How does online social networking enhance life satisfaction? The relationships among online supportive interaction, affect, perceived social support, sense of community, and life satisfaction

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ABSTRACT

The purpose of this study is to examine whether supportive interactions on social networking sites mediate the influence of SNS use and the number of SNS friends on perceived social support, affect, sense of community, and life satisfaction. Employing momentary sampling, the current study also looked at the relationship between supportive interaction and immediate affect after the interaction over a period of 5 days. An analysis of 339 adult participants revealed a positive relationship between supportive interaction and positive affect after the interaction. A path model revealed positive associations among the number of SNS friends, supportive interactions, affect, perceived social support, sense of community, and life satisfaction. Implications for the research of online social networking and social support are discussed. © 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Social networking today is one of the most popular activities on the Internet. A recent report found that visiting social networking sites (SNSs) is the most frequent online activity of Internet users (comScore, 2011). Over 90% of adult users in the US have visited social media (Simmons, 2011). On average, social networking accounts for one of every 6 minutes that people spend online (comScore, 2011).

Considerable scholarly attention has focused on the psychological outcomes of online social networking, but the results have been inconsistent. Although researchers have studied various psychological outcomes (Burke, Marlow, & Lento, 2010; Ellison, Steinfield, & Lampe, 2007; Kim & Lee, 2011; Steinfield, Ellison, & Lampe, 2008; Valenzuela, Park, & Kee, 2009; Valkenburg, Peter, & Schouten, 2006), major indicators of online social networking (i.e., number of SNS friend, the amount of social networking) often failed to predict positive outcomes (Kalpidou, Costin, & Morris, 2011; Kim & Lee, 2011; Klingensmith, 2010; Valenzuela et al., 2009; Vitak, Ellison, & Steinfield, 2011). Inconsistent findings suggest two possibilities: First, prior online social networking studies have focused on varying predictors of psychological outcomes, some of which may be more valid than others. Second, there may be a third variable that either mediates or moderates the relationships between the predictors and the outcomes.

The current study explores one possible mechanism through which peoples’ online social networking leads to psychological outcomes. Specifically, this study proposes that the amount of supportive interaction mediates the relationship between general SNS use and users’ psychological states. The traditional social network literature also highlights the importance of the quality of interaction among members in a network (Pinquart & Sörensen, 2000) and the perception of available social support from other members (Young, 2006). Pursuing this argument, the current study proposes several mediating variables that include supportive interaction, affect, and perceived social support.

The present study focuses on two psychological outcomes, sense of community and life satisfaction, as they appear frequently in online communication and social network literature (Kim & Lee, 2011; Klingensmith, 2010; Köbler, Riedl, Vetter, Leimeister, & Krämer, 2010; Young, 2006). Using a momentary sampling technique, which allows an examination of affect immediately after a behavior, this study first examines the direct relationship between the amount of supportive interaction and the positive affect following that interaction for five days. Secondly, the study uses a path model to explore the possible mechanism through which online social networking can lead to a greater sense of community and life satisfaction. By doing both, we expect to contribute to a better understanding of the positive outcomes of online social networking and clarify the issues related to mixed findings in the existing SNS literature.

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2. Theoretical background

2.1. Online social networking

Social network sites (SNSs) are defined as web-based applications that allow their users to construct a profile that other users can see and also list connections with other users (Ellison et al., 2007). Although the goal of an online social network remains the same as an offline social network, i.e., connecting people and sharing resources in the network, online networking further benefits users with its unique features related to computer-mediated communication. With the growing use of SNSs, certain studies have found that there are positive psychological outcomes from engaging in social networking on various social networking sites (Burke et al., 2010; Ellison et al., 2007; Kim & Lee, 2011; Steinfeld et al., 2008; Valenzuela et al., 2009; Valkenburg et al., 2006). The number of SNS friends and the amount of SNS use are currently the two most studied indicators that represent the amount of online social networking.

The number of friends, the main source of social support (Boyd, 2006), is one of the widely studied constructs in the online social networking literature (Ellison et al., 2007; Kim & Lee, 2011). These studies, however, reported inconsistent results when they treated the number of SNS friends as a direct predictor of psychological outcomes, thus suggesting the possibility that either mediating or moderating variables do exist (Kalpidou et al., 2011; Kim & Lee, 2011). For example, Kim and Lee (2011) found an inverted U relationship between the number of SNS friends and perceived social support among college students, where the number of total SNS friends was positively associated with perceived social support until the number of friends reached a certain point.

