. Consequently, researchers have called out the need for robust causal research to determine the impact of online communication on well-being (Best, Manktelow, & Taylor, 2014; Wang et al., 2014). Therefore, more longitudinal work is needed to determine causal directions which will also be able to clarify some of the processes through which ICT use influences SWB. So far, research on the specific purposes of ICT use, especially regarding active vs. passive uses, seems to be in agreement that active and social uses generally promote well-being, whereas passive and consumption uses do not. However, other processes of communication have not been well-researched, such as self-disclosure, perceived responsiveness, and psychological need satisfaction.

Moreover, there is a need to investigate a media landscape in which many different types of ICTs are being used per day. Valkenburg and Peter (2009) have suggested that future work in ICT use and well-being needs to investigate the simultaneous effect of different ICTs. Most studies reviewed so far have only focused on one or two ICTs at the most (e.g., Internet use, SNS use, Facebook use, etc.), but in reality, people regularly use more than one ICT to communicate

on a daily basis, and there is a gap in work that compares the effects of different ICT use.

In light of the concerns above, and by synthesizing the research reviewed in previous chapters, I will now propose a study to investigate a conceptual framework that links together social interactions through multiple media, self-disclosure, perceived responsiveness, psychological need satisfaction, and the consequent effects on well-being. In particular, this study seeks to investigate the longitudinal relationship between multiple media use and its effects on SWB. This study will conceptualize the channel or ICT as a potential moderating influence by looking at the intervening effects of ICTs in combination with other factors. Thus, the study will take a contextual approach, looking at a combination of factors external to the medium itself, such as interaction quality and need satisfaction, that work together with the medium to produce effects on well-being, rather than looking at the medium's effects in isolation. Therefore, this study visualizes the medium of communication as a force that shapes different communication processes.

Hypotheses and Research Questions

According to research conducted on the affordances of availability of cues and synchronicity, people tend to engage in higher amounts of self-disclosure and perceive higher levels of partner responsiveness in channels with more available cues and higher levels of synchronicity (e.g., Jiang & Hancock, 2013). Taken as a whole, research that has been conducted on the aforementioned two affordances suggest that higher levels of each affordance could have positive impacts on how much people self-disclose and how responsive people perceive their interaction partners to be. Therefore, I predict that:

H1: a) Higher availability of cues and b) higher synchronicity are associated with increased self-disclosure.

H2: a) Higher availability of cues and b) higher synchronicity are associated with increased perceived responsiveness.

On the other hand, research on the affordance of audience reach suggests that broadcasting messages to a large audience leads to less intimate self-disclosure (Bazarova, 2012) and decreases in tie strength (Burke & Kraut, 2014). Thus, the following hypothesis is suggested about the influence of the audience reach affordance on self-disclosure and perceived responsiveness:

H3: Higher audience reach is associated with a) decreased self-disclosure and b) decreased perceived responsiveness.

In turn, increases in levels of self-disclosure and perceived partner responsiveness are expected to lead to higher levels of SWB through the satisfaction of the relatedness need (Reis et al., 2000). In accordance with previous reviews on behavioral mechanisms of interpersonal communication and well-being, I predict that:

H4: Increased amounts of a) self-disclosure and b) perceived responsiveness within an interaction are associated with higher levels of relatedness need satisfaction.

H5: Increased relatedness need satisfaction is associated with higher levels of subjective well-being: a) increased positive affect, b) decreased negative affect, and c) increased life satisfaction.

Additionally, whereas they do not follow the same communicative mechanisms as the satisfaction of the relatedness need, the satisfaction of the autonomy and competence needs still directly influence well-being (Deci & Ryan, 2014). Since the increases in feelings of autonomy and competence are expected to be associated with higher levels of SWB, I suggest the following two hypotheses:

H6: Increased autonomy need satisfaction is associated with higher levels of subjective well-being: a) increased positive affect, b) decreased negative affect, and c) increased life satisfaction.

H7: Increased competence need satisfaction is associated with higher levels of subjective well-being: a) increased positive affect, b) decreased negative affect, and c) increased life satisfaction.

However, a question arises as to how the autonomy and competence needs are influenced by the technological affordances of ICTs. As of now, not enough research has been conducted on these two specific psychological needs and ICT use to be able to pose directional hypotheses. Thus, I propose the following research questions about the effect of cue availability, synchronicity, and audience reach on autonomy and competence need satisfaction:

RQ1: How are the affordances of a) availability of cues, b) synchronicity, and c) audience reach associated with the satisfaction of the autonomy need?

RQ2: How are the affordances of a) availability of cues, b) synchronicity, and c) audience reach associated with the satisfaction of the competence need?

Finally, to investigate the potentially mediating role of relatedness need satisfaction between communication processes (i.e., self-disclosure and perceived relatedness) and SWB, the following hypotheses are proposed:

H8: Satisfaction of the relatedness need mediates between self-disclosure and subjective well-being: a) positive affect, b) negative affect, and c) life satisfaction.

H9: Satisfaction of the relatedness need mediates between perceived responsiveness and subjective well-being: a) positive affect, b) negative affect, and c) life satisfaction.

In light of the hypotheses and research questions suggested above, the current study will

seek to investigate the relationship between multiple ICT use and its effects on SWB (positive affect, negative affect, and life satisfaction) by examining the communication processes of self-disclosure, perceived partner responsiveness, and satisfaction of the relatedness need (see Figure 1 for a summary of the relationships between hypotheses).

CHAPTER 5

METHOD

To investigate the aforementioned hypotheses and research questions, data was collected using a week-long experience sampling method (ESM) study. ESM is a method where participants respond to periodic questionnaires throughout the day and record what they are doing or how they feel at the moment, as well as answer any other questions that are relevant for the study at hand (Scollon, Kim-Prieto, & Diener, 2009). ESM allows for *in situ* data collection, and is able to sample moment-to-moment moods that can be linked to different situations and times of day (Scollon et al., 2009). The advantage of ESM lies in its ability to capture how people feel at the moment, rather than asking them to reflect on prior experiences at a later time. ESM is an appropriate method for measuring moment-to-moment affective well-being in response to social interactions over ICT, especially since it is a method that is highly effective in measuring how subjective experiences change as a result of people's experiences of external events (Hektner, Schmidt, & Csikszentmihalyi, 2007). To this effect, ESM has often been used to measure how everyday activities influence people's happiness and well-being, since it can separate the effects of the immediate environment vs. more lasting effects on happiness (Csikszentmihalyi & Hunter, 2003). Since this study looked at daily changes in people's well-being in response to many different types of social interactions, I decided that ESM would be a more appropriate method of data collection than collecting cross-sectional data on media use and well-being separately. Whereas there are certain drawbacks to the method, such as the need for prolonged participation and the large number of surveys that the participant has to respond to which can place a burden on the participant, the data that can be gathered using ESM can be very rich and informative in nature (Hektner et al., 2007).

This study employed signal-contingent sampling, which is often used in ESM, and participants answered surveys based on random signals throughout the day, in order to sample a wide range of contexts and time periods during the course of a day (Hektner et al., 2007). Data were collected between October 2015 and March 2016.

Procedure

Participants consented to the study and agreed to receive and fill out surveys regarding their media use and communication. Before participating in the week-long ESM study, participants visited the research lab for an in-person training session. In this session, participants were instructed on the basics of what they are expected to do in order to participate in the study, as well as being given a detailed explanation of how to answer the ESM questionnaire.

In this training session, participants were also asked to fill out a pre-study survey that includes baseline measures of SWB, self-esteem, loneliness, demographics, personality characteristics, and frequencies of different ICT use. This information was collected to control for the baseline SWB, and the influence of other relevant factors on SWB. Since satisfaction with life, the cognitive component of SWB, remains relatively stable over time (Diener, 2009), it did not make sense to measure it multiple times per day in the ESM surveys. Thus, satisfaction with life was only measured twice, before and after the ESM phase.

In the week-long ESM phase of the study, participants were sent periodic text messages using the ESM data collection service SurveySignal (Hofmann & Patel, 2014). One text message was sent at a random time per 130-minute window, with 5 messages sent during a day between 10 a.m. and 11 p.m., which are the hours during which college students are most likely to be awake (Hektner et al., 2007). Additionally, each message was at least 15 minutes apart from the last message participants received in order to increase the chances of there being an additional

social interaction occurring between the two signals. This enabled the gathering of 35 potential data points from each participant.

Participants were required to have a smartphone with Internet access in order to fill out the ESM surveys. Each text message had a link to an online survey with questions from the measures described in detail below. In the survey, participants were asked to recall the last significant social interaction they had in the time period between the last message and the time they got the latest message. The interpretation of what constitutes as a “significant” social interaction was left up to the participant to decide (Baym et al., 2004). However, the aim of these instructions were to ensure that only the interactions that were most significant, salient, or relevant would be sampled, those of which would also have the most impact on well-being. Here, social interactions are not limited to dyadic interactions, and can include “half” social interactions (Gonzales, 2014, p. 199), such as asynchronous posts on Facebook and Twitter. These “half” social interactions were not limited to the production of messages, but also included browsing and consumption of other-generated content.

Participants were then asked what medium they used for the interaction (e.g., face-to-face, phone call, video call, text message, IM and chat, social media, etc.), how close they are with the interaction partner, what type of relationship they have with the interaction partner, and various characteristics of the interaction such as whether or not they disclosed any information about themselves, how responsive their interaction partner was, and to what extent the three psychological needs of autonomy, competence, and relatedness were satisfied. If they indicated that they had self-disclosed during the interaction, the survey also included questions about the type and amount of self-disclosure. Finally, participants were asked to complete measures of affective SWB and emotional arousal at the end of every survey. The total time it took to fill out

each survey was less than 3 minutes, to ensure that participants were not overly burdened by the many data points collected over the course of a week.

