

# FACEBOOK FIENDS: COMPULSIVE SOCIAL NETWORKING AND ADJUSTMENT TO COLLEGE

Robert LaRose

*Michigan State University*

*409 Communication Arts, East Lansing, MI 48824, USA*

Donghee Yvette Wohn

*Michigan State University*

*409 Communication Arts, East Lansing, MI 48824, USA*

Nicole B. Ellison

*Michigan State University*

*409 Communication Arts, East Lansing, MI 48824, USA*

Charles Steinfield

*Michigan State University*

*409 Communication Arts, East Lansing, MI 48824, USA*

## ABSTRACT

The use of Social Network Sites (SNS) has been associated with both positive and negative effects on adolescents. To untangle these conflicting findings, the present research investigates relationships among differing indicators of SNS use and indices of academic, social and psychological adjustment in a population of first year college students in the United States. Compulsive use rather than heavy, intense, or habitual use was found to account for maladjustment.

## KEYWORDS

Social network sites, habit, Facebook, compulsive use, academic adjustment, loneliness

## 1. INTRODUCTION

The popularity of social network sites (SNS) among adolescents has led to investigations of their effects on young users. SNS use has been positively associated with high self-esteem and well-being (Valkenberg et al., 2006) and enhanced social capital (Ellison et al., 2007; Steinfield et al., 2008) and time series research suggests that SNS use causes these effects (Steinfield et al., 2008). Although time spent on social network sites could detract from time spent studying, there is very little empirical evidence of negative effects on academic performance (Pasek et al., 2009). However, previous research has found that compulsive SNS use is related to loneliness (LaRose & Kim, 2008) and to missing work, school, or real world social activities (LaRose et al., 2010). Negative relationships may be especially likely among vulnerable populations; Facebook use was negatively related to psychological well-being among college freshmen but not among older students (Kalpidou et al., 2011).

The present research furthers our understanding of SNS use by examining the relationships among differing indicators of SNS use and the social and psychological adjustment of first year college students in the United States. It argues that compulsive use, defined here as that which is perceived to be out of the control of the user, rather than normal, intense, or merely habitual use, may account for negative relationships and conflicting findings. Those with high levels of compulsive use are the "Facebook fiends" of the title, someone who is absorbed or obsessed with SNS use.

## 2. SNS USAGE AND ITS IMPACTS

Several different indicators of SNS usage have appeared in previous research. An explication of their conceptual relationship to one another and to dimensions of psycho-social adjustment can deepen our understanding of the impacts of SNS use.

### 2.1 Varieties of SNS use

While SNS usage is often included as a variable in social media research it has not been fully conceptualized. Here, SNS usage is defined as overt, observable acts of SNS activity. A variety of operational definitions of SNS usage can be found. These include self-reports of the number of hours spent on SNS in a typical day, the number of days per week that the sites are accessed, and the duration of the average of the average session (Kalpidou et al., 2010; Ellison et al., 2007; Valkenberg et al., 2006). The number of "Friends" has also been included in a widely cited index of SNS activity dubbed Facebook Intensity (Ellison et al., 2007) and, since the number of friends generally builds over time, could be considered as an indication of cumulative use over a long period of time. Although, of course, an indiscriminate Friender could easily have more Friends than someone who uses the site only to connect with a small group of close friends, even if the former had joined the site more recently.

Compulsive use is a mental state rather than a directly observable behavior. Indicators of compulsive use include the perception that it has become a problem in the user's life (Meerkerk et al., 2009), unsuccessful attempts to cut down on the amount of use, the perception that use is out of control (Caplan, 2010; LaRose et al., 2003), mounting use to achieve one's thrills, or attempts to hide SNS involvement from others (LaRose et al., 2003). Compulsive Internet use is related to the amount of usage (LaRose et al., 2003), however, the amount of use is not necessarily an indicator of a problem. Rather, it is the perception that the amount of use is excessive and needs to be brought under control that matters. Four hours of SNS use a day may not be a problem for some, while an hour a day might be a problem for others if it disrupts important life activities or binds the individual to unproductive online interactions. It is also possible that individuals who struggle with their media habits may have periods of remission in which they temporarily restore effective self-control. So, if they were asked during one of those periods how much they use Facebook in a typical day they might indicate low levels even while still recognizing that their use is problematic in the longer run.

