

Getting Even Lonelier? Psychological Well-Being and Problematic Use of Media in the Over-Connected Society

Jung-Hyun Kim

Sogang University, South Korea

“I have absolutely no pleasure in the stimulants in which I sometimes so madly indulge. It has not been in the pursuit of pleasure that I have periled life and reputation and reason. It has been the desperate attempt to escape from torturing memories, from a sense of insupportable loneliness and a dread of some strange impending doom.” — Edgar Allan Poe

People do not seem to do better than when Edgar Allan Poe lamented about his inescapable loneliness and doom. Journalists and scholars have been using terms like “silent plague” or “epidemic” to emphasize the seriousness of loneliness (e.g., Gill, 2014). Numbers support these dreadful terms: Nearly half of Americans always or sometimes feel lonely (46%) or left out (47%) (Cigna, 2018), while another survey showed that more than one in five adult Americans (22%) say that they are always or often lonely (The Economist, 2018). Loneliness is not just America’s plague, but the United Kingdom (UK) also joined the club showing that 23% of adults always or often feel lonely (The Economist, 2018). The epidemic of loneliness has been so grave to the point that the UK became the first country ever to appoint a minister of loneliness to combat this growing plague (John, 2018). Asians are not doing any better: More than 25% of South Koreans said that they always or very often feel lonely (Korean Research, 2018).

One of the reasons for such global escalation of loneliness might be that more people are living alone than ever. For example, one-third of households (34%) in the European Union (EU) are single-person households (Eurostat, 2019), and 28% of Canadians live alone (Grenier, 2017). The increase of single-person households suggests a decrease in the amount of face-to-face interaction, which is crucial for reducing loneliness and increasing psychological well-being (Kim, 2017; Pea et al., 2012). As a way to compensate for the lack of direct human contacts, today’s individuals rely on mediated communication a lot. Especially, diverse computer-mediated communication (CMC) channels (e.g., social media, short message services, live chat services available in computers or smartphones) have made it easier for people to avoid or replace forming substantive relationships requiring face-to-face encounters, time, and effort (Worland, 2015).

Among many mediated communication tools, social media and smartphones have become major channels for mediated interaction. Social media are defined as “forms of media that allow people to communicate and share information using the internet or mobile phones” (Cambridge Dictionary, 2019). Since Facebook’s debut in 2006, close to 2.77 billion people are using social media in 2019. Seventy percent of both East Asians and North Americans use social media respectively, and 67% of Northern Europeans use them. As of July 2019, Facebook is the number one social media platform (2,375 million active users), followed by YouTube (2,000 million active users) and WhatsApp (1,600 million active users) (Clement, 2019). Meanwhile, a smartphone is

defined as “a cell phone that includes additional computer software functions such as e-mail or an internet browser” (Merriam-Webster, 2019). Being highly portable, constantly accessible, and loaded with diverse functions, smartphones have become the number one device for all the internet-based services and applications beating personal computers (Gibbs, 2016). The number of smartphone users is expected to surpass 3.3 billion in 2020 (Holst, 2019). More than three-quarters (77%) of Americans own smartphones, whereas 94% of South Koreans use smartphones, ranking number one in the smartphone penetration rate (Deyan, 2019). People downloaded more than 194 billion applications on their smartphones in 2018, and communication applications such as WhatsApp and Facebook Messenger were the top ranked applications downloaded by users (Sensor Tower, 2019). These statistics support the fact that smartphones have become the major social interaction device exceeding all the other communication tools.

Given that more and more people are living alone and relying on CMC as a major means for social interaction than ever, it is natural to ask whether mediated communication can satiate people’s desire to be with others as much as face-to-face interaction, or even replace it. Although it might be hard to provide a definitive answer to this question, the prospect of relieving loneliness via CMC seems gloomy. A small group of studies showed positive effects of CMC on users, including the increase of users’ subjective well-being (e.g., Kim & Lee, 2011) and perceived social support (e.g., Manago et al., 2012), while diminishing depression (e.g., Grieve et al., 2013) and loneliness (e.g., Pittman & Reich, 2016). However, another and a much larger group of studies demonstrates that it is hard to relieve users’ psychological ill-being by relying on CMC, and that some individuals even end up having an additional problem – falling into the trap of problematic use of media, which is defined as excessive or uncontrolled reliance on media (Billieux, 2012) (e.g., Kim, 2018b; Li et al., 2016; Shen & Wang, 2019).