Finally, after the one-week ESM sampling period was over, participants were asked to complete the full measure of SWB one last time using an online survey that was e-mailed to them. After all the phases of the study had been completed, participants were compensated with either \$25 in cash, or course extra credits and \$5 in cash to compensate for mobile phone text and data usage.

Participants

159 students from a university in the Northeastern U.S. participated in this study. 71.1% ($N = 113$) of participants were female, with an average age of 20.01 ($SD = 1.45$). The majority of participants identified as Caucasian (51.7%), with 28.7% being Asian, 7.5% Hispanic/Latino, 6.9% African American, and 5.2% Other. Overall, 5037 ESM surveys were collected from participants. Participants who did not complete 65% or more of the daily ESM surveys ($N = 15$) were excluded from the dataset (original $N = 174$). The average response rate was 87.5%.

Measures

Pre- and post-ESM measures. The pre-study survey included the media use frequency scale, which measured frequency of communication media use on a scale of “1=Never” to “6=Very Frequently” (Ledbetter, 2009), questions about demographics, personality traits (ten item personality inventory; Gosling, Rentfrow, & Swann, 2003), and a baseline measure of SWB using the positive and negative affect schedule (PANAS; Watson, Clark, & Tellegen, 1988) and the satisfaction with life scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). Since satisfaction with life, the cognitive component of SWB, remains relatively stable over time (Diener, 2009), it did not make sense to measure it multiple times per day in the ESM surveys.

Thus, satisfaction with life was only measured twice, before and after the ESM phase. Other common measures of mental health and well-being were also included in the pre-study survey such as loneliness (UCLA loneliness scale; Russell, 1996), self-esteem (Robins, Hendlin, & Trzesniewski, 2001), and general well-being (Lyubomirsky & Lepper, 1999). See Appendices A and B for a copy of the measures included in this survey.

Self-disclosure. For every ESM survey that the participants filled out, the presence of self-disclosure within an interaction was gauged by a one-item scale that asks participants: “During the last interaction, did you reveal any information about yourself?” If participants answered yes to that question, they were further asked to report levels of factual, cognitive, and emotional self-disclosure by answering three separate questions that asked: “During the interaction, how much did you share information about a) facts about yourself, b) your thoughts, c) your feelings?” Participants responded on a scale of “1=very little” to “5=very much.”

Perceived responsiveness. The perceived responsiveness of the interaction partner was measured on a scale of “1=strongly disagree” to “5=strongly agree” using a composite scale of two items: “During the interaction, I felt accepted by the person/people I was interacting with.” and “During the interaction, I was understood by the person/people I interacted with.” (Laurenceau et al., 1998).

Psychological need satisfaction. The ESM survey also included a measure of the three psychological needs as outlined in SDT. To measure the extent to which participants felt that the three psychological needs were satisfied within the interaction, each ESM survey contained questions that measure feelings of autonomy, competence, and relatedness on a scale of “1=strongly disagree” to “5=strongly agree.” To measure autonomy, participants were asked to rate the statement “The person/people I interacted with provided me with choices and options.”

(adapted from Deci, La Guardia, Moller, Scheiner, & Ryan, 2006). For competence, participants rated the statement “I felt effective and competent during the interaction.” (Reis et al., 2000), and for relatedness, “During the interaction, I felt close and connected with the person/people I was interacting with.” (Reis et al., 2000).

Relationship closeness. Relationship closeness with the interaction partner was measured on a scale of “1=extremely not close” to “7=extremely close” with the answer to the question “How close are you with the person that you interacted with?” If the participants have chosen Facebook, Twitter, or other social media as the medium used for interaction, they were asked to indicate to which audience they targeted their message to (e.g., to the whole network, to a portion of the network, etc.). If they answered that they used a directed channel (e.g., timeline posts and private messages on Facebook, direct messages on Twitter, etc.), they were asked the same closeness question as above.

Affective well-being. Measures of affective SWB used in the five-times per day ESM surveys included three questions to measure the positive and negative affect components of SWB. Participants were asked to indicate how positive and negative they feel by answering the question: “How positive do you feel at the moment?” and “How negative do you feel at the moment?” on a scale of 1 to 10. Positive and negative affect were measured separately since the presence of positive affect does not automatically lead to the absence of negative affect (Diener, 1984). Also, the emotional arousal of participants was measured by asking participants to place how they feel on a 5-point semantic differential scale from sleepy to alert (Russell, Weiss, & Mendelsohn, 1989). See Appendix C for a full copy of the ESM questionnaire.

Analytical Approach

Since several data points were collected from each participant during the week of

participation in the ESM study, multilevel modeling was used to account for the nested structure of the data within participants. Multilevel modeling can also be used to analyze longitudinal data collected from individuals over time (Singer, 1998). In an attempt to establish a causal relationship between the independent and dependent variables, the main dependent variables (i.e., the affective well-being measures) were lagged and entered as variables in analysis. A lagged multilevel regression model is useful when one variable can influence another with a time lag (Singer, 1998). In this case, previous levels of affect will most likely influence current levels of affect, in that participants who felt more positively at the time of one ESM survey will most likely still feel positive, or will still be influenced by their previous feelings when they fill out the next ESM survey. To solve this problem, lagged analysis uses the past levels of a dependent variable as an independent variable in the current analysis. Thus, each analysis on positive and negative affect controlled for the participant's level of affect at the previous time point. Therefore, the analysis measured changes in the dependent variables associated with the particular levels of independent variables (i.e., self-disclosure, perceived responsiveness, and psychological need satisfaction) that occurred during the time between filling out the previous and current ESM surveys.

Additionally, in order to investigate the mediating influence of relatedness need satisfaction between communication processes and SWB, multilevel structural equation modeling (MSEM) was used to account for the nested structure of data while allowing for tests of mediation. MSEM was used in analysis since traditional multilevel modeling approaches to mediation may produce conflated estimates of indirect effects and cannot handle mediation paths that cross levels (Preacher, Zhang, & Zyphur, 2010), such as one component of the mediation model being on the participant level (i.e., Level 2) rather than the interaction level (i.e., Level 1).

Currently, MSEM models cannot be computed by the IBM SPSS Statistics program, so Mplus (Muthén & Muthén, 2015) was used for the mediation analyses. The independent variables, mediator variables, and dependent variables were all on Level 1, so a 1-1-1 mediation model with fixed slopes and random intercepts was used in analysis (Preacher et al., 2010; Syntax I). Level 1 variables have both between- and within-group variances, so both between and within indirect effects were calculated and tested for significance. For instance, even though the variable of relatedness need satisfaction is measured for every interaction, and therefore is measured at Level 1, both between-participant changes and within-participant changes in feelings of relatedness can mediate the relationship between the communication mechanism variables (i.e., self-disclosure and perceived responsiveness) and SWB. The between and within indirect effects in MSEM analysis are a representation of this concept; the between indirect effect accounts for how independent variables influence dependent variables on the between-participant level, and the within indirect effect estimates the mediating relationship on the within-participant level (Robitaille et al., 2013).

CHAPTER 6

RESULTS

IBM SPSS Statistics 23 and Mplus 7.31 were used for all analyses. Analyses for Hypotheses 1 through 7 and Research Questions 1 and 2 were conducted using SPSS, and analyses for Hypotheses 8 and 9 were conducted using Mplus. Three-level multilevel models were used with interaction-level variables nested under the day of the week the interaction took place in, and the day of the week being nested under participant characteristics. All analyses controlled for demographic factors (i.e., age, gender, ethnicity), media use frequency, and relationship closeness; however, only significant factors are reported below.

ICT Use

During the pre-ESM survey, participants reported that their most frequently used ICT was text messaging, followed by e-mail, and then social media (see Table 1). Each ICT was also characterized by the specific levels of technological affordances associated with each, as described in the introduction and based on characterizations that have been frequently used in prior research (see Table 1). Out of the 5037 social interactions that participants reported as “significant,” 56.9% were conducted face-to-face, and 42.5% were conducted through various ICTs. The most frequently used ICT was text messaging, followed by phone calls, and IM. E-mail, social media, and video calls each were less than in 5% frequency (see Table 1). Participants also reported that they engaged in self-disclosure in 59.4% of all sampled social interactions.

Baseline Measures of Well-Being

In order to determine the participants’ baseline level of well-being, several scales of well-being were included in the pre-study survey. Affective SWB was measured using the

PANAS scale, which ranges from 10 to 50, with higher scores being associated with higher levels of positive or negative affect. Overall, participants had medium levels of positive affect ($M = 27.29$, $SD = 8.51$) schedule of the PANAS scale and scored relatively low on the negative affect ($M = 14.57$, $SD = 5.00$) schedule of the PANAS scale. Cognitive SWB, namely satisfaction with life, was measured on a scale of 7 to 35, with higher scores representing higher satisfaction with life. The pre-study average for the satisfaction of life scale was 24.78 ($SD = 5.83$), which is considered an average score of life satisfaction (Diener, 2006).

Hypothesis Tests

H1 and H2 looked at the effects of the technological affordances cue availability, synchronicity, and audience reach on amounts self-disclosure and perceptions of partner responsiveness within an interaction. Results showed that both cue availability, $F(2, 2164) = 49.42$, $p < .001$, and synchronicity, $F(2, 2154) = 42.33$, $p < .001$, had a significant association with the amount of self-disclosure that occurred during an interaction (see Table 2). H1a was only partially supported, since ICTs with medium levels of cues were associated with the highest amounts of self-disclosure, followed by high- and then low-level cue ICTs. On the other hand, H1b was fully supported, with interactions on the most synchronous ICTs being associated with the highest amounts of self-disclosure. In sum, the higher availability of cues in an ICT did not lead to the most amounts of self-disclosure, so there was not a linear effect of cue availability on self-disclosure. On the other hand, ICTs with higher levels of synchronicity were indeed associated with the most self-disclosure.

