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Exploring the Relationships between Different Types of Facebook Use, Perceived Online
Social Support and Adolescents' Depressed Mood

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FACEBOOK USE, ONLINE SOCIAL SUPPORT, AND ADOLESCENTS' DEPRESSED MOOD

Abstract

The current study aims to provide a deeper understanding of the relationships between different types of Facebook use, perceived online social support, and boys' and girls' depressed mood. To address this aim, the present study (N = 910) developed a comprehensive model which (1) differs between specific types of Facebook use, (2) examines the mediating role of perceived online social support, and (3) takes adolescent users' gender into account. Structural equation modeling showed that the harmful impact of Facebook use exclusively occurs among *girls* who passively use Facebook and among *boys* who actively use Facebook in a public setting. *Girls*, however, who actively use Facebook, either in a public or private setting and subsequently perceive online social support, benefit from actively using Facebook, as perceived online social support negatively predicted girls' depressed mood. The discussion focuses on the explanation and understanding of these findings, key limitations, and directions for future research.

Keywords: Adolescence, active Facebook use, passive Facebook use, perceived online social support, depressed mood

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Exploring The Relationships Between Different Types of Facebook Use, Perceived Online Social Support and Adolescents' Depressed Mood

Introduction

Adolescence is a critical period for the development of depressive symptoms. Previous studies have reported that 20% of girls and 7% of boys develop depressive symptoms before the end of adolescence (e.g., Angold, Erkanli, Silberg, Eaves, & Costello, 2002). Depressive symptoms, including depressed mood, often precede clinical diagnosis of depression, which in turn is associated with adverse effects on social functioning (e.g., Fröjd et al., 2008), as well as an increased risk for substance abuse and suicide (e.g., Vander Stoep et al., 2011) and depression later in life (e.g., Copeland, Shanahan, Costello, & Angold, 2010). This high prevalence and harmful consequences underscore the need to understand factors that may affect the development of depressive symptoms in this age group.

Various researchers (e.g., Kross et al., 2013) argue that social networking sites (SNSs) are a new potential risk factor for the development of depressive symptoms. Others (e.g., Valenzuela, Park, & Kee, 2009), however, suggest that SNSs have the potential to protect adolescents against developing a depressed mood. Despite this controversy, researchers agree that the rapid growth and popularity of SNSs have changed the nature and manner in which adolescents interact. Approximately 81% of adolescents aged 12 to 17 years uses SNSs with 94% of them being active on Facebook (Madden, Lenhart, Cortesi, Smith, & Beaton, 2013), suggesting that SNSs are integrated into many adolescents' lives and that continued research on the effects of SNS on well-being is required.

The present study contributes to the existing literature in following ways. First, although Burke, Marlow, and Lento (2010) recently recognized that different types of Facebook use may yield different effects, the majority of studies examined the impact of general Facebook use (e.g., Kross et al., 2013) or the number of Facebook friends on young

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people's well-being (e.g., Kim & Lee, 2011). Therefore, in line with the suggestion of Burke et al. (2010), the present study differentiates between two types of SNS use: passive Facebook use and active Facebook use. *Passive Facebook use* refers to the monitoring of other people's lives by viewing the content of others' profiles. *Active Facebook use* consists of interactions between the user and other Facebook friend(s) in a private or public setting (e.g., instant messaging; status updating).

Second, various studies have investigated the direct impact of Facebook use on adolescents' well-being, without examining possible mechanisms that may explain this relationship (e.g., Lee, Lee, & Kwon, 2011). One important mechanism is *perceived social support* (i.e., social interaction through which emotional concerns, instrumental aid, or information is perceived, Dunkel-Schetter & Brooks, 2009), as studies have found a positive relationship between SNS use and adolescents' perceptions of online social support (e.g., Liu & Yu, 2013) and perceived online social support in turn has been negatively related with young people's well-being (e.g., Frison & Eggermont, 2015). Therefore, the current study aims to explore the mediating role of perceived online social support within the relationship between specific types of Facebook use and adolescents' depressed mood.

Third, while SNS use (e.g., McAndrew & Jeong, 2012), level of perceived social support (e.g., Demaray & Malecki, 2002) and risk to develop a depressed mood (e.g., Angold et al., 2002) has been shown to vary according to gender, no study has yet examined whether these concepts relate differently between boys and girls. The current study will therefore test whether the relationships between different types of Facebook use, perceived online social support and depressed mood differ among male and female adolescents.

Passive Facebook Use and Adolescents' Depressed Mood

Variables associated with the concept of *passive* Facebook use or the monitoring of other people's lives by viewing the content of others' profiles, have been found to decrease

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individuals' well-being. For instance, Burke et al. (2010) found that the mere consumption of Facebook content positively predicted feelings of loneliness. In addition, Qiu, Lin, Leung, and Tov (2012) showed that after Facebook browsing, individuals low in narcissism perceived their friends' lives to be better than their own, which in turn negatively predicted their social well-being.

