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The Impact of Daily Stress on Adolescents' Depressed Mood: The Role of Social Support

Seeking through Facebook

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Abstract

This study examined relationships among daily stress (i.e., school- and family-related stress), social support seeking through Facebook, perceived social support through Facebook, and depressed mood among adolescents ($N = 910$). Structural equation modeling showed that daily stress positively predicted adolescents' seeking of social support through Facebook. In addition, when social support was sought on Facebook and subsequently perceived, social support seeking through Facebook *decreased* adolescents' depressed mood. However, when social support was sought on Facebook, but not perceived, social support seeking through Facebook *increased* adolescents' depressed mood. When comparing these relationships with similar relationships in a traditional social support context, results showed that the exacerbating impact of social support seeking on depressed mood exclusively transpires in a social networking site context. The discussion focuses on the understanding and explanation of these findings, and directions for future research.

Keywords: adolescence, daily stress, social support seeking through Facebook, perceived social support through Facebook, depressed mood

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1. Introduction

Adolescence is a critical period for depression. Prevalence rates significantly increase among young people (Abela & Hankin, 2008); major depressive disorder is present in 2-5% of the adolescents (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). A precursor to major depressive disorder is depressed mood, which refers to the presence of sad and unhappy feelings (e.g., feeling 'blue' or hopeless) (Petersen et al., 1993). Community prevalence rates for depressive symptoms, including depressed mood, were observed to be 18.2% for early adolescents (Saluja et al., 2004) and 28.6% for seventh to 12th grade students (Rushton, Forcier, & Schechtman, 2002). Depression during adolescence has been associated with a greater risk for suicide attempts (e.g., Vander Stoep et al., 2011). Furthermore, adolescent depression may also accompany other problems, such as academic failure (e.g., Fröjd et al., 2008) and substance abuse (e.g., Chaiton, Cohen, O'Loughlin, & Rehm, 2009) and is related to depression later in life (e.g., Copeland, Shanahan, Costello, & Angold, 2009). Given this high prevalence and the relationship between depressive symptoms and clinical depression, it is critical to identify factors that may affect the development of depressive symptoms among young people.

Complex factors contribute to adolescents' depressed mood, including stress (Grant, Compas, Thurm, McMahon, & Gipson, 2004). Various longitudinal studies have found that stress predicted the development of adolescents' depressive symptoms (e.g., Cole, Nolen-Hoeksema, Girgus, & Paul, 2006; Ge, Conger, & Elder, 2001; Hankin, 2008; Meadows, Brown, & Elder, 2006). According to Lazarus and Folkman (1984), stress occurs when an individual perceives a situation as threatening, challenging, or harmful and does not have an appropriate coping response. Especially young people experience substantial levels of stress

in their daily lives, partly due to the various changes that are typical for this developmental period (Arnett, 1999). Although several studies have used a global measure to assess adolescents' level of perceived stress (e.g., Ge et al., 2001), scholars specifically argue that domain-specific stress predicts adolescents' depressive symptoms (e.g., Kendler et al., 2001). The most common everyday hassles, which affect a considerable number of adolescents, are related to school (e.g., academic failure) and interpersonal relationships (e.g., conflicts with parents) (Boldero & Fallon, 1995; Donaldson, Prinstein, Danovsky, & Spirito, 2000; Seiffge-Krenke, 2001; Williamson et al., 2003).

The way in which adolescents cope or respond to these stressors may be of critical importance for their well-being (Seiffge-Krenke, 1995). The cognitive appraisal theory of stress and coping (Lazarus & Folkman, 1984) argues that coping is an active, purposeful process, by which an individual responds to stimuli appraised as taxing or exceeding his or her resources. When facing a stressful situation, individuals can rely on a wide range of coping strategies (Compas et al., 2001), which are behavioral, emotional or cognitive attempts to manage stressful situations (Thoits, 1995). Roth and Cohen (1986) have dichotomized coping strategies into two fundamental types. Approach or active coping refers to direct attempts to change a stressful situation, for instance, by seeking social support, whereas avoidant coping consists of strategies to manage cognitive or emotional reactions that are oriented away from the source of stress (e.g., withdrawal). Similarly, other scholars have distinguished between problem-focused and emotion-focused coping (Lazarus & Folkman, 1984) and functional and dysfunctional coping (Seiffge-Krenke, 1995).

Regardless of which classification is used, all include social support seeking as an adaptive mode of coping with stress. Social support refers to social interaction through which emotional concerns, instrumental aid, or information is expressed, perceived or received (Dunkel-Schetter & Brooks, 2009) and can be considered as a multidimensional construct,

referring to multiple sources (e.g., family, friends, special person) and multiple types (e.g., emotional, instrumental, informational, appraisal) (Malecki & Demaray, 2002). The present study focuses on emotional social support, which is "information leading the subject to believe that he is cared for and loved … esteemed and valued … and belongs to a network of communication and mutual obligation" (Cobb, 1976, p. 300).

Social support seeking has been shown to be a frequently used active coping strategy in adolescence; especially the direct seeking of emotional support from friends and other peers increases from childhood to adolescence (Zimmer-Gembeck & Skinner, 2011). This social support seeking has been associated with a number of positive health outcomes (e.g., Clarke, 2006; Compas et al., 2001; Fields & Prinz, 1997). For instance, a recent longitudinal study demonstrated that social support seeking positively predicted adolescents' global life satisfaction (Saha, Huebner, Hills, Malone, & Valois, 2014). In addition, Murberg and Bru (2005) demonstrated a mitigating impact of seeking support on adolescents' depressive symptoms.

1.1. Present Study

Although several studies have demonstrated that traditional social support seeking protects adolescents against the harmful impact of stress on the development of depressive symptoms (e.g., Murberg & Bru, 2005), no study has yet looked at the role of social support seeking through social networking sites (SNSs) in this process. For contemporary adolescents, however, the notion of seeking social support may have significantly changed due to the emergence of SNSs. Given the growing importance of SNSs, such as Facebook, it could be hypothesized that Facebook has become an important tool for adolescents' social support seeking. More than 81% of adolescents aged 12 to 17 years uses SNSs and 94% of these users has a Facebook account (Madden, 2013), thus providing adolescents with a new type of peer relationships and increased access to their peers. Therefore, the current study

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examines the role of social support seeking through Facebook, as a potential new platform for coping, within the relationship between stress and adolescents' depressed mood.

Earlier work on this topic has mainly focused on coping with major life events, such as suffering from cancer, through participation in specific online support groups (e.g., Beaudoin & Tao, 2007; Wright & Bell, 2003). Much less is however known about coping with everyday hassles in more general types of online social networks, such as Facebook. The present study aims to fill this gap of critical knowledge by exploring the impact of social support seeking through Facebook among adolescents who are confronted with school –and family-related stress. If the relationships reported in previous research also tend to occur in this broader context, this would imply a significant expansion of the focus of this field of research.