In support of H2, the effects of cue availability, $F(2, 3739) = 57.99$, $p < .001$, and synchronicity, $F(2, 3741) = 130.36$, $p < .001$, were significantly associated with levels of perceived responsiveness. However, H2a was not fully supported, since medium levels of cue

availability were associated with the highest amounts of perceived responsiveness, followed by ICTs with high, and then low levels of cues having respectively lower amounts of perceived responsiveness (see Table 2). On the other hand, increased synchronicity was positively associated with higher amounts of perceived responsiveness, with high synchronicity being associated with the highest amounts of perceived responsiveness, followed by medium, and then low levels of synchronicity (see Table 2). Thus, H2b was supported. These results followed a very similar pattern to the results of H1, with medium cue channels being associated with the most perceived responsiveness. Again, the effects of synchronicity are more clear, with increasing amounts of synchronicity in an ICT being associated with increased amounts of perceived partner responsiveness.

In accordance with H3a and H3b, the increased audience reach that is available on social media platforms was negatively associated with self-disclosure, $F(1, 2118) = 31.83, p < .001$, and perceived responsiveness, $F(1, 3746) = 215.20, p < .001$. ICTs with high audience reach were associated with both lower amounts of self-disclosure and perceived partner responsiveness when compared to ICTs with lower audience reach (see Table 2). Overall, a higher level of audience reach seems to impact self-disclosure and perceived responsiveness in a negative manner.

H4 investigated how self-disclosure and perceived responsiveness were associated with satisfaction of the relatedness need. In support of H4a, increased amounts of self-disclosure during an interaction were associated with higher levels of relatedness, $F(1, 2590) = 257.27, p < .001$ (see Table 3). Moreover, in accordance with H4b, higher levels of perceived responsiveness were also significantly associated with a higher satisfaction of the relatedness need, $F(1, 3453) = 3042.54, p < .001$ (see Table 3). In accordance with predictions, the

communication mechanisms of self-disclosure and perceived responsiveness were positively associated with the satisfaction of the relatedness need.

Finally, H5 investigated how satisfaction of the relatedness need contributed to feelings of SWB as measured by a) positive affect, b) negative affect, and c) life satisfaction. In support of H5a and H5b, higher satisfaction of the relatedness need was significantly associated with higher positive, $F(1, 3690) = 447.56, p < .001$, and lower negative affect, $F(1, 3677) = 119.62, p < .001$ (see Table 3), even when controlling for the levels of positive and negative affect felt during the previous time period. However, contrary to expectations, higher fulfilment of the relatedness need was not significantly associated with life satisfaction, $p = .14$, and thus, H5c was not supported. From these analyses, it can be concluded that increased feelings of relatedness contributed to affective well-being in the predicted ways, with higher levels of relatedness need satisfaction being associated with higher positive and lower negative affect. However, satisfaction of the relatedness need did not significantly predict levels of life satisfaction, suggesting that there were no effects on cognitive well-being.

Next, Hypotheses 6 and 7 were tested, which predicted that increases in the satisfaction of the autonomy (H6) and the competence (H7) needs would be associated with higher SWB. Both H6a and H6b were supported, since there was a significant positive effect of autonomy need satisfaction on positive affect, $F(1, 3716) = 218.84, p < .001$, and a significant negative effect of autonomy need satisfaction on negative affect, $F(1, 3651) = 57.31, p < .001$. On the other hand, increases in the satisfaction of the competence need were found to be significantly associated with higher positive affect, $F(1, 3728) = 569.17, p < .001$, and lower negative affect, $F(1, 3712) = 258.70, p < .001$, in support of H7a and H7b (see Table 4). Thus, it can be concluded that higher levels of autonomy and competence need satisfaction are associated with

higher positive affect and lower negative affect. However, neither autonomy ($p = .65$) nor competence ($p = .11$) had a significant effect on life satisfaction when controlling for the level of life satisfaction felt before the start of the week. Therefore, H6c and H7c were not supported.

RQ1 and RQ2 asked about the influence of technological affordances on levels of autonomy and competence need satisfaction, respectively. To answer RQ1a, there was a significant effect of cue availability on autonomy need satisfaction, $F(2, 3765) = 46.92, p < .001$, with the highest levels of autonomy felt in ICTs with medium cues, followed by ICTs with high cues, and the lowest levels of autonomy being associated with ICTs with low cues (see Table 2). Synchronicity also had a significant effect on autonomy need satisfaction, $F(2, 3767) = 49.23, p < .001$ (RQ1b). ICTs with high synchrony were associated with the highest levels of autonomy, followed by ICTs with medium synchrony, and then low synchrony. As for RQ1c, audience reach also had a significant effect on autonomy need satisfaction, $F(1, 3778) = 77.97, p < .001$ (see Table 4). Participants felt lower levels of autonomy in ICTs with a high audience reach when compared to those with a low audience reach.

For RQ2a, again, cue availability was significantly associated with competence need satisfaction, $F(2, 3749) = 25.36, p < .001$. ICTs with medium cue availability were associated with the highest levels of competence need satisfaction, followed by high cues, and low cues (see Table 2). Interestingly, the difference in feelings of competence between ICTs with high vs. medium availability of cues was not significant. The effect of synchronicity was also significant, $F(2, 3756) = 44.47, p < .001$ (RQ2b). ICTs with high synchronicity were associated with the highest feelings of competence, followed by ICTs with medium, then low synchronicity. Finally, answering RQ2c, ICTs with low audience reach were significantly associated with higher levels of autonomy need satisfaction than ICTs with high audience reach, $F(1, 3752) = 79.23, p < .001$

(see Table 4).

H8 and H9 predicted that the effect of self-disclosure (H8) and perceived responsiveness (H9) on SWB is mediated by satisfaction of the relatedness need. However, since the results of H5c revealed that the effect of relatedness need satisfaction was not significantly associated with life satisfaction, mediation analyses were not conducted on H8c and H9c (i.e., the effect of self-disclosure or perceived responsiveness on life satisfaction is mediated by fulfillment of the relatedness need). To test H8a, the indirect effect of self-disclosure on positive affect through the mediating influence of relatedness need satisfaction was estimated. Supporting the hypothesis, mediation analysis showed that the indirect effect of within-participant self-disclosure through relatedness need satisfaction on positive emotion was significant, estimate = .23, $p < .001$, 95% CI [.18, .27] (see Table 5). The between-participants indirect effect of self-disclosure on positive affect via relatedness need satisfaction was also significant, estimate = .50, 95% CI [.20, .80], $p < .01$ (see Table 5). This suggests that participants who self-disclosed more during interactions felt more related to their interaction partners, which in turn mediated the influence of self-disclosure on positive affect. H8b predicted that the effect of self-disclosure on negative affect is also mediated by the satisfaction of the relatedness need. In support of this hypothesis, results showed that both the within indirect effect, estimate = -.15, $p < .001$, 95% CI [-.18, -.11], and between indirect effect, estimate = -.39, 95% CI [-.67, -.10], $p < .01$, were both significant (see Table 5). Thus, participants who self-disclosed more felt increased levels of relatedness, which in turn decreased the amounts of negative affect participants experienced.

H9a and H9b predicted that perceived responsiveness will have an indirect effect on positive (H9a) and negative (H9b) affect through the mediator of relatedness need satisfaction. In support of H9a, the within indirect effect of perceived responsiveness on positive affect via

relatedness need satisfaction was significant, estimate = .23, 95% CI [.16, .30], $p < .001$. However, the between indirect effect was not significant, $p = .20$. Looking closely at the breakdown of within and between level estimates, the between-participant effect of relatedness on positive affect was not significant, rendering the between indirect effect insignificant as well (see Table 5). This suggests that even though there is a significant mediating influence of relatedness need satisfaction on the within-participant level, the mediator was not significant for between-participant differences in how increased perceived responsiveness decreases negative affect. The results of H9b were similar in that they showed that there was a significant within indirect effect of perceived responsiveness on negative affect through the mediating influence of relatedness, estimate = -.09, 95% CI [-.15, -.02], $p < .01$, whereas the between indirect effect was not significant, $p = .52$. Again, the insignificance of the between indirect effect was due to the fact that the relationship between relatedness need satisfaction and negative affect was not significant, suggesting that there is not enough evidence to suggest that between-participant differences in feelings of relatedness have an effect on both positive and negative affect (see Table 5). Overall, these results showed that participants who perceived their interaction partner as being more responsive felt higher levels of relatedness, which mediated the effect of perceived responsiveness on positive and negative affect.

CHAPTER 7

DISCUSSION

This study investigated different communication processes involved in social interactions through various ICT, using a theoretical framework that combines the interpersonal process model of intimacy (Reis & Shaver, 1988) and self-determination theory (Ryan & Deci, 2000) to see how social interactions conducted on ICTs impact SWB. Traditional research on SWB has found that the quality of personal relationships and social interactions matter for SWB. Now that ICTs offer convenient ways to enhance and maintain relationships, research has found that some types ICT use can lead to higher quality social interactions, which leads to increases in well-being (Cotten, 2008). Building on this kind of research, this study offered an integrated theoretical model of social interactions on ICTs and well-being that involves concepts of interpersonal communication and well-being drawn from self-determination theory and the interpersonal process model of intimacy.

The main findings of this study suggest that, first of all, the traditional theories of interpersonal communication and well-being are still relevant in ICT communication. Results of hypothesis testing showed that increases in self-disclosure and perceived partner responsiveness were associated with increases in the satisfaction of the need to be related to others. In turn, this process enhanced the affective well-being component of SWB. This, in effect, confirmed the explanatory power of the IPMI to predict relational intimacy and well-being in an ICT setting. However, the results were not as clear when it came to the cognitive aspect of SWB, which was measured by life satisfaction. By and large, there were no significant effects of self-disclosure, perceived responsiveness, or satisfaction of the three core psychological needs on life satisfaction.

