

Impacts of Social Media Connection Demands: A Study of Irish College Students

Completed Research Paper

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ABSTRACT

This study investigates the cumulative impacts of connection demands across media channels. A survey with 202 Irish college students showed that the magnitude of connection demands across social media channels increases both negative affect and positive affect. A connection overload path model indicated that difficulties controlling connection habits were related to negative impacts on important life activities, stress, and affect. While negative affect was influenced by connection demands only through an indirect mechanism, there were both indirect and direct links between connection demands and positive affect.

Keywords

Connection overload, psychological well-being, social media.

INTRODUCTION

The demands of maintaining connections across multiple social media technologies continue to mount as do concerns about their impact on important real world activities and individuals' psychological well-being, a state that is defined as connection overload. Until now, the demands imposed by each of the various social media platforms and their effects have typically been studied in isolation from one another. What are the cumulative impacts of the billions of online connections from the continual barrage of email, text messages, Facebook notifications, and tweets experienced by many users?

The present study is an attempt to answer this question, focusing on the demands of maintaining communications discipline in social media, including receiving and responding to messages generated by social media applications and maintaining relationships online through frequent log-ins and postings. Here, social media are defined as those communication channels that are used to form or maintain social relationships through electronic interpersonal communication, including Social Networking Systems (SNS), microblogs, electronic mail, and text messaging.

Although connection overload is related to perceived information overload (Misra and Stokols, 2011), connection overload differs from information overload. Connection overload occurs in individuals' online social environments, while information overload occurs in individuals' work environment. Information overload is typically examined in relationship to the

information required for task-oriented decision making under time pressure, which neither accurately describes the media context in general (Hargittai, Neuman and Curry, 2012) nor the social media context specifically.

Connection overload may cause a wide range of problems in individuals, from minor interruptions of life activities such as family gatherings to serious disruptions that might be considered compulsive or problematic, or even pathological or “addictive” problems, in extreme cases. The present study, however, is not to sound an alarm about a dangerous pathology afflicting society. Thus, the present study focuses on a phenomenon that weakens effective self-regulation of technological intrusions and results in moderate levels of psychological distress, rather than serious life consequences that are seldom observed in normal populations (see LaRose, 2004; Shaffer, Hall and Vander Bilt, 2000).

CONNECTION OVERLOAD AND PSYCHOLOGICAL WELL-BEING

The present study continues a stream of research about the effects of online communication that began with the Internet Paradox studies (e.g., Bessiere, Kiesler, Kraut and Boneva, 2008; Kraut et al., 1998; Kraut et al., 2002). Although studies reported both positive and negative effects of Internet use (Kraut et al., 1998; Kraut et al., 2002), a meta-analysis of 43 studies report a weak negative relationship between Internet use and psychological well-being (Huang, 2010).

Social media can exert both positive and negative effects on psychological well-being. For example, Ellison, Steinfield and Lampe (2007) reported that Facebook use can help college students build and maintain social capital. Facebook use also correlates with poor academic performance (Kirschner and Karpinski, 2010), jealousy in romantic relationships (Muise, Christofides and Desmarais, 2009), and peoples’ perceptions that they are less happy than others (Chou and Edge, 2012). In a survey of U.S. college students, 85.7 % reported Facebook-induced stress (Campisi et al., 2012).

Frequent mobile phone use was correlated with stress, sleep disturbances, and depression (Thomé, Härenstam and Hagberg, 2011). However, mobile phones are mainly used for interpersonal relationships with intimate friends (Igarashi, Motoyoshi, Takai and Yoshida, 2008). LaRose, Eastin and Gregg (2001) showed that email exchanges increase social support, and in turn decrease hassles and depression.

Following this line of research, the present study suggests a dual process model that might explain how connection demands sometimes result in positive outcomes whilst at other times they result in negative ones.