1.2. Facebook context

1.2.1 Social Support Seeking through Facebook

SNSs are perceived to have the capacity to facilitate supportive interaction among young users. College students list social support seeking (Kim, Sohn, & Choi, 2001), companionship support (Papacharissi & Mendelson, 2011) and socializing (Park, Kee, & Valenzuela, 2009) as primary reasons for using SNSs. Content analyses confirm that students make use of Facebook to display stress references and symptoms of depression. Allusions to stress were displayed in 37% of the Facebook profiles (Egan & Moreno, 2011) and 25% of Facebook profiles contained suggestions of depressive symptoms (Moreno et al., 2011). Hampton et al. (2011) added that Facebook users did experience higher levels of social support compared with other Internet users, demonstrating that individuals do perceive social support from their online social network. Other studies have described a positive relationship between the number of Facebook friends and college students' perceptions of social support (Nabi, Prestin, & So, 2013), social support on Facebook (Manago, Taylor, & Greenfield,

2012) and companionship support (Oh, Ozkaya, & LaRose, 2014), suggesting that SNSs

offer an additional platform for adolescent social support seekers.

Consistent with these perceptions, most previous studies on seeking online support

have argued that the Internet facilitates social support. They have reached this conclusion by

focusing on access to online support groups (Eastin & LaRose, 2005; Tichon & Shapiro,

2003; Wright, 2000), which are "electronic venues in which people post topical threads

regarding the issues associated with different stressors" (High & Solomon, 2011, p. 124).

This online support seeking by, for instance, cancer patients, however, clearly differs from

online support seeking by adolescents through Facebook. Whereas online support groups

consist of weak ties between people who face similar problems (Granovetter, 1973), an

adolescent's Facebook network consists of strong(er) ties. Friends become increasingly

important during adolescence (e.g., Scholte & Van Aken, 2006) and adolescents frequently

discuss personal problems with them (e.g., Stone, Hankin, Gibb, & Abela, 2011), resulting in

increased perceptions of social support from friends (e.g., Helsen, Vollebergh, & Meeus,

2000) and more reliance on SNSs when social support is needed (e.g., Papacharissi &

Mendelson, 2011; Park, Kee, & Valenzuela, 2009). Furthermore, while online support groups

are characterized by a high level of anonymity, members of SNSs are not anonymous (e.g.,

High & Solomon, 2011). As adolescents mainly turn to people who they known when social

support is needed (e.g., Colarossi & Eccles, 2003), SNSs may thus provide an appealing

context for social support seeking adolescents. In addition, while members of online support

groups see others as very similar to themselves, users of SNSs are more heterogeneous (e.g.,

High & Solomon, 2011). Depending on the type of problem (e.g., problem at school), SNSs

thus offer the possibility to interact both with friends who are aware of the problem (e.g.,

classmates), as well as with friends who are unrelated to the problem.

SNSs, in particular Facebook, may thus offer their users a unique context for seeking social support, different from previous online support contexts, such as online support groups, but perhaps also different from a traditional face-to-face context. Based on indications in the literature (e.g., Bryant, Marmo, & Ramirez, 2011; Spies Shapiro & Margolin, 2013), it can even be argued that social support seeking adolescents may be more attracted to a SNS context than to a face-to-face context. For instance, in comparison to a face-to-face context, social support needs may be more easily expressed in a SNS context, as Facebook functions, such as status updating or instant messaging, facilitate the sharing of social support needs. Also, compared to face-to-face settings, SNSs offer social support seekers the possibility to interact with numerous peers and friends, which may result in a wide range of diverse feedback. In addition, in contrast to a face-to-face context, social support needs may be expressed anyplace, anytime through SNSs, as seeking social support through SNSs is independent of time and place.

The literature thus provides evidence that SNSs may offer a unique setting for adolescents who are seeking social support, different from previous settings of online support seeking and traditional face-to-face settings. The question then arises whether this supportive interaction through SNSs is capable of taking over the positive and protective function of face-to-face social support seeking in the relationship between stress and depressed mood. We will aim at answering this question by testing a model that integrates four hypotheses, i.e. hypotheses on the relationship between stress and seeking social support through Facebook (H1), on the direct relationship between seeking Facebook support and depressive symptoms (H2), and on the indirect relationship between seeking social support through Facebook and depressed mood via perceived social support through Facebook (H3-4).

1.2.2. Stress, Social Support Seeking through Facebook and Adolescents' Depressed Mood

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Although evidence has shown that stress exposure predicts adolescents' social support seeking (e.g., Galaif et al., 2003), few studies have examined this relationship in a SNS context (e.g., Oh, Lauckner, Boehmer, Fewins-Bliss, & Li, 2013). Only Oh et al. (2013) argued that Facebook may be an adequate tool for coping with health concerns, showing that distressed individuals actively seek social support from close connections via SNSs. However, no studies, to date, have specifically examined the link between adolescents facing school- and family-related stress, the most common everyday hassles (Williamson et al., 2003), and social support seeking through Facebook.

The hypothesis that daily stress (i.e., school- and family-related stress) leads to adolescents' social support seeking through Facebook relies on *optimal matching theory* (Cutrona & Russell, 1990), which argues that certain types of social support may be most effective when matched with specific types of stress. Applying the premises of this theory to the relationship between stress and social support seeking, adolescents faced with school- and family-related stress may search for social support among peers that are in similar situations. Given the fact that SNSs are widely used among adolescents (e.g., Madden, 2013) to communicate with friends and peers from the offline world (e.g., Pempek, Yermolayeva, & Calvert, 2009; Reich, Subrahmanyam, & Espinoza, 2012) and to express feelings of stress (Egan & Moreno, 2011), adolescents seeking social support may be most likely to find the best match for coping with daily stress on SNSs. Therefore, the following hypothesis is proposed:

H1: School- and family-related stress will positively predict adolescents' social support seeking through Facebook.

Various studies have demonstrated a positive relationship between social support seeking and adolescents' well-being (e.g., Clarke, 2006; Compas et al., 2001; Fields & Prinz, 1997; Murberg & Bru, 2005; Saha et al., 2014), as well as a prosperous impact of social

support seeking in the context of an online support group on individuals' levels of stress (e.g., Rains & Young, 2009). Despite this evidence, little attention has been paid to the existence and direction of this relationship in a more general type of online social network context, such as Facebook.