There are two important theoretical contributions that this study offers. First, it outlines theoretical mechanisms that connect different aspects of interactions, such as self-disclosure and perceived responsiveness, with well-being, via the satisfaction of the relatedness need. Whereas these mechanisms have been studied separately in different studies of ICT (e.g., Gonzales, 2014; Jiang & Hancock, 2013; Valkenburg & Peter, 2007), this study offers an integrated framework that outlines communication and psychological mechanisms that lead to improvements in well-being. Second, this study examines these mechanisms in social interactions within different ICTs, which reflects today's landscape of people's technology use where people rely on multiple ICTs to connect and communicate with others. Through momentary assessments of moods and interaction experiences over a week-long period, this study was able to gather comprehensive data on what participants considered as meaningful interactions in different communication channels, and how the affordances of cue availability, synchronicity, and audience reach influenced self-disclosure and perceived partner responsiveness.

This study adds theoretical value by investigating different communication processes involved in social interactions through various ICTs and how they impact SWB, focusing on mechanisms such as self-disclosure, perceived responsiveness, and core psychological need satisfaction. Prior work has emphasized the need for both theoretical and empirical examinations of mechanisms involved in how social ties influence well-being (Thoits, 2011). This study goes a step beyond this call by examining social interactions on novel forms of ICT communication and incorporating the framework of technological affordances to provide an explanatory mechanism for how characteristics of the ICT channel can influence judgments of the quality of social interactions conducted on it. It is also one of the first studies to investigate how the technological affordances of multiple ICTs compare with each other in terms of promoting relational intimacy

via self-disclosure and perceived responsiveness, as well as enhance well-being through the satisfaction of core psychological needs.

The study also attempts to integrate the hedonic and eudaimonic perspectives of well-being together by combining the concept of psychological motivations and needs from SDT with elements of affective and cognitive well-being from SWB. Thus, this study attempts to paint a bigger picture of well-being that encompasses both perspectives, as well as applying these theories of well-being to ICT settings.

The Influence of Technological Affordances on Processes of Well-Being

Perhaps most importantly, the results of this study showed that different technological affordances influence the types of communication processes that occur in mediated social interactions, effectively moderating the influence of social interactions on well-being. The current study contributes to the literature on technological affordances by providing a parsimonious way to categorize ICTs based on their available affordances, which is also coherent with previous characterizations of affordances in the mediated communication and well-being literature. As mentioned previously, not all interactions conducted through text messages will be low in cue availability, medium in synchronicity, or low in audience reach. People can send pictures or videos which entail higher levels of cues, as well as converse in real-time with each other for higher synchronicity. However, a majority of text messaging interactions will be text-based, relatively asynchronous in nature, and in one-on-one conversations. The characterization of different ICTs into varying levels of technological affordances as was done in this study represents a way to break down the multiple media that people use to examine the influence of different affordances.

Both cue availability and synchronicity affected levels of self-disclosure and perceived

partner responsiveness, with people reporting higher amounts of self-disclosure and perceived responsiveness in synchronous media and in channels offering medium levels of cue availability, followed by ICTs with high and low levels of cues. Interestingly, channels with the highest levels of cues (i.e., face-to-face, video calls) were not associated with the highest amounts of self-disclosure and perceived responsiveness. Contrary to expectations, channels with moderate levels of cues (i.e., phone calls) were associated with high amounts of self-disclosure and perceived responsiveness, which predicted increased satisfaction of the relatedness need and in turn, predicted higher affective well-being. One reason that a moderate level of cues could be more conducive to higher amounts of self-disclosure and perceived partner responsiveness is that when a lower number of cues are available in an ICT, people adapt their communication to a more constrained technological environment. Jiang and Hancock (2013) found that couples in long-distance relationships adapt their self-disclosure behaviors and perceptions of responsiveness most drastically in low-cue channels. However, moderate levels of cues present within an ICT could create an optimal level of adaptation, which is why the highest amounts of perceived partner responsiveness was associated with medium-cue ICTs. This finding is also in line with Gonzales' (2014) study, in which she found that cell-phone communication was associated with the highest levels of interaction meaningfulness. These findings combined could suggest that use of a medium-cue ICT leads to the highest quality social interactions in terms of self-disclosure and perceived responsiveness.

Results of the study also showed how increased levels of self-disclosure and perceived responsiveness were associated with increased satisfaction of the relatedness need, which, in turn, was related to higher affective well-being (higher positive affect and lower negative affect). Thus, this study confirmed previous research which has found that perceived partner responsiveness is

a key mechanism through which successful relationships are maintained, thereby contributing to positive outcomes on well-being (Reis, 2012), but extended these findings for the first time to interactions in ICTs. This study was also one of the first to directly measure perceived responsiveness and psychological need satisfaction within day-to-day ICT social interactions. As mentioned before, there is a current dearth of research that examines theoretical mechanisms of the effects of social ties on well-being and this study sought to close the gap. The findings were also in line with previous studies which found that satisfaction of the relatedness need is a crucial determinant of daily well-being (Reis et al., 2000).

The findings about mechanisms of well-being were tied together in mediation analyses (H8 and H9) which showed that satisfaction of the relatedness need mediates the relationship between communication mechanisms (i.e., self-disclosure and perceived responsiveness) and affective well-being (i.e., positive and negative affect). This is evidence for the causal chain between how higher levels of self-disclosure and perceived partner responsiveness increase feelings of relatedness, and which in turn increases positive affect or decreases negative affect. An unexpected finding of self-disclosure on negative affect suggested that whereas the direct influence of increased self-disclosure increases negative affect, when the influence is mediated by changes in relatedness need satisfaction, negative affect is decreased again. This may suggest that higher amounts of self-disclosure by itself increases negative feelings, only certain types of self-disclosure that also increase feelings of relatedness will decrease negative affect. Thus, it opens up the possibility that not all types of self-disclosure have a uniformly positive influence, and only the type of self-disclosure that increases the level of relatedness need satisfaction has beneficial effects on well-being.

One thing to be cautious about in interpreting the findings of this mediation analysis as

being direct evidence for causality is that a statistical model alone cannot be used to make causal claims. However, since the model being tested was based on prior research and contained theoretically relevant variables and processes, the claim of causality can be strengthened in this case (Preacher et al., 2010). On the other hand, no mediation analyses were conducted on the life satisfaction component of SWB, since it was found that on a weekly basis, satisfaction of the relatedness need does not have a significant effect on levels of life satisfaction. Therefore, a causal model could not be tested using mediation.

In addition, findings from the two research questions probed the relationship between technological affordances and the autonomy and competence needs as outlined in SDT. The analyses showed some interesting relationships between the ICT affordances and satisfaction of the autonomy and competence needs. An unexpected finding suggested that communication in medium vs. high cue availability ICTs was associated with similar levels of competence, which were the only two groups of affordances to be not significantly different from each other in the entire study. However, when looking at the general trend of results, it is shown that the highest levels of autonomy and competence need satisfaction occur in ICTs with medium availability of cues. These results point again to the promising nature of medium-cue channels, which may be providing just the right number of cues to have the most beneficial effects. Additionally, in congruence with predictions, the satisfaction of both psychological needs contributed to increases in affective well-being.

On the other hand, the findings failed to establish a connection between interaction quality, feelings of relatedness, and life satisfaction. However, it must be noted that life satisfaction is a relatively stable component of SWB (Diener, 2009) and thus would not change much over the course of a week. In fact, a study which examined the influence of mediated

interactions over a six-month period only found small increases in life satisfaction after communicating on SNSs (Dienlin et al., 2017). Thus, the change in life satisfaction due to ICT use may not be large enough to be detected with a week's worth of mediated interactions. Furthermore, satisfaction of both the autonomy and competence needs did not predict changes in life satisfaction either. This is unexpected, since prior research has documented robust effects of autonomy and competence on increasing SWB (Deci & Ryan, 2014). However, it could be the case that these two needs play a more direct role in well-being when they are satisfied through ICTs, and the need satisfaction itself could be akin to raised well-being, as shown in the findings on affective well-being.

Communication Patterns on Multiple ICTs

As mentioned in the introduction, not many studies have examined communication on a combination of multiple ICTs, which is important since many people nowadays use multiple ICTs on a daily basis for social interactions. The results from this study updated findings from Baym, Zhang, and Lin's (2004) diary study about the frequency with which people use different ICTs for meaningful interactions. Baym and colleagues found that 64% of meaningful interactions were conducted face-to-face, 18.4% over the telephone, and 16.1% over the Internet. The results of the current study found that overall, there was an increase in the frequency of telephones and the Internet used as a channel for meaningful interactions. Yet, some things remain the same in that face-to-face communication was the most often used form of meaningful social interactions. Furthermore, the current study extends Baym et al.'s (2004) findings by looking not only at the frequency of these mediated interactions, but also at the effects they had on people's psychological need satisfaction and well-being.

Harking back to the concept of personal communication systems and the frequency of

use for different media (Boase, 2008), this study found that people do indeed utilize many forms of ICTs for communication, even though face-to-face was the main channel reported for conducting significant social interactions. However, many studies reviewed in the introductory chapters focus on the effects of online communication and social media, such as Facebook, on well-being. However, this study found that social media interactions comprise only a small percentage (4.3%) of significant social interactions. This may signal the fact that the current research focus on how social media interactions enhance or detract from personal well-being may be signaling that a part of the bigger picture is being missed. As the results of the study showed, social media interactions were not representative of the effects of ICTs on well-being; whereas social media interactions were associated with lower levels of self-disclosure and need satisfaction, other forms of ICTs such as text messaging or instant messaging had higher levels of each, suggesting that not all forms of ICTs are uniformly associated with well-being processes and outcomes. Thus, studies that examine social media channels only, such as time spent on a site (e.g., Facebook; Kross et al., 2013) or active vs. passive uses (e.g., Verduyn et al., 2015) take a narrow approach to examining impacts on well-being in the overall landscape of ICT use. However, these studies could be bolstered by an investigation of specific communication processes that occur in each social media interaction, which will enable researchers to determine the forces that are fundamentally driving the effects on well-being extended past social media use only. Furthermore, the findings of the current study showed that the expanded audience reach affordance that is available in social media platforms was consistently associated with lower levels of self-disclosure, perceived responsiveness, and psychological need satisfaction. Prior studies that have found detrimental effects of Facebook use on well-being may be conflating the effect of this particular affordance with Facebook use overall, which again points to a need to

examine the exact communicative mechanisms that are occurring on any ICT.