Facebook intensity, developed to measure the amount of Facebook use (Ellison et al., 2007), has also been frequently measured in the SNS literature. It combines the number of Facebook friends, hours or frequency of using Facebook, and the emotional attachment to Facebook, as well as indicators of habit strength and compulsive use (LaRose, Wohl, Ellison, & Steinfield, 2011). Studies using this construct often suffered from its weak explanatory power when it was included in a regression model (Valenzuela et al., 2009). Facebook intensity showed either negative (Klingensmith, 2010) or non-significant (Vitak et al., 2011) relationships with other indicators of well-being.

On the other hand, clinical studies have reported negative consequences associated with using Facebook (e.g., O’Keeffe and Clarke-Pearson, 2011; Pantic et al., 2012). A terminology “Facebook Depression” was developed by O’Keeffe and Clarke-Pearson (2011) in their clinical report to highlight a phenomenon that excessive use of Facebook leads to depression among certain groups of young people. Although this report has been criticized due to its exaggerated notion without clear evidence showing a direct causality between Facebook use and depression (e.g., Magid, 2011), there is still an ongoing debate on whether online social networking leads to clinical disorders such as depression. For example, Pantic et al. (2012) found a positive relationship between frequency of Facebook use and indicators of depression among high school students. Another recent survey study found no evidence suggesting the relationship between SNS use and clinical depression (Jelenchick, Eickhoff, & Moreno, 2013). These studies, however, used shallow measures of SNS use such as frequency of SNS use or time spent on SNS without considering actual activities or communication exchanged on those sites, which might have caused empty debates based on inaccurate evidence.

To address the need for nuanced measures for SNS use, Burke et al. (2010) distinguished between person-directed communication and consumption of content on a social networking site. This study found that person-directed communication lowered loneliness and enhanced bonding social capital, which is a perception of available emotional and/or tangible aids from one’s social ties (Ellison et al., 2007). The solitary consumption of content, however, reduced social capital and enhanced loneliness. This study provided strong evidence that the mere use of social networking sites might not be a good indicator of online social networking, because it includes the solitary consumption of content which is not any different from general Internet use.

In sum, the type of online interaction should be examined to better understand online social networking that produces positive psychological outcomes. To further address this issue, the current study focuses on the amount of supportive interaction; namely, the amount of directed supportive communication a user engages in with another user. Admittedly, the amount of supportive interaction is likely associated with the level of general SNS use and the number of SNS friends, as people who have many SNS friends and use SNS frequently will have a greater probability of being involved in supportive interaction with other users. This study, therefore, begins with proposing that the number of SNS friends and the frequency of online social networking are positively associated with the amount of supportive interaction on social networking sites.

H1. The number of SNS friends is positively associated with the amount of supportive interaction on the social networking site.

H2. The frequency of online social networking is positively associated with the amount of supportive interaction on the social networking site.

2.2. Supportive interaction and social support on social networking sites

Social support, defined as the resources or aids exchanged between individuals through interpersonal ties (Cohen & Hoberman, 1983), is one of the key benefits that SNS users perceive from online social networking (Park, Kee, & Valenzuela, 2009). This concept is considered as one of the most widely used concepts across various domains in social science, and has expanded its scope into the online context to explain the positive outcomes of online social networking.

Studies on online social networking have examined the exchange of social support through online social networking and its outcomes. Acquiring social support from others in a social network is found to be one of the most important reasons for online social networking (Park et al., 2009). In a recent report, SNS users perceived a greater level of emotional support and companionship than did general Internet users (Hampton, Goulet, Rainie, & Purcell, 2011), at a level that was almost equivalent to the amount that married or cohabitating Americans normally perceive from their live-in partners.

Although social networking sites may provide greater opportunities for exchanging social support, not all the elements of these sites are associated with social support. SNS users can use direct communication services, such as chatting and direct messaging, but they can also engage in third-party activities, such as updating profiles, viewing photographs of celebrities, searching for events at commercial companies, and playing games. Measuring general SNS use and linking the use with perceived social support is likely to produce a weak relationship because of the redundant indicators of online social networking. A recent study corroborates this argument, as it failed to reveal any significant relationship between Facebook intensity and social support (Vitak et al., 2011).

The current study examines the amount of supportive interaction that individuals engage in with others through direct user-
to-user communication. Since the actual amount of received or exchanged support seldom fully translates into recipients’ perception of social support (Haber, Cohen, Lucas, & Baltes, 2007), the positive affect generated after the interaction is conceptualized as a mediator that links the amount of supportive interaction and perceived social support. A detailed discussion on affect and its relationship to social support appears in the following section. Hypotheses 3 and 4 address the relationship between the amount of supportive interaction, positive affect generated after the interaction, and perceived social support.