This negative impact of passive Facebook use on adolescents' well-being may be explained by *social comparison theory* (Festinger, 1954). According to this theory, people have a drive to evaluate their opinions and abilities, which is served through comparing with similar others. Given that SNSs are one of the most commonly used platforms to see what others are doing, as well as to acquire information about others (e.g., Pempek, Yermolayeva, & Calvert, 2009), it is likely that adolescents use these profile elements to compare themselves with similar others. Especially *upward comparison* or comparison to others we perceive to be socially better than ourselves, has been related to the development of negative affect (e.g., Bänzner, Broemer, Hammelstein, & Meyer, 2006; Haferkamp and Krämer, 2011). Due to the fact that people spend considerable time optimizing their *online* self-presentation (Reich, 2010), applying various techniques, such as carefully selecting photographs (Ellison, Heino, & Gibbs, 2006), disclosing especially positive emotional experiences, as well as presenting a better impression of their emotional well-being (Qiu et al., 2012), people may get the feeling that others are happier than they are, which may lead to unpleasant feelings (e.g., Chou & Edge, 2012; Lee, 2014). We therefore expect the following:

H1: Passive Facebook use will positively predict adolescents' depressed mood.

Active Facebook Use and Adolescents' Depressed mood

Variables related to *active* Facebook use or interactions between the user and other Facebook friend(s) in a private or public setting, have been shown to be positive predictors of individuals' well-being. For instance, Burke et al. (2010) found that directed-communication

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or active Facebook use reduced feelings of loneliness. In addition, Deters and Mehl (2013) showed that participants who posted more status updates over the past week, reported, on average, a decrease in loneliness and an increase in daily sense of connectedness.

This positive impact of active Facebook use on individuals' well-being can be explained by *hyperpersonal communication theory* (Walther, 1996), which argues that due to the reduction in contextual, visual, and auditory cues, typical for computer-mediated communication, individuals in online interactions, such as active forms of Facebook use (e.g., instant messaging, status updating, etc.), become less concerned about how others perceive them and feel fewer inhibitions in disclosing themselves. Thus, their communication becomes more intimate or *hyperpersonal*, compared to face-to-face communication. In line with this assumption, studies showed that online communication increases adolescents' self-disclosure (e.g., Tidwell & Walther, 2002), which in turn may enhance adolescents' well-being (e.g., Lee et al., 2011). Based on prior research (e.g., Deters & Mehl, 2013) and *hyperpersonal communication theory* (Walther, 1996), we therefore expect the following:

H2: Active Facebook use will negatively predict adolescents' depressed mood.

Active Facebook Use – Perceived Online Social Support – Depressed Mood

Perceived emotional support or “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), has been recognized to improve individuals' well-being (e.g., Murberg & Bru, 2004; Rueger, Malecki, & Demaray, 2010). Friends in particular are an important source of social support for many adolescents (e.g., Bokhorst, Sumter, & Westenberg, 2010) and increasingly gain importance during adolescence (e.g., Scholte & Van Aken, 2006). However, for contemporary youth, the notion of perceived friend support may have changed, due to the emergence and widespread use of SNSs. Moreover, research has shown that SNSs have the capacity to facilitate supportive interaction among adolescent users

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(Hampton, Goulet, Rainie & Purcell, 2011). As a result, studies began to examine the relationship between SNS use and people's perceptions of online social support (e.g., Liu and Yu, 2013). However, because not all SNS activities are equally "social", various scholars (e.g., Aubrey & Rill, 2013; Burke, Kraut, & Marlow, 2011) argue that different types of SNS use may produce different effects, and subsequently call for more differentiated analyses of SNS use.

In line with this suggestion, Burke et al. (2011) showed that active Facebook use (i.e., directed communication with individual friends) was associated with increases in bridging social capital. In addition, several studies reported a positive relationship between "social" SNS motivations, which are closely related to the concept of active SNS use, and individuals' social capital, which is associated with the concept of social support (e.g., Aubrey & Rill, 2013; Brandtzaeg, 2012; Ellison, Steinfield, & Lampe, 2011). This notion that "social" or active Facebook use will predict an increase in social capital can be explained by *the rich get richer hypothesis* (Kraut et al., 2002), which proposes that those who already have strong social networks will get more social benefit from using the Internet. More specifically, people with strong offline relationships are more likely to actively use SNSs, because active SNS use is more useful for the maintenance of these relationships (Burke et al., 2011) than passive SNS use. This active SNS use in turn may reinforce the existing relationships, which in turn may lead to positive social outcomes, including increased perceptions of social support.

Given that active Facebook use is expected to facilitate supportive interaction among adolescent users, the question arises whether this type of social support (i.e., online social support) has the same positive impact as face-to-face supportive interactions on adolescents' well-being. Despite evidence that perceived social support negatively affects adolescents' depressive symptoms (e.g., Murberg & Bru, 2004; Rueger et al., 2010), only few studies (e.g.,

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Frison & Eggermont, 2015; Oh, Ozkaya, & LaRose, 2014; Wright, 2012) have focused on the impact of perceived *online* social support. Frison and Eggermont (2015), for instance, found the positive impact of perceived Facebook social support on adolescents' well-being (i.e., depressed mood) to be similar to the impact of face-to-face supportive interactions. This positive impact of *online* social support on adolescents' well-being can be explained by *the main effects model of social support* (Cohen & Wills, 1985), which argues that social support directly affects individuals' well-being, independent of the amount of stress one experiences. Therefore, based on *the rich get richer hypothesis* (Kraut et al., 2002), *the direct or main effects hypothesis* (Cohen & Wills, 1985) and empirical findings (e.g., Aubrey & Rill, 2013; Frison & Eggermont, 2015), we propose the following hypothesis:

H3: Perceptions of online social support will mediate the relationship between active Facebook use and adolescents' depressed mood

Taken together, the literature has provided empirical evidence for relationships between different types of Facebook use (i.e., passive Facebook use/active Facebook use), perceived online social support and adolescents' depressed mood. The present study brings these proposed pathways together in a comprehensive model, shown in Figure 1.