Taking such a negative outlook into account, this chapter discusses the following questions: (1) Is loneliness a cause or an outcome of problematic use of media, or both? (2) Why would lonely people tend to develop problematic use of media more than those who are less lonely? (3) What would help reduce the possibility of developing problematic use of media? In exploring these topics, this chapter suggests a few frameworks that can be useful for navigating the abundant amount of research on the association between problematic use of media and psychological well-being, especially loneliness. In addition, this chapter attempts to provide a systematic overview of noteworthy research findings for interested readers to have a better understanding of where we are and where we can go from here in this domain of research endeavor.

Problematic Use of Media

Even though both social media and smartphones were originally designed to facilitate communication with one another by overcoming the limits of space and time, a disquieting phenomenon of problematic use has been observed. A large group of studies shows that heavy use of these media does not seem to do much in alleviating users’ existing problems, but even creates new ones such as problematic, excessive, unhealthy, or addictive use of media (e.g., Kim & Haridakis, 2009; Durak & Seferoğlu, 2019; Nishida et al., 2019; Kross et al., 2013). A group of scholars categorizes problematic use of media as a type of behavioral addictions (e.g., pathological gambling, compulsive shopping, or gaming disorder; Choliz, 2010; Petry & O’Brien, 2013). Such categorization is based on the fact that problematic users of media share similar indicators of those who are suffering from behavioral addiction, such as thinking about the media all the time (preoccupation); feeling anxious, irritable, or bored when not using the media (withdrawal); continual increase in the usage time needed to achieve the same level of satisfaction (tolerance); attempting unsuccessfully to cut back using the media (difficult to control); continued excessive use despite awareness of its serious negative effects on users’ lives (disregard of harmful consequences); loss of interest in other important activities or relationships; relying on the media as a way to alleviate or escape from negative emotional states; lying about media use to others (American Psychiatric Association, 2013; Kim, 2019; Sarkis, 2014; Tao et al., 2013).

In addition to such classic indicators of addiction, excessive smartphone use even puts people in physically dangerous situations such as texting while driving or walking (Kim, 2019), disturbing sleep, or giving emotional

distress (Choliz, 2010) as well as financial problems (Billieux et al., 2008). One thing that needs to be noted, however, is that spending a lot of time on smartphones does not automatically make one a problematic user. Individuals who have psychological issues, such as high levels of loneliness (Kim et al., 2015), depression (Elhai et al., 2017), ADHD (attention deficit hyperactivity disorder) (Seo et al., 2015), or low levels of self-esteem (Billieux, 2012) have been found to develop problematic use of smartphones more than those with healthier psychological characteristics (Kim, 2018b). In sum, excessive smartphone use may put people at risk for problematic outcomes, but there may also be preexisting risk factors that increase the likelihood of problematic use.

Many researchers have been investigating the worrisome outcomes of problematic use of media as the number of CMC services via computers or smartphones is drastically increasing. Although there is a plethora of studies in this domain, the present chapter focuses on the body of research looking into the association between problematic use of media and users' psychological well-being. This group of research can be largely categorized into the following three topics (Kim, 2018a): (1) What are psychological factors that make some people rely more heavily on media than others? (2) What are possible psychological consequences for users after/while using media? (3) Do people's existing psychological issues improve, or are they exacerbated by media use? Utilizing this categorization scheme, this chapter examines three competing perspectives in explaining the association between loneliness and problematic use of media such as social media, smartphones, or the internet in general: (1) Loneliness is a cause of problematic use of media, (2) problematic use of media makes users lonely, and (3) loneliness and problematic use of media have a bidirectional relationship intensifying one another. The following sections discuss these three perspectives and how they are supported in empirical studies.