A MODEL OF CONNECTION OVERLOAD

The proposed Connection Overload model is shown in Figure 1. It describes how the use of social media, initially in pursuit of the positive feelings associated with social interaction, leads to habitual usage and in some cases to uncontrolled social media behavior that competes with important life activities to the point that it produces dysphoric states of stress and negative affect. Ongoing maintenance and repeated use of social media can lead to automatic behavior in the form of media habits (LaRose, 2010). Habits form to conserve scarce mental resources so that the routines of maintaining electronic connections, such as checking and responding to postings and messages, can be carried out with a minimum investment of awareness and attention, without even the effort of forming conscious intentions. It is known that brain regions that are related to the formation and expression of habits are especially sensitive to social stimuli (Graybiel, 2008) so it is to be expected that communication channels that focus on the conveyance of social stimuli will be especially habit forming. Those ever-present tools of electronic communication, personal computers, tablets, and smartphones, provide the consistent contexts that cue repeated performance of social media behaviors.

Through continual cueing of repeated actions, habitual behaviors may come to be performed automatically without reference to the positive outcomes that initially motivated them and may even continue when the behavior (e.g., responding to email prompts or smartphone alerts) becomes noxious. At that point, individuals may make unsuccessful attempts to moderate their behavior but find that they are unable to apply the necessary self-corrective measures, a state of deficient self-reaction (LaRose, 2010). Previous research has found habit strength and deficient self-reaction to be directly related (LaRose, Kim and Peng, 2010; LaRose, Lin and Eastin, 2003). Although the causal relationship between habit and deficient self-regulation remains undetermined, the present study suggests that habits lead to deficient self-reaction on the premise that connection demands continually expand over time as individuals attempt to cope with expanding networks of contacts and feel pressured to respond appropriately to their many texts, tweets, pokes, and status updates, leading to failures of self-control.

Habitual use of social media is expected to cause negative outcomes, experienced as life problems, as a function of the mounting time demands and competing priorities that accompany growing social networks as well as the misunderstandings and conflicts that sometimes arise within those interactions. However, negative outcomes and dysphoric feelings are more likely to arise when connection demands spiral out of control, and deficient self-reaction to social media has been found to be strongly related to negative outcomes (LaRose et al., 2010). Previous research also reports negative psychological well-being and negative life outcomes of social media (e.g., Campisi et al., 2012; Stern and Taylor, 2007) and negative impacts of perceived information overload (Misra and Stokols, 2011). Finally, this study proposes that deficient self-reaction impacts

negative affect through two paths: (1) through negative outcomes; and (2) through negative outcomes and stress – considering that the adverse life events are inherently stressful (Kohn, Lafreniere and Gurevich, 1990).

Although social media use can adversely affect important life activities and psychological well-being, in particular when connection demands overwhelm the individual’s ability to cope with them, regular use of social media helps to coordinate social, school and work activities and connect individuals to social support and social resources (Ellison et al., 2007; Kim, Sohn and Choi, 2011; LaRose et al., 2010). The number of Facebook friends was correlated with the level of happiness (Kim and Lee, 2011). In addition, psychophysiological evidence suggests that Facebook use can directly evoke positive affect (Mauri, Cipresso, Balgera, Villamira and Riva, 2011). Thus, this study proposes a direct and positive relationship between connection demands and positive affect. However, as described in the preceding paragraph, connection demands, also have an indirect negative relationship with positive affect, mediated by habits, deficient self-reaction, negative outcomes, and stress.

The proposed dual process model is shown in Figure 1.

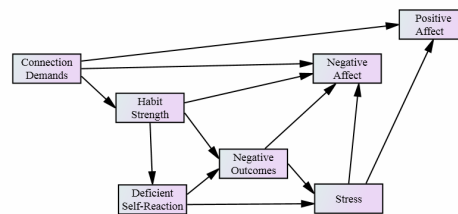


Figure 1. Hypothesized Connection Overload Path Model

RESEARCH METHODS

Participants

Two hundreds and two students from a large university in Ireland participated in an online survey. Their demographic and connection media characteristics are shown in Table 1.