Every day, people use multiple ICTs to maintain interpersonal relationships, and yet there is still a need to look at a media landscape of ICTs and see how they influence well-being in comparison to each other. To do this, the current study took the approach of the “medium as the modifier of the message” and suggested that different ICTs can modify the outcomes of an interaction based on the characteristics of a medium (Ledbetter, 2014, p. 458). The framework of technological affordances can be very helpful in this endeavor, since the concept of affordances provides a clear way to break down how different aspects of an ICT can shape people’s experiences on a channel (Sundar & Bellur, 2010).

Some studies have already investigated this phenomenon across multiple media. For instance, Gonzales (2014) investigated the influence of social interactions on different media, and found that meaningful social interactions led to increases in self-esteem, through increases in self-disclosure. The current study builds on this work by investigating additional processes of well-being, such as need satisfaction and perceived partner responsiveness, as well as combining traditional theories of interpersonal communication and well-being with the technological affordances framework. As suggested by the media ecology perspective, efforts to disentangle how and why people communicate on multiple platforms need to include the consideration of influences such as affordances, audiences, and norms (Zhao et al., 2016). Also, Parks (in press) suggests that relationships that are conducted on multiple media offer unique challenges and opportunities for interpersonal communication scholars. Just as the use of a whole array of communication media can “reflect and drive social interpersonal communication and social relationships” (Parks, in press, p. 3), the challenge in ICT use and well-being research is to seek out how ICTs can shape the processes of social interactions and well-being.

Future Directions

Whereas this study was an important step in the right direction of constructing and testing an integrated theoretical model of ICT use and well-being, there are still many topics that are left unexplored in the area. As the next step in advancing theory about technological affordances and how they influence communication processes, future work should also examine how people perceive affordances on different ICTs. Some scholars have argued that the existence of an affordance by itself is meaningful in an ICT even when it is not perceived or used, and that available and perceived affordances need to be thought of separately (Sundar & Bellur, 2010). However, others have strongly advocated for directly measuring which affordances people perceive to exist within a particular channel (Fox & McEwan, 2017). This concern stems from the fact that even though an affordance is uniformly present within an ICT, different people may have a wide range of perceptions about how to use the affordance, and ultimately, how it affects their communication behavior. Since these differences cannot be measured without actively asking participants about perceived affordances, future work could incorporate this theoretical concept into study design.

Also, this dissertation mostly focused on the relatedness need as outlined in self-determination theory and only conducted exploratory data analyses on the psychological needs of autonomy and competence. Future research could use the full theoretical model of SDT to see how the three needs work together in mediated social interactions. For instance, the current study found that there was a mediating influence of relatedness need satisfaction on how communication mechanisms influenced well-being. More work still needs to be done to illuminate the communication processes that are associated with the autonomy and competence needs, and how the need satisfaction achieved through those mechanism has consequences for

well-being. For instance, the notion of “autonomy support” in friendships (Deci et al., 2006) suggests that acknowledgement or support from friends can be instrumental in fulfilling the autonomy need. Similar processes also exist within mediated social interactions, and the effect of technological affordances on those processes needs to be further investigated for each psychological need.

In addition to advancing theory in the area of mediated communication and well-being, this study also has practical applications for researchers or practitioners who are trying to understand the implications of technology use on well-being and mental health. The findings of the current study represent a step towards advancing what is known about specific uses of ICTs that enhance well-being. These findings can be used to inform “best practices” or guidelines for ICT use. Thoits (2011) claims that in order to design effective health interventions, researchers need to “understand intervening mechanisms as well as the relative impact of each of those mechanisms on health outcomes” (p. 156). This study found that increased self-disclosure and perceived partner responsiveness are two key mechanisms that work to enhance SWB in ICT social interactions. Future work can build upon the findings of the current study to inform efforts that promote better well-being, in the form of health interventions, educational programs, or others.

Limitations

While this study was one of the first to investigate multiple ICT use and well-being, there are several limitations that need to be noted. First of all, due to the nature of the convenience sampling method, the participants were mostly young, female, and Caucasian college students. This has implications for the generalizability of this work, in that ICT use patterns may be very different in another demographic. Whereas the beneficial influence of

social interactions on SWB has been confirmed across all stages of adulthood (Ishii-Kuntz, 1990), the difference in patterns of ICT use between college students and other demographics, such as adolescents or older adults, may lead to different processes that are involved in enhancing well-being.

Additionally, one limitation of this study is that there are more influences on people's SWB, other than ICT social interactions, which could not be captured within the scope of the current study. Even though the current study tried to capture the interaction that would have the most effect on SWB by asking participants to report on their most significant social interaction between ESM surveys, there are other factors that could have influenced well-being levels. More work is needed to untangle the diverse influences outside of ICTs that influence SWB. For instance, a key question arises of how we can conduct research on the specific influence of technology use on SWB, which encompasses the influences of everything in an individual's life. Whereas studies may be able to control for certain factors that impact well-being (e.g., physical and mental health), more work is needed to figure out how technology use fits into the bigger picture of SWB. Of special interest is how long-term life satisfaction is impacted by social interactions on ICTs, since no significant findings were reported in the current study.

One additional limitation of this study may be the oversampling of face-to-face interactions, which comprised more than half (57.3%) of all interactions that were recorded in this study. Consequently, ICTs such as social media, which comprised only 4.3% of all recorded interactions, may have been underrepresented in the study. This may have been due to the way that participants interpreted what to report as a "significant" interaction, even though it intentionally left up to the participants to determine what they consider as significant and meaningful social interactions that they choose to report in the study. However, given the need to

focus on ICTs and well-being, future work could consider sampling solely from ICT interactions to understand the wide variety of ICT use in daily life. The focus on “significant” interactions also may be missing the influence of non-intimate, routine daily interactions that comprise most of social interactions within relationships (Duck, Rutt, Hoy, & Strejc, 1991). For instance, participants rated their use of social media as being very frequent ($M=4.46$ out of 6) but reported social media as a channel for significant interactions less than 5% of the time. This may suggest that most social media communication may not necessarily be considered to be significant most of the time, but still exerts a considerable influence on people’s lives.

Conclusion

This study investigated how interpersonal communication and ICT use impact SWB. While there have been many studies in this area, there has been conflicting evidence on the influences of ICT use on well-being, with findings pointing to both negative and positive outcomes. To make sense of this discrepancy, some of the main findings of this study point to the importance of investigating specific communication processes that occur on the ICTs, such as self-disclosure, perceived partner responsiveness, and satisfaction of psychological needs. Using an experience sampling method, this study found that different technological affordances were associated with changes in interaction processes, which had implications for levels of relatedness need satisfaction and consequent changes in SWB. To sum up, this study provided additional support for well-established mechanisms of interpersonal communication and well-being but in novel ICT environments, as well as providing an integrated theoretical approach to investigating social interactions that occur on ICTs by using the lens of technological affordances.

References

- Altman, I., & Taylor, D. (1973). *Social penetration: The development of interpersonal relationships*. New York: Holt, Rinehart, and Winston.
- Amichai-Hamburger, Y. (2009). Technology and well-being: Designing the future. In Y. Amichai-Hamburger (Ed.), *Technology and Well-being* (pp. 260-278). Cambridge: Cambridge University Press.
- Amichai-Hamburger, Y. & Barak, A. (2009). Internet and well-being. In Y. Amichai-Hamburger (Ed.), *Technology and Well-being* (pp. 34-76). Cambridge: Cambridge University Press.
- Argyle, M. (1987). *The psychology of happiness*. London: Methuen.
- Baym, N. K., Zhang, Y. B., & Lin, M.-C. (2004). Social interactions across media: Interpersonal communication on the internet, telephone, and face-to-face. *New Media & Society*, 6(3), 299-318.
- Bazarova, N. N. (2012). Public intimacy: Disclosure interpretation and social judgments on Facebook. *Journal of Communication*, 62(5), 815-832.
- Berndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychological Science*, 11, 7-10.
- Bessiere, K., Kiesler, S., Kraut, R., & Boneva, B. S. (2008). Effects of Internet use and social resources on changes in depression. *Information, Community & Society*, 11(1), 47-70.
- Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review*, 41, 27-36.
- Boase, J. (2008). Personal networks and the personal communication system. *Information, Communication, & Society*, 11(4), 490-508.

- Brown, J. D. and Bobkowski, P. S. (2011). Older and newer media: Patterns of use and effects on adolescents' health and well-being. *Journal of Research on Adolescence*, 21, 95-113.
- Burke, M., & Kraut, R. E. (2014, April). Growing closer on Facebook: Changes in tie strength through social network site use. In *Proceedings of the 32nd annual ACM conference on Human factors in computing systems* (pp. 4187-4196). ACM.
- Burke, M., & Kraut, R. E. (2016). The relationship between Facebook use and well-being depends on communication type and tie strength. *Journal of Computer-Mediated Communication*, 21(4), 265-281.
- Burke, M., Marlow, C., & Lento, T. (2010). Social network activity and social well-being. In *Proceedings of the 2010 ACM Conference on Computer-Human Interaction (SIGCHI)*, Atlanta, GA. New York: ACM.
- Campbell, S. W. (2015). Mobile communication and network privatism: A literature review of implications for diverse, weak, and new ties. *Review of Communication Research*, 3(1), 1-20.
- Chan, M. (2015). Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being. *New Media & Society*, 17(1), 96-113.
- Choi, Y. H., & Bazarova, N. N. (2015). Self-disclosure characteristics and motivations in social media: Extending the functional model to multiple social network sites. *Human Communication Research*, 41(4), 480-500.
- Choi, M., & Toma, C. L. (2014). Social sharing through interpersonal media: Patterns and effects on emotional well-being. *Computers in Human Behavior*, 36, 530-541.
- Cotten, S. R. (2008). Students' technology use and the impacts on well-being. *New Directions for Student Services*, 124, 55-70.

