

Is Social Media Use for Networking Positive or Negative? Offline Social Capital and Internet Addiction as Mediators for the Relationship between Social Media Use and Mental Health

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The augmentation and displacement hypotheses generated two mediators for the relationship between social media use and mental health. A representative online sample of 1157 New Zealanders (stratified on age, gender, and region) were measured on social media use for networking, offline social capital, internet addiction, anxiety, and depression. Results showed that social media use for networking's relationship with anxiety and depression was mediated by both offline social capital and internet addiction. Anxiety and depression were lower when mediated by offline social capital, and higher when mediated by internet addiction. Applied to everyday social life, this suggests that when someone uses social media to build on pre-existing offline social capital, their mental health is "augmented". However, if their online social connections are unrelated to their offline social capital, this might be associated with an internet addiction where their offline social life is "displaced" by over-reliance on brittle online connections.

Keywords: social media, social networking, social capital, internet addiction, anxiety, depression, mental health

Social media has become a pervasive force in many daily lives. According to Facebook's latest report in June 2017, the platform had 1.32 billion daily active users and 2.01 billion monthly active users (Facebook, 2017). Social media is an equally dominant force in New Zealand society, with 88% of New Zealanders online visiting a social media site in any given month (The Nielson Company, 2016). According to the Nielson Company (2016), 3.1 Million New Zealanders (81% of the population above 10 years old), own a personal mobile device, while 3.4 Million (88% of the population above 10 years old) use the internet in any given week. A key question asked in the current literature is whether social media positively or negatively impacts the mental health of its users. Currently, there are conflicting answers to this question (Huang, 2010; Huang 2012). However, some of these contradictions might be explained by looking at how people use social media in the context of their online and offline relationships, and how such internet use might be associated with harmful addiction.

Positive and Negative effects of Social Media Use

There is currently a lack of consensus in the literature as to whether social media has a positive or negative effect on the wellbeing of its users. Some early research claimed the internet to be a negative force in people's lives, stating that it was associated with reductions in a person's social circle and general communication with family members (Kraut et al., 1998). Kraut et al. (1998) also found that internet use was associated with increases in depression and loneliness. However Kraut et al.'s (2002) follow up study on the same sample found that the negative effects had later mostly disappeared, with depression even showing a decrease in the second time period. In a separate study, reported in the same paper, Kraut et al. (2002) found that using the internet for

communication and general social involvement was associated with positive effects. In general, use of the internet predicted positive outcomes for extraverts and people with higher levels of social support and predicted negative outcomes for introverts and people with lower levels of social support. This has been described as "the rich getting richer and the poor getting poorer".

Although over a decade has passed since Kraut et al.'s seminal studies, there is still complexity and paradox present in the literature that recent meta-analyses have highlighted. Huang (2010) found a significant relationship between internet use and decreased overall wellbeing. Although the effect size was small, the measure of wellbeing used encompassed a wide range of factors like depression, self-esteem, and loneliness. However, two years later in a subsequent meta-analysis, Huang (2012) did not replicate the relationship between internet use and psychological wellbeing, and called for extra attention to be paid to issues in measurement and the effects other variables may have. There is the additional caveat that most published findings are based on cross-sectional (correlational) studies, and very few are based on longitudinal or experimental studies. The current study is also limited to cross-sectional data, and therefore focuses on a mediational model to at least provide some guidance as to what might be a plausible account of the relationship between social media use and mental health.

Since these seminal findings were published, several studies have supported the theory that the use of social media can negatively impact on mental health (e.g., Sidani et al., 2016; Vannucci, Flannery, & Ohannessian, 2017). However, in line with the findings of Kraut et al. (2002), social media use has a positive effect when people follow fewer strangers (Lup, Trub, & Rosenthal, 2015) and receive positive feedback from

others (Valkenburg, Peter, & Schouten, 2006). These findings can be explained by the augmentation hypothesis, while the literature that claims social media has a negative effect may be explained by the displacement hypothesis (Huang, 2010). These hypotheses should be treated as over-arching explanatory accounts of the relationship between social media use and mental health. Augmentation and displacement should not be interpreted as measures, as they have been operationalized in the literature through different constructs and measures.