However, given that SNSs clearly differ from online social support groups and face-to-face settings, social support seeking through Facebook may not necessarily produce similar effects on adolescents' well-being. Literature even suggests to expect the opposite and to hypothesize that social support seeking through Facebook leads to an *increase* of adolescents' depressed mood, for three reasons. First, because computer-mediated communication may be less effective in stress reduction. According to *hyperpersonal communication theory*, computer-mediated communication may be characterized by a reduction in contextual, visual and auditory cues, and an almost entire elimination of non-verbal cues (Walther, 1996). As a consequence, and specifically with respect to social support seeking, computer-mediated communication may be less successful compared to face-to-face communication, since contextual, visual, auditory and non-verbal cues are especially important when seeking emotional support. Thus, although reduced cues in the context of computer-mediated communication have been shown to stimulate individuals' self-disclosure, reduced cues may also lack the expression and direct contact that are important for social support to be effective.

Second, although various studies have frequently underlined the positive consequences of computer-mediated communication, several scholars have warned for adverse effects of this type of communication. For instance, while SNSs are important communication tools for adolescents' social interaction and provide many possibilities for adolescents' development (e.g., identity exploration), they are also often platforms for negative behavior (e.g., Lenhart et al., 2011) and bullying (e.g., Kwan & Skoric, 2012). For instance, 88% of social media-using teens have witnessed other people be mean or cruel on SNSs, with 15% of these teens

confirming they have been the target of online meanness (Lenhart et al., 2011). Kwan and Scoric (2013) added that Facebook bullying seemed to be relatively common among adolescents: 59.4% experienced at least one form of bullying in the past year, whereas 56.9% engaged in at least one form of Facebook bullying.

Third, research has shown that adolescent Facebook users have an average of 400 Facebook friends (e.g., Kim & Lee, 2011; Kim, Sohn, & Choi, 2011; Manago et al., 2012). The relative amount of close Facebook friends (i.e., strong ties) is therefore likely to be much lower than the amount of weaker Facebook friends. Facebook thus being a context in which Facebook friends are more likely not to provide support than to give social support corresponds to Stefanone, Kwon, and Lackaff's (2012) finding that 80% of the observed requests for instrumental help on Facebook went unanswered. Therefore, although social support may be frequently sought on Facebook, these requests may often remain unanswered. Based on these suggestions, we hypothesize that:

H2: Social support seeking through Facebook will positively predict adolescents' depressed mood.

1.2.3. The Role of Perceived Social Support

Seeking social support is likely to relate to the perception of having received social support. While social support seeking refers to a coping strategy, perceived social support can be considered as a coping resource or "a social fund from which people may draw when handling stressors" (Thoits, 1995, p. 64). Scholars have argued that the relationship between the two concepts in a traditional, offline context is strong, as social support would only be perceived when it is sought; emotional social support can only be acquired through active and intentional seeking. Individuals must thus express a need for social support in order to perceive social support from others in their network (Cicognani, 2011).

A similar positive relationship between social support seeking through Facebook and adolescents' perceptions of social support through Facebook can be expected. Oh et al. (2013) confirmed that health-related social support seeking through Facebook was significantly associated with perceived emotional support. Based on this and similar research we hypothesize that:

H3: Social support seeking through Facebook will positively predict adolescents' perceived social support through Facebook.

In turn, *the direct or main-effects hypothesis* (Cohen & Wills, 1985) predicts that this perceived social support (through Facebook) reduces adolescents' depressed mood. This hypothesis posits that there is a direct relationship between perceived social support and well-being, independent of the experienced amount of stress. In line with this hypothesis, perceived social support has repeatedly proven to be a strong predictor of adolescents' well-being, both in an offline (e.g., Chu, Saucier, & Hafner, 2010; Nilsen et al. 2013; Wight, Botticello, & Aneshensel, 2006) and online (e.g., Oh et al., 2014; Wright, 2012) context. For instance, Oh et al. (2014) found empirical evidence for a positive relationship between perceived social support from Facebook friends and life satisfaction. Therefore, the following hypothesis is proposed:

H4: Perceived social support through Facebook will negatively predict adolescents' depressed mood.

In sum, we hypothesize that when social support is sought on Facebook, but not perceived, it will *directly increase* adolescents' depressed mood, whereas when social support is sought on Facebook and subsequently perceived, it will *indirectly decrease* adolescents' depressed mood. These hypotheses are shown in figure 1.

[Figure 1 about here]

1.3. Traditional Social Support Context

Based on indications in the literature (e.g., Chan, 2012; Chu et al., 2010; Cicognani, 2011; Galaif et al., 2003), we argue that some of our abovementioned hypothesized relationships are similar in a traditional social support context, while others are dependent on the type of social support context. To test this claim, the relationships between daily stress, social support seeking, perceived social support and adolescents' depressed mood will be examined in a traditional social support seeking context and integrated in our hypothesized online model.

More specifically, on the one hand, we expect that, similar to the Facebook context, when social support is sought in a traditional social support context, and subsequently perceived, it will *indirectly decrease* adolescents' depressed mood. Previous studies have found support for a positive association between stress and social support seeking among adolescents (e.g., Galaif et al., 2003). In addition, research has shown that social support seeking has been associated with increased adolescents' perceptions of social support (Cicognani, 2011), and perceived social support in turn has been shown to increase adolescents' well-being (e.g., Chu et al., 2010; Nilsen et al., 2012; Wight et al., 2006).

On the other hand, we expect that, different from the Facebook context, when social support is sought in a traditional social support context, but not perceived, it will *directly decrease* adolescents' depressed mood. Several qualitative reviews have reported positive associations between active coping and adolescents' health (Compas et al., 2001; Fields & Prinz, 1997). For instance, Compas et al. (2001) showed that problem-focused coping was consistently related with healthy functioning. Consistent with these conclusions, a quantitative meta-analysis by Clarke (2006) found support for a small, but positive relationship between active coping and adolescents' psychosocial functioning. In addition, Chan (2012) found that seeking social support decreased adolescents' depressive mood.

In sum, to test our claim that social support seeking will indirectly decrease adolescents' depressed mood, regardless of the type of context, while the direct impact of social support seeking on adolescents' depressed mood is assumed to be dependent on the type of context, the proposed pathways will be examined in a traditional offline context and integrated in our hypothesized model. This additional model is presented in figure 2.

[Figure 2 about here]

2. Method

2.1. Sample

A quantitative survey study was conducted in Spring 2013 at 18 high schools. Data were gathered through a two-step sampling method. First, we targeted schools in different parts of Flanders, Belgium. Second, the 18 selected schools were visited. The pupils who were present at the time of the researchers' visit were asked to complete a pencil-and-paper survey. Respondents were informed that the goal of the study was to investigate their leisure habits and were assured that all answers would be treated anonymously. Approval for the survey was received from the institutional review board of the host university. As is customary in Belgium, informed consent was obtained from the school head.

A total of 910 pupils with a mean age of 15.44 years ($SD = 1.71$) completed the survey. The sample consisted of 51.9% girls. On average, the majority of the parents obtained a professional or academic college degree (76.2%), 20.7% of the parents had graduated from secondary school and 3.1% had an elementary school degree or no degree. The majority of the respondents (96.1%) were born in Belgium, 1.8% in Europe and 2.1% in a non-European country.