Gender	Male (%)	96 (47.5%)
	Female (%)	106 (52.5%)
Year	First year (%)	2 (1.0%)
	Second year (%)	138 (68.3%)
	Third year (%)	14 (6.9%)
	Fourth year (%)	32 (15.8%)
	Fifth plus (%)	16 (7.9%)
Age	Mean = 22.24	SD = 4.05
PC	Yes (%)	195 (96.5%)
Cell phone	Yes (%)	199 (99.0%)
Smart phone	Yes (%)	168 (83.2%)
Tablet	Yes (%)	19 (9.5%)
SNS	Yes (%)	191 (94.6%)
Microblog	Yes (%)	71 (35.5%)
Email	Yes (%)	200 (99.0%)
Text	Yes (%)	200 (99.0%)

Note: The percentages shown in this table exclude missing data.

Table 1. Demographic and Technology Adoption Characteristics of Participants

Operational Measures

Unless otherwise noted, participants rated items on a Likert scale ranging from 1 (disagree very much) to 7 (agree very much). Missing values were replaced with means prior to computing additive scales and the values were then averaged across the component items in each multi-item scale. Fewer than 4% of the items were missing on any individual item. Where necessary, items were reworded to focus on social media connection behaviors.

Habit strength was measured using Verplanken and Orbell’s (2003) Self-Report Habit Index (e.g., “I connect automatically,” “I connect without having to consciously remember”). Although the original scale had 12 items, two items (Connecting “is

something I do frequently” and “is something I have been doing for a long time”) were excluded from this study because they are confounded with response frequency. The ten items measure was highly reliable ($\alpha = .93$).

Deficient self-reaction (DSR) was measured using three items from 14-item compulsive internet use scale (Meerkerk, van den Eijnden, Vermulst and Garretsen, 2009): “I find it difficult to stop connecting once I start,” “I continue to keep connected despite my intention to stop,” and “I think about connecting even when I’m not doing it” ($\alpha = .79$).

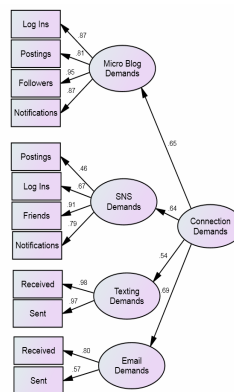
Negative outcomes was a subscale from Caplan’s (2010) Generalized Problematic Internet Use Scale 2 (GPIUS2), which was composed of three items: “My use of online connecting has made it difficult for me to manage my life,” “I have missed social engagements or activities because of my use of electronic connections,” and “Keeping connected has created problems for me in my life” ($\alpha = .87$).

Stress was measured using four items from Cohen, Karmarck and Mermelstein’s (1983) perceived stress scale: “In the last month, how often have you felt that you were unable to control the important things in your life?” , “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?” , “In the last month, how often have you felt confident about your ability to handle your personal problems?”, and “In the last month, how often have you felt that things were going your way?” Participants rated stress using a Likert scale that ranged from 1 (never) to 5 (very often) ($\alpha = .70$).

Following Thompson’s (2007) Positive And Negative Affect Schedule (PANAS), *negative affect* and *positive affect* were constructed: “Thinking about yourself and how you felt during the past week, indicate to what extent you felt the following ways during the past week” (1=very slightly or not at all, to 5= extremely). For positive affect, the question items were alert, inspired, determined, attentive, and active ($\alpha = .80$); for negative affect, the five items included upset, hostile, nervous, ashamed, and afraid ($\alpha = .69$).

Connection demands were assessed through a battery of 12 questions that asked about the frequency of common connection tasks (e.g., logging into social networks, receiving notifications from social media sites) and the magnitude of the online communities that individuals maintained (e.g., the number of social networking friends, the number of micro blog followers). Those who indicated they did not use a particular connection technology were assigned values of zero . The values were subject to log10 (value +1) transformations to normalize the distributions. The resulting composite scale had good internal consistency ($\alpha = .80$).