The Augmentation and Displacement Hypotheses

Considering the augmentation and displacement hypotheses in tandem provides a pathway for explaining some of the contradictions present in the literature. The augmentation hypothesis states that use of the internet builds on and adds to existing face to face relationships, and may improve the giving and receiving of social support, resulting in better mental health for the user. However, the displacement hypothesis states that use of the internet, especially in connecting with people online, displaces face to face social relationships and the quality of social support given and received. This reduces the number and quality of existing friendships and results in negative effects for the user (Huang, 2010). Although these theories appear to be in direct conflict with one another, this can be resolved by looking at possible mediator variables (Huang, 2012).

Ahn and Shin (2013) found that the relationship between offline communication and wellbeing was mediated by both connectedness and *avoidance of social isolation*. However, the relationship between social use of media and wellbeing was mediated by connectedness alone. This demonstrates that the use of social media for communication facilitates connectedness with others, while face to face communication can facilitate both connectedness and *avoidance of social isolation*. These findings help explain both the augmentation and displacement hypotheses. When someone is seeking connectedness (especially shy people, see Baker & Oswald, 2010), use of the internet can boost social capital offline (i.e., the value of face to face relationships). However, if they are trying to avoid social isolation, use of the internet may instead displace existing offline social relationships by filling up time with brittle and shallow online connections with people who are largely strangers, and failing to develop better social skills. Displacement may also occur when an individual uses the internet excessively, and develops an internet addiction that may then further take time away from face to face relationships (e.g., offline social capital) and positive social interactions. The present paper attempts to demonstrate that the augmentation and displacement hypotheses can be combined through testing the mediators 'offline social capital' and 'internet addiction', focusing specifically on the potentially problematic variable of social media use for networking.

Offline Social Capital and Internet Addiction

It is a well-established finding in the literature that an increase in offline social connections is associated with improvements in mental health (Kawachi & Berkman, 2001; Silva, McKenzie, Harpham, & Huttly, 2005). Thus, it makes

sense that the use of online social media platforms would lead to improvements in mental health when it facilitates the development of the user's social capital offline, as well as the giving and receiving of social support. For instance, Manago et al. (2012) found that the undergraduate students who maintained higher proportions of past social connections (e.g. high school friendships on Facebook) were more likely to feel more social support. Use of the internet specifically for maintaining social connections also shows improvements in mental health. In a survey conducted by Bessiere, Kiesler, Kraut and Boneva (2008), using the internet to communicate with friends and family was associated with reductions in depression after a 6 month period. The same study found that using the internet for gaining information and consuming entertainment had no effect on levels of depression. Therefore, in accord with the augmentation hypothesis, we hypothesize that social media use for networking that facilitates offline social networks should be negatively associated with symptoms of anxiety and depression.

The detrimental effect of internet addiction is an equally established finding. Almost two decades ago, Young and Rogers (1998) found a relationship between depression and pathological internet use. Since then multiple studies have highlighted the wide range of detrimental effects internet addiction may have. Kim et al. (2006) conducted a survey on Korean high school students, finding 1.6% of the students to be internet addicts and 38% to be possible internet addicts. The internet addicted group showed the highest levels of both depression and suicidal ideation. Correlational studies have also found a positive relationship between internet addiction and depression, anxiety and stress (Akin & Iskender, 2011). Excessive internet use may be the result of an individual being lonely and lacking social skills (Kim, LaRose, & Peng, 2009). This excessive use may in turn lead to the development of an internet addiction, resulting in further detrimental effects.