H3. The amount of supportive interaction on the social networking site is positively associated with positive affect after the interaction.

H4. The positive affect generated after supportive interaction on the social networking site is positively associated with perceived social support from SNS friends.

2.3. Psychological outcomes of social support: Life satisfaction, and a sense of community

In the social support literature, positive outcomes of social support are often more psychological than physical (Schafer, Coyne, & Lazarus, 1981). Psychological well-being and life satisfaction are the most studied topics in this domain. Life satisfaction is the overall evaluation of one’s environment, which can be either positive or negative (Scheufele & Shah, 2000). Traditionally, this concept is frequently linked with the quality of a social network and the perceived social support acquired from the network (Pinquart & Sörensen, 2000; Young, 2006) as a result of interpersonal communication that produces positive affect (Diener, Sandvik, & Pavot, 1991). Following prior studies on social support and life satisfaction, the current study tests the relationship between perceived social support and life satisfaction. Perceived social support should be positively related to life satisfaction, as the existing studies suggest that perceived social support, but not necessarily objective amount of supportive interaction, is strongly associated with life satisfaction (Haber et al., 2007; Kazarian & McCabe, 1991).

H5. Perceived social support is positively associated with life satisfaction.

Positive affect, as opposed to negative affect, is a more proactive measure that is closely linked to subjective well-being and life satisfaction. Affect is a combination of moods and emotions and is seen as “on-line evaluation toward the events that occur in lives” (Diener, Suh, Lucas, & Smith, 1999, p. 277). For decades, positive emotions and affect have been studied and confirmed as key predictors of life satisfaction (Fredrickson & Joiner, 2002). Moreover, affect was studied as being closely related to social support, either as another indicator (Aynes, Mittelmark, & Hetland, 2010), or as a mediator that transfers the influence of social support to positive health behavior (Gonzalez et al., 2004) and life satisfaction (Greenberg & Fiskebaum, 2009). Therefore, it is proposed that positive affect derived from supportive interaction is also positively associated with life satisfaction.

H6. Positive affect is positively associated with life satisfaction.

Another important psychological outcome of perceived social support is the sense of community. It is defined as a feeling of belonging to a group or community within which members perceive themselves as similar in characteristics and dependent on each other (Sarason, 1974). Studies on the relationship between SNS use and indicators of sense of community have often produced mixed findings. On one hand, SNS users who frequently update their statuses were reported to feel a greater a sense of connectedness with other SNS users than those with less frequent updates (Köbler et al., 2010). On the other, Facebook intensity was sometimes found to be negatively associated with sense of belonging (Klingensmith, 2010). As examining mere frequency of interactions produces weak arguments, Kwak, Shah, and Holbert (2004) highlighted the need for measuring the type of interaction in order to better predict social relationships. To further address this argument, it is proposed that perceived social support from supportive interaction is closely associated with a sense of community.

H7. Perceived social support acquired from online social interaction is positively associated with sense of community.

Since social support and sense of community are often referred to as byproducts of social networks, both have been investigated as determinants of psychological well-being of people within real-world social networks (Vieno, Santinello, Pastore, & Perkins, 2007). Many studies have confirmed the role of social support and sense of community as predictors of life satisfaction (Kutek, Turnbull, & Fairweather-Schmidt, 2011; Manago, Taylor, & Greenfield, 2012), and prior research has also proposed a mechanism whereby the effect of social support on psychological outcomes is mediated by that sense of community (Vieno et al., 2007). Therefore, the current study tested the direct relationship between sense of community and life satisfaction.

H8. Sense of community is positively associated with life satisfaction.

Online social networking platforms are designed to engage in different supportive interactions (i.e., share information, provide encouragement, and show liking), which may produce differential outcomes and be linked to differential social support dimensions. For example, positive feedback received from SNS friends was found to be the source of enhanced self-esteem (Valkenburg et al., 2006). Different tools and applications on social networking sites may accommodate supportive interactions in different forms. For example, esteem support can be expressed by “liking” a friend’s new profile picture, whereas companionship can be conveyed by inviting a friend to a social networking group. Prior studies have reported distinctive roles of different social support dimensions in offline environments (Richmond, Ross, & Egeland, 2007; Young, 2006), but little attention has been paid to the nuanced effects of social support exchanges online. This study sorts out the unique proportion of such outcomes explained by individual support dimension (i.e., esteem, appraisal, and companionship). To further explore the differential relationships of social support types, following research questions are proposed.