2.2. Measures

Control variables. Participants responded to questions about gender, age, educational level of the parents and country of origin.

Stress. School- and family-related stress were assessed using The Adolescent Stress Questionnaire (ASQ) (Byrne, Davenport, & Mazanov, 2007). Items were rated on a 5-point scale, ranging from *not at all stressful (or is irrelevant to me)* (= 1) to *very stressful* (= 5) and reflect nine stress domains. Two stress dimensions were included in the present study. In the *Stress of School Performance* subscale respondents evaluated seven items, such as "How stressful do you find having to study things you do not understand" and "How stressful do you find teachers expecting too much from you". In the *Stress of Home Life* subscale respondents evaluated 12 statements, such as "How stressful do you find arguments at home" and "How stressful do you find disagreements between your parents."

Given that school- and family-related stress are two subdimensions of the Adolescent Stress Questionnaire, we tested whether these two dimensions may be explained by one general factor (i.e., daily stress). More specifically, we conducted a second-order confirmatory factor analysis in AMOS. Following Byrne (2010), we allowed error covariances among the observed items within the same subscale. The items with a factor loading < .40 were excluded from the model, resulting in a 13 item scale. The chi-square-squared-to-degrees-of-freedom ratio (χ^2/df), the root mean square error of approximation (RMSEA) and the comparative fit index (CFI) were estimated to determine the model fit (Byrne, 2010). Results showed that the model fit statistics indicated an adequate fit for the measurement model: χ^2 (59), 4.099, $p < .001$, *CFI* = .959, *RMSEA* =.059. The two subscales thus reflect one underlying construct, i.e., daily stress. Furthermore, a reliability analysis showed a Cronbach's alpha of .86.

Social Support Seeking through Facebook. We operationalized this construct with two items, which both started with: "If you are feeling down or in a difficult situation …". The items were: "I turn to Facebook to seek help" and "I turn to Facebook to talk with

someone about my problems" ($r = .90$; $p < .001$). Response categories ranged from *strongly disagree* (= 1) to *strongly agree* (= 5).

Social Support Seeking. Using a five-point scale rang from *strongly disagree* (= 1) to *strongly agree* (= 5), the respondents evaluated following two items: "If you are feeling down or in a difficult situation …" (1) "I turn to my friends to seek help" and (2) "I turn to my friends to talk about my problems" ($r = .86$; $p < .001$).

Perceived Social Support through Facebook. Respondents' perception of social support through Facebook was assessed using an adapted version of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). More specifically, the items of the family subscale were adapted by phrasing them in terms of perceived social support through Facebook. Using a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*), respondents evaluated four items which started with: "When you are feeling down or in a difficult situation …". The items were: (1) "I can find help on Facebook", (2) "I can find the emotional help and support that I need on Facebook", (3) "I can talk with someone on Facebook about my problems" and (4) "I can find someone on Facebook that helps me take decisions". The Cronbach's alpha in this study was .95.

Perceived Social Support. On a five-point scale ranging from *strongly disagree* (= 1) to *strongly agree* (= 5), the respondents evaluated the items of the friends subscale of the MSPSS (Zimet et al., 1988). All the four items started with: "When you are feeling down or in a difficult situation …": The items were: (1) "My friends really try to help me", (2) "I can count on my friends when things go wrong", (3) "I have friends with whom I can share my joys and sorrows and (4) "I can talk about my problems with my friends" ($\alpha = .90$).

Depressed Mood. Respondents' level of depressed mood was assessed using five items from the Center for Epidemiological Studies Depression Scale for Children (CES-DC) (Radloff, 1991). Olsson and von Knorring (1997) examined the psychometric properties of

CES-DC in a Swedish adolescent sample and found support for a strong underlying factor, i.e., depressed mood. Therefore, on a 4-point scale (*Not at all* (= 1) − *A lot* (= 4)), respondents evaluated five statements. Examples of items are "During the past week I wasn't able to feel happy, even when my family or friends tried to help me feel better" and "During the past week I felt down and unhappy". Based on the average of the five items, a scale with a Cronbach's alpha of .84 was created.

2.3. Analysis

The hypothesized relationships were tested with structural equation modeling (AMOS), using maximum likelihood method. The chi-square-squared-to-degrees-of-freedom ratio (χ^2/df), the root mean square error of approximation (RMSEA), the adjusted goodness of fit index (AGFI) and the comparative fit index (CFI) were used to address the fit of the models (Byrne, 2010).

Furthermore, our models controlled for respondents' gender, age, educational level of the parents and country of origin by adding them as predictors for adolescents' level of stress (i.e., stress of school performance or stress of home life), social support seeking through Facebook, perceived social support through Facebook and depressed mood, and by allowing them to covariate with each other.

In addition, we used bootstrapping method to assess the significance of the indirect effects (Cheung & Lau, 2008). Multiple imputation was performed, since the bootstrapping method does not allow the sample to include missing values (Honaker & King, 2010). Moreover, we generate 1000 bootstrap samples from the dataset and estimate a 95% confidence interval (CI) for the indirect effects. When the CI does not include zero, the indirect effect can be said to significantly differ from zero.

3. Results

3.1. Preliminary Analyses

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Table 1 displays descriptive statistics for all relevant variables. Daily stress was found

to have a mean level of 3.25 (*SD* = .76), social support seeking through Facebook of 1.55 (*SD*

= .86), and perceived social support through Facebook of 2.11 (*SD* = 1.03). In addition, the

mean level of adolescents' depressed mood was 1.58 (*SD* = .62).

[Table 1 about here]

Zero-order inter-correlations among adolescents' level of daily stress, social support

seeking through Facebook, perceived social support through Facebook and depressed mood

are presented in Table 2.

[Table 2 about here]

The strength of the measurement model can be demonstrated through a measure of

discriminant validity (Hair, Black, Babin, Anderson, & Tatham, 2006). Discriminant validity

or the extent to which a latent variable discriminates from other conceptually distinct

constructs was assessed by comparing the correlation between the two constructs and the

respective square root of average variance extracted (AVE) (Fornell & Larcker, 1981). As

shown in table 3, the square root of AVE exceeded the construct's correlation with every

other construct, indicating that the constructs in the measurement model differ from each

other. The questions used in this study thus established sufficient discriminant validity.

[Table 3 about here]

3.2. Hypothesized Model

This model tested the relationships among daily stress (i.e., school- and family-related

stress), social support seeking, perceived social support, and adolescents' depressed mood in a

Facebook context. The model showed an adequate fit of the data and yielded a chi-square

value of 932.44 with 346 degrees of freedom, *p* < .001, RMSEA = .04; AGFI = .91; CFI =

.95; χ^2/df = 2.70. Concerning the fraction of variance explained (i.e., R-square), the results

indicated that social support seeking through Facebook had an R-square value of 2%,

perceived social support through Facebook reached an R-square value of 28%, and the final dependent construct (i.e., depressed mood) reached an R-square value of 12%.