This study will test whether the variables internet addiction and offline social capital mediate the link between social media use for networking and anxiety and depression. This builds on previous studies and further connects and operationalizes the augmentation and displacement hypotheses. In accord with the augmentation hypothesis, we anticipate that social media use for networking will be associated with decreased levels of anxiety and depression when mediated through offline social capital; but following the displacement hypothesis, we anticipate elevated anxiety and depression when this is mediated through internet addiction.

Methods

Sample

Analyses were conducted on New Zealand data ($n = 1157$, 56% female) from a much larger multinational study, the 'Worldwide Digital Influence Survey' (Liu, Milojev, Gil de Zúñiga, & Zhang, 2018). The first wave of the study was fielded online between September 14 and 24, 2015, by Nielsen, a popular media polling company based in the United States that curates a worldwide, online panel with more than 10 million potential participants (see Gil de Zúñiga & Liu, 2017 for

details). Nielsen used stratified quota sampling techniques to create samples whose demographics closely matched those reported by official census agencies in each country for age, gender, and region. Because of the complexity of the meaning of ethnicity in a global context, data on ethnicity were not available. The average age of the New Zealand sample was 49.54 years old ($SD = 17.32$). 22.9% of the participants lived in a rural area, while 77.1% lived in an urban area; 88.6% of the participants reported that they use the internet 7 days a week. The average amount of time spent online per day was 5.47 hours ($SD = 4.46$).

Materials and Procedures

Participants were asked to respond to 7-point Likert-type scales (1 = Never, 2 = Rarely, 3 = Somewhat Rarely, 4 = Occasionally, 5 = Somewhat Frequently, 6 = Frequently and 7 = All the time) for the following measures (except where other scale labels are described):

Social media use for networking

This variable refers to the degree to which the participants use social media for the specific purpose of connecting with others. It was constructed by combining five items following the stem question: "People also use social media for a variety of things. Listed below are some activities you may, or may not have engaged in. Please tell us how often you have used social media in the past 3 (three) months for the following: "To stay in touch with friends and family", "To meet new people who share my interests", "To contact people I wouldn't meet otherwise", "To find people to solve problems in my community", "To connect community members to each other". This variable was derived from a more general measure of social media social capital (Gil de Zuniga, Barnidge, & Scherman, 2017) but we removed items unrelated to connecting relationally with others to get a focused measure of internet use for social networking. This measure had a Cronbach's alpha coefficient of .86.

Anxiety

The Generalized Anxiety Disorder scale (GAD) (Spitzer, Kroenke, Williams, & Löwe, 2006) was used to get a measure of symptoms of anxiety: it is constructed from seven items ("Feeling nervous, anxious, or on edge", "Not being able to stop or control worrying", "Worrying too much about different things", "Having trouble relaxing", "Being so restless that it's hard to sit still", "Becoming easily annoyed or irritable" and "Feeling afraid as if something awful might happen"). This measure had a Cronbach's alpha coefficient of .94.

Depression

This variable relates to the level of depressive symptoms experienced by the participant. It was constructed from two items ("Having little interest or pleasure in doing things" and "Feeling down, depressed, or hopeless") drawn from the Patient Health Questionnaire-4 (PHQ-4) (Löwe et al., 2010) with a Cronbach's alpha coefficient of .85.

Offline social capital

This variable refers to the participant's connection to the people in their community. It is constructed from five items

("People in my community feel like family to me", "I think people in my community share values", "In my community, we talk to each other about community problems", "I think people in my community feel connected to each other" and "In my community, people help each other when there is a problem"). Participants were asked to rate how much they agreed with each statement (1 = Disagree Completely, 2 = Disagree, 3 = Disagree a Little, 4 = Neutral, 5 = Agree a Little, 6 = Agree, 7 = Agree Completely). This measure had a Cronbach's alpha coefficient of .91.