An exploratory principal components factor analysis of the communication demands items was conducted using varimax rotation. A four-factor solution explained 78.47% of the variance in which indicators associate with each of the four connection channels (microblog, SNS, texting, and email) loaded on separate dimensions. A confirmatory factor analysis confirmed a second order factor structure subsuming the four channels (Figure 2). A solution incorporating a second-order connection demands factor was a good fit to the data (CFI = .969, RMSEA = .074, Chi-square (48) = 205.8, $p < .001$) and the 12 log transformed values were added to compute the Connection Demands variable use in multivariate analyses ($M = 49.12$, $SD = 50.25$, $\alpha = .80$).



CFI = .969, RMSEA = .074, Chi-square (48) = 205.8, $p < .001$. All indicator variable were subjected to log10 (value + 1) transforms.

Figure 2. Confirmatory Factor Analysis of Connection Demands.

RESULTS

Descriptive information on connection demands for each media platform is shown in Table 2.

	Mean	S.D.
SNS Daily Log-ins	5.32	5.74
SNS Weekly Updates	2.18	3.55
SNS Number of Friends	384.07	284.22
SNS Weekly Notifications	37.98	40.81
Microblog Daily Log-ins	1.06	2.81
Microblog Daily Postings	.59	1.56
Microblog Followers	45.13	222.55
Microblog Weekly Notifications	6.84	23.27
Emails Received Per Day	10.08	8.25
Emails Sent Per Day	2.62	3.42
Texts Received Per Day	37.60	65.83
Texts Sent Per Day	37.28	65.95

Table 2. Connection Demands

Bivariate Pearson product-moment correlations among variables and across the entire sample are shown in Table 3.

Variable	1	2	3	4	5	6	7
1. Connection Demand	1						
2. Habit Strength	.31***	1					
3. Deficient Self-Reaction	.08	.61***	1				
4. Negative Outcome	-.05	.27***	.53***	1			
5. Stress	.03	.14	.25***	.25***	1		
6. Negative Affect	-.00	.11	.19**	.29***	.46***	1	
7. Positive Affect	.18*	-.05	-.12	-.17*	-.37***	-.13	1
α	.80	.93	.79	.87	.70	.69	.80
Mean	.84	5.12	4.14	2.33	3.86	2.07	3.33
SD	.28	1.29	1.48	1.44	.76	.71	.82

Note: Connection demand was subjected to $\log_{10}(\text{value} + 1)$ transforms. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3. Pearson Product Moment Correlation Matrix of Variables

The hypothesized path model was tested using Amos version 20.0 (IBM Corporation, 2011). The data were fitted to the hypothesized model and produced a good fit ($\chi^2(9) = 9.721$, CFI = .997, RMSEA = .020). Nonsignificant paths were trimmed to produce a more parsimonious model and the changes did not affect fit ($\chi^2(4) = 2.805$, n.s.). The final path model, shown in Figure 3 with its standardized path coefficients, remained a good fit ($\chi^2(13) = 12.526$, CFI = 1.00, RMSEA = .001). The hypothesized relationships among the dependent variables were observed, with negative outcomes preceding negative affect ($\beta = .16$, $p < .05$) and stress ($\beta = .31$, $p < .001$) and stress in turn preceding negative affect ($\beta = .42$, $p < .001$). Stress was inversely related to positive affect ($\beta = -.41$, $p < .001$). As hypothesized, connection demands were directly related to habit strength ($\beta = .30$, $p < .001$), which was in turn directly related to deficient self-reaction ($\beta = .61$, $p < .001$). Deficient self-reaction was directly related to negative outcomes ($\beta = .53$, $p < .001$) as hypothesized. Connection demands directly related to positive affect ($\beta = .19$, $p < .01$).

In sum, there was no direct relationship between connection demands and negative affect. Connection demands influenced negative affect indirectly through habit, deficient self-reaction, and negative outcomes. Then, negative outcomes were found to directly influence negative affect and also induced stress that in turn also exacerbated negative feelings.

