Frequency and Quality of Social Networking Among Young Adults: Associations With Depressive Symptoms, Rumination, and Corumination

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Abstract

Two studies examined associations between social networking and depressive symptoms among youth. In Study 1, 384 participants (68% female; mean age = 20.22 years, *SD* = 2.90) were surveyed. In Study 2, 334 participants (62% female; *M* age = 19.44 years, *SD* = 2.05) were surveyed initially and 3 weeks later. Results indicated that depressive symptoms were associated with quality of social networking interactions, not quantity. There was some evidence that depressive rumination moderated associations, and both depressive rumination and corumination were associated with aspects of social networking usage and quality. Implications for understanding circumstances that increase social networking, as well as resulting negative interactions and negative affect are discussed.

Keywords

social networking; depression; rumination; corumination

With technological advances have come increased opportunities for social networking via the Internet (e.g., Facebook, MySpace, instant messaging [IMing]), and cell phones (e.g., text messaging), and most young people take advantage of these opportunities. Indeed, according to the Pew Internet and American Life Project, more than 70% of youth and young adults (ages 12 to 29) who use the Internet use social networking sites (Lenhart, Purcell, Smith, & Zickuhr, 2010). In addition, one in three teens sends more than 100 text

messages a day, with at least 70% of 17 year olds texting daily (Lenhart, Ling, Campbell, & Purcell, 2010). This has raised questions about the potential benefits and negative consequences of such activity, and, at best, the results are decidedly mixed. This is particularly true with regard to the effects of such use on mood, specifically depressive symptoms (e.g., sad mood, anhedonia, worthlessness, hopelessness), which is the focus of the present study.

One of the earliest studies on the effects of Internet use among young people reported that greater usage predicts increases in depressive symptoms over 1 year (Kraut et al., 1998). Although a follow-up to this study demonstrated that these effects disappeared over a longer time period (2 years; Kraut et al., 2002), a number of recent studies replicated the original longitudinal association between depressive symptoms and Internet usage (e.g., Selfhout, Branje, Delsing, ter Bogt, & Meeus, 2009; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). On the other hand, a number of studies have demonstrated positive effects of Internet use (e.g., Morgan & Cotten, 2003) and particularly of social networking activity. For instance, for adolescents using the Internet to maintain existing social contacts (via IMing through social networking sites and related online chat rooms), usage is associated with greater social connectedness and well being (e.g., Valkenburg & Peter, 2007, 2009a).

As scholars have begun to recognize (e.g., Valkenburg & Peter, 2009b), the inconsistent findings may reflect the likelihood that different types of Internet use may have different effects on users. In the original study demonstrating the association between depressive symptoms and Internet usage, Kraut et al. (1998) examined overall usage, including e-mailing, web surfing, chatting, reading, and so forth. Therefore, there was no way to know what activity in particular was associated with increasing depressive symptoms (not to mention the fact that Internet usage may have been less normative and very different in 1998 compared to now). More recent studies now show that depressive symptoms may be uniquely related to certain types of Internet activity. For example, van den Eijnden et al. (2008) found that IMing predicted increases in depressive symptoms among youth, whereas other online activities (e.g., information seeking, surfing, downloading, emailing, chatting) did not. In line with this, Ybarra, Alexander, and Mitchell (2005) found that youth with depressive symptoms engaged in more personal disclosure online, perhaps as a way to reach out to others (which may not be effective). Ybarra et al. (2005) also found that youth with depressive symptoms may be replacing in-person social contact with online activities. Consistent with this, Selfhout et al. (2009) found that time spent surfing the web was associated with increases in depressive symptoms, particularly for youth with poor friendship quality. Ybarra (2004) also found that youth with depressive symptoms were more likely than other youth to have experienced online harassment.

Taken together, existing findings begin to suggest that the social context of online activity among youth is important in understanding its association with depressive symptoms. This is not surprising, as what happens in relationships is closely linked with depression at all ages (see Gotlib & Hammen, 2009). Therefore, we specifically focused on social networking activities (rather than other Internet activities) and their association with depressive symptoms. In addition, a specific focus not just on the time spent engaging in social networking, but on the quality or nature of social networking experiences seems warranted as the quality of relationship experiences is linked with depression (see Davila, Stroud, & Starr, 2009; La Greca, Davila, & Siegel, 2008). This is in line with recent research that examined types of reactions adolescents' received to their online profiles on social networking sites. Self-esteem was not associated with frequency of social networking or the number of online relationships, but youth who received more negative reactions (from others) reported lower self-esteem (Valkenburg, Peter, & Schouten, 2006). Therefore, we

examined not only the association between the time spent engaging in social networking and depressive symptoms, but also the association between the quality of the interactions (i.e., how positive and negative they were reported to be) and depressive symptoms.

It is important to begin to focus on identifying for which youth social networking activities will be most associated with depressive symptoms. Most studies have focused on aspects of the activities (e.g., type and frequency), rather than aspects of the individual. Individual differences in how one processes and responds to negative experiences may shed light on mechanisms underlying the relationship between depressive symptoms and social networking usage and experiences. We selected two related variables, corumination and depressive rumination, which have been shown to increase risk for depressive symptoms and which have relevance for how individuals process negative experiences both with others and on their own.