Internet addiction

This variable refers to how much the participant believes they are addicted to the internet. It is constructed from a single item ("I am addicted to the internet") in which participants were asked to rate how much they agreed with the statement (1 = Disagree Completely, 2 = Disagree, 3 = Disagree a Little, 4 = Neutral, 5 = Agree a Little, 6 = Agree, 7 = Agree Completely).

Control variable

In addition to the main variables, we also included 'social media use for news' as a control variable to rule out the effect of non-social networking social media use. This variable relates to the participant using social media for the purpose of gaining news information. It is constructed from three 'social media use' items ("To stay informed about current events and public affairs", "To stay informed about my local community" and "To get news about current events from mainstream media (e.g., professional news services)", drawn from work by Gil de Zúñiga, Jung, and Valenzuela (2012). This measure had a Cronbach's alpha coefficient of .87. It was constructed as a control variable only. This control variable was included as a covariate when predicting the mediators (the internet addiction and offline social capital) and the outcomes (anxiety in Model 1 and depression in Model 2) of social media use for networking.

Results

Descriptive statistics and the correlation matrix for all variables are presented in Table 1.

Table 1
Descriptive Information and Correlations for the Analysed Variables

	α	M	SD	1	2	3	4	5
1. Anxiety	.94	3.02	1.33	1				
2. Depression	.85	2.76	1.45	.77**	1			
3. Internet Addiction	—	3.04	1.83	.25**	.25**	1		
4. Offline Social Capital	.91	3.79	1.28	-.06*	-.12**	-.01	1	
5. Social Media Use for Networking	.86	3.08	1.33	.20**	.14**	.34**	.13**	1
6. Social Media Use for News	.87	3.63	1.59	.18**	.12**	.26**	.09**	.75**

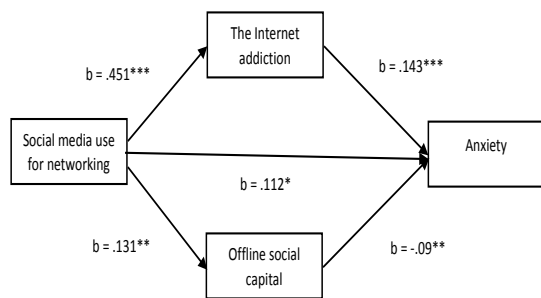
Note. * $p < .05$ (2-tailed), ** $p < .01$ (2-tailed)

To test the augmentation and replacement hypotheses, a series of multiple mediation analysis was performed using PROCESS, a statistical package developed by Hayes (2012). In determining the mediation effects, we followed Baron & Kenny's (1986) three criteria; (1) there must be a significant relationship between the independent variable and the dependent variable, (2) there must be a significant relationship

between the independent variable and the mediating variable, and (3) the mediator must be a significant predictor of the outcome variable in an equation including both the mediator and the independent variable. Finally, a Sobel test was then performed to test whether each of these mediation effects was statistically significant (Sobel, 1982). Our analyses were conducted based on the mean scores of the variables.

Model 1: A multiple mediation analysis predicting anxiety symptoms

Figure 1. Social media use for networking and anxiety, mediated through internet addiction and offline social capital controlling for social media use for news. * $p < .05$, ** $p < .01$, *** $p < .001$.