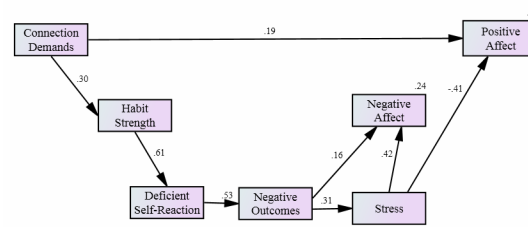


Figure 3. Final connection overload path model

In comparison, connection demands had both indirect and direct effect on positive affect. Overall, 26 percent of the variance in positive affect was accounted for through two different mechanisms involving connection demands, one acting directly and through habit strength, deficient self-reaction, negative outcomes, and stress to reduce positive affect.

DISCUSSION

The finding of this study suggests that the demands of staying connected with “friends” and “followers” and close associates across social media platforms can have both positive and negative effects on the psychological well-being of their users. This finding is consistent with social media studies that have found both positive and negative effects (e.g., Ellison et al., 2007; Campisi et al., 2012), but extends the prior research by examining the cumulative impact of social media across multiple technological platforms including SNS, microblogs, email, and text messaging.

Connection demands were positively related to negative affect via habit and deficient self-reactions. Connection overload seems to lead to deficient self-reaction, also sometimes known as compulsive use, making individuals struggle with self-control over their connection behaviors. The relationship between deficient self-reaction and negative outcomes has been well established for general Internet use (Tokunaga and Rains, 2010), but the present study suggests that there is a relationship between deficient self-reactions and negative outcomes in social media modalities, specifically.

This study also shows a possibility that deficient self-reactions can be a late stage of habit development. In the path model, habit preceded deficient self-reaction, unlike in prior research (LaRose et al., 2003; LaRose et al., 2010). When people become aware of their habitual use of social media and its negative outcomes, they may struggle to moderate them, but find themselves unable to do so. This study also provides new insights into the relationship between social media and psychological well-being. Deficient self-reaction of connection demands led to negative outcomes, and in turn to negative feelings. Negative outcomes also induced stress that in turn also exacerbated negative feelings. These paths provide a possible explanation for nonlinear relationships between the number of Facebook friends and positive psychological states (Steinfeld, Ellison and Lampe, 2008). A large number of Facebook friends may increase connection demands, beyond what individuals can manage effectively. Consequently, they may have to neglect their daily routines of family, work or school. Missing social activities due to connecting activities and the stress of trying to cope with competing real world and virtual world demands can lead to negative feelings.

Nevertheless, it should be noted that the level of negative outcomes of connection demands was very low in the study (well below the midpoint of the seven-item scale). Only 4 individuals “strongly agreed” that they had experienced all of the negative outcomes of staying connected. These findings affirm that extreme cases that might be considered problematic, or even “addictive” use are rare and that the disease model is not appropriate (see LaRose, 2004; Shaffer et al., 2000).

On the other hand, there was a positive relationship between connection demands and positive affect. Perhaps by connecting individuals with social support, social media act as a buffer against stress (LaRose et al., 2001). Furthermore, consistent with recent psychophysiological research (Mauri et al, 2011), social media may produce feelings of enjoyment and that directly counter negative feelings with positive ones.

The findings should be interpreted with the following limitations in mind. The generalizability of the study is limited considering that only undergraduate students participated. The responses from the participants might also be inaccurate, as with any self-reporting studies. Other forms of social media (e.g., Pinterest, Groupon, Bebo) were not measured in this study.

As with any cross-sectional study, causality cannot be established, notwithstanding the construction of path models as these merely reflect assumptions about causality without the ability to conclusively verify them. Reciprocal relationships are possible and indeed likely. For example, habitual connection behavior is likely to cause negative outcomes, as proposed in the present model, but awareness of those outcomes may also disrupt habits by restoring effective self-observation of one’s

behavior when individuals note the degradation important life activities. In order to establish the causal directions of key relationships in the connection overload model, time series studies are needed.