[Figure 1 about here]

Gender Differences

According to *social role theory* (Eagly, 1987), gender differences can be understood by attending to the social roles of men and women. More specifically, as a result of gender differences in social roles, men and women learn different skills and beliefs, which in turn, may lead to gender differences in men and women's social behavior. While men are expected to be *agentic* (i.e., independent, competitive, and rational), women are expected to be *communal* (i.e., dependent, submissive, and gentle). The female gender role thus especially favors the engagement of women in interpersonal activities. Recently, scholars (e.g.,

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Guadagnano, Muscanell, Okdie, Burke, & Ward, 2011; Kimbrough, Guadagnano, Muscanell, & Dill, 2013) argue that social roles in the offline world contribute to gender differences in the online world. For instance, Kimbrough et al. (2013) found, in agreement with social role theory, that women use technology more for social connectivity, compared to men. Social role theory hereby provides a theoretical framework for why girls are expected to be more attracted to passive and active Facebook use, compared to boys, as both types of Facebook activities allow Facebook users to maintain their interpersonal relationships (Ellison, Vitak, & Lampe, 2014), which is a communal activity and hereby especially fulfills *girls'* social role expectations. In line with this suggestion, McAndrew and Jeong (2012) found that women spent more time looking at the Facebook pages of same-age others (i.e., passive Facebook use) and report more direct interaction with Facebook friends (i.e., active Facebook use), compared to men.

As a result of these gender differences in Facebook behavior, which may be explained by *social role theory* (Eagly, 1987), an important role of gender within the relationships between different types of Facebook, perceived online social support and adolescents' depressed mood is likely to expect. First, there are various indications in the literature to expect a stronger relationship between passive Facebook use and *girls'* depressed mood. More specifically, boys and girls have different self-presentation concerns: girls are more concerned about the image they present and how they are perceived by others, compared to boys, both in face-to-face interactions (e.g., Dolgin & Minowa, 1997) and online interactions (e.g., McAndrew & Jeong, 2012). In addition, men and women have different motives for using SNSs: whereas women are more likely to use SNSs to compare themselves with other users, men are more likely to use SNSs to look at other people's online profiles to find friends (e.g., Haferkamp & Krämer, 2011; Haferkamp, Eimler, Papadakis, & Kruck, 2012). These results suggest that especially girls may be more vulnerable for the impact of passive

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consumption of Facebook content, as they are more likely than boys to compare themselves with other SNS users, which in turn may lead to negative outcomes.

Second, there are various reasons to assume that the relationship between active Facebook use and adolescents' depressed mood is expected to be stronger among *girls*. More specifically, *the stimulation hypothesis* argues that online communication enhances well-being through its positive effect on time spent with existing friends and the quality of these relationships (Valkenburg & Peter, 2007; 2009). Boys and girls, however, may differ in the amount of communication with existing friends (e.g., Bonetti, Campbell, & Gilmore, 2010; Muscanell & Guadagno, 2012), with girls being more likely to communicate with existing friends, than boys. Furthermore, Forest and Wood (2013) argue that active SNS use in particular may enable self-disclosure from individuals who would not normally disclose personal information in face-to-face interaction. Studies, however, have shown that girls communicated more than boys about how they felt (Bonetti et al., 2010), as well as post more personal status messages (Winter et al., 2014). Given that self-disclosure has been shown to increase adolescents' well-being (e.g., Lee et al., 2011), it is likely to expect that this impact of active Facebook use on adolescents' depressed mood will be stronger for *girls*.

Third, we believe that the mediating role of perceived online social support within the relationship between active Facebook use and adolescents' depressed mood will be stronger among *girls*. On the one hand, studies have pointed out gender differences in perceived social support (e.g., Demaray & Malecki, 2002; Cheng & Chan, 2004) and SNS use (McAndrew & Jeong, 2012; Muscanell & Guadagno, 2012). Cheng and Chan (2004), for instance, showed that girls report higher perceptions of peer support than boys. In addition, McAndrew & Jeong (2012) indicated that women are more active users than men. Given that girls are more likely to use SNS to communicate with existing friends than boys (e.g., Bonetti et al., 2010; Muscanell & Guadagno, 2012), we may expect that girls who actively use Facebook will also

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perceive higher levels of online social support than boys. At the same time, scholars have repeatedly reported gender differences in depression, with girls exhibiting more depressive symptoms (e.g., Angold et al., 2002) than boys. In line with this reasoning, Kendler, Myers, and Prescott (2005) found that, compared to males, females showed significant stronger relationships between social support and depression. Subsequently, we expect a similar stronger relationship between perceived online social support and *girls'* depressed mood. In sum, based on *social role theory* (Eagly, 1987) and various indications in the literature which refer to gender differences in adolescents' Facebook use, we expect the following:

H4: Hypothesis 1, Hypothesis 2, and Hypothesis 3 will be stronger among *girls*

Method

Sample

In March 2013, a survey study was carried out among 18 high schools in [country deleted]. A two-step sampling method was used for selecting respondents. First, 18 schools in different parts of [country deleted] were randomly selected and contacted with the request to participate in the study. Next, research assistants visited the selected schools to administer the questionnaire. All students who were present at the time of the schools visits completed paper-and-pencil surveys. The respondents were informed that the goal of the study was to investigate their leisure habits and were assured strict confidentiality of their answers. Approval for the questionnaire was granted by the institutional review board of the host university and informed consent was obtained from the school head, which is customary in Belgium.