Corumination refers to excessive discussion of problems within friendships, including repeated conversations, conjecture about causes, and heightened focus on negative emotions (Rose, 2002). Though associated with positive friendship quality and closeness, corumination also predicts increases in depressive symptoms, particularly among adolescent girls (Calmes & Roberts, 2008; Rose, 2002; Rose, Carlson, & Waller, 2007). Given the frequency with which young people engage in social networking activities, they may provide opportunities for corumination. To the extent that young people are coruminating in these venues, their use might be associated with more immediate negative affect and greater depressive symptoms. Therefore, we examined whether corumination moderated the associations between social networking activities and depressive symptoms. We predicted a stronger association among social networking activities (usage and interaction quality) and depressive symptoms for youth scoring higher on corumination. We also examined correlations between corumination and social networking usage (i.e., time spent) and experiences (i.e., quality of interactions and negative affect following interactions) to see whether corumination, on its own, was related to these activities and experiences.

Depressive rumination refers to passively focusing on symptoms of distress and their possible causes and consequences, leading to fixation on problems and negative feelings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). There is ample evidence that rumination is relatively stable over time, associated with interpersonal problems (including a dependent, clingy, and aggressive interpersonal style) and low social support, and functions both to maintain and increase risk for future depression at all ages (for a review see Nolen-Hoeksema et al., 2008). Individuals prone to depressive rumination may be more likely to use social networking (because of their dependent nature) and have negative social networking experiences (because of their interpersonal problems), and those experiences may be particularly depressogenic (because of their tendency to ruminate on them). Therefore, we examined whether depressive rumination moderated the associations between social networking activities and depressive symptoms. We predicted a stronger association among social networking activities (usage and interaction quality) and depressive symptoms for youth scoring higher on depressive rumination. We also examined correlations between depressive rumination and social networking usage (i.e., time spent) and experiences (i.e., quality of interactions and negative affect following interactions) to see whether depressive rumination, on its own, was related to these activities and experiences.

To summarize, we focused on the following research questions:

1. How are social networking use and the quality of interactions associated with depressive symptoms? We made no predictions about time spent using, given the mixed findings in the literature. Instead, in line with the idea that it is the quality of the interactions that matter for depression, we predicted that more negative and less

positive social networking interactions would be associated with greater depressive symptoms.

2. How are social networking use, the quality of interactions, and depressed mood immediately following those interactions associated with corumination and depressive rumination? In line with the logic outlined earlier, we predicted that higher scores on corumination and depressive rumination would be associated with greater use, more negative and less positive interactions, and greater depressed mood immediately following interactions.

3. Do the rumination variables (corumination and depressive rumination) moderate the association between social networking (use and quality of interactions) and depressive symptoms? Again, in line with the logic outlined earlier, we expected that the strongest associations would emerge for people scoring higher on either type of rumination.

The hypotheses were examined in two relatively large samples of college-age youth. Our definition of social networking activities included both online activities (Facebook, MySpace, and IMing) and text messaging. The research on Internet social networking and well being is growing, but virtually no research examines text messaging, which, as noted earlier, is an extremely common form of social communication among youth. We found no studies on its association with depressed mood, although one study showed that more texting was associated with greater neuroticism (Ehrenberg, Juckes, White, & Walsh, 2008). Thus, the present study is the first to examine its association with depressive symptoms. Given this, no predictions were made regarding differential effects for online versus text messaging activities.

Study 1

Study 1 was a cross-sectional survey designed to examine concurrent associations outlined in the above research questions.

Method

Participants—Participants were 384 young adults (68% female) enrolled in either an introductory psychology or abnormal psychology course during the 2009–2010 academic year. Inclusion criterion required that participants be at least 18 years of age, and participants reported a mean age of 20.22 years (SD = 2.90; range = 18–46). Of those reporting ethnicity, 44% described themselves as Caucasian, 7% African American, 31% Asian/Pacific Islander, 11% Latino, and 7% other. The Institutional Review Board at the affiliated university approved this research.

Procedure—Participants provided informed consent and then completed a packet of questionnaires regarding their social networking use, rumination, and depressive symptoms. Participants enrolled in introductory psychology completed the study in our lab and received course credit in exchange for participation. Participants enrolled in abnormal psychology completed the study in the classroom and participated voluntarily as part of a class activity.