Dysphoric states may be both the cause and the effect of uncontrolled online behavior (Kim, LaRose and Peng, 2009). Connection demands might be increased by negative affect and stress because individuals seek relief online (LaRose et al., 2003). This may also impair effective self-reaction (Tokunaga and Rains, 2010), potentially leading to a downward spiral. That is, mounting connection demands stimulate dysphoric states, and in turn lead to a greater reliance on online connections and further undermine self-control. At the suggestion of a reviewer of an earlier version of this paper we tested a reversal of the link between stress and deficient self-reaction and found that to be an equally good-fitting model for these data. Panel studies that track the same individuals across several points in time are needed to further untangle these relationships.

This study found both positive and negative effects of social media. This difference might be a function of the valence of the feedback individuals receive from others (Valkenburg, Peter and Schouten, 2006) or as a consequence of specific types of activities that they engage in through social media (Burke, Marlow and Lento, 2010). Future investigations should be conducted to find other moderators such as culture. The two measures of negative states used here, stress and negative affect, were moderately related ($r = .46, p < .001$), raising questions about the discriminant validity. However, in the present study the correlation between stress and the negative affect and between stress and positive affect ($r = -.37$) were considerably lower than in prior research (e.g., Denollet and deVries, 2006) and so may distinct constructs among college student populations. Additional measures of psychological well-being such as depression, loneliness, and life satisfaction should be considered in future studies. Finally, the antecedents of connection demands should also be explored. For example, connection demands can be generated by the self or others and may vary according to the type of relationship involved and the motivations of the user.

In summary, considering that individuals may offset the positive or negative effects of one modality by resorting to another, for example, by using text messages to seek social support from close associates following unhappy experiences with social networking sites, it is important to examine the cumulative impacts of connection demands across multiple social media technologies. This study provides insights that advance our understanding of the cumulative impact of connection demands across media.

REFERENCES

1. Bessiere, K., Kiesler, S., Kraut, R. and Boneva, B. S. (2008). Effects of Internet use and social resources on changes in depression. *Information, Community & Society*, 11(1), 47-70.
2. Burke, M., Marlow, C. and Lento, T. (2010). Social network activity and social well-being. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI'10)*. ACM, New York, NY, USA, 1909-1912.
3. Campisi, J., Bynog, P., McGehee, H., Oakland, J. C., Quirk, S., Taga, C. and Taylor, M. (2012). Facebook, stress, and incidence of upper respiratory infection in undergraduate college students. *Cyberpsychology, Behavior, and Social Networking*, 15.
4. Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 26, 1089-1097.
5. Chou, H. T. and Edge, N. (2012). They are happier and having better lives than I am: The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior, and Social Networking*, 15, 117-122.
6. Cohen, S., Karmarck, T. and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
7. Denollet, J. and De Vries, J. (2006). Positive and negative affect within the realm of depression, stress and fatigue: The two-factor distress model of the Global Mood Scale (GMS). *Journal of Affective Disorders*, 91, 171-180.
8. Ellison, N. B., Steinfield, C. and Lampe, C. (2007). The benefits of Facebook "friends;" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12, 1143-1168.
9. Graybiel, A. M. (2008). Habits, rituals, and the evaluative brain. *Annual Review of Neuroscience*, 31, 359-387.
10. Hargittai, E., Neuman, W. R. and Curry, O. (2012). Taming the information tide: Perceptions of information overload in the American home. *The Information Society*, 28, 161-173.
11. Huang C. (2010). Internet use and psychological well-being: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, 13, 241-249.
12. Igarashi, T., Motoyoshi, T., Takai, J. and Yoshida, T. (2008). No mobile, no life: Self-perception and text-message dependency among Japanese high school students. *Computers in Human Behavior*, 24, 2311-2324.