In total, 910 pupils filled out the questionnaire; 51.9% were girls and the average age was 15.44 years ($SD = 1.71$). The majority of the parents obtained a post-secondary degree (76.2%), 20.7% of the parents had graduated from secondary school and 3.1% had an

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elementary school degree or no degree. The majority of the sample (96.1%) was born in Belgium, 1.8% in Europe, and 2.1% in a non-European country.

Measures

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

Facebook use. Items that assess different types of Facebook use were rated on a 7-point scale, ranging from *never* (= 1) to *several times per day* (= 7). The present study measured two dimensions of Facebook use: active and passive Facebook use. A principal components analysis, however, revealed three distinct factors that explained 74% of the variance: active public Facebook use, active private Facebook use and passive Facebook use. *Active public Facebook use* refers to interactions between the user and other Facebook friend(s) in a public setting (e.g., status updating; photo/picture posting) and consists of following three items: “How often do you post a message on your own Facebook timeline”, “How often do you post a photo on your own Facebook timeline” and “How often do you post a picture on your own Facebook-timeline” ($\alpha = .84$). *Active private Facebook use* refers to interactions between the user and other Facebook friend(s) in a private setting (e.g., private message sending; instant messaging) and consists of two items: “How often do you send someone a personal message on Facebook” and “How often do you chat with someone on Facebook” ($r = .66; p < .001$). *Passive Facebook use* was measured with two items: “How often do you visit a Facebook profile of a Facebook friend?” and “How often do you visit a Facebook profile of someone that does not belong to your friends list?” ($r = .52; p < .001$). Based on the average of the items of each dimension, three estimates were created.

Perceived online social support. To measure respondents' perceptions of online social support, a 4-item measure was developed by consulting the family subscale of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, & Zimet,

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1988). The items from this subscale were adapted by phrasing them in terms of perceived online social support. 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 items demonstrated high internal consistency ($\alpha = .95$). An estimate of perceived online social support was created, based on the average of the four items.

Depressed mood. The Center for Epidemiological Studies Depression Scale for Children (CES-DC) was used to assess respondents' level of depression. This 20-item scale uses a 4-point Likert scale (*Not at all* (= 1) – *A lot* (= 4)), to determine depressive symptoms among adolescents. For the operationalization of adolescents' depressed mood we selected five items, based on the study of Olsson and von Knorring (1997). This study examined the psychometric properties of CES-DC in a Swedish adolescent sample, and found support for one strong underlying factor, i.e., depressed mood. This factor included items such as "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" and showed high internal consistency ($\alpha = .84$). By summing the item scores and dividing the sum by the total of items, an estimate of adolescents' depressed mood was produced.

Analysis

We tested our hypothesized model with structural equation modeling (AMOS), using maximum likelihood method. The chi-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).

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In order to examine whether perceived online social support mediates the relationship between active FB use and adolescents' depressed mood, we assessed the statistical significance of the indirect effects with the bootstrapping method (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 estimated a 95% bias-corrected confidence interval for all values of interest (1000 bootstrap sample). When the CI does not include zero, the indirect effect can be said to significantly differ from zero.

To test whether the hypothesized relationships were stronger for girls than for boys, a multi-group analysis was conducted. We compared the unconstrained model (i.e., model where the parameters were allowed to vary between the groups) with the constrained model (i.e., model where the parameters were constrained to be equal across the groups). In addition, we conducted a path-by-path analysis to examine whether the significant relationships were moderated by gender. More specifically, we compared the unconstrained model with each model where a significant relationship among boys or girls was constrained to be equal across groups.

All analyses controlled for respondents' gender, age, educational level of the parents and country of origin by adding them as predictors for adolescents' different types of Facebook use, perceived online social support, and depressed mood and by allowing them to covariate with each other.

While the present study builds on existing findings that different types of Facebook use impacts adolescents' depressed mood, it should be noted that it is also possible that depressed adolescents may use Facebook in certain ways (i.e., actively or passively), as a cross-sectional survey design cannot empirically test this hypothesized direction of causality. Therefore, throughout the description of the results, no causal terms are being used.