In the context of SNS use, compulsive use would be manifested as a failure to curb SNS usage that may disrupt important life activities. Most individuals learn to control behavior they regard as problematic by applying self-reactive influence, such as by making commitments to moderate the behavior in question, avoiding the situations in which the behavior is likely to occur, indulging pangs of guilt, or self-administering rewards for moderation (Bandura, 1986). However, in the course of restoring effective self-regulation, an initial step is to recognize a problem exists followed by a struggle to restore self-control. Reliance on the Internet to achieve self-reactive outcomes, such as reducing boredom, has been found to be positively related to both usage behavior and compulsive use (LaRose et al., 2003).

Not all automatic, uncontrolled behavior is necessarily problematic, however. Compulsive use (also known as deficient self-reaction) is thought to be one of the two dimensions of deficient self-regulation (LaRose, 2010; Caplan, 2010) that govern problematic Internet use. The other is deficient self-observation, also known as habit strength (Verplanken & Orbell, 2003) or preoccupation (Caplan, 2010; Meerkerk, 2009). Habits exist when individuals engage in a behavior without conscious knowledge, awareness or intention. They come about when control over a behavior switches from the prefrontal cortex to the basal ganglia in the cerebrum so that routine, repetitive behaviors can be executed without sapping limited cognitive resources (LaRose, 2010). Habitual behaviors are perceived to be part of a routine, are missed if not enacted, may come to be identified with the individual's self-concept, and are associated with frequent and long-term involvement with the behavior. However, repeat behaviors are manifestations of the mental construct of habit rather than its defining quality although the two are highly correlated (Verplanken, 2006).

The concept of Facebook Intensity (FBI) found in the SNS literature (Ellison et al., 2007) can be aligned with habits through the overlap in their operational definitions. The previously mentioned markers of habit including routine ("Facebook is part of my everyday activity," "Facebook has become part of my daily routine"), missing out ("I feel out of touch when I haven't logged onto Facebook for a while," "I would be sorry if Facebook shut down"), and self-concept ("I feel I am part of the Facebook Community," "I am proud

to tell people I'm on Facebook”) are also components of the Facebook Intensity measure. Facebook Intensity also includes indicators of the amount of use (the number of minutes per day spent on Facebook) and number of Facebook Friends. However, while the latter should be correlated with habit strength, they are regarded as part of a distinct construct in the present theoretical scheme (see LaRose et al., 2003). And, when examining the effects of SNS usage, the inclusion of items that measure usage in habit introduces a potential confound.

Thus, it is compulsive SNS use that is subject to deficient self-reaction that is problematic, not the overall amount of usage. “Heavy” use, when defined according to some arbitrary number of hours that is deemed to be excessive, should not in itself be the cause of problems. That is even so when the usage has become so habitual or “intense” that it is no longer subject to effective self-observation. That being the case, it is possible that overall high or intense levels of Facebook use could have positive effects (as in Ellison et al., 2007 and Valkenberg et al., 2006) even while masking the problems of a subset of users for whom SNS usage is problematic.

## **2.2 Loneliness, SNS and the first-year college student**

The transition to college is of particular interest here since it marks a time in which interpersonal relationships, media habits, and normally stable states of well-being are in flux. The psychological, social, and academic adjustments of first year college students are topics of enduring interest to educators (e.g., Pascarella & Terenzini, 1983; Robbins et al., 2004). Studies have shown that adjustment during the first year of college has a strong impact on academic achievement and persistence (e.g., Westwood & Barkett, 1990; Wintre & Bowers, 2007).

SNSs have the potential to foster successful adjustment by helping new students identify like-minded friends and obtain useful information from peers about classes and study strategies (e.g., Liccardi et al., 2007; Madge et al., 2009). However, loneliness has long been recognized as a reality for students in their first year of college (Russell et al., 1980). Loneliness is associated both with academic adjustment (Nipcon, et al., 2007) and with compulsive use of SNS (LaRose et al., 2010). Loneliness could be ameliorated through infusions of social support (Mattanah et al., 2010) mediated by SNS but adjustment could also be impeded by continuing SNS contacts with precollege friends (Paul & Brier, 2001). Loneliness begins at the periphery of social networks but quickly spreads to the rest of the network (Cacioppo et al., 2009). Since Facebook makes it easier to access and interact with social networks that are not co-located, it is important to understand the relationship between Facebook use and feelings of loneliness among first-year students.

## **2.3 Research Questions**

The basic question that guides the present research is how the differing concepts of SNS usage relate to indicators of social, psychological, and academic adjustment among first year college students. Based on the previous discussion, it was expected that compulsive use would have the most consistent, negative relationship with adjustment.