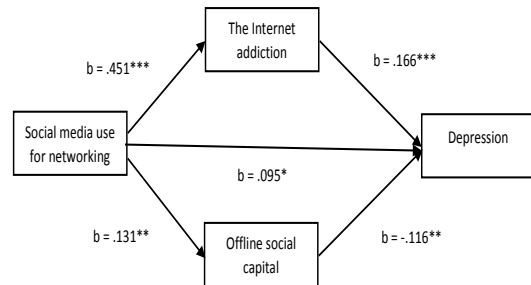


In Step 1 of the multiple mediation model¹, social media use for networking was found to significantly and positively predict anxiety, $b = .164$, $t(.044) = 3.726$, $p < .001$, after controlling for social media use for news [$b = .053$, $t(.037) = 1.428$, $p > .05$]. Step 2 showed that the regressions of social media use for networking on both mediators, internet addiction [$b = .451$, $t(.058) = 7.82$, $p < .001$] and offline social capital [$b = .131$, $t(.043) = 3.085$, $p < .01$], were also significant after controlling for social media use for news [$b = .019$, $t(.048) = .389$, $p > .05$ and $b = -.008$, $t(.036) = -.219$, $p > .05$, respectively]. In Step 3, Internet addiction [$b = .143$, $t(.022) = 6.46$, $p < .001$] and offline social capital [$b = -.09$, $t(.03) = -3.01$, $p < .01$] significantly predicted anxiety, whilst the direct regression effect of social media use for networking on anxiety was reduced, $b = .112$, $t(.045) = 2.501$, $p < .05$ (see Figure 1). Results remained significant after controlling for social media use for news [$b = .049$, $t(.036) = 1.366$, $p > .05$]. Finally, a Sobel test was conducted and found a positive partial mediation effect of internet addiction ($b = .065$, $Z(.013) = 4.96$, $p < .001$) and a negative partial mediation effect of offline social capital ($b = -.012$, $Z(.006) = -2.1$, $p < .05$). In conclusion, these findings supported both hypotheses, that social media use for networking is positively associated with anxiety when mediated by internet addiction (the displacement hypothesis), and conversely, is negatively linked with anxiety when mediated through social capital offline (the augmentation hypothesis).

¹ All path coefficients reported are unstandardized, so caution should be used before interpreting these in terms of effect sizes. However, in crudely general terms, the path coefficients represented modest to small sized effects

Model 2: A multiple mediation analysis predicting symptoms of depression

Figure 2. Social media use for networking and depression, mediated through internet addiction and offline social capital controlling for social media use for news. * $p < .05$, ** $p < .01$, *** $p < .001$.



Next, we examined the mediational roles of internet addiction and offline social capital on the link between social media use for networking and symptoms of depression. Step 1 of the multiple mediation model yielded a significant regression of social media use for networking [$b = .154$, $t(.045) = 3.39$, $p < .001$] on depression, even after controlling for social media use for news [$b = .035$, $t(.038) = .908$, $p > .05$]. In Step 2, social media use for networking significantly predicted both Internet addiction [$b = .451$, $t(.058) = 7.82$, $p < .001$] and offline social capital [$b = .131$, $t(.043) = 3.08$, $p < .01$], after controlling for social media use for news [$b = .019$, $t(.048) = .389$, $p > .05$ and $b = -.008$, $t(.036) = -.219$, $p > .05$ respectively]. Finally, Step 3 showed that internet addiction [$b = .166$, $t(.023) = 7.33$, $p < .001$] and offline social capital [$b = -.116$, $t(.031) = -3.76$, $p < .001$] predicted depression, while the regression coefficient of social media for networking substantially decreased [$b = .095$, $t(.046) = 2.08$, $p < .05$] indicating partial mediation. These results remained significant after controlling for social media use for news [$b = .049$, $t(.036) = 1.366$, $p > .05$]. Finally, a Sobel test showed a positive mediation effect of internet addiction [$b = .075$, $Z(.014) = 5.32$, $p < .001$] and a negative mediation effect of offline social capital [$b = -.015$, $Z(.007) = -2.34$, $p < .05$]. In accord with Model 1, Model 2 supported both the displacement and augmentation hypotheses; social media use for networking was positively linked to depression when mediated by Internet addiction, and conversely, was negatively associated with depression when mediated by social capital offline (i.e., face to face relationships).

Discussion

Currently debate exists in the literature over whether social media use has a positive or negative effect on individual wellbeing. The augmentation hypothesis states that using the internet builds existing social capital offline and the giving and receiving of social support, and that this is associated with positive effects for the user. The displacement hypothesis opposes this, stating that internet use diminishes offline social connectedness (i.e. social capital), which is associated with negative effects for the user. Addressing these two competing views, this study aimed to test a mediational model where the effect of social media use on well-being is contingent on intervening processes (Huang, 2012).