Results

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Descriptive Statistics

Table 1 displays descriptive statistics of each measure for boys and girls. Using Pillai's Trace, a MANCOVA analysis (controlling for age, educational level of the parents and respondents' origin) showed significant differences between boys and girls, $V = .05$, $F(5, 536) = 5.64$, $p < .001$, $h_p^2 = .10$. Separate independent ANCOVA-tests revealed that girls scored significantly higher on active private Facebook use (boys $M = 4.47$, $SD = 1.54$; girls $M = 4.72$, $SD = 1.29$), $F(1, 648) = 6.07$, $p < .05$, $h_p^2 = .01$, active public Facebook use (boys $M = 2.18$, $SD = .99$; girls $M = 2.48$, $SD = .99$), $F(1, 642) = 7.53$, $p < .05$, $h_p^2 = .01$, and depressed mood (boys $M = 1.47$, $SD = .56$; girls $M = 1.67$, $SD = .66$), $F(1, 671) = 21.98$, $p < .001$, $h_p^2 = .03$. No significant differences were found regarding passive Facebook use and perceived online social support.

[Table 1 about here]

Table 2 presents the zero-order inter-correlations with regard to all relevant variables in the model for boys and girls.

[Table 2 about here]

Testing Hypothesized Model

The final model, presented in figure 2, showed a good fit of the data and yielded a chi-square value of 448.02 with 157 degrees of freedom, $p < .001$, RMSEA = .05; AGFI = .93; CFI = .96; $\chi^2/df = 2.854$.

First, in line with hypothesis 1, the results showed that passive Facebook use positively predicted adolescents' depressed mood, $\beta = .12$, $B = .05$, $SE = .02$, $p < .05$. Second, based on the principal components analysis, we decided to distinguish between active *public* Facebook use and active *private* Facebook use. Therefore, hypothesis 2 and 3 were tested two times. On the one hand, and rather unexpectedly, active *public* Facebook use positively predicted adolescents' depressed mood, $\beta = .13$, $B = .06$, $SE = .02$, $p < .05$. On the other

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hand, active *private* Facebook use was not a significant predictor of adolescents' depressed mood. Hypothesis 2 could therefore not be confirmed. Next, results showed that active *public* Facebook use, $\beta = .23$, $B = .30$, $SE = .06$, $p < .001$, and active *private* Facebook use, $\beta = .16$, $B = .11$, $SE = .02$, $p < .001$, positively predicted adolescents' perceptions of online social support. Furthermore, results revealed that perceived online social support negatively predicted adolescents' depressed mood, $\beta = -.08$, $B = -.03$, $SE = .01$, $p < .05$.

[Figure 2 about here]

The Mediating Role of Perceived Online Social Support

To test whether perceived online social support mediated the hypothesized relationship, we used the bootstrapping method. The results from a bootstrapping procedure (1000 samples, ML bootstrap, 95% CI) revealed that the relationship between active *private* Facebook use and adolescents' depressed mood, was significantly mediated by perceived online social support, $CI = [-.032, -.002]$, $SE = .01$, $p < .01$. In addition, results indicated that perceived online social support also mediated the relationship between active *public* Facebook use and adolescents' depressed mood, $CI = [-.043, -.003]$, $SE = .01$, $p = .01$, hereby supporting hypothesis 3.

Testing Gender Differences

In order to investigate whether the hypothesized relationships were stronger for girls than for boys, we conducted multi-group analysis with gender as the grouping variable. The model for the two gender groups, i.e., boys (see figure 3) and girls (see figure 4), showed a good fit of the data and yielded a chi-square value of 580.82 with 290 degrees of freedom, $p < .001$, $RMSEA = .04$; $AGFI = .90$; $CFI = .96$; $\chi^2/df = 2.003$. Results showed that the unconstrained model significantly differed from the constrained model ($p < .05$), indicating that gender is a significant moderator within the hypothesized model.

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First, results showed that passive Facebook use positively predicted girls' depressed mood, $\beta = .18$, $B = .09$, $SE = .04$, $p < .05$, but not boys' depressed mood ($p > .05$). In addition, the path-by-path analysis confirmed that the relationship between passive Facebook use and adolescents' depressed mood significantly differed between boys and girls ($p < .05$). Next, in contrast with our expectations results indicated that active *public* Facebook use positively predicted boys' depressed mood, $\beta = .25$, $B = .09$, $SE = .03$, $p < .01$, but not girls' depressed mood. Gender, however, was not a significant moderator within this relationship ($p > .05$). Furthermore, results indicated, on the one hand, that active *public* Facebook use positively predicted boys', $\beta = .18$, $B = .27$, $SE = .11$, $p < .05$, and girls', $\beta = .27$, $B = .32$, $SE = .07$, $p < .001$, perceived level of online social support. The relationship, however, did not differ significantly between boys and girls ($p > .05$). On the other hand, results showed that active *private* Facebook use positively predicted girls' perceptions of online social support, $\beta = .27$, $B = .20$, $SE = .04$, $p < .001$, but not boys' perceived social support. The path-by-path analysis further confirmed that the relationship between *private* Facebook use and adolescents' perceived online social support significantly differed between boys and girls ($p < .05$). Lastly, results showed that perceptions of online social support negatively predicted girls' depressed mood, $\beta = -.12$, $B = -.05$, $SE = .02$, $p < .05$, but not boys' depressed mood. However, no significant difference was found between boys and girls ($p > .05$)

[Figure 3 about here]

[Figure 4 about here]

The Mediating Role of Perceived Online Social Support

The bootstrapping method was again used to test whether perceived online social support mediated the hypothesized relationship. The results from a bootstrapping procedure (1000 samples, ML bootstrap, 95% CI) showed that the relationship between active *private* Facebook use and *girls'* depressed mood was significantly mediated by perceived online

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social support, $CI = [-.070, -.005]$, $SE = .02$, $p < .05$. In addition, results revealed that perceived online social support also mediated the relationship between active *public* Facebook use and *girls'* depressed mood, $CI = [-.075, -.004]$, $SE = .02$, $p < .05$.