Loneliness as a Cause of Problematic Use of Media, and Mediating Factors Linking the Two

In investigating how lonely people might end up becoming problematic users of media, the definition of loneliness can be a good starting point. Loneliness is the perception of deficiency one feels when his/her relationship networks are smaller (quantity) or less satisfying (quality) than one desires (Peplau et al., 1979, p. 55). According to this definition, loneliness is one's perceived discrepancy between his/her desired amount or quality of relationships and what he/she actually attains (Peplau & Perlman, 1982). Such discrepancy is a threat to humans' fundamental desire to be connected to others, so loneliness motivates people to repair their deficiency in relationships (Goossens, 2018). Ironically, loneliness can also hinder people's effort to connect with others. Being isolated or lonely means that there is a lack of support from others, which makes lonely people feel insecure and unprotected during interaction with others. Naturally, as a way to protect themselves from further rejection or hurt, lonely people tend to develop hypervigilance for potential social threats from others (Cacioppo et al., 2017). Thus, lonely people tend to pay more attention to socially threatening cues than welcoming ones, and attribute negative or hostile intentions to others more than reality (Spithoven et al., 2017). This can create a self-defeating cycle for lonely people: Feeling anxious and doubtful about their ability to create favorable impressions on others (Jackson & Ebnet, 2006) and being overly sensitive to negative cues from others, lonely people are inclined to avoid social interaction and even prefer spending time alone (Nikitin & Freund, 2017; Spitzberg & Canary, 1985), which eventually intensifies their loneliness. Taken together, lonely people are driven by dual motivations – a motivation to reduce loneliness by connecting to others and a motivation to protect themselves from being rejected by others.

In that sense, one of the safe ways to deal with such conflicting motivations would be to interact with others via CMC channels, rather than face-to-face interaction. Face-to-face interaction can be a risky choice for lonely people because of its synchronous interaction pattern that allows little time to modify what they want to say verbally or express via nonverbal cues (e.g., gestures, facial expressions, voice, etc.; Kim et al., 2009). CMC might be less threatening to lonely people because they have more opportunities and time to modify what they want to express before they send messages to others in CMC (Kim et al., 2009). Therefore, lonely individuals'

dual and contradictory motivations – connecting with others and avoiding social interaction at the same time – might lead them to prefer mediated communication over face-to-face interaction (Caplan, 2005). According to Davis (2001) and Caplan (2005), however, those who rely on media as a way to cope with or escape from loneliness might not be able to alleviate their loneliness. Rather, their loneliness would be intensified, and they might even have a higher chance to develop problematic use of media than those who have lower levels of loneliness (Caplan, 2007; LaRose et al., 2003).

Then why would lonely people have higher chances to develop problematic use of media than those who are less lonely? According to Bandura (1999), the level of self-control or self-regulation is one of the key factors in determining who might become problematic users of media or not. Self-control helps individuals to be aware of their behavior and its impact on themselves as well as others through self-monitoring (Bandura, 1991). When self-control is weakened, people are usually governed by immediate gratification, impulses, sensation-seeking, and short-term goals, thus also becoming prone to unregulated use of media (Davis, 2001; Slater, 2003). Psychological ill-being such as loneliness or depression is known to weaken self-control, since negative emotional states cause an individual to consume the majority of his/her cognitive energy on eliminating or coping with them, leaving not much space for exerting healthy self-control (Bandura, 1991; Sinha, 2009). Lonely people's cognitive and emotional preoccupation with protecting themselves from potential rejection and social threats would also interfere with exerting proper self-control. Supporting these propositions, a group of studies found that using media to alleviate negative emotional or psychological states (e.g., loneliness or depression) leads to deficient self-regulation, which eventually increases the possibility of problematic use of media (e.g., Caplan, 2007; Gamez-Guadix et al., 2012; Özdemir et al., 2014).

Looking more closely into how loneliness occupies individuals' emotional and cognitive energy, lonely people's heightened concern to fulfill their need to belong or be connected to others (Baumeister & Leary, 1995) would also work as another factor to deter healthy self-regulation. Lonely people's urgent and intensified need to avoid isolation can be explained better by need for social assurance, "a general need for reassurance from at least one or more persons for a sense of belongingness" (Lee & Robbins, 1995, p. 237). Those high in need for social assurance tend to engage in activities that help to maintain and develop relationships with others more than those low in need for social assurance (Baumeister & Leary, 1995). The former tend to have been frustrated from receiving appropriate empathy and support from significant others such as parents or peers during childhood or early adolescence, so they usually lack appropriate social skills and confidence to function independently (Kohut, 1984; Lee & Robbins, 1995; Wolf, 1988). Those with chronic loneliness tend to experience recurrent dissatisfaction with the quantity or quality of their social relationships, not being able to fulfill their need for social assurance. Therefore, it is valid to guess that they would be other-dependent and seek diverse ways such as CMC to satiate their need for social assurance more than those who are not that lonely.