# **3. RESEARCH METHODS**

## **3.1 Participants**

Incoming first year students assigned to four residence halls at a large U.S. university were invited to participate in a study of a campus-specific social media service. Students were recruited with sweepstakes drawings and nominal cash incentives delivered by postal mail to complete two waves of online surveys and the present study is based on the 364 students who completed both surveys with the second survey administered at the end of their first semester. Participants were mostly female (70.1%) around the age of 18 ( $m=17.76$ ,  $sd=.741$ ). Ethnicity was predominantly Caucasian (81.2%), followed by Asian (6.9%), African American (5.8%), Hispanic (4.8%), and Native American (0.5%).

## 3.2 Measures

Except as noted, all items were rated on a 5-point Likert-type scale from “strongly disagree (scored 1)” to “strongly agree (5).” There was also a single-item trait self-esteem ( $m=3.26$ ,  $sd=1.074$ ) measure from Robins et al. (2001) and a four-item state self-esteem ( $m=3.2$ ,  $sd=.903$ ) adapted from Heatherton and Polivy (1991). Loneliness ( $m=2.09$ ,  $sd=.617$ ) was measured with four items (rated on a 4-point scale ranging from never to always) from the UCLA Loneliness Scale (Russell et al., 1980). Student adjustment to college (SACQ) was a 24-item inventory adapted from Bayer and Siryk (1989) The subscales uncovered here included academic attachment ( $m=3.91$ ,  $sd=.573$ ; e.g., “I consider a college degree important,” “I enjoy academic work”), academic motivation ( $m=4.64$ ,  $sd=1.573$ ; e.g., “I am not motivated to study” reverse-coded), academic performance ( $m=3.28$ ,  $sd=.756$ ; e.g., “I do not do well academically considering effort” reverse-coded), social adjustment to college ( $m=3.61$ ,  $sd=.763$ ; e.g., “I am satisfied with my social participation at college”), attachment to college ( $m=4.38$ ,  $sd=.664$ ; e.g., “I am pleased about my decision to attend [institution]”), and satisfaction with college environment ( $m=3.78$ ,  $sd=.763$ ; e.g., “I am satisfied with my academic situation at [institution]”). Separate from the SACQ, academic expectations ( $m=4.17$ ,  $sd=.656$ ) was a four-item scale about the student’s confidence about how well he or she is doing in courses, such as getting good grades (Chemers, Hu, & Garcia, 2001).

Multi-item measures of SNS use were also comprised of 5-point Likert-type items. Compulsive SNS use ( $m=2.16$ ,  $sd=.783$ ) was comprised of four items drawn from Caplan (2010) and Meerkerk et al. (2009): “I think of Facebook as a problem in my life,” “I have tried to stop doing it for long periods of time,” “I am unable to reduce the amount of time I spend on Facebook,” and “I have made unsuccessful attempts to control my use of Facebook.” The self-reactive outcomes variable ( $m=2.16$ ,  $sd=.783$ ) consisted of two items: “When I am bored, I use Facebook to pass the time” and “I use Facebook when there is nothing else to do.” Habit ( $m=3.64$ ,  $sd=.783$ ) was a six-item including five previously identified with Facebook Intensity (Ellison et al., 2007) mentioned earlier, and a further one added was “I use Facebook because it’s a habit.” On average, participants had 500 Facebook friends ( $m=499.93$ ,  $sd=317.636$ ) ranging from 20 to 2710. After removing outliers, the number of friends was log transformed ( $m=2.62$ ,  $sd=.288$ ). The log number of friends was used for analysis. Time spent on Facebook in a typical day ( $m=4.95$  hours,  $sd=1.542$ ) was a drop-down menu of eight choices, from “none,” “less than 10 minutes,” “between 10 to 30 minutes,” “more than 30 minutes, less than one hour,” and then in one hour increments up to “more than four hours.”

Finally, gender was dummy coded, 1 if male, 2 if female.

## 4. RESULTS

Pearson-product moment correlation coefficients among SNS and adjustment variables are shown in Table 1. First, the different components of the Facebook Intensity measure that have been used in many previous studies were separated here: time spent on Facebook, number of Facebook friends, and habit strength. While all three variables were significantly correlated with each other they were only weakly to moderately correlated here, justifying their separation. Participants who spent more time on Facebook were likely to have more Facebook friends ( $r=.223$ ,  $p<.001$ ) and stronger habit strength ( $r=.535$ ,  $p<.001$ ). The number of Facebook friends was positively related to habit strength ( $r=.285$ ,  $p<.001$ ). Consistent with prior research (LaRose et al., 2003), compulsive use was positively correlated to the time spent on Facebook ( $r=.290$ ,  $p<.001$ ), the number of friends ( $r=.238$ ,  $p<.001$ ), and habit strength ( $r=.221$ ,  $p<.001$ ). Also in line with previous findings, self-reactive outcomes were positively correlated with the same three variables ( $r=.401$ ,  $.238$ ,  $.579$ ,  $p<.001$ , respectively) and with compulsive use ( $r=.210$ ,  $p<.001$ ).