Discussion

The present study aimed to increase scholars' knowledge regarding the relationship between SNS use and adolescents' depressed mood, by examining the impact of different types of Facebook use on adolescents' depressed mood, looking at the role of perceived online social support within these relationships and taking adolescents' gender into account.

The results of our study offer three important contributions that can be used to guide future research. First, our findings showed that active and passive Facebook use are differentially related to adolescents' depressed mood. The present study thus provides a clearer understanding of the relationship between SNS use and adolescents' depressed mood and suggest that future studies should further differentiate between different types of SNS use. Second, the results provided support for the hypothesized mediated impact of perceived online social support, within the relationship between active Facebook use and girls' depressed mood, suggesting a need for future studies to further examine the mediating influence of perceived online social support. Third, our study found that gender plays an important role in the proposed relationships, highlighting the importance of taking into account users' gender in future research.

Hypothesized Model

This study reported a positive association between passive Facebook use and adolescents' depressed mood, which was in line with our first hypothesis. This positive relationship between passively using Facebook and adolescents' well-being confirms previous studies (e.g., Burke et al., 2010; Krasnova et al., 2013; Qiu et al., 2012), and can be explained by the process of upward social comparison (e.g., Haferkamp & Krämer, 2011). This finding

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thus suggest that passive Facebook use may have harmful consequences during adolescence, such as an increased depressed mood. However, to provide a deeper understanding of this relationship, future studies should further examine relevant underlying mechanisms.

However, in contrast with hypothesis 2, results showed that active *public* Facebook use positively predicted adolescents' depressed mood. This finding differs from previous studies that found support for a positive impact of Facebook interactions on adolescents' well-being (e.g., Burke et al., 2010; Deters & Mehl, 2013; Tobin, Vanman, Verreynne, & Saeri, 2014). This finding, however, underlines the need for future research to examine other potential mechanisms that may explain the relationship between active *public* Facebook use and depressed mood during adolescence. For instance, the frequency with which adolescents receive feedback on their SNS profiles, as well as the tone of this feedback (i.e., positive or negative) may explain how active public Facebook use is related to an increased depressed mood among young people. Public Facebook activities, such as status updating (e.g., Ong et al., 2011) or photo posting (e.g., Madden et al., 2013) are popular among adolescents. Even more popular among young people is commenting on these Facebook posts. For instance, Hampton et al. (2011) found that commenting on another user's post is one of the most popular activities on Facebook, with 21% of Facebook users ages 18-22 comment Facebook posts several times a day. Deters and Mehl (2013), however, argue that a lack of online feedback could be perceived as social rejection, which in turn could negatively impact adolescents' well-being. In other words, Facebook users who receive few comments or likes on a public post are expected to be more vulnerable to develop negative feelings. In addition, although the majority of adolescent SNS users receives only positive feedback, scholars suggest that also a small number of adolescents receives negative online feedback (e.g., Koutamanis, Vossen, & Valkenburg, 2014; Valkenburg et al., 2006). This negative online feedback could lead to harmful consequences, as one study showed that negative online

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reactions negatively influenced adolescents' well-being (Valkenburg et al., 2006). Therefore, the frequency (e.g., Deters & Mehl, 2013), as well as the tone of this feedback (e.g., Valkenburg et al., 2006) may explain the relationship between public Facebook use and adolescents' depressed mood and should be further investigated in future studies.

On the other hand, no support was found for a direct relationship between active *private* use and adolescents' depressed mood. Hypothesis 2 could therefore not be confirmed. However, perceived online social support may provide a possible explanation for this non-significant relationship. More specifically, our results indicated a positive relationship between both types of active Facebook use (i.e., active *private* and active *public* Facebook use) and adolescents' perceptions of online social support, which is in line with earlier studies, suggesting that active private Facebook use increases individuals' perceptions of social support (e.g., Burke et al., 2011) and *the rich-get-richer hypothesis*, which refers to the notion that active Facebook use may reinforce existing relationships, which in turn may lead to positive social outcomes. Results further showed that perceptions of online support negatively predicted adolescents' depressed mood. This finding supports *the direct or main-effects hypothesis* (Cohen & Wills, 1985) in an online context, as perceiving social support from Facebook friends leads to similar positive outcomes as perceiving social support from real life friends. Furthermore, and in line with hypothesis 3, mediation tests examining possible indirect mechanisms revealed that perceived online support mediated the relationship between active Facebook use and adolescents' depressed mood. These findings validate the hypothesized explanatory role of perceived online social support in the relationship between active Facebook use and adolescents' depressed mood. Perceived online social support is thus an important explanatory mechanism in the relationship between active Facebook use and girls' well-being. In sum, only when adolescents actively use Facebook and subsequently perceive social support from their Facebook friends, it decreased adolescents' depressed

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mood. However, when social support is not perceived, active private Facebook use has no impact on adolescents' depressed mood.