RQ1. How does positive affect after the interaction is related to different dimensions of social support?

RQ2. How does each dimension of social support, namely companionship, appraisal, and esteem support, is associated with sense of community?

RQ3. How does each dimension of social support, namely companionship, appraisal, and esteem support, is associated with life satisfaction?

Fig. 1 depicts a path model to examine the eight hypotheses and three research questions proposed above.
The recruitment was a part of a class project: students at a major Midwestern university were asked to recruit their friends and family members. This recruitment yielded 339 participants in total. The age of the participants ranged from 18 to 81 with a mean of 28 years old (SD = 11.77, Median = 23 years old). More than 50% were women (51.2%). Also, most of the participants had a personal computer (92.6%), whereas 72.1% had a smart phone and 15.6% owned a tablet PC.

3.2. Procedure

The current study employs a momentary sampling technique. Momentary sampling allows participants to document feelings and behaviors as they go about their daily activities (Carpentier et al., 2008). This technique is beneficial when recording affect that results from certain behaviors because the time lag that occurs between the experience and reporting is very brief. Studies have shown various benefits of the momentary sampling technique over other self-report methods in terms of capturing the affect people feel as a result of their media use, as it reduces errors inherent in retrospective reports (Carpentier et al., 2008; Wood, Quinn, & Kashy, 2002).

3.2.1. Diary

Respondents were given a diary survey booklet and asked to record their first session of SNS use each evening over a 5-day period (Sunday–Thursday). The title page of the booklet included a brief introduction about the study including the purpose of the survey and general instructions for keeping the diary. The second page then contained questions about participants’ general SNS use and detailed instructions on how to respond to the questions about their SNS use and feelings after their SNS session on each day. Starting from the third page, participants were asked to record their first social networking session for each evening (after 6:00 pm) including (1) the title of SNS, (2) the time the session started and ended, (3) the features they used (i.e., wall post, message, etc.), (4) the type of supportive interaction and support exchanged during the interaction, and (5) the affect they experienced right after that session. Social networking sites were defined here as web-based applications such as Facebook, MySpace, and Cyworld that enable people to connect with others by creating a profile, inviting friends to access the profile, and exchanging messages. In the last page, participants were asked to provide their gender and age. They also reported their general perception about social support, sense of community, and life satisfaction.

3.3. Measures

3.3.1. Person-level variables

First, respondents were asked to indicate the total number of their SNS friends (M = 574.26, SD = 377.61) and how many of them were their close friends (M = 46.78, SD = 58.76). The total number of close friends was later log-transformed as the data were

![Fig. 1. Conceptual model with proposed hypotheses.](image-url)
significantly right-skewed (4.57). The frequency of using SNSs was measured with a 6-point ordinal scale ranging from (1) once a week or less to (6) more than 5 times a day. Responses were well-distributed: 25% reported that they use SNS more than 5 times a day and other options fell between 15% and 20% except for “once a week or less” (5.3%). The history of SNS use was measured by asking respondents how long they have been using SNSs. A majority of respondents indicated that they have been using SNSs for more than 2 years (74.3%).

Perceived social support was measured with 9 items reflecting three dimensions of perceived social support: appraisal support, companionship, and esteem support. Each item was measured with a 7 point Likert-type scale ranging from (1) definitely false to (7) definitely true. The items were adopted from Eastin and LaRose (2005), which modified Cohen’s original Interpersonal Support Evaluation List (ISEL) (Cohen, Mermelstein, Kamarck, & Hoberman, 1985). The tangible support dimension was excluded as it was found to be irrelevant in prior online social support studies (Braithwaite, Waldron, & Finn, 1999). Therefore, we measured three dimensions: appraisal support ($M = 6.18, SD = .94, \alpha = .87$), companionship support ($M = 5.57, SD = 1.28, \alpha = .75$), and esteem support ($M = 5.52, SD = 1.19, \alpha = .72$) in this study and treated each dimension as a separate construct. A confirmatory factor analysis with the three factors explained by the nine items produced an acceptable fit: $\chi^2 (24) = 40.80, p = .02, CFI = .99, RMSEA = .05$.

Sense of community was measured with three items (Sheldon & Gunz, 2009) using a 7 point Likert-type scale ranging from (1) definitely false to (7) definitely true ($M = 5.69, SD = 1.04, \alpha = .77$). Originally, the sense of community scale had 6 items, but the pretest results showed that the three reversed items (i.e., I am lonely, I feel unappreciated by one or more important people, and I have disagreements with people I get along with) significantly decreased the reliability of the scale, so they were excluded from the scale for further analysis.