In terms of relationships with academic adjustment variables, time spent on Facebook and habit strength showed similar patterns. Participants who were spending more time on Facebook or using Facebook habitually had low academic attachment, motivation, and performance. However, the number of friends had no relationship to these variables. Time spent on Facebook was negatively associated with satisfaction with the college environment ( $r=-.134$ ,  $p<.05$ ) and academic expectation ( $r=-.192$ ,  $p<.001$ ), but the number of friends and habit strength were unrelated. Compulsive use exhibited the same pattern of relationships to academic adjustment variables. These relationships tended to be stronger for compulsive use than for time spent for academic motivation and academic performance.

Table 1. Pearson Product-Moment Correlations Among Facebook Use and Adjustment Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Time spent on FB	---															
2. No. of FB friends	.223**	---														
3. Habit Strength	.535**	.285**	---													
4. Compulsive Use	.290**	.160**	.221**	---												
5. Self Reactive Outcomes	.401**	.238**	.579**	.210**	---											
6. Trait Self-Esteem	-.100	.038	-.005	-.227**	-.010	1.000										
7. State Self-Esteem	-.100	-.001	-.096	-.184**	-.074	.542**	---									
8. Loneliness	.025	-.243**	-.069	.062	.004	-.300**	-.429**	---								
9. Academic Attachment	-.179**	-.055	-.113*	-.157**	-.097	.233**	.202**	-.145**	---							
10. Academic Motivation	-.138**	.028	-.166**	-.236**	-.189**	.150**	.210**	-.255**	.394**	---						
11. Academic Performance	-.193**	-.008	-.112*	-.207**	-.118*	.251**	.301**	-.286**	.390**	.532**	---					
12. Social Adjustment	-.043	.102	.059	-.054	.000	.272*	.375**	-.582**	.190**	.215**	.291**	---				
13. Attachment to College	-.080	.023	.037	-.063	.033	.219**	.291**	-.387**	.376**	.166**	.253**	.469**	---			
14. Satisfaction w/ College	-.134*	-.103	-.045	-.131*	-.102	.248**	.273**	-.274**	.417**	.270**	.438**	.494**	.425**	---		
15. Academic Expectation	-.192**	-.028	-.072	-.161**	-.099	.306**	.291**	-.247**	.366**	.294**	.540**	.429**	.379**	.558**	---	
16. Gender (1=M, 2=F)	.187**	.125*	.211**	.126*	.215**	-.172**	-.148**	.009	-.041	.083	-.026	-.097	-.015	-.117*	-.110*	---

\*p<.05 (two-tailed), \*\*p<.001 (two-tailed)

Numbers in brackets [ ] on the diagonal represent the Cronbach's alpha of each scale

Gender was coded 1 for males and 2 for females

In terms of psychological adjustment, however, general use of Facebook and compulsive use showed different patterns. Time spent on Facebook had negative but non-significant relationships to both trait and state self-esteem. However, compulsive use was inversely related to trait self-esteem ( $r=-.227, p<.001$ ) and state self-esteem ( $r=-.184, p<.001$ ). Neither the time spent on Facebook nor its compulsive use were related to loneliness; however, the number of Facebook friends was negatively related to loneliness ( $r=-.243, p<.001$ ).

Higher trait self-esteem was also negatively associated with loneliness ( $r=-.300, p<.001$ ), as was state self-esteem and loneliness ( $r=-.429, p<.001$ ). Loneliness was negatively associated with all academic adjustment variables. Participants who were more lonely were more likely to have weaker attachment to their schoolwork ( $r=-.145, p<.001$ ), lower motivation to study ( $r=-.255, p<.001$ ), lower academic performance ( $r=-.286, p<.001$ ), lower attachment to college ( $r=-.387, p<.001$ ), lower academic expectations ( $r=-.247, p<.001$ ), and lower satisfaction with the college environment ( $r=-.274, p<.001$ ).

Participants who were more lonely had fewer friends on Facebook ( $r=-.243, p<.001$ ) but were not necessarily spending more time on Facebook or using it habitually. This, along with the fact that Facebook use had a negative relationship with many of the academic adjustment variables but a positive relationship with number of friends, suggests that the use of Facebook is mediated by the number of one's friends, and that more friends can lead to more use of Facebook and less loneliness.

Finally, significant gender differences were noted. Females were heavier users of Facebook than males, had more Facebook friends, had stronger Facebook habits and were more compulsive users. Consistent with the above findings, females had lower trait and state self-esteem than males. They also had lower satisfaction with college and lower academic expectations.