The main contribution of the present study was to provide evidence that social media use for social networking was associated with higher or lower levels of anxiety and depression symptoms depending on the mediational pathway it evoked. Our first analyses showed that social media use for social networking had indirect effects on both depression and anxiety in the negative direction if mediated by internet addiction. There may be a set of tendencies where social media use for social networking is associated with excessive internet use, and more symptoms of depression and anxiety. These findings seem to be well explained by the displacement hypothesis, that is, the positive experiences that an individual user gains from social media networking possibly drive him or her to develop an excessive love for the internet that takes away from time for social interactions offline and/or reduces social support from these interactions; these are then connected to higher levels of symptoms for depression and anxiety (Ahn & Shin, 2013).

However, these are statistical relationships that must be treated with caution, as our study also demonstrated that the networking uses of social media are associated with lower depression and anxiety when their relationship is mediated through offline social capital. This is in line with the augmentation hypothesis that internet use might have positive effects on an individual's well-being because it can enhance his or her social connectedness (Huang, 2012).

Because the data presented here are correlational, the mediational analyses reported should be treated as plausible interpretations of statistical patterns, not as evidence of causal relationships. For example, it is very easy to imagine an alternative model where it is symptoms of anxiety or depression that lead a person to feel their internet use is becoming an addiction. In terms of the raw correlation matrix reported, there was no relationship between internet addiction and offline social capital, as one might expect if the displacement hypothesis were treated as providing a causal account of patterns observed. Internet addiction is *not* adequate as a proxy measure for displacing face-to-face social relationships, but rather could be part of an online syndrome where the *subjective experience of the internet* (interpreted by participants as "addiction") is associated with disturbances to their mental health. Hence, augmentation and displacement should be considered as over-arching explanatory frameworks for understanding the possible relationship between social media usages and mental health, not as specifically measured constructs in the context of the current study.

Conclusion

The current study suggests that both augmentation and displacement may occur through the use of social media for networking. Internet addiction and offline social capital may play important roles as mediators that determine whether social media use for networking produces positive or negative effects on mental health. It is possible that the effects of social media use for networking on mental health depend on the particular user's ability to avoid the addictive side of it (O'Keeffe & Clarke-Pearson, 2011; Song, Larose, Eastin, & Lin, 2004; Young & Rogers, 1998). However, it is worth noting that

consistent with Huang (2010), the direct paths between social media use for networking and slightly lower mental health remained significant even after mediation. Overall, the size of path coefficients tended to be small.

Despite the utility of these findings, it is important to note that the current study contains several limitations. First, though internet addiction yielded significant mediational effects for both depression and anxiety, it was measured with only a single item. Therefore, for future studies it is important to replicate the model with a better measure of internet addiction. Second, while our models were tested with a relatively powerful statistical analysis on a large representative sample, any causal inferences should be avoided as the analyses were conducted based on a cross-sectional data. Further studies may consider using quasi-experimental or longitudinal designs to test the causal effects of social media use on the users' anxiety and depression.

The findings of this study do appear to have wider implications for society. Education could be provided to people about the addictive effect of networking using social media. People could be encouraged to instead be mindful of the importance of their offline connections, and use social media as a tool to improve their existing social capital. This might be an especially important message for older adults whose use of social media is increasing (despite them growing up without this technology, see Madden, 2010). This paper also highlights a need for support services (akin to alcohol and drug services) to adapt, and provide treatment for internet related addictions, especially as internet usage continues to expand (Grubbs, Stauner, Exline, Pargament, & Lindberg, 2015).