Measures

Social networking use and experiences: The Social Networking Survey was designed for this study to assess amount of time respondents spent engaging in various types of social networking activities, the quality of their interactions, and how they felt after their interactions. The survey focused on three types of social networking: Facebook/MySpace (FB/MS), instant messaging (IMing; e.g., online instant messaging such as AOL IM, Microsoft Messenger, Google Talk, Yahoo! Messenger, iChat, ICQ, Skype, or eBuddy), and

texting. For each type, participants were first asked if they engaged in it (yes/no). If yes, they were asked to estimate average amount of time per day they spent interacting with others via that particular social networking activity. Next, for each social networking activity, quality of their interactions was assessed by asking them to rate (in separate questions) how positive and how negative their interactions were (e.g., "Thinking about all your interactions on FB/MS, how positive are your interactions with people on FB/MS?"), ranging from 1 (*not at all*) to 7 (*extremely*). Finally, for each social networking activity, participants were asked to rate, on a 1 (*never*) to 7 (*all the time*) scale, how they felt, on average, after their interactions: "How often do you feel down or depressed after you interact with people [on FB/MS, when IMing, when texting]?" Ratings of the positivity and negativity of interactions were correlated across types of social networking activity, as were ratings of depressive affect following interactions (*r*s ranged from .32 to .42). Because of the consistency and strength of these associations, to simplify analyses, composite variables were created by taking the mean of each rating across the social networking activities (resulting in one positivity rating, one negativity rating, and one depressive affect rating). These composite variables were used in all subsequent analyses.[1] Cronbach's alpha coefficients were 0.70 for the positivity rating, 0.64 for the negativity rating, and 0.65 for the depressive affect rating. Finally, because FB/MS can be used for purposes other than interacting with others (e.g., posting information about oneself, posting pictures, playing games), participants were also asked to estimate the average number of times per day they checked FB/MS and the average amount of time per day spent on FB/MS (but not necessarily interacting with others), to provide a more comprehensive picture of use.

Corumination: Corumination was assessed with the Corumination Questionnaire (Rose, 2002), a 27-item self-report measure designed to assess the extent to which individuals discuss and revisit problems with their closest, same-sex friend. Sample items include "We spend most of our time together talking about problems that my friend or I have" and "When we talk about a problem that one of us has, we talk a lot about how bad the person with the problem feels." Items were rated on a 1–5 scale (1 = *not at all true* and 5 = *really true*), and responses were summed to calculate a total score; higher scores represent higher levels of corumination. Cronbach's alpha was 0.96.

Depressive rumination: Depressive rumination was assessed with the Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991), a 22-item self-report questionnaire designed to assess how frequently individuals engage in various thoughts, feelings, and actions when they experience a depressed mood. Items are rated on a 1 (*almost never*) to 4 (*almost always*) scale and responses are summed to calculate a total score such that higher scores represent higher levels of depressive rumination. Sample items of the RRS include "Think about how sad I feel" and "Analyze recent events to try to understand why you are depressed." Prior data suggest high internal consistency (Cronbach's alpha = .89) as well as an association with the number and severity of depressive symptoms (Nolen-Hoeksema & Morrow, 1991). In the present sample, Cronbach's alpha was 0.93.

Depressive symptoms: Depressive symptoms were assessed with the Beck Depression Inventory–Second Edition (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report measure designed to assess the affective, cognitive, and somatic symptoms of depression. Respondents are asked to choose which of four statements (0–3 scale) best describes the way they have been feeling during the past 2 weeks. An overall score is calculated by summing responses to all of the items; higher scores represent greater severity

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[1]Analyses conducted on the individual variables yielded similar results further supporting the appropriateness of analyzing the composite variables.

of depressive symptoms. Beck et al. (1996) reported high internal consistency of BDI scores (Cronbach's alpha = .93 among undergraduate students) as well as high correlations with the BDI-IA (r = .93) and the Hamilton Psychiatric Rating Scale for Depression (r = .71), suggesting construct validity. In the present sample, Cronbach's alpha was 0.92.

Results

The first column of Table 1 presents the means and SDs for all variables. On average, participants reported spending between 1 and 4 hr/day engaging in the various types of social networking activities (with most time spent texting), rated their interactions during those activities as relatively positive, and reported relatively low levels of negative affect following interactions. Zero-order correlations among the variables are shown in Tables 2 through 4. As shown in Table 2, across the board, time spent engaging in one type of social networking activity was positively and significantly correlated with time spent engaging in other types (rs range from .14 to .55), suggesting that individuals who use one type of social networking activity are also likely to use other types. As shown in Table 3, across social networking activities, having fewer positive interactions was significantly correlated with having more negative interactions (r = −.51) and greater depressed mood following interactions (r = −.33; both of which were positively and significantly correlated with one another; r = .60). As shown in Table 4, depressive symptoms, corumination, and depressive rumination were positively and significantly correlated with one another (rs range from .22 to .59), suggesting that individuals who tend to focus on symptoms of distress are likely to do so both alone and with friends, and both of these ruminative strategies are correlated with symptoms of depression. For the remaining analyses testing our primary research questions, alpha was conservatively set at $p < .01$.

How are social networking use and the quality of interactions associated with depressive symptoms? Regarding time spent engaging in social networking, as shown in Table 5, depressive symptoms were not significantly correlated with any of the usage variables. Regarding the quality of social networking interactions, depressive symptoms were significantly correlated with more negative interactions (r = .15), as predicted.