Life satisfaction was measured with four items (e.g., I am satisfied with my life) using a 7 point Likert-type scale ranging from

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### Table 1

<table>
<thead>
<tr>
<th>Items</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Loadingb</th>
<th>( \alpha )</th>
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<tbody>
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<td><strong>Person-level variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total SNS friend (network size)</td>
<td>320</td>
<td>574.26</td>
<td>377.61</td>
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<td>Close SNS friend</td>
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<td>Frequency of SNS use</td>
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<td>SNS history</td>
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<td></td>
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<tr>
<td>Appraisal support</td>
<td>330</td>
<td>6.18</td>
<td>.94</td>
<td>.87</td>
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<tr>
<td>There is at least one person I know whose advice I really trust</td>
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<td>6.32</td>
<td>1.01</td>
<td>.84</td>
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<tr>
<td>There is really someone who can give me objective feedback...</td>
<td>330</td>
<td>6.16</td>
<td>1.02</td>
<td>.84</td>
<td></td>
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<tr>
<td>I feel that there is someone with whom I can share my most private</td>
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<td>6.05</td>
<td>1.14</td>
<td>.81</td>
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<td>Companionship</td>
<td>331</td>
<td>5.57</td>
<td>1.28</td>
<td>.75</td>
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<tr>
<td>No one I know would throw a birthday party for me†</td>
<td>330</td>
<td>5.91</td>
<td>1.56</td>
<td>.62</td>
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<tr>
<td>Most people I know don’t enjoy the same things that I do†</td>
<td>330</td>
<td>5.35</td>
<td>1.67</td>
<td>.73</td>
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<tr>
<td>I feel that I’m on the fringe in my circle of friends†</td>
<td>329</td>
<td>5.44</td>
<td>1.49</td>
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<tr>
<td>Esteem support</td>
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<td>5.52</td>
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<td>People don’t have much confidence in me†</td>
<td>330</td>
<td>5.80</td>
<td>1.42</td>
<td>.79</td>
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<tr>
<td>My friends feel that I’m not very good at helping them solve problems†</td>
<td>331</td>
<td>5.73</td>
<td>1.47</td>
<td>.68</td>
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<tr>
<td>Most of my friends are more successful at making changes in their lives than I am†</td>
<td>331</td>
<td>5.05</td>
<td>1.57</td>
<td>.56</td>
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<tr>
<td>Sense of community</td>
<td>332</td>
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<td>1.04</td>
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<td>I feel sense of contact with people who care for me</td>
<td>330</td>
<td>5.55</td>
<td>1.31</td>
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<td></td>
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<tr>
<td>I feel connected with others who are important to me</td>
<td>332</td>
<td>5.92</td>
<td>1.13</td>
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<td>I feel intimate with people I spent time with</td>
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<td>Life satisfaction</td>
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<td>1.02</td>
<td>.86</td>
<td></td>
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<tr>
<td>In most ways my life is close to my ideal</td>
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<td>5.03</td>
<td>1.17</td>
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<tr>
<td>The conditions of my life are excellent</td>
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<td>5.16</td>
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<td>I am satisfied with my life</td>
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<td>1.12</td>
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<td>So far I’ve gotten the important things I want in life</td>
<td>332</td>
<td>5.20</td>
<td>1.31</td>
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**Momentary variables**

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<tr>
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<th>M</th>
<th>SD</th>
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<td>Number of supportive interaction (weekly average)</td>
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<tr>
<td>Sunday</td>
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<tr>
<td>Monday</td>
<td>262</td>
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<td>Tuesday</td>
<td>249</td>
<td>1.88</td>
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<tr>
<td>Wednesday</td>
<td>256</td>
<td>2.22</td>
<td>3.59</td>
<td></td>
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<tr>
<td>Thursday</td>
<td>249</td>
<td>2.08</td>
<td>3.28</td>
<td></td>
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<td>Positive affect (weekly average)</td>
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<td>.86</td>
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<td>.08</td>
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<tr>
<td>Thursday</td>
<td>247</td>
<td>4.02</td>
<td>.09</td>
<td></td>
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<tr>
<td>Negative affect (weekly average)</td>
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<td>.81</td>
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<td>1.11</td>
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a Reversed item.
b Standardized coefficient.
definitely false to (7) definitely true (M = 5.22, SD = 1.02, \( \alpha = .86 \)). The items were adopted from the Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985). Table 1 shows the actual items for all the variables with their descriptive information and reliability scores.