## 5. DISCUSSION

The present results suggest a need for further refinement of SNS usage concepts and measurement. In the current study, the nature and direction of the relationships with academic adjustment and psychological variables depended upon which indicator of SNS use was involved, suggesting that the amount of usage, the number of friends, habitual use, and compulsive use are distinct constructs. Going forward, analyses combining the first three of these into a single index of Facebook Intensity might be supplemented with separate analyses of the three components explored here, as Kalpidou et al. (2010) chose to do. Otherwise, there is the possibility that the SNS impacts (e.g., on loneliness) will be disguised by the combination of indicators that point in different directions. Here, the number of friends was negatively related to loneliness, while the amount of time spent had a positive, but non-significant, relationship to loneliness. Nonlinear relationships should also be explored. In Ellison et al. (in press) the relationship between the number of "actual" friends and social capital was positive to a point, and then turned negative. Very weak ties may not provide social capital benefits. Here, loneliness declined until participants had about 300 friends, then leveled off, suggesting diminishing gains from additional friends beyond 300.

We agree with Meerkerk et al. (2009) that greater conceptual clarity would be a welcome addition to this stream of research. At the same time the present argument takes issue with Meerkerk et al.'s conceptual framework in which compulsive use was an umbrella concept overarching the separate indicators of SNS use examined above. Here, we drew from models advanced by Caplan (2010) and LaRose et al. (2010) which reserved the term compulsive use for behavior that is perceived to be out of control by the user. Those models make an important distinction between usage that is habitual but functional (a concept corresponding to preoccupation in Meerkerk et al.) and that which is potentially problematic.

Further clarification of the relationship between Facebook Intensity and habit strength is needed. As was demonstrated above, there is a very high degree of overlap in the operational definitions of the two constructs. Yet, the varying nomenclature implies very different conceptualizations of the construct. "Intensity" connotes very active and concentrated involvement. Habit strength denotes just the opposite in that habitual media behaviors are to a considerable degree performed automatically without conscious awareness or intention (LaRose, 2010). The present research does not resolve the issue, although it can be noted that the relationships among usage, habit strength, compulsive use, and self-reactive outcomes observed here were consistent with a model of deficient self-regulation of Internet use that supports the habit strength interpretation (LaRose et al., 2003).

The present research extends our understanding of the adjustment problems of first year college students in relationship to their SNS usage previously raised by Kalpidou et al. (2010). We extended the previous research to include loneliness and state (as well as trait) self-esteem. We also added a further indicator of academic adjustment, academic expectations, which proved to be a more reliable variable than scales derived from the SACQ used in prior research. Consistent with the prior results for first year students, we also found a negative but non-significant relationship between Facebook time and self-esteem. However, the relationship between the number of Facebook friends and self-esteem was slightly positive here, possibly a result of differing approaches to handling outliers (i.e., standard scores vs. log transforms). However, Facebook time (although not the number of Facebook friends) had significant negative relationships to several indicators of academic adjustment, possibly a function of the improved power that accompanied the size of the present sample ( $N=364$ ) compared to the prior study ( $N=70$ ). However, it may also be that role of SNS use in first year adjustment may vary in large public universities such as the one involved in the present study compared to a small Catholic college surveyed by Kalpidou et al.

All academic adjustment dimensions (motivation, performance, attachment) and academic expectation had a negative relationship with compulsive use. Based on the present results, should “Facebook fiends” be advised to curtail their SNS use to improve academic adjustment? As a cross sectional analysis this study can only speculate as to whether or not decreased Facebook use would lead to better academic adjustment or if better academic adjustment leads to decreased Facebook use. However, prior research (Steinfeld et al., 2008) established that there could be a causal relationship between Facebook use and positive outcomes so it is perhaps plausible that SNS can also have negative outcomes, especially among compulsive Facebook fiends who have difficulty controlling their use. However, from the current findings we suspect that there are two different mechanisms at work. One mechanism acts through the number of Facebook friends to reduce loneliness and so may contribute to adjustment dimensions that are inversely related to loneliness. However, a second mechanism involving compulsive use appears to have a direct, negative impact on psychological well-being and academic adjustment, perhaps reflecting a common inability to effectively control one’s SNS use as well as one’s social and academic lives (see LaRose et al., 2010). There is also the possibility of a third mechanism in which the time spent on Facebook impacts academic adjustment (but not psychological well-being), perhaps through a time allocation problem in which SNS time and the time attending to one’s social network detracts from the time spent studying. Path analysis and time-series studies can further explore these possibilities.

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