Gender Differences

The present study confirmed that gender plays an important role in the proposed relationships. More specifically, while passively using Facebook yielded negative outcomes (i.e., depressed mood) among *girls*, interacting on Facebook, either in a public or private sphere, yielded positive outcomes among *girls*. In addition and rather unexpectedly, interacting in a public sphere yielded negative outcomes among *boys*.

Passive Facebook use. Results showed that passive Facebook use positively predicted *girls*' depressed mood, but not boys' depressed mood. These findings are in line with studies that have examined the relationship between passive forms of Facebook use and individuals' well-being (Burke et al., 2010; Krasnova, Wenninger, Widjaja, & Buxmann, 2013; Qiu et al., 2012), but extend past research by showing that this relationship only holds for adolescent girls. The fact that girls are more attracted by passive Facebook activities (McAndrew & Jeong, 2012), combined with girls' tendency to compare themselves with other Facebook users (Haferkamp et al., 2012; Haferkamp and Krämer, 2011), may explain why girls are more at risk for exposure to Facebook profiles of other users, compared to boys.

Active Facebook use. While the relationship between privately using Facebook and adolescents' depressed mood was in line with our expectations, publicly using Facebook yielded somewhat unexpected results, as active public Facebook was found to be an indirect, negative predictor of *girls*' depressed mood, but a direct, positive predictor of *boys*' depressed mood. On the one hand, results revealed that active *private* Facebook use negatively predicted *girls*' depressed mood, but not boys' depressed mood. These results hereby show that the negative relationship between active private Facebook use and adolescents' depressed mood occurs exclusively among girls. On the other hand, and rather unexpectedly, results

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showed that public Facebook use oppositely predicted boys' and girls' depressed mood. More specifically, while active public Facebook use *positively* predicted *boys'* depressed mood, active public Facebook use *negatively* predicted *girls'* depressed mood, through girls' perceptions of social support. Although these findings validate the hypothesized explanatory role of perceived online social support in the relationship between active Facebook use and girls' depressed mood, they also reveal a more harmful impact of public Facebook use on *boys'* depressed mood. These findings, however, are in line with a recent study of Brandtzaeg et al. (2012). This study showed that using SNSs was found to be beneficial for girls (i.e., females were lonelier when they were non-SNS users), but detrimental for boys (i.e., males were lonelier when they were SNS users).

This differential impact of active private and active public Facebook use may be partly explained by the differences between both types of active Facebook use. Although active public Facebook use and active private Facebook are closely related constructs, they are at the same time clearly distinct. While, private Facebook interaction is likely to refer to communication between small groups of Facebook friends and thus between strong ties (i.e., smaller circle of ties) (e.g., Boneva et al., 2006), public Facebook interaction is likely to refer to communication towards the whole network of Facebook friends and thus between weak ties (i.e., wider circle of ties) (e.g., Stefanone, Kwon, & Lackaff, 2012). In addition, while private Facebook communication refers to communication in a private setting or a confidential and safe environment where one can carefully select persons to interact with, public Facebook use refers to communication in a public setting or a less confidential environment, where communication between all Facebook friends takes place. It is therefore likely to suggest that communication with strong ties in a private, safe setting may be beneficial for adolescents' well-being, whereas communication with weak ties in a public, less confidential setting may be more harmful for adolescents' well-being. These different characteristics of each type of

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active Facebook use may thus partly explain their differential impact on adolescents' depressed mood.

The gender difference may be explained by adolescents' difference in social skills, as research has shown that girls are more socially skilled than boys (e.g., Rose & Rudolph, 2006) and believed to use more expression in offline and online social interaction than boys (e.g., Kaare et al., 2007). According to *social role theory* (Eagly, 1987), men are expected to be *agentic* (i.e., instrumental), while women are expected to be *communal* (i.e., expressive). These differences in gender roles may result in different social skills, with girls being characterized by traits that manifest expressive behavior. In line with this suggestion, (Kaare et al. (2007) reported that in online interactions, girls prefer pictures and symbolic drawings to express close and devoted relationships, while boys prefer these expressive tools in a much lesser extent. As a result of these differences in social skills and expression, girls develop more easily meaningful online relations, which in turn protects them from developing a depressed mood, while boys deficits' in online social skills is likely to harm their well-being.

An additional explanation for this gender difference may refer to the fact that especially the tone of feedback is expected to differ between boys and girls. More specifically, boys are more involved in negative online conversations than girls, as one study found that boys are more likely to be victims of cyberbullying (Erdur-Baker, 2009). Given that negative online reactions decreases adolescents' well-being (Valkenburg, Peter, & Schouten, 2006) and boys are more involved in such negative online behavior (Erdur-Baker, 2009), it is likely that this tone of feedback may explain the impact of boys' public Facebook use on their depressed mood. Future studies should therefore need to differ between specific types of Facebook use, as well as should take users' gender into account.