- Csikszentmihalyi M., & Hunter, J. (2003). Happiness in everyday life: The uses of experience sampling. *Journal of Happiness Studies*, 4, 185-199.
- Davila, J., Hershenberg, R., Feinstein, B. A., Gorman, K., Bhatia, V., & Starr, L. R. (2012). Frequency and quality of social networking among young adults: Associations with depressive symptoms, rumination, and corumination. *Psychology of Popular Media Culture*, 1, 72-86.
- Deci, E. L., La Guardia, J. G., Moller, A. C., Scheiner, M. J., & Ryan, R. M. (2006). On the benefits of giving as well as receiving autonomy support: Mutuality in close friendships. *Personality and Social Psychology Bulletin*, 32(3), 313-327.
- Deci, E. L., & Ryan, R. M. (2006). Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies*, 9(1), 1-11.
- Deci, E.L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology*, 49(1), 14-23.
- Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology: Vol. 1* (pp. 416-437). Thousand Oaks, CA: Sage.
- Deci, E. L., & Ryan, R. M. (2014). Autonomy and need satisfaction in close relationships: Relationships motivation theory. In N. Weinstein (Ed.), *Human motivation and interpersonal relationships* (pp. 53-73). Dordrecht: Springer.
- Deters, F. G., & Mehl, M. R. (2013). Does posting Facebook status updates increase or decrease loneliness? An online social networking experiment. *Social Psychological and Personality Science*, 4, 579-586.
- Diener, E. (2009). Subjective well-being. In E. Diener (Ed.), *The science of well-being: The*

- collected works of Ed Diener*. New York: Springer.
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71-75.
- Diener, E., Scollon, C. N., & Lucas, R. E. (2009). The evolving concept of subjective well-being: The multifaceted nature of happiness. In E. Diener (Ed.), *The science of well-being: The collected works of Ed Diener*. New York: Springer.
- 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*.
- Dolev-Cohen, M., & Barak, A. (2013). Adolescents' use of instant messaging as a means of emotional relief. *Computers in Human Behavior*, 29, 58-73.
- Duck, S., Rutt, D. J., Hurst, M. H., Strejc, H. (1991). Some evident truths about conversations in everyday relationships: All communications are not created equal. *Human Communication Research*, 18, 228-267.
- Evans, S. K., Pearce, K. E., Vitak, J., & Treem, J. W. (2017). Explicating affordances: A conceptual framework for understanding affordances in communication research. *Journal of Computer-Mediated Communication*, 22(1), 35-52.
- Finkenauer, C., & Rimé, B. (1998). Socially shared emotions vs. emotional experiences kept secret: Differential characteristics and consequences. *Journal of Social and Clinical Psychology*, 17(3), 295-318.
- Forest, A. L., & Wood, J. V. (2012). When social networking is not working: Individuals with low self-esteem recognize but do not reap the benefits of self-disclosure on Facebook. *Psychological Science*, 23(3), 295-302.

- Fox, J., & McEwan, B. (2017). Distinguishing technologies for social interaction: The perceived social affordances of communication channels scale. *Communication Monographs*.
- Gaver, W. W. (1991). Technology affordances. In *Proceedings of the 1991 SIGCHI Conference on Human Factors in Computing Systems* (pp. 79-84). ACM.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Hillsboro, NJ: Erlbaum.
- Gonzales, A. L. (2014). Text-based communication influences self-esteem more than face-to-face or cellphone communication. *Computers in Human Behavior*, 39, 197-203.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37(6), 504-528.
- Hampton, K. N., Goulet, L. S., Marlow, C., & Rainie, L. (2012). Why most Facebook users get more than they give. *Pew Internet & American Life Project*, 3, 1-40.
- Hampton, K. N., Lu, W., & Shin, I. (2016). Digital media and stress: The cost of caring 2.0. *Information, Communication, and Society*, 19(9), 1267-1286.
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life*. Thousand Oaks, CA: Sage.
- Hofmann, W., & Patel, P. V. (2015). SurveySignal: A convenient solution for experience sampling research using participants' own smartphones. *Social Science Computer Review*, 33, 235-253.
- Huta, V., & Ryan, R. M. (2010). Pursuing pleasure or virtue: The differential and overlapping well-being benefits of hedonic and eudaimonic motives. *Journal of Happiness Studies*, 11(6), 735-762.
- Huta, V., & Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: Developing a classification and terminology for understanding conceptual and operational definitions.

- Journal of Happiness Studies*, 15, 1425-1456.
- Ishii-Kuntz, M. (1990). Social interaction and psychological well-being: Comparison across stages of adulthood. *International Journal of Aging and Human Development*, 30, 15-36.
- Jelenchick, L. A., Eickhoff, J. C., & Moreno, M. A. (2013). "Facebook depression?" Social networking site use and depression in older adolescents. *Journal of Adolescent Health*, 52(1), 128-130.
- Jiang, L. C. & Hancock, J. T. (2013). Absence makes the communication grow fonder: Geographic separation, interpersonal media, and intimacy in dating relationships. *Journal of Communication*, 63(3), 556-577.
- Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 43(2), 207-222.
- Keyes, C. L. M. (2009). Flourishing. In I.B. Wiener & W. E. Craighead (Eds.), *The Corsini encyclopedia of psychology*. London: Wiley.
- Ko, H. C., & Kuo, F. Y. (2009). Can blogging enhance subjective well-being through self-disclosure? *CyberPsychology & Behavior*, 12(1), 75-79.
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues*, 58(1), 49-74.
- 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, e69841.
- Laurenceau, J. P., Barrett, L. F., & Pietromonaco, P. R. (1998). Intimacy as an interpersonal process: The importance of self-disclosure, partner disclosure, and perceived partner responsiveness in interpersonal exchange. *Journal of Personality and Social Psychology*,

74(5), 1238-1251.

- Ledbetter, A. M. (2009). Patterns of media use and multiplexity: Associations with sex, geographic distance and friendship interdependence. *New Media & Society, 11*, 1187-1208.
- Ledbetter, A. M. (2014). The past and future of technology in interpersonal communication theory and research. *Communication Studies, 65*, 456-459.
- Lee, K. T., Noh, M. J., & Koo, D. M. (2013). Lonely people are no longer lonely on social networking sites: The mediating role of self-disclosure and social support. *Cyberpsychology, Behavior, and Social Networking, 6*, 413-418.
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research, 46*(2), 137-155.
- Marche, S. (2012). Is Facebook making us lonely? *The Atlantic, May 2012*. Retrieved from <https://www.theatlantic.com/magazine/archive/2012/05/is-facebook-making-us-lonely/308930/>
- Morgan, C., & Cotten, S. R. (2003). The relationship between Internet activities and depressive symptoms in a sample of college freshmen. *CyberPsychology & Behavior, 5*, 133-142.
- Muthén, L.K. & Muthén, B.O. (2015). *Mplus user's guide (Seventh Edition)*. Muthén & Muthén: Los Angeles, CA.
- Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network site use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behavior, and Social Networking, 16*(10), 721-727.
- Parks, M. R. (in press). Embracing the challenges and opportunities of mixed-media relationships. *Human Communication Research*.

- Pennebaker, J. W., Zech, E., & Rimé, B. (2001). Disclosing and sharing emotion: Psychological, social, and health consequences. In M. Stroebe, W. Stroebe, R. O. Hansson, & H. Schut (Eds.), *Handbook of bereavement research: Consequences, coping, and care* (pp. 517-543). Washington, DC: American Psychological Association.
- Pew Research Center. (2017, March). *Internet/Broadband Fact Sheet*. Retrieved from <http://www.pewinternet.org/fact-sheet/internet-broadband/>
- Preacher, K. J., Zhang, Z., & Zyphur, M. J. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods, 15*(3), 209-233.
- Reinecke, L., & Oliver, M. B. (Eds.). (2017). *The Routledge Handbook of media use and well-being*. New York: Routledge.
- Reis, H. T. (2012). Perceived partner responsiveness as an organizing theme for the study of relationships and well-being. In L. Campbell and T. J. Loving (eds.), *Interdisciplinary research on close relationships: The case for integration* (pp. 27-52). American Psychological Association.
- Reis, H. T., Clark, M. S., & Holmes, J. G. (2004). Perceived partner responsiveness as an organizing construct in the study of intimacy and closeness. In D. J. Mashek & A. Aron (Eds.), *Handbook of closeness and intimacy* (pp. 201-225). Mahwah, NJ: Erlbaum.
- Reis, H. T., & Shaver, P. (1988). Intimacy as an interpersonal process. In S. W. Duck (Ed.), *Handbook of personal relationships* (pp. 367-389). Chichester, England: Wiley.
- Reis, H. T., Sheldon, K., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*, 419-435.
- Rice, R. E., Evans, S. K., Pearce, K. E., Sivunen, A., Vitak, J., & Treem, J. W. (2017).