3.3.2. Momentary variables

The study includes two momentary measures that were reported five times. The momentary measures were the amount of supportive interaction and the affect generated immediately after the interaction. Supportive interaction was measured by asking participants to indicate whether they had interacted with other people during their first SNS session in each evening, and whether they had provided or received each of the following types of support during the interaction: (1) giving advice, (2) showing empathy, (3) validating thoughts, (4) complimenting, (5) teaching something new, (6) inviting to a new group, (7) sharing information, (8) giving encouragement, and (9) inviting to a group plan. Respondents were asked to check all types of support they had provided to others or received from other users. Then, the total number of supportive interaction was reconstructed as a single item-variable by counting the number of positive responses ("yes").

Affect was measured with the Positive and Negative Affect Schedule (PANAS) scale (Watson, Clark, & Tellegen, 1988), supplemented by items that came out from a pretest through undergraduate students in a media research class. Students were asked to indicate other feelings they had after using social networking sites that were not listed in PANAS, which yielded thirteen items in total. Each item was measured with a 7-point scale ranging from (1) definitely false to (7) definitely true (weekly average = 4.08, SD = .04, \( \alpha = .86 \)) and negative affect (weekly average = 2.47, SD = 1.01, \( \alpha = .81 \)). One item (i.e., Alert) was excluded from the further analysis, as it was cross-loaded to both positive and negative affect dimensions. Twelve items explained 62.57% of the total affect variance. Table 1 shows daily average of both positive affect and negative affect.

3.4. Analytic strategies

3.4.1. Path model

A path model was utilized to test the proposed relationships among the number of SNS friends, the frequency of SNS use, the amount of supportive interactions, affect, perceived social support, sense of community, and life satisfaction. Because the model included two momentary variables (i.e., the amount of supportive interaction and affect), they were aggregated across each participant to create two person-level variables by averaging the amount of supportive interactions and affect across 5 days. For the path analysis, the AMOS 19.0 program was utilized to obtain maximum-likelihood (ML) estimates of the model parameters (Arbuckle, 2010). Table 2 shows the correlation matrix for estimating the recursive model hypothesized in this study. The number of SNS friends and the frequency of SNS use were treated as exogenous variables, and the other seven variables—the amount of supportive interaction, positive affect, perceived social support (appraisal, esteem, and companionship), sense of community, and life-satisfaction—were endogenous variables. Incomplete survey responses were list-wise deleted, which resulted in the final sample size of 295. Due to its low correlations with other key variables, the number of close SNS friends was excluded from the path model.

The initial path model included the frequency of SNS use and the number of SNS friends (total number of SNS friends) as exogenous variables. Although the initial model showed almost a perfect fit, \( \chi^2 (17) = 11.67, p = .82, \text{CFI} = 1.00, \text{RMSEA} = .00 \), the frequency of SNS use was not significantly associated with the amount of supportive interaction. A model without the frequency of SNS use still showed a good model fit, \( \chi^2 (12) = 17.27, p = .14, \text{CFI} = .99, \text{RMSEA} = .04 \). The chi-square difference testing indicated no significant change in the model fit between the two models (\( \chi^2 \Delta = 5.6, p = .35 \)). To obtain a parsimonious model, the second model was retained. From this model, 32% of the variance in life satisfaction were explained, and 46% of the variance in the sense of community were explained. Multicollinearity or normality problems were not found in the data. Fig. 2 presents our final model with standardized coefficients and their statistical significance.

3.4.2. Multilevel model using momentary variables

The direct relationship between the amount of supportive interaction and affect following the interaction that participants reported each day were also analyzed using multilevel analysis (SPSS 19.0) with an estimation of restricted maximum likelihood. The diary design yielded a nested data structure within subjects, such that their responses across 5 days were not independent from each other. The multilevel modeling allows multiple levels of analysis with a series of regression equations in order to account for nesting of assessments within subjects. The data structure in this study required two levels. The first level variables consist of momentary measures, the amount of supportive interaction and positive/negative affect. To test the within-individual hypotheses,
the relationships between affect (positive/negative) and supportive interaction were tested at level 1, and the aggregated parameters at level 2 across all the participants were then estimated. For the cross-level effect, slopes and intercepts were estimated with the momentary variable (i.e., supportive interaction), the person-level variables (i.e., number of SNS friends, frequency of SNS use, and history of SNS use), and the cross-level interactions between the two levels. As suggested by Hofmann, Griffin, and Gavin (2000), all the predictors were centered at each individual’s mean in order to remove any between-individual variance in the estimates of the relationships among the variables. Hence, the intra-individual estimates obtained from multilevel modeling were not confounded by individual differences. Considering the sensitive and complex nature of multilevel modeling, this study proceeded from a null model to a fixed coefficient model step-by-step with level-1 and level-2 variables. At each step, the results were inspected to see which parameters are significant, and how much of the residual errors were left unexplained at each of the two levels. After fitting the model, the intercept and slope were explored using all person-level factors, the momentary factor, and cross-level interactions. Days with no data entry were deleted resulting in the total sample size of 1322 social networking sessions.