Need for social assurance cannot be fueled without frequent interactions with others, and today's smartphones are an ultimate communication device for incessant connection to others (Kim, 2018b). With voice call, short message services (SMS), social media, or other internet-based communication applications, smartphones can make users believe that they can be connected to others all the time and anytime, even without ever being alone (Turkle, 2011). This heightened expectation of "being always connected to others" naturally escalates users' anticipation to get immediate responses from others as well as their paranoia to be always available for others (Atchley & Warden, 2012; Walsh et al., 2011). Such urgency for immediate connection inevitably leads to a high level of dependency on smartphone-mediated communication services and a strong attachment to a smartphone itself (Kim, 2018b).

Thus, being motivated by heightened needs for both social assurance and immediate connection, lonely people tend to be highly dependent on mediated communication as well as others more than those who are less lonely. Accompanied by their consistent struggles of finding ways to cope with loneliness and being hypervigilant toward others' signs of rejection, obsessions to be assured by and connected to others do not leave much cognitive energy for lonely individuals to maintain healthy self-regulation. Such deficient self-regulation would increase the possibility of developing unregulated and problematic reliance on media.

Loneliness as an Outcome of Problematic Use of Media

Although loneliness has been identified as one of the causes of problematic use of media, another group of studies has shown that loneliness can be an outcome of problematic use of media. For instance, one of the very first research investigating the internet's effects on users' psychological well-being by Kraut and his colleagues (1998) demonstrated that heavy use of the internet reduced the amount of family communication and social engagement, thus increasing loneliness and depression. More recent studies suggest today's situation might not be that different from that of 1998. Even though many CMC services are available via smartphones and the number of smartphone users has been exploding, loneliness still seems to be haunting us (e.g., Jin & Park, 2013; Yao & Zhong, 2014; Worland, 2015).

Surrounded by many options of media, people rely on mediated interaction much more than before, which generates various and complex issues in users' well-being. In terms of social media, it turns out that heavy use hurts how people feel daily and how satisfied they are with their lives (Kross et al., 2013). Verduyn and his colleagues (2015) also found that passive use of social media (i.e., browsing news feed or looking at friends' postings without posting anything) leads to a decline in users' affective well-being. Another study revealed that using social media to compensate for one's deficient social skills increased peer-related loneliness rather than reducing it (Teppers et al., 2014). Furthermore, problematic use of social media turned out to induce higher alienation to peers and lower levels of emotional stability (Assunção & Matos, 2017), and even increase the possibility of substance use (Hormes et al., 2014). Meanwhile, problematic use of smartphone has been found to increase depression and anxiety (Coyne et al., 2019), while lowering self-esteem (Elhai et al., 2017). Finally, problematic use of the internet causes both physical (e.g., going to bed late, skipping meals) and psychosocial issues (e.g., restlessness, anger, decreased relationships with family and friends, boredom) (Gur et al., 2015). Taken together, problematic use of media (social media, smartphone, the internet) seems to increase physical as well as psychological ill-being of users.

With so many CMC applications available in smartphones, today's "smartphone-smart" young people are virtually connected to others more than any generation in history. However, looking at others' (usually happy) postings or waiting for someone from their long lists of social media friends to contact them does not seem to reduce their feeling of isolation. Instead, excessive reliance on smartphones or social media seems to replace offline social interaction opportunities and increase loneliness (Kim et al., 2009). Supporting such "more reliance on mediated communication, the lonelier" proposition, a group of recent surveys found that today's young people are lonelier than older ones. According to BBC Radio 4's survey, two in five (around 40%) of UK youngsters aged 16–24 feel lonely often or very often, compared to 29% of those aged 65–74 and 27% of those aged 75 and older (Quine, 2018). Americans aged 18–22 also turned out to be the loneliest generation, while those in the range of 72 and older are the least lonely (Cigna, 2018). In Japan, more than half a million Japanese under 40 have not left their houses nor interacted with others face-to-face for at least six months (The Japan Times, 2016). Overall, the fact that today's young people suffer from loneliness more than older ones implies that relying on and being competent with a larger number of mediated communication channels does reduce, but rather increase loneliness.