- Organizational media affordances: Operationalization and associations with media use. *Journal of Communication*, 67(1), 106-130.
- Rieger, D., Reinecke, L., Frischlich, L., & Bente, G. (2014). Media entertainment and well-being: Linking hedonic and eudaimonic entertainment experience to media-induced recovery and vitality. *Journal of Communication*, 64(3), 456-478.
- Rimé, B., Finkenauer, C., Luminet, O., Zech, E., & Philippot, P. (1998). Social sharing of emotion: New evidence and new questions. *European Review of Social Psychology*, 9(1), 145-189.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin*, 27(2), 151-161.
- Robitaille, A., Piccinin, A. M., Muniz, G., Hoffman, L., Johansson, B., Deeg, D. J. H.,... & Hofer, S. M. (2013). Longitudinal mediation of processing speed on age-related change in memory and fluid intelligence. *Psychology of Aging*, 28, 887-901.
- Ruppel, E. K. (2015). Use of communication technologies in romantic relationships: Self-disclosures and the role of relationship development. *Journal of Social and Personal Relationships*, 32(5), 667-686.
- Russell, D. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, 66, 20-40.
- Russell, J. A., Weiss, A., & Mendelsohn, G. A. (1989). Affect grid: A single-item scale of pleasure and arousal. *Journal of Personality and Social Psychology*, 57(3), 493-502.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.

- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141-166.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069-1081.
- Ryff, C. D. (1995). Psychological well-being in adult life. *Current Directions in Psychological Science*, 4(4), 99-103.
- Ryff, C. D., & Singer, B. H. (2008). Know thyself and become what you are: A eudaimonic approach to psychological well-being. *Journal of Happiness Studies*, 9, 13-39.
- Saphire-Bernstein, S., & Taylor, S. E. (2013). Close relationships and happiness. In S. David, I. Boniwell, & A. Conley Ayers (Eds.), *The Oxford handbook of happiness* (pp. 821-833). Oxford, UK: Oxford University Press.
- Scollon, C. N., Kim-Prieto, C., & Diener, E. (2009). Experience sampling: Promises and pitfalls, strengths and weaknesses. In E. Diener (Ed.), *Assessing well-being: The collected works of Ed Diener* (pp. 157-180). Dordrecht: Springer.
- Segrin, C. (2006). Family interactions and well-being: Integrative perspectives. *The Journal of Family Communication*, 6(1), 3-21.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2014). Positive psychology: An introduction. *American Psychologist*, 55, 5-14.
- Shakya, H. B., & Christakis, N. A. (2016). Association of Facebook use with compromised well-being: A longitudinal study. *American Journal of Epidemiology*, 185(3), 203-211.
- Sheldon, K. M., Abad, N., & Hinsch, C. (2011). A two-process view of Facebook use and relatedness need-satisfaction: Disconnection drives use, and connection rewards it.

Psychology of Popular Media Culture, 1(5), 2-15.

Singer, J. D. (1998). Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics*, 23(4), 323-355.

Song, H., Zmyslinski-Seelig, A., Kim, J., Drent, A., Victor, A., Omori, K., & Allen, M. (2014). Does Facebook make you lonely? A meta-analysis. *Computers in Human Behavior*, 36, 446-452.

Sprecher, S., & Hendrick, S. S. (2004). Self-disclosure in intimate relationships: Associations with individual and relationship characteristics over time. *Journal of Social and Clinical Psychology*, 23(6), 857-877.

Sundar, S. S., & Bellur, S. (2010). Concept explication: The case of political interactivity. In E. P. Bucy & R. L. Holbert (Eds.), *Sourcebook for Political Communication Research: Methods, Measures and Analytical Techniques* (pp. 485-504). New York: Routledge.

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, 52(2), 145-161.

Treem, J. W. & Leonardi, P. M. (2012). Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Communication Yearbook*, 36, pp. 143-189.

Valkenburg, P. M., & Peter, J. (2007). Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication*, 12(4), 1169-1182.

Valkenburg, P. M., & Peter, J. (2009). Social consequences of the internet for adolescents: A decade of research. *Current Directions in Psychological Science*, 18, 1-5.

- van den Eijnden, R. J. J. M, Meerkerk, G.-J., Vermulst, A. A., Spijkerman, R., & Engels, R. C. M. E. (2008). Online communication, compulsive internet use, and psychosocial well-being among adolescents: A longitudinal study. *Developmental Psychology, 44*, 655-665.
- Verduyn, P., Lee, D. S., Park, J., Shablack, H., Orvell, A., Bayer, J. ... & Kross, E. (2015). Passive Facebook use undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology: General, 144*(2), 480-488.
- Walen, H. R., & Lachman, M. E. (2000). Social support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood. *Journal of Social and Personal Relationships, 17*(1), 5-30.
- Wang, J. L., Jackson, L. A., Gaskin, J., & Wang, H. Z. (2014). The effects of social networking site (SNS) use on college students' friendship and well-being. *Computers in Human Behavior, 37*, 229-236.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.
- Wethington, E., & Kessler, R. C. (1986). Perceived support, received support, and adjustment to stressful life events. *Journal of Health and Social Behavior, 78*-89.
- Zhang, R. (2017). The stress-buffering effect of self-disclosure on Facebook: An examination of stressful life events, social support, and mental health among college students. *Computers in Human Behavior, 75*, 527-537.
- Zhao, X., Lampe, C., & Ellison, N. B. (2016). The social media ecology: User perceptions, strategies, and challenges. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, 89-100.

Table 1

Affordances of ICTs and Descriptive Statistics of Use

	Cue Availability	Synchronicity	Audience Reach	Frequency of Use <i>M (SD)</i>	Proportion of Daily Interactions
Face-to-face	<i>High</i>	<i>High</i>	<i>Low</i>	N/A	57.3%
Phone call	<i>Medium</i>	<i>High</i>	<i>Low</i>	4.07 (1.19)	6.9%
Video call	<i>High</i>	<i>High</i>	<i>Low</i>	2.98 (1.48)	1.9%
Text messaging	<i>Low</i>	<i>Medium</i>	<i>Low</i>	5.49 (.90)	21.1%
Instant messaging	<i>Low</i>	<i>Medium</i>	<i>Low</i>	4.41 (1.51)	5.6%
E-mail	<i>Low</i>	<i>Low</i>	<i>Low</i>	5.24 (.90)	3.0%
Social media	<i>Low</i>	<i>Low</i>	<i>High</i>	4.46 (1.23)	4.3%

Table 2

LS-Means and Standard Errors for Technological Affordances

	Self-Disclosure	Perceived Responsiveness	Autonomy Need	Competence Need
	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>
Cue				
Availability				
Low	2.76 (.07)	3.72 (.03)	3.36 (.04)	3.65 (.04)
Medium	3.57 (.09)	4.13 (.05)	3.84 (.06)	3.90 (.06) [†]
High	3.13 (.06)	3.94 (.03)	3.59 (.03)	3.84 (.03) [†]
Synchronicity				
Low	2.30 (.13)	3.23 (.05)	3.13 (.06)	3.39 (.06)
Medium	2.83 (.07)	3.85 (.04)	3.43 (.04)	3.73 (.04)
High	3.18 (.06)	3.96 (.03)	3.62 (.03)	3.85 (.03)
Audience				
Reach				
Low	3.08 (.06)	3.91 (.03)	3.56 (.03)	3.81 (.03)
High	1.96 (.20)	3.11 (.06)	2.95 (.07)	3.24 (.07)

Note. All means were significantly different from each other at $p < .001$ except for the pair marked with [†].

Table 3

Summaries of Multilevel Statistical Models

	H1 & H3a	H2 & H3b	H4	H5a	H5b
Predictors	DV: Self-disclosure	DV: Perceived responsiveness	DV: Relatedness	DV: Positive affect	DV: Negative affect
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Intercept	3.13 (.06)**	3.94 (.03)**	3.72 (.02)**	5.18 (.14)**	1.50 (.10)**
Cue					
Availability					
Low	-.37 (.05)**	-.22 (.02)**	-	-	-
Medium	.44 (.08)**	.19 (.04)**			
High	0	0			
Synchronicity					
Low	-.88 (.12)**	-.69 (.04)**			
Medium	-.35 (.05)**	-.11 (.03)**	-	-	-
High	0	0			
Audience Reach					
Low	1.12 (.19)**	.80 (.05)**	-	-	-
High	0	0			
Self-Disclosure	-	-	.18 (.01)**	-	-
Perceived Responsiveness	-	-	.76 (.02)**	-	-
Relatedness	-	-	-	.62 (.03)**	-.30 (.03)**
ICC	0.31	0.25	0.19	0.58	0.57
Random Variance	0.42	0.13	0.16	3.20	2.61
Deviance	6543.79	7903.37	5712.45	14752.88	14240.27

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

Table 4

Summaries of Multilevel Statistical Models (Cont.)