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References

- Ahn, D., & Shin, D. H. (2013). Is the social use of media for seeking connectedness or for avoiding social isolation? Mechanisms underlying media use and subjective well-being. *Computers in Human Behavior*, 29(6), 2453-2462.
- Akin, A., & Iskender, M. (2011). Internet addiction and depression, anxiety and stress. *International Online Journal of Educational Sciences*, 3(1), 138-148.
- Baker, L.R., & Oswald, D.L. (2010). Shyness and online social networking services. *Journal of Personal and Social Relationships*, 27(7), 873-889. DOI: 10.1177/0265407510375261
- Baron, R. M. & Kenny, D. A. (1986) The moderator-mediator distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*; 51:1173-1182.
- Becker, M. W., Alzahabi, R., & Hopwood, C. J. (2013). Media multitasking is associated with symptoms of depression and social anxiety. *Cyberpsychology, Behavior, and Social Networking*, 16(2), 132-135.
- 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.

- Chang, P. F., Choi, Y. H., Bazarova, N. N., & Löckenhoff, C. E. (2015). Age differences in online social networking: Extending socioemotional selectivity theory to social network sites. *Journal of Broadcasting & Electronic Media*, 59(2), 221-239.
- Cotten, S. R., Ford, G., Ford, S., & Hale, T. M. (2012). Internet use and depression among older adults. *Computers in human behavior*, 28(2), 496-499.
- Facebook. (2017). Stats. Retrieved from <https://newsroom.fb.com/company-info/>
- Frost, R. L., & Rickwood, D. J. (2017). A systematic review of the mental health outcomes associated with Facebook use. *Computers in Human Behavior*, 76, 576-600.
- Gil de Zúñiga, H., & Liu, J.H. (2017). Second screening politics in the social media sphere: Advancing research on dual screen use in political communication with evidence from 20 countries. *Journal of Broadcasting & Electronic Media*, 61(2), 193-219. doi: 10.108/08838151.2017.1309420
- Gil de Zúñiga, H., Barnidge, M., & Scherman, A. (2017). Social media social capital, offline social capital, and citizenship: exploring asymmetrical social capital effects. *Political Communication*, 34(1), 44-68. doi:10.1080/10584609.2016.1227000
- Gil de Zúñiga, H., Jung, N., & Valenzuela, S. (2012). Social media use for news and individuals' social capital, civic engagement and political participation. *Journal of Computer-Mediated Communication*, 17(3), 319-336.
- Grubbs, J. B., Stauner, N., Exline, J. J., Pargament, K. I., & Lindberg, M. J. (2015). Perceived addiction to Internet pornography and psychological distress: Examining relationships concurrently and over time. *Psychology of Addictive Behaviors*, 29(4), 1056.
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling: University of Kansas, KS.
- Huang, C. (2010). Internet use and psychological well-being: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, 13(3), 241-249.
- Huang, C. (2012). Internet use and psychological well-being. In Z. Yan (Ed.), *Encyclopedia of Research on Cyber Behavior* (pp. 302-314). Hershey, PA, USA: Information Science Reference, IGI Global.
- Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban Health*, 78(3), 458-467. <https://doi.org/10.1093/jurban/78.3.458>
- Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the Cause and the Effect of Problematic Internet Use: The Relationship between Internet Use and Psychological Well-Being. *CyberPsychology & Behavior*, 12(4), 451-455. <https://doi.org/10.1089/cpb.2008.0327>
- Kim, K., Ryu, E., Chon, M. Y., Yeun, E. J., Choi, S.Y., Seo, J. S., & Nam, B. W. (2006). Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey. *International Journal of Nursing Studies*, 43(2), 185-192. <https://doi.org/10.1016/j.ijnurstu.2005.02.005>
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet Paradox Revisited. *Journal of Social Issues*, 58(1), 49-74. <https://doi.org/10.1111/1540-4560.00248>