4. Results

4.1. Path model: Outcomes of supportive interaction

The single exogenous variable, the number of SNS friends, was found to be a significant predictor of the amount of supportive interaction ($\beta = .21$, $p < .001$), supporting hypothesis 1. However, hypothesis 2 was not supported as the initial model showed no significant relationship between the frequency of SNS use and the amount of supportive interaction. The amount of supportive interaction was significantly related to positive affect felt after the interaction ($\beta = .32$, $p < .001$), supporting hypothesis 3. Positive affect then was a significant predictor of perceived companionship support ($\beta = .20$, $p < .01$), appraisal support ($\beta = .15$, $p < .01$), and life satisfaction ($\beta = .21$, $p < .001$). This result partially supported hypothesis 4, but fully supported hypothesis 5. Among the three perceived social support dimensions, perceived companionship support was a positive predictor of life satisfaction ($\beta = .20$, $p < .001$), whereas perceived appraisal and esteem support were positively related to sense of community ($\beta = .55$, $p < .001$ and $\beta = .16$, $p < .001$ respectively), but not to life satisfaction. Therefore, hypotheses 6 and 7 were partially supported. The findings also address research questions 1–3, by showing differential relationships of each social support dimension to affect, sense of community, and life satisfaction. Finally, the sense of community was positively associated with life satisfaction ($\beta = .36$, $p < .001$), which supports hypothesis 8.

4.2. Multilevel model: Relationship between supportive interaction and affect

Before testing hypothesis 9 and research questions associated with the multi-level analyses, a null model without level-1 and level-2 predictors was tested in order to ensure that the proposed variables had sufficient variance to influence momentary affect and the relationship between the amount of supportive interactions and affect. The null model yielded an ICC score of .53, indicating that the effect of the within-individual variance was significant enough to influence the within-individual variance (Bliese, 2000). Table 3 provides the results obtained from a series of multilevel modeling estimated to predict affect. Since including the interactions between momentary and person-level variables significantly worsened the model ($\Delta\chi^2 = 33.50$, $p < .001$), we only estimated the main effects of the person-level variables, but not the cross-level interactions between momentary and person-level variables.

The first multilevel model estimated to predict positive affect indicated a positive relationship between the amount of supportive interaction and positive affect, after accounting for the person-level variables ($\beta = .10$, $p < .001$). Among the person-level variables, however, only the history of SNS use was significantly and directly related to the momentary positive affect ($\beta = .22$, $p < .05$). Other person-level variables did not significantly influence positive affect or the relationship between supportive interaction and positive affect. The relationship between supportive interaction and negative affect was also tested using the identical procedure. The null model suggested a significant variability both within a person and between persons. However, when the second model included a fixed effect of supportive interaction on negative affect, there was no significant relationship between supportive interaction and negative affect ($\beta = .01$, $p = .18$). In other words, although there was a significant variability in negative affect between persons and within one person across 5 days, this variability cannot be attributed to the amount of supportive interaction or other person-level variables. These results supported hypothesis 9. Since there was no fixed effect of supportive interaction on negative affect, further models including person-level variables were not fitted.
5. Discussion

The main purpose of this study was to explore a mechanism through which people’s online social networking produces positive psychological outcomes. Using momentary sampling, the direct relationship between the amount of supportive interaction and immediate affect after the interaction each day was assessed. It is also tested whether the size of one’s online social network (the total number of friends and close friends in particular), frequency of online social networking, and history of networking directly influence one’s affective state or moderate the relationship between supportive interaction and affect.