Do corumination and/or depressive rumination moderate the associations between social networking variables (use and quality of interactions) and depressive symptoms? Seven hierarchical regression analyses were conducted to examine whether corumination moderated associations between the five social networking use variables and the two quality of interaction variables (positivity and negativity) and depressive symptoms. For each analysis, the main effects of predictor variables were entered first, and the interaction term was entered second. All predictor variables were mean-centered prior to computing interaction terms to reduce multicol-linearity (Aiken & West, 1991), and sample sizes were based on participants who provided complete data for the variables in each analysis. Contrary to expectations, none of the corumination interactions were significant.

Following the same procedures, seven hierarchical regression analyses were conducted to examine if depressive rumination moderated the association between the five usage and two quality-of-interaction variables and depressive symptoms. Similar to corumination, none of the usage variables were significant. However, level of negativity of interactions yielded a significant interaction with depressive rumination. The full model was significant, $F(3, 343)$ = 64.01, $p < .001$, and the incremental effect of the interaction term was also significant (R^2 = .36; ΔR^2 = .02; $p = .004$). After decomposing the simple slopes, according to Aiken and West's (1991) procedures, we found that, for those who reported higher levels of depressive rumination (i.e., 1 SD above the mean), more negative interactions were significantly associated with greater depressive symptoms (β = 0.15, $p = .01$). In contrast, for those who reported lower levels of depressive rumination (i.e., 1 SD below the mean), more negative

interactions were negatively, though not significantly, associated with depressive symptoms ($\beta = -0.11$, $p = .10$). This suggests that having more negative social networking interactions is associated with greater depressive symptoms, but only for individuals who tend to ruminate about their depressive thoughts and feelings.

How are social networking use, the quality of interactions, and depressed mood immediately following those interactions associated with corumination and depressive rumination? As shown in Table 5, higher levels of corumination were correlated with greater time on FB/MS (i.e., greater frequency of checking, greater time using, and greater time interacting; rs range from .14 to .18) and greater time spent texting ($r = .16$) but not with time spent IMing. Regarding quality of social networking interactions, higher levels of corumination were correlated with more negative interactions ($r = .18$). Regarding depressed mood following those interactions, higher levels of corumination were correlated with feeling more down/ depressed following social networking interactions ($r = .19$). Unlike corumination, depressive rumination was not correlated with time spent engaging in social networking, but, as predicted, higher levels of depressive rumination were correlated with more negative as well as less positive social networking interactions and with feeling down/depressed following social networking interactions (rs range from $-.23$ to .35).

Discussion

Study 1 suggests the following. First, there is more evidence that it is the quality, rather than the frequency, of social networking activities that is associated with depressive symptoms. Second, depressive rumination appears to strengthen the association between negative social networking interactions and depressive symptoms. Third, both depressive rumination and corumination are correlated with more negative interactions and greater depressed mood following interactions, and corumination is associated with greater frequency of certain types of social networking activity. However, the effect sizes of the significant correlations were quite small, and in some instances, were close in magnitude to some of the nonsignificant correlations. Therefore, Study 2 was conducted to replicate and extend these findings.

Study 2

Study 2 built on Study 1 in two important ways. First, Study 1 was limited by its cross-sectional nature. To examine whether social networking activities predicted increases in depressive symptoms over time, Study 2 included a 3-week follow-up. Second, Study 2 included questions about interactions with developmentally salient close others (peers and romantic partners) to further refine understanding of the types of social networking interactions associated with depressive symptoms.

Method

Participants—Participants were 334 undergraduate students (62% female) enrolled in an introductory psychology course during the 2010–2011 academic year. Inclusion criterion required that participants be at least 18 years of age. Participants reported a mean age of 19.44 years ($SD = 2.05$; range = 18–34). Forty-one percent described themselves as Caucasian, 41% Asian/Pacific Islander, 6% African American, 6% Latino, and 6% other. The Institutional Review Board at the affiliated university approved this research.

Procedure—Participants provided informed consent and completed online questionnaires regarding social networking use and experiences, rumination, and depressive symptoms. Three weeks after Time 1 (T1), participants were e-mailed instructions to complete an online follow-up survey that included an assessment of depressive symptoms. Participants

received course credit in exchange for participation. Of the 334 individuals who participated at T1, 301 participated at Time 2 (T2; retention = 90%). Independent-samples *t* test (for age) and chi-square tests (for ethnicity and gender) were conducted to examine whether there were any significant differences between individuals who only participated at T1 and those who participated at both T1 and T2. Results indicated that there were no significant differences (smallest *p* = .27).

Measures

<u>**Social networking use and experiences:**</u> The same Social Networking Survey used in Study 1 was used except all questions were asked in regard to three different types of interaction partners—people in general, close friends, and romantic partners—in order to examine potential differences based on different developmentally salient interaction partners. The Cronbach alphas ranged (across interaction partners) from .69 to .78 for the positivity ratings, .58 to .78 for the negativity ratings, and .71 to .86 for the depressed affect following interactions ratings.

<u>**Corumination:**</u> Corumination was again assessed with the Corumination Questionnaire (Rose, 2002; α = .96).

<u>**Depressive rumination:**</u> Depressive rumination was again assessed with the RRS (Nolen-Hoeksema & Morrow, 1991; α = .94).