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox. A social technology that reduces social involvement and psychological well-being? *The American Psychologist*, 53(9), 1017-1031.
- Lau, K. M., Hou, W. K., Hall, B. J., Canetti, D., Ng, S. M., Lam, A. I. F., & Hobfoll, S. E. (2016). Social media and mental health in democracy movement in Hong Kong: A population-based study. *Computers in Human Behavior*, 64, 656-662. <https://doi.org/10.1016/j.chb.2016.07.028>
- Liu, J. H., Milojev, P., Gil de Zúñiga, H., & Zhang, R.J. (2018). The global trust inventory as a "proxy measure" for social capital: Measurement and impact in 11 democratic societies. *Journal of Cross-Cultural Psychology*, 49(5), 789-810. DOI: 10.1177/0022022118766619.
- Löwe, B., Wahl, I., Rose, M., Spitzer, C., Glaesmer, H., Wingenfeld, K., ... & Brähler, E. (2010). A 4-item measure of depression and anxiety; Validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population. *Journal of Affective Disorders*, 122(1), 86-95. doi: 10.1016/j.jad.2009.06.019
- Lup, K., Trub, L., & Rosenthal, L. (2015). Instagram #Instasad?: Exploring Associations Among Instagram Use, Depressive Symptoms, Negative Social Comparison, and Strangers Followed. *Cyberpsychology, Behavior, and Social Networking*, 18(5), 247-252. <https://doi.org/10.1089/cyber.2014.0560>
- Madden, M. (2010). Older adults and social media: Social networking use among those ages 50 and older nearly doubled over the past year. Retrieved from Pew Research Center website: <http://www.pewinternet.org/2010/08/27/older-adults-and-social-media/>
- Manago, A. M., Taylor, T., & Greenfield, P. M. (2012). Me and my 400 friends: the anatomy of college students' Facebook networks, their communication patterns, and well-being. *Developmental Psychology*, 48(2), 369.
- O'Keeffe, G. S., & Clarke-Pearson, K. (2011). The impact of social media on children, adolescents, and families. *Pediatrics*, 127(4), 800-804.
- Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., Hoffman, B. L., ... & Primack, B. A. (2016). Association between social media use and depression among US young adults. *Depression and Anxiety*, 33(4), 323-331.
- Silva, M. J. D., McKenzie, K., Harpham, T., & Huttly, S. R. A. (2005). Social capital and mental illness: a systematic review. *Journal of Epidemiology & Community Health*, 59(8), 619-627. <https://doi.org/10.1136/jech.2004.029678>
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological methodology*, 13, 290-312.
- Song, I., Larose, R., Eastin, M. S., & Lin, C. A. (2004). Internet gratifications and Internet addiction: On the uses and abuses of new media. *CyberPsychology & Behavior*, 7(4), 384-394.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092-1097. doi: 10.1001/archinte.166.10.1092
- The Nielson Company. (2016). Media trends 2016: How New Zealanders consume newspapers, magazines, TV, radio & digital content. Retrieved from <http://www.nielsen.com/nz/en/insights/reports/2016/new-zealand-media-trends-2016.html>
- Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend Networking Sites and Their Relationship to Adolescents' Well-Being and Social Self-Esteem. *CyberPsychology & Behavior*, 9(5), 584-590. <https://doi.org/10.1089/cpb.2006.9.584>
- Vannucci, A., Flannery, K. M., & Ohannessian, C. M. (2017). Social media use and anxiety in emerging adults. *Journal of Affective Disorders*, 207, 163-166.
- Vroman, K. G., Arthanat, S., & Lysack, C. (2015). "Who over 65 is online?" Older adults' dispositions toward information communication technology. *Computers in Human Behavior*, 43, 156-166.
- Young, K. S., & Rogers, R. C. (1998). The Relationship Between Depression and Internet Addiction. *CyberPsychology & Behavior*, 1(1), 25-28. <https://doi.org/10.1089/cpb.1998.1.25>
- Young, K. S., & Rogers, R. C. (1998). The relationship between

depression and Internet addiction. *CyberPsychology & Behavior*,
1(1), 25-28.

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