First, a positive relationship between daily stress and adolescents' depressed mood, β = .26, B = .12, SE = .03, p < .001, was found. The model further indicated that daily stress positively predicted social support seeking through Facebook, β = .10, B = .13, SE = .06, p < .05, which in turn positively associated with adolescents' depressed mood, β = .13, B = .05, SE = .02, p < .01. The study's findings thereby confirm hypothesis 1 and 2. Furthermore, social support seeking through Facebook positively predicted adolescents' perceived social support through Facebook, β = .51, B = .58, SE = .04, p < .001, which in turn minimized adolescents' depressed mood, β = -.12, B = -.04, SE = .01, p < .01. Hypothesis 3 and 4 were thus confirmed. The results from a bootstrapping procedure (1000 samples, ML bootstrap, 95% CI) further revealed that the standardized indirect effect of social support seeking through Facebook on adolescents' depressed mood was mediated by perceived social support through Facebook, CI = [-.096, -.010], SE = .02, p < .05.

[Figure 3 about here]

3.3. Additional Model

This model tested the relationships among daily stress (i.e., school- and family-related stress), social support seeking, perceived social support, and adolescents' depressed mood, both in a Facebook context as well as in a traditional social support context. The model showed a good fit of the data and yielded a chi-square value of 1318.20 with 516 degrees of freedom, p < .001, RMSEA = .04; AGFI = .90; CFI = .95; χ^2/df = 2.56. Results indicated that depressed mood had an R-square value of 13%. The R-square values for social support seeking and perceived social support were respectively 7% and 36%, compared to 2% and 31% in the Facebook context.

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On the one hand, the relationships between social support seeking through Facebook, perceived social support and adolescents' depressed mood remained the same after including the offline pathways in the hypothesized model. On the other hand, regarding the offline relationships, results showed a positive relationship between daily stress and adolescents' depressed mood, $\beta = .24$, B = .11, SE = .03, $p < .001$. However, although the direction of these relationships were in line with our expectations, no support was found for a significant relationship between daily stress and adolescents' social support seeking ($p > .05$), nor between social support seeking and adolescents' depressed mood ($p > .05$). Furthermore, results showed that social support seeking positively predicted adolescents' perceived social support, $\beta = .57$, B = .42, SE = .02, $p < .001$, which in turn minimized adolescents' depressed mood, $\beta = -.10$, B = -.05, SE = .02, $p < .05$.

Thus, while social support seeking, both in a Facebook and traditional social support context, indirectly decreased adolescents' depressed mood via perceived social support, the direct impact of social support seeking on adolescents' depressed mood is dependent on the type of support context. More specifically, social support seeking through Facebook directly increased adolescents' depressed mood, whereas traditional social support seeking had no direct impact on adolescents' depressed mood.

[Figure 4 about here]

3.4. Additional Analyses

Gender Differences. Results showed that gender significantly influenced all relevant variables, with the exception of social support seeking through Facebook. Therefore, we decided to test with a multiple-group analysis whether the hypothesized model would be moderated by adolescents' gender. We compared the unconstrained model (i.e., model were the parameters were allowed to vary between the groups) with the constrained model (i.e., model were the parameters were constrained to be equal across the groups). Results showed

for both models that the unconstrained model significantly differed from the constrained model ($p < .05$). In addition, we conducted a path-by-path analysis to examine whether the hypothesized relationships were moderated by gender. More specifically, we compared the unconstrained model with each model where the hypothesized relationship was constrained to be equal across groups. Results showed that daily stress positively predicted *girls'* depressed mood, $\beta = .41$, B = .25, SE = .07, $p < .001$. This relationship was not found among boys *($p > .05$)*. Regarding the other hypothesized relationships, none of the differences were significant from zero ($p > .05$).

Separate Stressor Models. Although we had statistical evidence to consider the two stressors in this study as one latent concept, we have also run the models separately for school- and family-related stress. The findings of these separate analyses were similar to the findings in the combined model.

4. Discussion

Although various researchers have repeatedly highlighted the experience of stress as an important risk factor for the development of adolescents' depressed mood (e.g., Grant et al., 2004), this study is one of the first to look at the role of social support seeking through Facebook within this relationship. Our study aimed to explore whether daily stress predicted adolescents' social support seeking through Facebook, and whether this social support seeking, in turn, influenced adolescents' depressed mood. Furthermore, we examined the role of perceived social support through Facebook within the relationship between social support seeking through Facebook and adolescents' depressed mood. Taken together, the results provided support for the hypothesized model.

Moreover, the results of the present study offer three important contributions that can be used to guide future research. First, this study extends past research by examining the *direct* and *indirect* impact of adolescents' social support seeking through Facebook within the

relationship between daily stress and depressed mood. Exploring the possible distinction between direct and indirect relationships has shown that a combination of these relationships is needed in future research in order to fully understand the role of social support seeking through Facebook. Second, although prior research has assumed that traditional social support seeking is an adaptive coping strategy, enhancing adolescents' well-being, the present study shows that seeking social support through Facebook directly leads to negative outcomes, highlighting the need for future research to distinguish between social support seeking in a traditional context versus a SNS context. Third, this study provides insight into how adolescents' cope with daily stressors in a frequently used online social context, i.e., Facebook. Future research should continue examining the impact of online coping with everyday stressors through Facebook, as well as to start investigating the influence of online coping with other everyday stressors (e.g., peer-related stress) through other frequently used online social platforms (e.g., Twitter).

4.1. Hypothesized Model

This study reported a positive association between daily stress and adolescents' depressed mood, which was in line with a considerable amount of previous studies that already identified stress as an important predicting factor in adolescents' depressive symptoms (e.g., Cole et al., 2006; Ge et al., 2001; Hankin, 2008; Meadows et al., 2006). More specifically, daily stress increased *girls'* depressed mood, but not boys' depressed mood. This finding is in line with *the stress reactivity model* (e.g., Hankin & Abramson, 1999), which states that girls exhibit greater levels of depression than boys, as well as with various studies showing that girls, who are confronted with stress, react more strongly with depressive symptoms, compared to boys (e.g., Hankin, Mermelstein & Roesh, 2007).

The results further indicated a positive relationship between daily stress and social support seeking through Facebook (Hypothesis 1). This finding is in agreement with prior

studies that have investigated the relationship between stress and adolescents' social support seeking (e.g., Galaif et al., 2003) and can be explained by *optimal matching theory* (Cutrona & Russell, 1990), which suggest that certain types of social support may be most effective when matched with specific types of stress. However, these results extend past research by demonstrating that stress relates to social support seeking through Facebook in particular. As stated earlier, adolescence is an important developmental period, and adjustment to the biological, psychological and social changes that are typical for this period, can produce relatively high levels of stress (e.g., Arnett, 1999), which may lead to adverse mental health outcomes, including depression (e.g., Cole et al., 2006). Our findings suggest that when adolescents are confronted with problems at school or conflicts with their parents, they turn to Facebook for social support, which highlight the important role of SNSs as new platforms for social support seeking among adolescents. The ways in which adolescents cope or respond to their levels of stress have thus expanded to a SNS context.