<u>**Depressive symptoms:**</u> Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item self-report measure designed to assess symptoms of depression. Respondents are presented with symptoms (e.g., "I felt depressed," "I felt sad") and asked to indicate how often they have felt that way during the past week. Each item was rated on a 4-point Likert-type scale (0 = *rarely or none of the time,* 1 = *some or a little of the time,* 2 = *occasionally or a moderate amount of time,* and 3 = *most or all of the time*). Total scores were computed by summing the responses to each of the items (after reverse-scoring some of the items). Total scores can range from 0 to 60, with higher scores indicating greater depressive symptoms. Radloff (1977) reported data to support the adequacy of the CES-D's psychometric properties. In the current study, Cronbach's alpha was .91 at T1 and .92 at T2.

Results

The second column of Table 1 presents the means and SDs for all variables. On average, participants reported spending between 45 min and 2.5 hr/day engaging in the various types of social networking activities (again, with most time spent texting) and rated their interactions across all interaction partners as relatively positive. Zero-order correlations among the variables are shown in Tables 2–4. We again found significant positive correlations between the usage variables (Table 2; *r*s range from .18 to .71). Quality of interactions across interaction partners were significantly positively correlated with one another, suggesting that interaction quality tends to be similar generally and with close others (Table 3; *r*s range from −.52 to .76). Finally, corumination was significantly positively correlated with T1 depressive symptoms (*r* = .16), depressive rumination was significantly positively correlated with T1 (*r* = .56) and T2 depressive symptoms (*r* = .49), and corumination was significantly positively correlated with depressive rumination (*r* = .19; Table 4). As with Study 1, for the remaining analyses testing, our primary research questions, alpha was conservatively set at *p* < .01.

Replication of Study 1 cross-sectional findings—How are social networking use and the quality of interactions associated with T1 depressive symptoms? As shown in Table

5, like Study 1, depressive symptoms were not significantly correlated with any of the usage variables. These results further confirm that time spent engaging in social networking activities is not a robust correlate of depressive symptoms. Regarding the quality of the interactions, and consistent with Study 1, more negative and less positive interactions were correlated with greater depressive symptoms across all three types of interaction partners examined (rs range from −.28 to .24).

How are social networking use, the quality of interactions, and depressed mood immediately following those interactions associated with corumination and depressive rumination? Similar to Study 1, greater usage across a number of social networking modalities was correlated with greater corumination (rs range from .17 to .20; see Table 5). Unlike Study 1, corumination was not correlated with any of the quality variables. In contrast, depressive rumination was not significantly correlated with any of the usage variables, but was significantly correlated with more negative and less positive interactions as well as greater negative affect following interactions across types of interaction partners (rs range from −.28 to .38), a pattern mirroring the findings of Study 1. In sum then, the cross-sectional findings from both studies are consistent in suggesting small but significant correlations of depressive symptoms and depressive rumination with poor social networking quality (but not with social networking usage) and of corumination with greater social network usage (but less so with poorer social networking quality).

Longitudinal analyses—Do social networking use and the quality of interactions predict depressive symptoms 3 weeks later? To examine whether the social networking use and quality variables were associated with changes in depressive symptoms over time, we conducted a series of 11 regression analyses with T1 depressive symptoms and each usage and quality variable as the predictor variable and T2 depressive symptoms as the outcome variable. Consistent with the cross-sectional results of both studies, none of the usage variables predicted changes in depressive symptoms over time. Further, as shown in Table 6, consistent with the cross-sectional findings of both studies, less positive and more negative interactions across all types of interaction partners predicted increases in depressive symptoms (βs range from −.22 to .17), indicating that not only are social networking interactions correlated with depressive symptoms, but they also lead to changes in depressive symptoms over time.

Do corumination and/or depressive rumination moderate the longitudinal associations between social networking variables and depressive symptoms? Finally, following the procedure outlined in Study 1, we conducted a series of hierarchical regression analyses to examine whether corumination and/or depressive rumination moderated the association between social networking variables and T2 depressive symptoms (controlling for T1 depressive symptoms). None of these analyses yielded significant interactions.

Discussion

Study 2 suggests the following. First, there continues to be evidence that it is the quality (i.e., how positive or negative it is), rather than the quantity, of social networking activities that is associated with depressive symptoms over time. Second, this finding is robust across interactions with developmentally salient close others. Third, there continues to be evidence that corumination is associated with greater frequency of social networking activities, whereas depressive rumination is exclusively associated with poorer quality, rather than the frequency, of those interactions.

General Discussion

The present studies were designed to examine associations between social networking activities and depressive symptoms among youth. Existing literature is equivocal and is limited in important ways. In particular, few studies have specifically examined social networking, focusing instead on online activities more generally and excluding text messaging. Further, few studies have examined the quality of interactions, focusing instead on frequency of usage alone. Finally, few studies have examined the specific conditions under which social networking activities and depressive symptoms may be associated, and few studies have included individual difference factors in that capacity. The present study addressed each of these gaps by examining both usage and quality of experiences, specifically with both online and text social networking, and by examining the potential moderating effects of theoretically relevant individual differences in corumination and depressive rumination. The following key findings emerged.