Vicious Bidirectional Cycle Between Loneliness and Problematic Use of Media

Even though a lot of studies have insinuated causal associations between users' psychological issues and problematic use of media, most of those studies used cross-sectional data that cannot determine the direction between causes and effects clearly (Kim et al., 2009; Kim et al., 2015). Given that causes should occur before outcomes, using data that are collected at just one time point has an inherent limitation in claiming causality among variables. That is why there has been a consistent call for longitudinal investigations on the causal association between problematic use of media and users' psychological well-being/ill-being. However, because of many challenges in longitudinal data collection procedures (e.g., high dropout rates of participants), there have not been many studies examining time-order causality between the two.

Still, in response to this demand, a small but growing number of studies have been putting efforts into scrutinizing the possibility of a bidirectional vicious cycle between loneliness and problematic use of media (e.g., Kim et al., 2009; Yao & Zhong, 2014). The vicious cycle can start from problematic reliance on media, which would increase loneliness by taking users' time and investment away from face-to-face interaction. The reduced opportunities to connect with others face-to-face drives people to depend even more on mediated communication as one of the few remaining options for their social interactions. As found in previous research, desperately relying on mediated communication as a way to cope with or alleviate loneliness would intensify users' already problematic use of media.

On the other hand, the vicious cycle might start from loneliness, in which lonely people tend to rely on media as a way to compensate for their deficient offline social interactions. However, they would end up developing problematic use of media because of their weakened self-regulation, strong attachment to and dependence on media, and intense needs for social assurance as well as immediate connection. Such uninhibited reliance on media might produce heightened but unfulfilled expectation of being connected to others all the time, while reducing their opportunities to build meaningful relationships with others in constructive ways, and eventually intensify their loneliness.

Interestingly, one of the very few studies investigating the full bidirectional association between loneliness and problematic use of media is actually the first longitudinal study investigating the effects of the internet on users' well-being by the HomeNet project (Kraut et al., 1998). This study showed that the more people used the internet, the lonelier and more depressed they got compared to two years ago when the participants had first joined the project. A similar result was found for adolescents who used instant messengers excessively for six months and ended up having higher levels of depression than before (van den Eijnden et al., 2008). Drawn from these two studies' findings, it seems that people's existing psychological issues are exacerbated rather than diminished by relying on media as a remedy for their psychological ill-being or deficient social relationships.

Pertaining to smartphones, a recent study employed cross-lagged path models to clarify causal relationships among loneliness, problematic use of smartphones, and other communication-related factors such as need for social assurance, time spent on face-to-face interaction, and time spent on smartphone-mediated communication over the course of four months (Kim, 2019). Cross-lagged path model analysis is designed to test a longitudinal influence of one variable on the other, after controlling for the stability of each variable over time (Finkel, 1995). This study tested two rival perspectives on the association between loneliness and problematic use of media – whether loneliness is a cause or an outcome of problematic use of media. In this study, loneliness turned out to increase problematic use of smartphones after four months, while problematic use of smartphones did not increase loneliness. At the same time, problematic use of smartphones reduced users' time spent on face-to-face interaction that is known to increase positive social feelings and reduce one's urge to rely on media (Pea et al., 2012). This finding is in line with previous studies showing that heavy use of TV (Perse & Rubin, 1990) or the internet (Kraut et al., 1998) took time away from face-to-face interaction and social engagement.

Another interesting and noteworthy finding of the aforementioned smartphone study (Kim, 2019) was that problematic use of smartphones also increased users' need for social assurance, which eventually led to augmented loneliness. Indeed, heavy or excessive reliance on smartphones seems to amplify users' need for social assurance by creating the illusion of always being connected to others. However, such "always being connected to others" illusion will never be realized, and the gap between the augmented anticipation of incessant connection with others and the reality of delayed or unrequited communication would inevitably discourage users. Such a vastly augmented, but unreachable mirage of "always being with others" via smartphones seems astonishingly similar to the classic definition of loneliness – perceived discrepancy between one's desired level of social relationships and what one actually achieves (Peplau & Perlman, 1982).