13. Kim, J., LaRose, R. and 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, 451-455.
14. Kim, J. and Lee, J. E. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *Cyberpsychology, Behavior & Social Networking*, 14, 359-364.
15. Kim, Y., Sohn, D. and Choi, S. M. (2011). Cultural difference in motivations for using social network sites: A comparative study of American and Korean college students. *Computers in Human Behavior*, 27, 365-372.
16. Kirschner, P. A. and Karpinski, A. C. (2010). Facebook and academic performance. *Computers in Human Behavior*, 26, 1237-1245.
17. Kohn, P. M., Lafreniere, K. and Gurevich, M. (1990). The inventory of college students' recent life experiences: A decontaminated hassles scale for a special population. *Journal of Behavioral Medicine*, 13, 619-630.
18. Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V. and Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues*, 58, 49-75.
19. Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T. and Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53, 1017-1031.
20. LaRose, R. (2004). Cybercompulsions: Media habits, media addictions and the internet. In P. Lee, L. Leung, & C. So (Eds.), *Impact and issues in new media: Toward intelligent societies* (pp.103-130). Cresskill, NJ: Hampton Press.
21. LaRose, R. (2010). The problem of media habits. *Communication Theory*, 20, 194-222.
22. LaRose, R., Eastin, M. S. and Gregg, J. (2001). Reformulating the Internet paradox: Social cognitive explanations of Internet use and depression. *Journal of Online Behavior*, 1(2), Retrieved from <http://www.behavior.net/JOB/v1n2/paradox.html>
23. LaRose, R., Kim, J. H. and Peng, W. (2010). Social networking: Addictive, compulsive, problematic, or just another media habit? In Z. Pappacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 59-81). New York, NY: Routledge.
24. LaRose, R., Lin, C. and Eastin, M. S. (2003). Internet addiction, habits and deficient self-regulation. *Media Psychology*, 5, 225-253.
25. Mauri, M., Cipresso, P., Balgera, A., Villamira, M. and Riva, G. (2011). Why is Facebook so successful? Psychophysiological measures describe a core flow state while using Facebook. *Cyberpsychology, Behavior, and Social networking*, 14, 723-731.
26. Meerkerk, G.-J., van den Eijnden, R. J. J. M., Vermulst, A. A. and Garretsen, H. F. L. (2009). The compulsive Internet use scale (CIUS): Some psychometric properties. *Cyberpsychology & Behavior*, 12, 1-6.
27. Misra, S. and Stokols, D. (2011). Psychological and health outcomes of perceived information overload. *Environment and Behavior*. Advance online publication.
28. Muise, A., Christofides, E. and Desmarais, S. (2009). More information than you ever wanted: Does Facebook bring out the green-eyed monster of jealousy? *Cyberpsychology & Behavior*, 12, 441-444
29. Shaffer, H. J., Hall, M. N. and vander Bilt, J. (2000). "Computer addiction": A critical consideration. *American Journal of Orthopsychiatry*, 70, 162-168.
30. Steinfield, C., Ellison, N. B. and Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology*, 29, 434-445.
31. Stern L. A. and Taylor, K. (2007). Social networking on Facebook. *North Dakota Journal of Speech & Theater*, 20, 9-20.
32. Thomée, S., Härenstam, A. and Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults-a prospective cohort study. *BMC Public Health*, 11, 66. Retrieved from <http://www.biomedcentral.com/1471-2458/11/66>
33. Thompson, E. R. (2007). Development and validation of an internationally reliable short-term of the positive and negative affect schedule (PANAS). *Journal of Cross Cultural Psychology*, 38, 227-242.
34. Tokunaga, R. S. and Rains, S. A. (2010). An evaluation of two characterizations of the relationships between problematic Internet use, time spent using the Internet, and psychosocial problems. *Human Communication Research*, 36, 512-545.
35. Valkenburg, P. M., Peter, J. and Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *CyberPsychology & Behavior*, 9, 584-590.

36. Verplanken, B. and Orbell, S. (2003). Reflections of past behavior: A self-report index of habit strength. *Journal of Applied Social Psychology*, 33, 1313-1330.