First, across both studies there was no evidence that social networking use was associated with depressive symptoms either concurrently or over time. Furthermore, across both studies, neither depressive rumination nor corumination moderated associations between social networking use and depressive symptoms. Therefore, the data suggest that engaging in social networking activities is not, on average, depressogenic for young people, nor is doing so particularly depressogenic for ruminators.

However, consistent with the findings of Valkenburg et al. (2006), the quality of social networking experiences was associated with depressive symptoms. Young people who reported less positive and more negative interactions during social networking activities reported greater depressive symptoms concurrently and over time. This is consistent with the larger depression literature, which has consistently demonstrated associations between depressive symptoms and poor interpersonal relationships (see Davila et al., 2009; La Greca et al., 2008). Moreover, Study 2 demonstrated this association for interactions with peers and romantic partners, which are developmentally salient relationships. Indeed, the literature on adolescent and young adult peer and romantic relationships demonstrates how problems in those relationships (e.g., rejection, conflict, exclusion) can contribute to depressive symptoms (see La Greca et al., 2008). The present study suggests that social networking is another venue in which such problematic relationships may manifest, play out, and affect well being.

Although the quality (positivity and negativity) of social networking experiences was associated with depressive symptoms for all participants concurrently and over time, there was tentative evidence that depressive rumination may moderate the cross-sectional association between depressive symptoms and negative interactions. Individuals scoring higher on depressive rumination showed the strongest associations between negative social networking interactions and depressive symptoms. As we discussed earlier, people prone to depressive rumination are more apt to fixate on problems and negative feelings (Nolen-Hoeksema et al., 2008). Therefore, when they experience negative interactions during social networking they may ruminate on them and the negative feelings they engender, thereby increasing feelings of depression. However, the moderating effect of depressive rumination was not replicated in the longitudinal analyses, calling into question the robustness of the effect. Thus, the cross-sectional finding should be interpreted with caution. In addition, although we were not able to test it, it may be the case that co-occurring dysphoria and rumination might impair people's ability for positive interactions; that is, the cross-sectional finding might actually mean that depressive symptoms predict more negative interactions over time among people prone to depressive rumination. This possibility should be explored in future research.

Although there was very little evidence for corumination and depressive rumination as moderators, both were related to social networking experiences and depressive symptoms in a consistent manner across both studies. Consistent with the literature (Calmes & Roberts, 2008; Nolen-Hoeksema et al., 2008; Rose, 2002; Rose et al., 2007; Starr & Davila, 2009), higher scores on both corumination and depressive rumination were associated with greater depressive symptoms. Furthermore, corumination was associated with greater engagement in social networking activities. Depressive rumination was associated with more negative and fewer positive social networking interactions and with feeling more depressed after social networking interactions. Taken together, these findings indicate that the tendency to ruminate, either alone or with friends, gets played out in the context of social interactions that do not involve face-to-face or even verbal interaction. That people high on depressive rumination have more negative social networking interactions and feel more depressed following those interactions is consistent with existing literature on rumination, interpersonal problems, and depression (Nolen-Hoeksema et al., 2008). Importantly, there has been considerably less research on corumination compared to depressive rumination and, as such, the present findings have implications for the corumination literature. First, that greater corumination is associated with greater engagement in social networking activities provides validity to the idea that people high on corumination engage in excessive and repeated discussion of problems (Rose, 2002). Indeed, online and text based social networking may function as another vehicle for coruminating. This is an idea in which the popular media has had much interest (e.g., Kershaw, 2008), and this study is the first to document its occurrence. Second, that greater corumination was, in Study 1, associated with feeling more depressed after social networking interactions adds validity to the idea that people high on corumination are at risk for internalizing symptoms as a function of their corumination (Rose, 2002). This finding would need to be further replicated, as it did not emerge in Study 2. Third, although corumination is typically associated with positive friendship experiences, our data from Study 1 suggest that it also can be associated with negative interactions, at least during social networking. This finding also did not emerge in Study 2 and, hence, requires replication.

The present study was able to address a number of important gaps in the literature and to do so with two fairly large samples of males and female subjects at a developmental stage where they are active and frequent users of social networking and also at increasing risk for depression (at least among female subjects; e.g., Kessler et al., 2001; Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 1993; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002). The results both replicated expected findings and extended the literature in a variety of ways, including being among the first to examine the role of rumination, particularly corumination in social networking, as well as being among the first to examine associations with text messaging. Regarding the latter, text messaging showed associations similar to online social networking. Indeed, all forms of social networking had similar associations with depressive symptoms and the rumination variables, suggesting they serve similar functions.