In short, lonely individuals rely on diverse mediated communication services as a way to compensate for their deficient social relationships, but are likely to replace (their already not that sufficient) face-to-face interaction with problematic reliance on them. The illusory incessant availability of others will never be realized for lonely people, but instead intensify their thirst for social assurance. Like the parched drinking salty water, the more users are obsessed with mediated interaction to quench their need to be assured by others, the lonelier they get (see Figure 17.1).

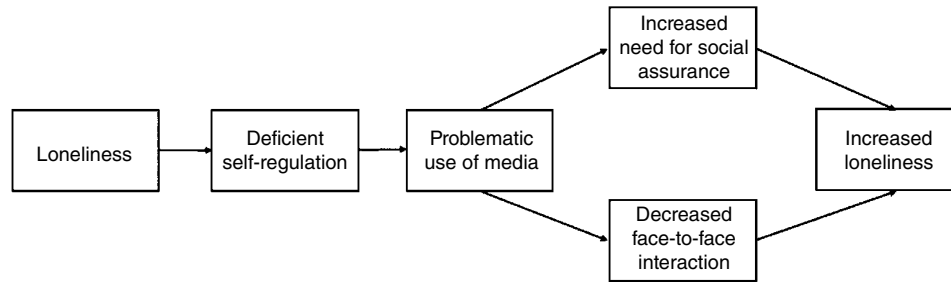


Figure 17.1 The vicious bidirectional cycle between loneliness and problematic use of media.

Two Competing Theoretical Models to Explain the Bidirectional Cycle

Such a vicious bidirectional cycle between loneliness and problematic use of media can be explained by social enhancement model (Kraut et al., 2002). This model is also called “the rich get richer, the poor get poorer” view, positing that individuals with affluent offline social resources and satisfactory social relationships would benefit more from online interactions than those who are deficient in offline social resources. “The social resource rich” tend to be confident in building as well as expanding their already well-off relationship networks, with support and protection from their existing social resources. In the meantime, “the social resource poor” tend to be incompetent in interacting with others online as offline, without much social protection to count on and with much distress from being anxious to compensate for what they lack offline (Han et al., 2012; Kim, 2017; Kim, 2018a). The difference between these two groups majorly depends on the amount of one’s existing social resources, which also affects his/her level of loneliness. Thus, it is natural for “the social resource poor” to feel lonelier and more anxious and less confident about communicating with others than “the social resource rich.” In that sense, this model suggests that relying on media as a remedy for one’s existing psychological issues or unsatisfactory social relationships would not improve his/her situation much, but rather worsen it. The social enhancement model was also supported by the follow up study of Kraut et al.’s (1998) project, by showing that using the internet increased self-esteem and decreased loneliness only for extroverts who are already well-off with their existing social resources, while the outcomes were reversed for introverts (Kraut et al., 2002).

On the contrary, another perspective called social compensation model (McKenna & Bargh, 1998) suggests that individuals who are lacking in social resources offline would benefit more from online interaction than those who have affluent offline social resources. This view is also called “the poor get richer” model in the sense that “the social resource poor” would benefit more from online social interaction than “the social resource rich.” This is because the former have more time and are more eager to develop relationships online than the latter who are already enjoying satisfactory offline social resources (Han et al., 2012; Kim, 2017; Kim, 2018a). According to this model, lonely individuals are expected to compensate for their deficient offline social relationships via online interaction and alleviate their loneliness. So far, however, to the best of the author’s knowledge, there has not been any study supporting the positive bidirectional cycle between heavy reliance on mediated communication and alleviation of loneliness.

Taken together, it seems that lonely people get even lonelier from relying on mediated communication rather than successfully coping with their issue. Lonely people usually do not have sufficient offline social resources and would be heavily dependent on mediated communication channels to alleviate their negative emotional states or compensate for their deficient offline social relationships. However, their psychological characteristics may persist across offline and online, and may not be successful in building or expanding social relationships online. Being preoccupied, but unfulfilled with the need to be assured by and connected to others, lonely people would even become lonelier.