	H6a & H7a	H6b & H7b	RQ1	RQ2
Predictors	DV: Positive affect	DV: Negative affect	DV: Autonomy	DV: Competence
	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>	<i>B (SE)</i>
Intercept	4.97 (.14)**	1.49 (.10)**	3.59 (.03)**	3.84 (.03)**
Cue				
Availability				
Low	-	-	-.23 (.03)**	-.19 (.03)**
Medium			.25 (.06)**	.06 (.05)
High			0	0
Synchronicity				
Low	-	-	-.49 (.05)**	-.46 (.05)**
Medium			-.19 (.03)**	-.12 (.03)**
High			0	0
Audience Reach				
Low	-	-	.14 (.02)**	.56 (.06)**
High			0	0
Self-Disclosure	-	-	-	-
Perceived				
Responsiveness	-	-	-	-
Relatedness	-	-	-	-
Autonomy	.48 (.03)**	-.23 (.03)**	-	-
Competence	.81 (.03)**	-.51 (.03)**	-	-
ICC	0.31	0.25	0.19	0.58
Random				
Variance	0.42	0.13	0.16	3.20
Deviance	6543.79	7903.37	5712.45	14752.88

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

Table 5

Estimates and Standard Errors of Mediation Models

	Path A (X→M)	Path B (M→Y)	Indirect Effect
	Estimate (SE)	Estimate (SE)	Estimate (SE)
H8a:			
X = self-disclosure			
M = relatedness			
Y = positive affect			
Within	.39 (.02)**	.58 (.05)**	.23 (.02)**
Between	.29 (.06)**	1.71 (0.35)**	.50 (.15)*
H8b:			
X = self-disclosure			
M = relatedness			
Y = negative affect			
Within	.39 (.02)**	-.37 (.04)**	-.15 (.02)**
Between	.29 (.06)**	-1.35 (.34)**	-.39 (.15)*
H9a:			
X = perc. responsiveness			
M = relatedness			
Y = positive affect			
Within	.88 (.02)**	.26 (.04)**	.23 (.04)**
Between	.91 (.05)**	.84 (.65)	.76 (.59)
H9b:			
X = perc. responsiveness			
M = relatedness			
Y = negative affect			
Within	.88 (.02)**	-.10 (.04)*	-.09 (.03)*
Between	.91 (.05)**	-.36 (.56)	-.33 (.51)

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

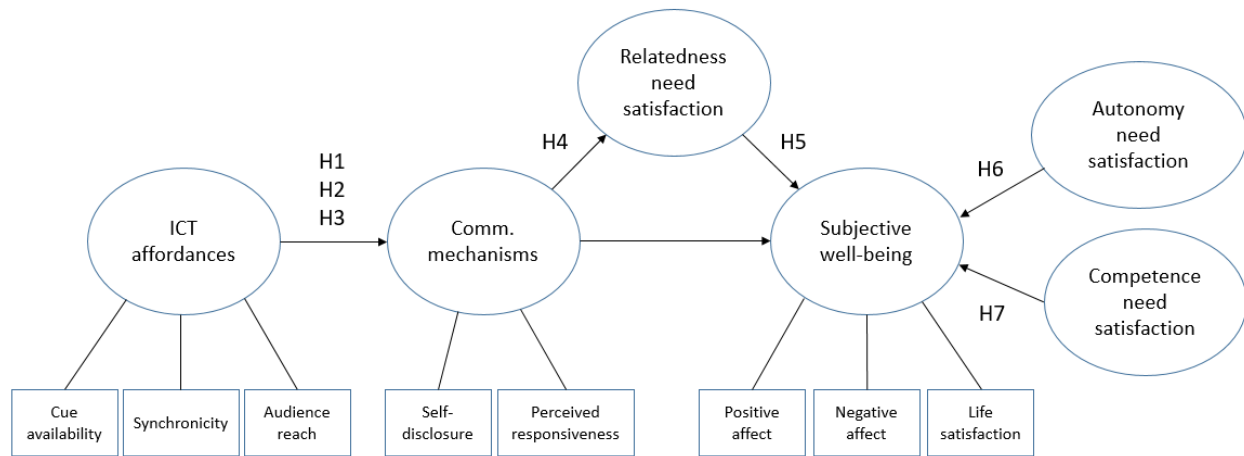


Figure 1. Integrated conceptual framework for the study.

Appendix A. Pre-ESM Survey Measures

PANAS (Watson, Clark, & Tellegen, 1988)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment OR indicate the extent you have felt this way over the past week (circle the instructions you followed when taking this measure)

1-Very Slightly or Not at All, 2-A Little, 3-Moderately, 4-Quite a Bit, 5-Extremely

_____ 1. Interested	_____ 11. Irritable
_____ 2. Distressed	_____ 12. Alert
_____ 3. Excited	_____ 13. Ashamed
_____ 4. Upset	_____ 14. Inspired
_____ 5. Strong	_____ 15. Nervous
_____ 6. Guilty	_____ 16. Determined
_____ 7. Scared	_____ 17. Attentive
_____ 8. Hostile	_____ 18. Jittery
_____ 9. Enthusiastic	_____ 19. Active
_____ 10. Proud	_____ 20. Afraid

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985)

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

7 - Strongly agree, 6 - Agree, 5 - Slightly agree, 4 - Neither agree nor disagree, 3 - Slightly disagree, 2 - Disagree, 1 - Strongly disagree

_____ In most ways my life is close to my ideal.

_____ The conditions of my life are excellent.

_____ I am satisfied with my life.

_____ So far I have gotten the important things I want in life.

_____ If I could live my life over, I would change almost nothing.

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

Below is a list of statements dealing with your general feelings about yourself. Please rate the following statements on a scale of 1-Strongly Agree, 2-Agree, 3-Disagree, 4-Strongly Disagree.

1. I feel that I am a person of worth, at least on an equal plane with others.

2. I feel that I have a number of good qualities.

3. All in all, I am inclined to feel that I am a failure.

4. I am able to do things as well as most other people.

5. I feel I do not have much to be proud of.

6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times I think I am no good at all.

UCLA Loneliness Scale (Russell, 1996)

The following statements describe how people sometimes feel. For each statement please indicate how often you feel the way described using the numbers below. There are no right or wrong answers.

1=Never 2=Rarely 3=Sometimes 4=Always

1. How often do you feel unhappy doing so many things alone?
2. How often do you feel you have no one to talk to?
3. How often do you feel you cannot tolerate being so alone?
4. How often do you feel as if no one understands you?
5. How often do you find yourself waiting for people to call or write?
6. How often do you feel completely alone?
7. How often do you feel unable to reach out and communicate with those around you?
8. How often do you feel starved for company?
9. How often do you feel it is difficult for you to make friends?
10. How often do you feel shut out and excluded by others?

Well-being (Lyubomirsky & Lepper, 1999)

1. I consider myself (1-not a very happy person, 7-a very happy person)
2. Compared to most of my peers, I consider myself (1-less happy, 7-more happy)
3. Some people are very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you RIGHT NOW? (1-not at all, -a great deal)
4. Some people are not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you right now? (1-not at all, 7-a great deal)

Demographic Questions

1. Age
2. Gender
3. Major
4. Class year
5. Which of the following best describes your ethnicity?

White/Non-Hispanic Caucasian, Hispanic/Latino, Black/African-American, Asian,
Native Hawaiian or Other Pacific Islander, Native American, Other

Appendix B. Post-ESM Survey Measures

PANAS (Watson, Clark, & Tellegen, 1988)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment OR indicate the extent you have felt this way over the past week (circle the instructions you followed when taking this measure)

1-Very Slightly or Not at All, 2-A Little, 3-Moderately, 4-Quite a Bit, 5-Extremely

- | | |
|-----------------------|----------------------|
| _____ 1. Interested | _____ 11. Irritable |
| _____ 2. Distressed | _____ 12. Alert |
| _____ 3. Excited | _____ 13. Ashamed |
| _____ 4. Upset | _____ 14. Inspired |
| _____ 5. Strong | _____ 15. Nervous |
| _____ 6. Guilty | _____ 16. Determined |
| _____ 7. Scared | _____ 17. Attentive |
| _____ 8. Hostile | _____ 18. Jittery |
| _____ 9. Enthusiastic | _____ 19. Active |
| _____ 10. Proud | _____ 20. Afraid |

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985)

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

7 - Strongly agree, 6 - Agree, 5 - Slightly agree, 4 - Neither agree nor disagree, 3 - Slightly disagree, 2 - Disagree, 1 - Strongly disagree

_____ In most ways my life is close to my ideal.

_____ The conditions of my life are excellent.

_____ I am satisfied with my life.

_____ So far I have gotten the important things I want in life.

_____ If I could live my life over, I would change almost nothing.

Appendix C. ESM Survey Questionnaire

For the next set of questions, please think back to the most recent SIGNIFICANT social interaction that you had.

1. Which medium did you use?

Face-to-face (in person), Phone call, Text message (SMS), Video call (Skype, Facetime, etc.), E-mail, Posting on social media (Facebook, Twitter, etc.), Browsing on social media (Facebook, Twitter, etc.), Instant messenger (IM; Facebook messenger, Skype chat, Google chat, etc.), Other

2. Did you share any information about yourself (facts, thoughts, feelings, etc.) during this interaction? Yes / No

3. (If “Yes” to Q2) During the interaction, how much did you share facts about yourself?

0 - Did not share, 1 - Very little, 2, 3 - Moderately, 4, 5 - Very much

4. During the interaction, how much did you share information about your thoughts?

0 - Did not share, 1 - Very little, 2, 3 - Moderately, 4, 5 - Very much

5. During the interaction, how much did you share information about your feelings?

0 - Did not share, 1 - Very little, 2, 3 - Moderately, 4, 5 - Very much

6. Who did you interact with?

Stranger(s), Acquaintance(s), Friend(s), Best friend(s), Significant other(s), Immediate family member(s), Extended family member(s)

7. (If “Social media” to Q1) Which audience did you post your message to?

Your entire network (all Facebook friends, all Twitter followers, etc.), A portion of your network (custom lists, etc.), One person through private messaging, A group of people

through private messaging, One person through public messaging (wall posts, @-mentions, etc.), Other

8. How close is your relationship with the person/people you interacted with?

Extremely close, Somewhat close, Neither close nor not close, Somewhat not close, Extremely not close

Please rate the extent to which you agree with the following statements:

Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

9. During the interaction, I felt accepted by the person/people I was interacting with.

10. During the interaction, I felt close and connected with the person/people I was interacting with.

11. I felt effective and competent during the interaction.

12. The person/people I interacted with listened to my thoughts and ideas.

13. During the interaction, I was understood by the person/people I interacted with.

14. The person/people I interacted with provided me with choices and options.

15. How positive and negative do you feel at the moment?

Positive - 1 to 10, Negative - 1 to 10

16. Please choose the option that best describes how you feel at the moment.

Sleepy, Somewhat sleepy, Neither sleepy nor alert, Somewhat alert, Alert