Furthermore, results showed, in line with our second hypothesis, that social support seeking through Facebook increased adolescents' depressed mood. These findings offer unique evidence, suggesting that, within a general type of online social network context, such as Facebook, social support seeking adolescents are more likely to develop depressive symptoms. Online social support groups and face-to-face support settings thus clearly differ from SNSs for social support seeking, as the exacerbating role of social support seeking on depressed mood exclusively transpires in a SNS context.

In addition, results showed that social support seeking through Facebook positively predicted adolescents' perceived emotional support through Facebook (Hypothesis 3), which is in line with earlier findings (e.g., Oh et al., 2013). This finding has two important implications. On the one hand, our findings confirm that perceived emotional support through Facebook can be acquired through social support seeking through Facebook. In other

words, Facebook users that express a need for emotional support can perceive emotional

support from their Facebook friends. On the other hand, SNSs, in particular Facebook, may

be an effective online platform for seeking social support, as adolescents perceive through this

online platform what they are searching for. Thus it may be valuable for future research to

explore both the role of social support seeking, as well as the role of perceived emotional

support, in a SNS context, within the relationship between stress and adolescents' well-being.

The results further indicated that this perceived emotional support through Facebook

was predictive of a reduction in adolescents' depressed mood (Hypothesis 4). This finding is

consistent with *the direct or main effects hypothesis*, which argues that social support directly

affects individuals' well-being, independent of the experienced amount of stress (Cohen &

Wills, 1985), and is in line with similar research that examined the relationship between

perceived online social support and adolescents' well-being (e.g., Nabi et al., 2013; Oh et al.,

2014; Wright, 2012). Our results thus provide evidence that perceiving social support from

Facebook friends leads to similar positive outcomes as perceiving social support from real life

friends.

4.2. The Mediating Role of Perceived Social Support through Facebook

A mediation test examining a possible indirect mechanism revealed that perceived

emotional support through Facebook mediated the relationship between social support

seeking through Facebook and adolescents' depressed mood. Social support seeking through

Facebook only has a positive impact on adolescents' depressed mood through the perception

of available emotional support from Facebook friends. If adolescents lack this perception of

available support through Facebook, stress exposure even leads to an increase of adolescents'

depressed mood. These findings suggest that social support seeking through Facebook is not

sufficient to protect adolescents against the harmful impact of stress and are in line with *the*

optimal matching model, which argues that there has to be a match between the needs of the

support seekers and the resources provided by social support networks, in order to see a positive impact of social support seeking on adolescents' well-being (Cutrona & Russel, 1990). More specifically, according to the matching hypothesis, social support may only have a positive impact on adolescents' well-being, if the type of social support matches the demands of the support seeker. If one is seeking emotional support after experiencing stress, and he or she perceived that members of his or her support network have competently listened, expressed empathy, and acknowledged the severity of the issue, then this would be an example of an optimal match between the support seeker and support provider. For instance, perceiving emotional support from a Facebook friend when seeking emotional support on Facebook after facing problems at school, can be considered as an optimal match between the needs of the support seeker and the provided social resources. Optimal matches may lead to positive perceptions of support that is being offered, which in turn, may influence positive outcomes. However, this study shows that this match is not always optimal, and that in those circumstances the impact is rather negative than positive. It is only when social support seeking is supplemented with perceived social support that Facebook can be considered as a positive coping tool. If the condition of perceiving received social support is not met, the influence of social support seeking through Facebook is negative.

4.3 Traditional Social Support Context

To confirm our claim that the indirect impact of social support seeking on adolescents' depressed mood is similar in a Facebook context or traditional social support context, while the direct impact of social support seeking on adolescents' depressed mood is dependent on the type of context, the hypothesized relationships were further examined in a traditional social support context and integrated in the original hypothesized model.

More specifically, we expected that, regardless of the type of context, when social support is sought, and subsequently perceived, it will *indirectly* decrease adolescents'

depressed mood. On the one hand, although we expected a similar impact of daily stress on

adolescents' social support seeking through Facebook or face-to-face, results found no

support for a positive impact of daily stress on traditional social support seeking. This

finding, however, can be explained by optimal matching theory, which suggests that certain

types of social support (i.e., *online* social support seeking) may be most effective when

matched with specific types of stress (i.e., daily stress), whereas other types of social support

(i.e., *traditional* social support seeking) are less effective when matched with specific types of

stress (i.e., daily stress). Results hereby show that when adolescents are confronted with daily

stress, they turn to their Facebook friends when they are looking for social support. On the

other hand, similar to the Facebook context and in line with traditional social support

literature, results showed that when social support was sought, and subsequently perceived, it

indirectly decreased adolescents' depressed mood.

Second, we expected that the direct impact of social support seeking on adolescents'

depressed mood would be dependent on the type of social support context. However,

although the direction of this relationship was in line with what we expected, results found no

support for a significant impact of traditional social support seeking on adolescents' depressed

mood. Previous studies already argued that active coping strategies may exert a small, but

positive impact on adolescents' health (Clarke, 2006). When examining the impact of a

specific coping strategy, such as social support seeking, it is likely that the positive impact

may be too small to occur. In line with this suggestion, a recent study of Horwitz, Hill, and

King (2011) found that specific problem-focused coping strategies, such as social support

seeking did not independently predict lower levels of depression.

4.4. Limitations and Strengths

The findings of the present study are limited in some respects. A first limitation of

this study is its cross-sectional design, preventing us from drawing causal inferences

regarding the relationships among variables. Future experiments or longitudinal studies are

needed to examine the proposed temporal or causal order of these expected relationships.

Second, the present study was limited by the self-report method that was used to measure

adolescents' depressed mood. Future studies might benefit from using medical examination

reports for a more accurate measure of adolescents' depressed mood. In addition, although

the depressed mood subscale is reliable, it does not provide an indication for the severity or

chronicity of depression. Future research may include a measure of depression, instead of

depressed mood. Third, although previous studies have frequently reported that school and

family are prevalent stressors among adolescents, future research may examine other types of

stressors (e.g., peer-related stress) as indicator for daily stress, to examine whether social

support seeking and perceived social support may also protect adolescents' from their harmful

impact on depressed mood. Furthermore, since there are no standardized measures for

investigating adolescents' social support seeking through Facebook, the present study

developed a new measure. Although our scale is built on the social support seeking subscale

of the coping scale for children and youth (Brodzinsky et al., 1992), it includes only two items

to examine social support seeking in a Facebook context. Future research is needed to

examine the operationalization and validation of this measure. Lastly, although no large

effect sizes could be reported, the explained variance of adolescents' depressed mood is in

line with similar research examining the impact of online social support seeking and

perceiving on young people's depressed mood (Oh et al., 2013).