Buffers to Problematic Use of Media: Face-to-Face Interaction and Social Support

This chapter has been implying that relying on media, especially CMC services, does not play a positive role in lessening loneliness or promoting psychological well-being of users. Such speculation has been supported by a recent national survey of more than 20,000 U.S. adults ages 18 and older, showing that social media does not help to reduce loneliness. Rather, this survey underscores the effectiveness of old-fashioned but virtuous remedies for loneliness: The amount of face-to-face interaction, living with others, and time spent with family turned out to be significant predictors of the decline in loneliness (Cigna, 2018). These survey findings highlight the importance of primary offline relationships and face-to-face interaction in reducing one's psychological ill-being and a small group of studies resonates with them (e.g., Pea et al., 2012; Kim, 2017).

Acknowledging the necessity of looking into one's primary relationships in explaining a person's psychological well-being as well as the possibility of developing problematic use of media, some scholars have started to pay attention to people's relationships with family members or significant others, even during their childhoods. For example, a study showed that the positive relationship with one's father reduced the probability of developing problematic use of social media (Lee et al., 2017). Similarly, problematic use of the internet turned out to be positively associated with bad peer relationships and low levels of communication with mother (Park et al., 2014). Childhood maltreatment such as abusive parenting (Jahng, 2019; Wang & Qi, 2017; Worsley et al., 2018) or neglect (Emirtekin et al., 2019; Kwak et al., 2018) is positively associated with problematic use of smartphones as well as the internet, mediated by depression and social anxiety. Both anxious attachment (Worsley et al., 2018) and avoidant attachment (Kim & Koh, 2018), as outcomes of childhood maltreatment, are also found to increase the possibility of problematic use of smartphones and social media.

In addition to the quality of relationships with significant others, the amount of daily face-to-face interaction turned out to be a crucial buffer to both loneliness (Cigna, 2018) and problematic use of media (Kim, 2017). A study observed what happens to lonely individuals when they attempt to relieve their loneliness via two routes of social interaction – face-to-face interaction vs. smartphone-mediated communication (i.e., social media and short message services) (Kim, 2017). Face-to-face interaction turned out to have a positive influence on participants' well-being by increasing their perceived social support, but smartphone-mediated communication did not. Face-to-face interaction also diminished lonely individuals' chances of falling into the trap of problematic use of smartphone, while relying on smartphone-mediated communication increased the chance (Kim, 2017). Such an important role of face-to-face interaction in improving media users' overall well-being (e.g., more sleep hours, positive feelings, social success) as well as in reducing the probability of developing problematic use of media has not been investigated much except for a small group of studies (e.g., Pea et al., 2012), and needs to be explored more as a promising avenue for intervention.

Another probable buffer to psychological ill-being and problematic use of media is social support given to or perceived by media users. The positive effects of (perceived) social support has been verified by a group of studies, such as decreasing depression (Finch et al., 1999), improving social adjustment (Dunkel-Schetter, 1984), and heightening self-esteem (Feather & Wainstock, 1989). Not only does (perceived) social support advance individuals' well-being directly, but it also indirectly influences well-being by affecting their choices of coping strategies when they have to deal with various life problems. For instance, the more social support breast cancer patients receive, the more likely they select active and positive coping strategies to deal with cancer, which eventually improve their emotional well-being (Kim et al., 2010). Pertaining to problematic use of media, (perceived) social support was found to reduce the probability of developing problematic use of the internet by helping users maintain appropriate amount of time spent on the internet as well as healthy emotional regulation (Mo et al., 2018). A meta-analysis of 76 studies with Chinese participants showed that there is a medium-sized negative correlation between social support and problematic use of the internet (Lei et al., 2018).

Overall, the aforementioned research focuses on the effects of social support gained from sound relationships with significant others and face-to-face interaction as buffers to loneliness and problematic use of media. Some studies show that social support received offline is negatively associated with problematic use of the internet, while social support received online is positively associated with problematic use of the internet

(e.g., Lin et al., 2018; Mazzoni et al., 2016). Still, there is another group of studies demonstrating the value of online social support in improving users' psychological well-being. In terms of social media, users tend to present their refined or positive sides of themselves most of the time, rather than showing honest or even discouraging facets. However, a few studies found that when users take courage and share their honest fear, hurt, or despair online, such candid revelation draws supporting comments from their friends on social media (Kim & Lee, 2011; Lee & Noh, 2013). Joinson (2001) advocates that self-disclosure plays a major role in building meaningful social relationships, both in offline and online contexts.

In sum, it seems that the most effective buffers against loneliness and problematic use of media are orthodox and primal means of social interaction – maintaining good relationships with significant others and having a lot of face-to-face interactions, rather than relying much on CMC, which has become the most common way to interact with others today.