A series of multilevel models showed that the amount of supportive interaction was positively associated with positive affect after the interaction, such that those who exchanged a greater amount of support with other members felt a greater level of positive affect. However, the amount of supportive interaction was not associated with negative affect. This result confirms the prior social support literature which found a significant relationship between real world social support and positive affect, but not between social support and negative affect (Baker, Jodrey, & Intagliata, 1992). Existing studies acknowledge that supportive interaction was positively associated with perceived companionship support, whereas perceived appraisal and esteem support were indirectly associated with life satisfaction through the enhanced sense of community. Prior work combined dimensions of social support in a unitary construct. However, a major limitation with such application is overlooking the gravity of each dimension of social support and psychological well-being, but not the frequency or amount of SNS use. Because these sites now have various solitary applications such as games and photo editing, users can engage with the sites without interacting with other users. Relevant research indicates that not all uses of SNS are social (Burke et al., 2010; Ellison, Steinfield, & Lampe, 2011). Findings of the present study show that general measures of Facebook use (i.e., Facebook intensity) might not be a direct predictor of well-being. The results further suggest that clinical researchers who have been debating over the linkage between general SNS use (i.e., frequency of SNS use and hours spent on SNS) and psychological well-being might contribute to reconciling the mixed findings by highlighting the importance of the actual type and quality of interaction between SNS users.

In the current study, the frequency of SNS use was not a significant predictor of supportive interaction and other outcome variables. This result suggests that it is the quality of interaction that matters in establishing social support and psychological well-being, but not the frequency or amount of SNS use. Because these sites now have various solitary applications such as games and photo editing, users can engage with the sites without interacting with other users. Relevant research indicates that not all uses of SNS are social (Burke et al., 2010; Ellison, Steinfield, & Lampe, 2011). Findings of the present study show that general measures of Facebook use (i.e., Facebook intensity) might not be a direct predictor of well-being. The results further suggest that clinical researchers who have been debating over the linkage between general SNS use (i.e., frequency of SNS use and hours spent on SNS) and psychological well-being might contribute to reconciling the mixed findings by highlighting the importance of the actual type and quality of interaction between SNS users.

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The multilevel models further showed that the network size (the number of SNS friends) or other indicators of general SNS use were not significantly associated with either positive or negative affect after online social networking. Also, these variables failed to moderate the relationship between the amount of supportive interaction and immediate affect after the interaction. This result corroborates the argument that the type of activities people engage in social networking sites better predicts psychological outcomes of SNS use (Burke et al., 2010) than do general measures such as Facebook intensity (Ellison et al., 2007).

The path model reveals a possible mechanism whereby the network structure or the frequency of social networking influences psychological well-being. The number of SNS friends led to positive psychological outcomes, but only when it was accompanied with actual supportive interaction and positive feelings after the interaction. Prior studies found inconsistencies between the number of SNS friends and psychological states (Kalpidou et al., 2011; Kim & Lee, 2011). Some suggested that the number of friends plays a positive role only up to a certain number (Kim & Lee, 2011). The present findings might contribute to reconciling the mixed findings by highlighting the importance of the actual type and quality of interaction between SNS users.

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life satisfaction, whereas appraisal and esteem support had indirect effects on life satisfaction through the sense of community.

This finding can be due to the difference in our participants’ relationship-orientation. Studies on the age and social relationship suggest that young adults tend to be more future-oriented, and thus value an expansion of one’s network, whereas older people engage more in emotional interaction with their close ties (Lang, 2001). Since more than 80% of our study participants were younger than 30 years old ($M = 27.56, SD = 11.77$), it is possible that their life evaluation was directly associated with whether they have friends who they can hang out with, share similar interest, and praise each other. Social support researchers have also suggested that characteristics of support recipients might influence how they interpret acquired social support (Collins & Feeney, 2004; Lakey & Cassady, 1990). Future study should explore further how each dimension of social support engenders differential outcomes across different groups of people.

6. Conclusion

Getting social support has long been a key to life satisfaction. Tools to fulfill such needs have advanced with the development of new communication tools, and the Internet and social media have entirely changed the ways people network. Although social networking sites do help people expand and manage their network easily, this network might not be meaningful if it fails to provide social support that recipients need. The present study highlights the importance of looking at specific supportive elements of social networking sites for better understanding the functions and benefits of those sites.

6.1. Limitation and future research

First, this research used correlational data, preventing inference of causal direction. Although the proposed model achieved almost a perfect fit, it is also very likely that rival models can fit the data equally well. With the path model proposed, the positive effects of supportive interaction on perceived social support, sense of community, and life satisfaction were tested. However, it is also likely that a greater sense of community leads people to actively engage in supportive interaction with others. Some SNS researchers note that the relationship between psychological states and SNS use can be reciprocal, such that those with lower levels of life satisfaction increase their use of social networking sites to increase their sense of community support clients.

References


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