Limitations

Of course, the studies had a number of limitations that must be considered when interpreting the findings. We have largely considered depressive symptoms as an outcome in our conceptualization, and the data from Study 2 support this. Future longitudinal studies are needed to ascertain whether depressive symptoms are also a predictor of social networking experiences, and we suspect they may function as both a predictor and a consequence. Indeed, the larger literature on depression and interpersonal functioning would suggest a bidirectional association (e.g., Davila, Karney, Bradbury, & Hall, 2003; see Joiner & Timmons, 2009). We also relied on self-report data, which renders findings vulnerable to

method variance problems. Similarly, the social networking survey, which was developed for this study, relies on self-report, and we did not collect any objective data with which to validate reports of frequency and quality of social networking. We also did not assess the exact nature of participants' positive and negative interactions, and we used different measures of depressive symptoms in the two studies, which may account for differences in results. In addition, findings may not generalize to other age groups. Even though we studied a salient age, studying younger people, particularly early and middle adolescents who also are active social networkers, may shed light on risk processes earlier in development. Also, because we focused on depressive symptoms, we did not examine the ways in which social networking might be useful and/or have positive outcomes for young people. The adaptive functions of social networking are equally important to identify. Finally, although the findings across the two studies were quite consistent, the effect sizes were small.

Conclusions

Despite limitations, the results of the study contribute to understanding of the circumstances that make social networking more likely to occur and more likely to include negative interactions and negative affect. This is important because, as alluded to earlier, the public has been very interested in whether social networking can be a breeding ground for depression. Also, the public, particularly parents and school personnel, should be interested in this question. The answer, fortunately, does not appear to be an across-the-board "yes." In fact, with regard to frequency of social networking, the answer appears to be "no"—more frequent usage is not associated with depressive symptoms. More negative interactions while social networking, are, however, like negative social interactions in general, associated with increases in depressive symptoms over time. Therefore, social networking may serve as a salient venue in which youth experience the depressogenic effects of poor quality relationships. In addition, there is some tentative evidence that some young people may be more at-risk than others. In particular, those young people who are prone to greater depressive rumination may be more likely to experience depressive symptoms in the context of negative social networking interactions, although this possibility will need to be further examined in future research. Also, young people prone to greater depressive rumination (and perhaps greater corumination) may tend to feel more depressed following social networking interactions. These findings lend support to such rumination behaviors as potential targets of intervention that may reduce risk for depression. We hope that future research will continue to identify the individual and contextual circumstances that increase risk for depression or promote positive social experiences and well being in this salient and highly utilized venue for interpersonal relating.

Acknowledgments

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Table 1

Means and Standard Deviations for Social Networking Variables, Rumination Variables, and Depressive Symptoms in Study 1 and Study 2

Variable	*M* (*SD*)	*M* (*SD*)
Number of times/day checking FB/MS	6.06 (8.77)	6.61 (7.97)
Total minutes/day using FB/MS	109.44 (127.84)	73.27 (82.44)
Total minutes/day interacting FB/MS	73.41 (97.95)	47.97 (59.25)
Total minutes/day IMing	109.30 (152.73)	74.09 (101.15)
Total minutes/day texting	205.50 (288.31)	134.85 (236.67)
Corumination	77.94 (22.39)	78.32 (23.65)
Depressive rumination	51.65 (14.90)	49.87 (14.41)
Depressive symptoms at baseline[a]	11.74 (9.84)	16.00 (10.73)
Depressive symptoms at follow-up	—	15.89 (11.16)
Level of positivity across all interactions	5.62 (.84)	5.61 (0.89)
Level of positivity of friend interactions	—	6.02 (0.98)
Level of positivity of romantic interactions	—	5.58 (1.17)
Level of negativity across all interactions	2.05 (.85)	2.12 (0.83)
Level of negativity of friend interactions	—	1.78 (0.81)
Level of negativity of romantic interactions	—	2.30 (1.13)
Feeling down or depressed across all interactions	2.08 (.98)	1.97 (0.93)
Feeling down or depressed after friend interactions	—	1.74 (0.90)
Feeling down or depressed after romantic interactions	—	2.19 (1.34)

Note. Study 1 did not discriminate among general, friend, and romantic interactions and therefore, data cannot be reported for those variables. FB/MS = Facebook/My Space; IMing = instant messaging.

[a]Depressive symptoms were assessed with the Beck Depression Inventory–Second Edition in Study 1 and the Center for Epidemiologic Studies Depression Scale in Study 2.

Table 2

Correlations Among Social Networking Usage Variables in Study 1 and Study 2

Variable	Variable				
	1	2	3	4	5
1. Number of times/day checking FB/MS	—	.34***	.25***	.05	.05
2. Total minutes/day using FB/MS	.38***	—	.71***	.18**	.33***
3. Total minutes/day interacting FB/MS	.27***	.55***	—	.12	.27***
4. Total minutes/day IMing	.28***	.31***	.17**	—	.21**
5. Total minutes/day texting	.15**	.45***	.29***	.14*	—

Note. Study 1 correlations are shown below the diagonal and Study 2 correlations are shown above the diagonal. FB/MS = Facebook/My Space; IMing = instant messaging.

*
p .05.