Where Do We Go From Here?

So far, this chapter has provided a systematic overview on what has been found and discussed in the domain of research investigating the association between loneliness and problematic use of media. Although an exploding amount of studies has been coming out in this domain of research, there are still some challenges that need to be tackled. With a huge number of CMC technologies permeating our everyday lives, analyzing dynamic and even bidirectional associations between problematic use of media and users' psychological well-being is becoming very complex. For example, it is very hard to tell when and how relatively healthy and controllable habits of media use turn into problematic use without closely looking into gradual changes of individuals' daily lives and media use activities. Experimental manipulation that strictly controls users' behaviors and environments can be one way to clarify the vibrant association between the two. However, considering how many media have become inseparable from our daily activities, it is extremely important to observe what we do with media in our everyday routines and interaction with others without much artificial intrusion. Therefore, ideally, longitudinal observation combined with regular diary writing, interviews, surveys, and accurate estimation of media use time and activities would help us understand what is truly going on between users' psychological well-being and problematic use of media.

In addition to the difficulty of inspecting one's long-term changes in media use behaviors and states of psychological well-being, another big challenge is measuring one's media use behavior itself accurately. Particularly, with people's growing tendency to engage in media multitasking (e.g., watching videos, exchanging texts with others, listening to music, and looking up information all at the same time) (Potter, 2012), relying on users' memory and self-report on how much time they spend on specific media features or content becomes very suspect. Responding to such challenges, researchers are encouraged to use log data that can be achieved via tracking software embedded in smartphones or computers. Of course, how much of the users' attention is paid to each of the multiple media is another huge hurdle to overcome. Overall, coming up with creative and valid ways to measure time and attention spent on each media feature as well as face-to-face interaction is a very challenging, but necessary step to advance this domain of research.

Another newly emerging and interesting area that needs more attention is social interaction with machine or artificial intelligence (AI), and how it affects humans. Communicative AI pushes and challenges the boundary of human communication, which has long been based on the anthropocentric (communication is possible only between humans) perspective. Facing the rise of these "non-human communicators," scholars are exploring questions, such as what functions AI can do as communicators, what kinds of new relational dynamics might appear between humans and AI, and what constitutes human after all (Guzman & Lewis, 2019). Considering that people communicate with others to fulfill the needs to belong and be connected to others, whether people can gain social or emotional support from interaction with AI has been a fascinating topic to investigate. In fact, some of the early studies on human-computer interaction found that computer agents' expression of empathic emotion increased human users' positive ratings of the agents in the areas of likeability, trustworthiness, caring, and support (e.g., Brave et al., 2005). Reflecting on such findings, there have been

consistent efforts to develop robots that can be used for social care, such as physically assistive robots for people with physical disabilities, and socially assistive robots to aid users' daily activities or improve their psychological status. However, the effectiveness of AI or robots in providing social or emotional care for humans has not been investigated much, due to the fact that many of these technologies have yet to move from concepts or early prototype states to wider application (Consilium Research & Consultancy, 2018). Still, provided that AI and machines can be 24/7 available for users without ever sleeping or being tired, it would be enthralling to investigate whether the illusory expectation of "being always connected to others" can be truly realized or some unexpected side effects would be brought about.

Conclusion

We are living in probably the most connected world, but at the same time, the loneliest era. Such irony might be due the potential vicious bidirectional cycle between loneliness and problematic reliance on media. That is, we rely on or are even obsessed with media to alleviate our negative emotions or compensate for unsatisfactory relationships, but we do not seem to gain what we want from the ever-present flood of media. Although today's ubiquitous media definitely foster the illusion of "always being connected to others," such augmented expectation is never fully met, which eventually makes us even lonelier. Being replaced by media and mediated communication, the reduction in quality and quantity of face-to-face interaction also seems to intensify our loneliness. Regardless of such gloomy perspective, still, we cannot give up on our traditional ways of connecting with others, because maintaining good relationships with significant others and spending much time on face-to-face interaction do reduce loneliness. It is truly notable and incongruous that the most basic and old-fashioned way of communication turns out to be one of the few effective remedies for loneliness in this era of unprecedentedly abundant mediated communication technologies.

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