Taken together, our results revealed that a specific online social support context (e.g.,

Facebook) clearly differs from a traditional social support context and that perceiving online

social support is a necessary condition under which online social support seeking yields

positive health outcomes. These findings have important implications, not only for future

studies, but also for parents, educators, and practitioners interested in adolescents' social

media use for social support purposes.

We therefore recommend that scholars should pay greater attention to the differences

between an offline and online social support context, as well as further explore the important

role of perceived online social support within the relationship between online social support

seeking and adolescents' depressed mood. In addition, future research is needed to examine

potential mediating and moderating variables, such as adolescents' online feedback, to

provide a deeper understanding of the relationships between adolescents' stress, online social

support seeking, perceived online social support and depressed mood. We further recommend

that practitioners, parents and educators should be aware of the direct negative impact of

online social support seeking on adolescents' depressed mood, as well as of the important role

of perceived social support within this relationship and should stimulate adolescents'

perceptions of available support, as it provides the key to positive health outcomes in an

online support setting.

Perceived social support in an online context may be stimulated, first, through social

support seeking in a private Facebook setting, and, second, through the receiving of positive

online feedback. On the one hand, a private Facebook setting is believed to better fulfill the

needs of social support seekers, compared to a public Facebook setting, as a private Facebook

setting offers social support seekers the possibility to carefully select one or more social

support provider from their list of Facebook friends to interact in a confidential setting.

Practitioners should therefore draw social support seekers' attention to the differences

between each type of Facebook setting, as well as stimulate the use of a private Facebook

setting when social support is needed. On the other hand, adolescents' perceptions of social

support may be further stimulated through the receiving of positive feedback. Previous studies

have shown that positive Facebook feedback (e.g., Valkenburg, Peter, & Schouten, 2006)

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enhanced adolescents' well-being, whereas negative Facebook feedback (Lee, Kim & Ahn, 2014) harmed individuals' bonding social capital. In addition, it is expected that social support seekers are especially vulnerable for feedback, as they are already have to cope with feelings of distress. Practitioners should therefore inform adolescent Facebook users about the differential impact of receiving feedback and stimulate positive feedback giving when someone is searching for social support.

In conclusion, these findings extend prior research on the relationship between stress and adolescents' depressed mood, by looking at the role of social support seeking through Facebook. The results demonstrated that distressed adolescents turn to Facebook for social support seeking. In addition, when social support was sought on Facebook and subsequently perceived, social support seeking through Facebook *decreased* adolescents' depressed mood. However, when social support was sought on Facebook, but not perceived, social support seeking through Facebook *increased* adolescents' depressed mood. This harmful impact of social support seeking on adolescents' depressed mood exclusively occurs in a Facebook context.

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DAILY STRESS, SOCIAL SUPPORT SEEKING THROUGH FACEBOOK, DEPRESSED MOOD

Table 1

Descriptive Statistics.

	Min	Max	*M*	*SD*
Daily stress	1	5	3.25	.76
Social support seeking through Facebook (SSS through FB)	1	5	1.55	.86
Perceived social support through Facebook (PSS through FB)	1	5	2.11	1.03
Depressed mood	1	4	1.58	.62

Note. N = 910

DAILY STRESS, SOCIAL SUPPORT SEEKING THROUGH FACEBOOK, DEPRESSED MOOD

Table 2

Zero-Order Inter-Correlations.

	Daily stress	SSS through FB	PSS through FB	Depressed mood
Daily stress	1			
SSS through FB	.05	1		
PSS through FB	.05	.54**	1	.
Depressed mood	.25**	.13**	-.01	1

Note. $N = 910$; $*p < .05$; $**p < .01$; $***p < .001$

DAILY STRESS, SOCIAL SUPPORT SEEKING THROUGH FACEBOOK, DEPRESSED MOOD

Table 3

Results of Discriminant Validity Testing.

Construct	Daily stress	SSS through FB	PSS through FB	Depressed mood
Daily stress	**0.653**			
SSS through FB	0.061	**0.950**		
PSS through FB	0.061	0.514	**0.905**	
Depressed mood	0.309	0.082	-0.038	**0.703**

Note. Diagonal elements (bold) are the square root of average variance extracted (AVE) between the constructs and their measures. Off-diagonal elements are correlations between constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.

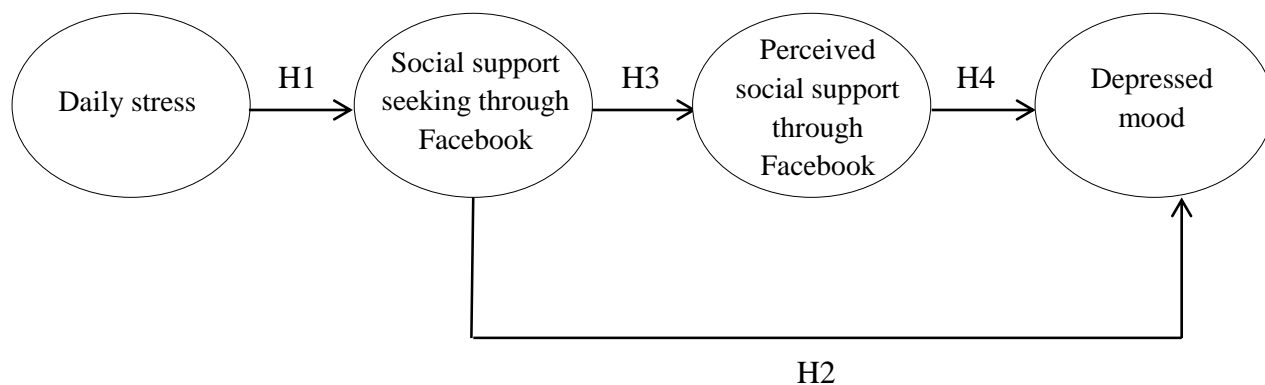DAILY STRESS, SOCIAL SUPPORT SEEKING THROUGH FACEBOOK, DEPRESSED
MOOD

Figure 1. Hypothesized relationships between daily stress, social support seeking through

Facebook, perceived social support through Facebook and adolescents' depressed mood.