**
p .01.

***
p .001 (two-tailed).

Table 3

Correlations Among Quality of Social Networking Interactions Variables in Study 1 and Study 2

Variable	Variable								
	1	2	3	4	5	6	7	8	9
1. Level of positivity across all interactions	—	.76***	.57***	−.48***	−.38***	−.27***	−.29***	−.32**	−.20**
2. Level of positivity of friend interactions	—	—	.57***	−.42***	−.43***	−.18**	−.32***	−.32***	−.18**
3. Level of positivity of romantic interactions	—	—	—	−.37***	−.32***	−.52***	−.39***	−.41***	−.47***
4. Level of negativity across all interactions	−.51***	—	—	—	.69***	.48***	.49***	.42**	.35***
5. Level of negativity of friend interactions	—	—	—	—	—	.46***	.51***	.55***	.38***
6. Level of negativity of romantic interactions	—	—	—	—	—	—	.45***	.42***	.73***
7. Feeling down or depressed across all interactions	−.33***	—	—	.60***	—	—	—	.76***	.66***
8. Feeling down or depressed after friend interactions	—	—	—	—	—	—	—	—	.61***
9. Feeling down or depressed after romantic interactions	—	—	—	—	—	—	—	—	—

Note. Study 1 correlations are shown below the diagonal and Study 2 correlations are shown above the diagonal. Study 1 did not discriminate among general, friend, and romantic interactions and therefore, data cannot be reported for those variables.

*
  $p < .05$.

**
  $p < .01$.

***
  $p < .001$ (two-tailed).

Table 4

Correlations Among Rumination Variables and Depressive Symptoms in Study 1 and Study 2

Variable	Variable			
	1	2	3	4
1. Depressive symptoms at baseline	—	.16**	.56***	.65***
2. Corumination	.22***	—	.19***	.10
3. Depressive rumination	.59***	.35***	—	.49***
4. Depressive symptoms at follow-up	—	—	—	—

Note. Study 1 correlations are shown below the diagonal and Study 2 correlations are shown above the diagonal.

*
p .05.

**
p .01.

***
p .001 (two-tailed).

Table 5

Correlations Between Social Networking Use, Quality of Social Networking Experiences, Rumination Variables, and Depressive Symptoms in Study 1 and Study 2

Variable	Study 1[a]			Study 2			
	Depressive symptoms	Corumination	Depressive rumination	Depressive symptoms at baseline	Depressive symptoms at follow-up	Corumination	Depressive rumination
Number of times/day checking FB	.13	.14**	.12	.03	−.01	.02	.00
Total minutes/day using FB	.03	.16**	.13	.14	.08	.19***	−.02
Total minutes/day interacting FB	.01	.18***	.07	.08	.06	.17**	−.02
Total minutes/day IMing	.00	.03	−.02	−.02	.01	.20**	.04
Total minutes/day texting	.04	.16**	.02	.02	−.09	.11	−.10
Level of positivity across all interactions	−.12	−.02	−.23***	−.17**	−.30***	.06	−.17**
Level of positivity of friend interactions	—	—	—	−.23***	−.35***	.11	−.18***
Level of positivity of romantic interactions	—	—	—	−.28***	−.38***	.01	−.28***
Level of negativity across all interactions	.15**	.18***	.20***	.22***	.30***	−.01	.21***
Level of negativity of friend interactions	—	—	—	.24***	.31***	−.03	.21***
Level of negativity of romantic interactions	—	—	—	.21***	.29***	.00	.28***
Feeling down or depressed across all interactions	.25***	.19***	.35***	.28***	.29***	.05	.34***
Feeling down or depressed after friend interactions	—	—	—	.27***	.33***	.07	.31***
Feeling down or depressed after romantic interactions	—	—	—	.32***	.36***	.08	.38***

Notes. FB = Facebook; IMing = instant messaging.

[a] Study 1 did not discriminate among general, friend, and romantic interactions, and therefore, data cannot be reported for those variables.

** p .01.

*** p .001 (two-tailed).

Table 6

Hierarchical Regression Analyses Predicting Depressive Symptoms at Follow-Up From Social Networking Usage and Quality of Interactions Variables

Variable	b	B	t	Overall R^2	F
Level of positivity across all interactions	−2.58	−.20	−4.56***	.46	123.05***
Depressive symptoms at baseline	.64	.62	14.08***		
Level of negativity across all interactions	2.17	.16	3.57***	.45	116.06***
Depressive symptoms at baseline	.64	.61	13.67***		
Level of positivity of friend interactions	−2.62	−.22	−4.91***	.47	125.91***
Depressive symptoms at baseline	.62	.60	13.60***		
Level of negativity of friend interactions	2.27	.17	3.68***	.45	116.77***
Depressive symptoms at baseline	.63	.61	13.55***		
Level of positivity of romantic interactions	−2.01	−.22	−4.19***	.45	88.67***
Depressive symptoms at baseline	.58	.58	11.01***		
Level of negativity of romantic interactions	1.48	.15	2.85**	.43	80.77***
Depressive Symptoms at Baseline	.61	.60	11.38***		

Note. b = unstandardized regression coefficient; *B* = standardized regression coefficient.

**
p .01.

***
p .001 (two-tailed).