DAILY STRESS, SOCIAL SUPPORT SEEKING THROUGH FACEBOOK, DEPRESSED MOOD
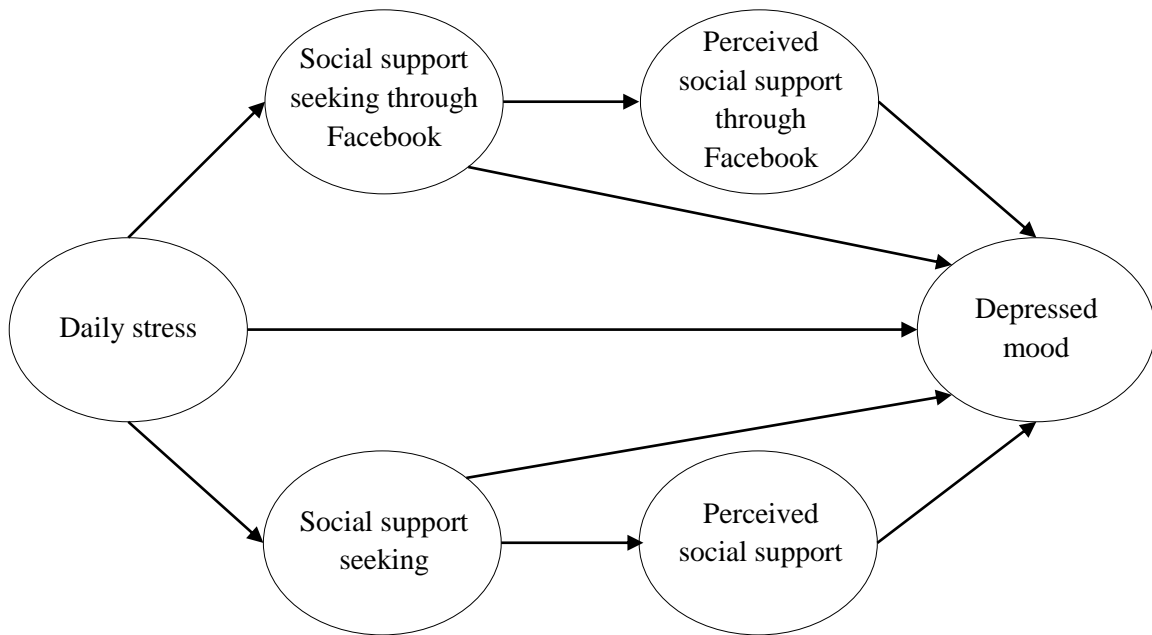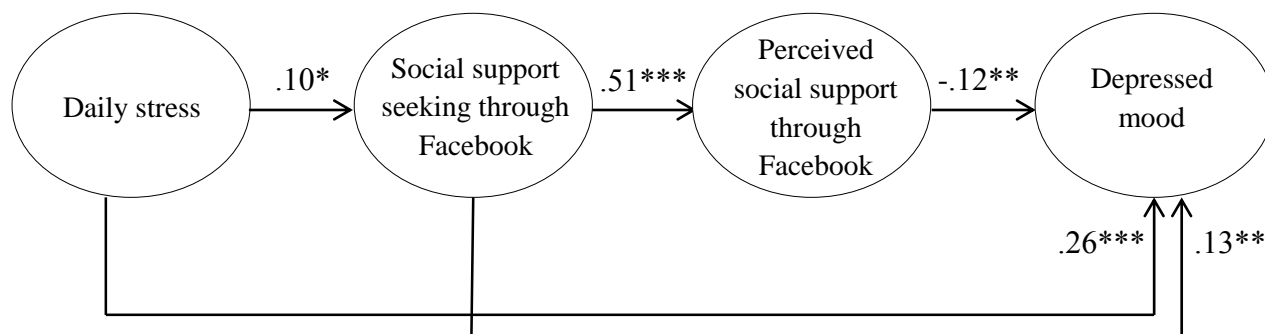

Figure 2. Hypothesized relationships between daily stress, social support seeking through Facebook/face-to-face, perceived social support through Facebook/face-to-face and adolescents' depressed mood.
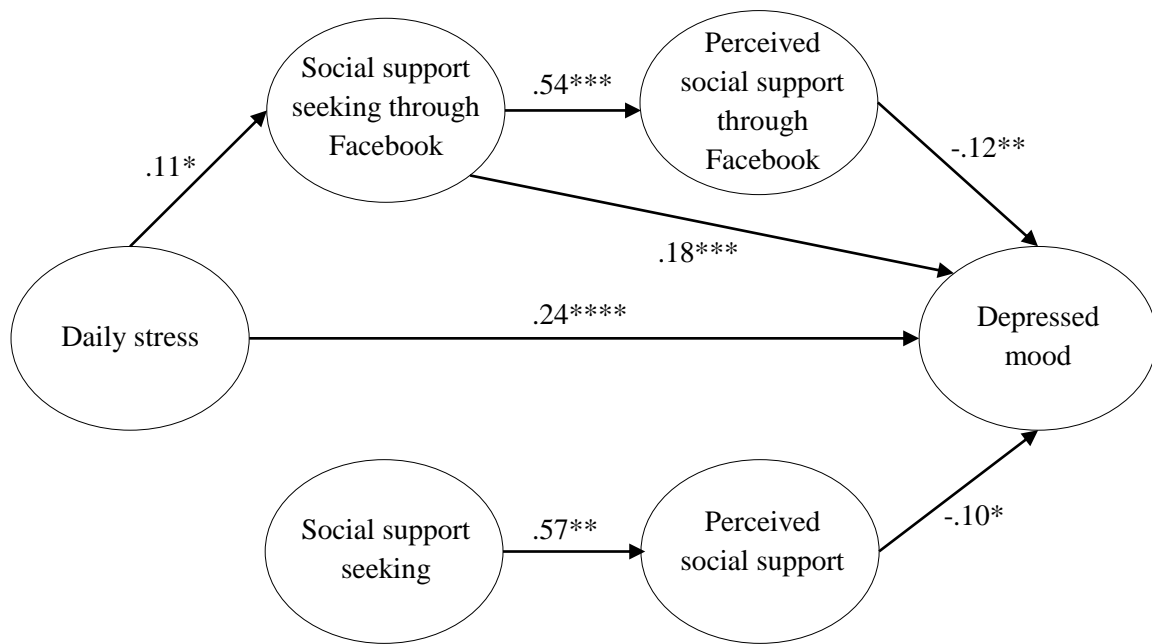
*p < .05; **p < .01; ***p < .001

Figure 3. Model examining the relationships between daily stress, social support seeking through Facebook, perceived social support through Facebook, and adolescents' depressed mood. *Note*: Values reflect standardized coefficients. For clarity, error terms, covariances, control variables, and measurements are not shown.

DAILY STRESS, SOCIAL SUPPORT SEEKING THROUGH FACEBOOK, DEPRESSED MOOD

p < .05; **p** < .01; ***p*** < .001

Figure 4. Model examining the relationships between daily stress, social support seeking through Facebook/face-to-face, perceived social support through Facebook/face-to-face and adolescents' depressed mood.