Limitations and Conclusion

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Although our study may provide some further insights into the relationship between SNS use and adolescents' well-being, there are at least three important limitations worth noting. First, the present study was restricted by its cross-sectional design and does not permit assessment of causality. To address this limitation, longitudinal and experimental research is needed to explore the order of the proposed relationships. Second, the current study focused on one potential mediating factor, i.e., perceived online social support. Although this factor provides a clearer understanding of the relationship between active Facebook use and girls' depressed mood, this relationship still remains unclear for adolescent boys. Future research is therefore needed to explore other potential mediating variables that may explain the relationship between different types of SNS use and boys' depressed mood. Third, the current study was limited by the fact that passive Facebook use and active private Facebook use were measured with only two items. Future studies may include, for instance, news feed reading as a third indicator for passive Facebook use and interactions in Facebook groups as an additional indicator for active private Facebook use.

A fourth limitation refers to the focus on one particular SNS, i.e., Facebook. Although Facebook is still the most popular SNS during adolescence, scholars should be aware of the increasing popularity of other SNSs such as Instagram and the rapid growth of private mobile apps (e.g., WhatsApp and Snapchat). Examining our hypothesized pathways in other SNS contexts, which are characterized by similar usage patterns (e.g., Instagram), should therefore be an important next research step.

Taken together, the findings of the present study contribute to a more complete understanding of the impact of SNS use on adolescents' well-being, showing that not all adolescent Facebook users are at risk for developing a depressed mood. On the one hand, the results demonstrated that the harmful impact of Facebook use exclusively takes place among *girls* who are exposed to other users' Facebook profiles (i.e., passive Facebook use), and

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among *boys* who communicate publicly on Facebook (i.e., active public Facebook use). On the other hand, girls who interact privately or publicly on Facebook (i.e., active private or active public Facebook use) and subsequently perceive online social support, however, benefit from this type of Facebook use, as perceiving online support negatively predicted girls' depressed mood. It is thus of growing importance that future studies should acknowledge this differential impact of SNS use on adolescents' well-being and should distinguish between different SNS usages, as well as pay special attention to the emergence of gender differences. Furthermore, the present study provides a deeper understanding about how the underlying mechanism of perceived online social support is at work in the relationship between active private Facebook use and adolescents' depressed mood. Continued research is therefore needed to more fully explore the role of other underlying mechanisms, as it may explain the direct impact of specific types of SNS use on adolescent boys' and girls' well-being.

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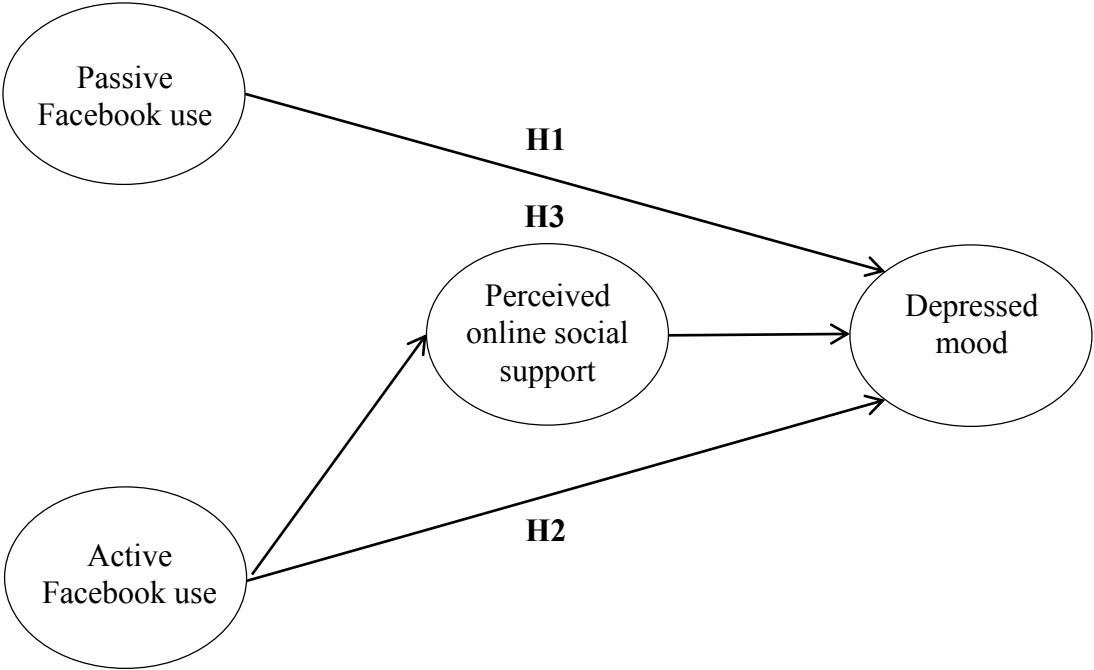
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Figure 1. Hypothesized model examining the impact of different types of Facebook use on adolescents' perceived online social support and depressed mood.



FACEBOOK USE, ONLINE SOCIAL SUPPORT, AND ADOLESCENTS' DEPRESSED MOOD

Table 1

Descriptive Statistics

	Min	Max	Boys		Girls	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Passive Facebook use	1	7	3.50	1.30	3.70	1.22
Active private Facebook use*	1	7	4.47	1.54	4.72	1.29
Active public Facebook use*	1	7	2.18	.99	2.48	.99
Perceived online social support	1	5	2.15	1.05	2.08	1.02
Depressed mood*	1	4	1.47	.56	1.67	.66

Note. Facebook (FB); $N = 910$; * $p < .05$; ** $p < .01$; *** $p < .001$

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Table 2

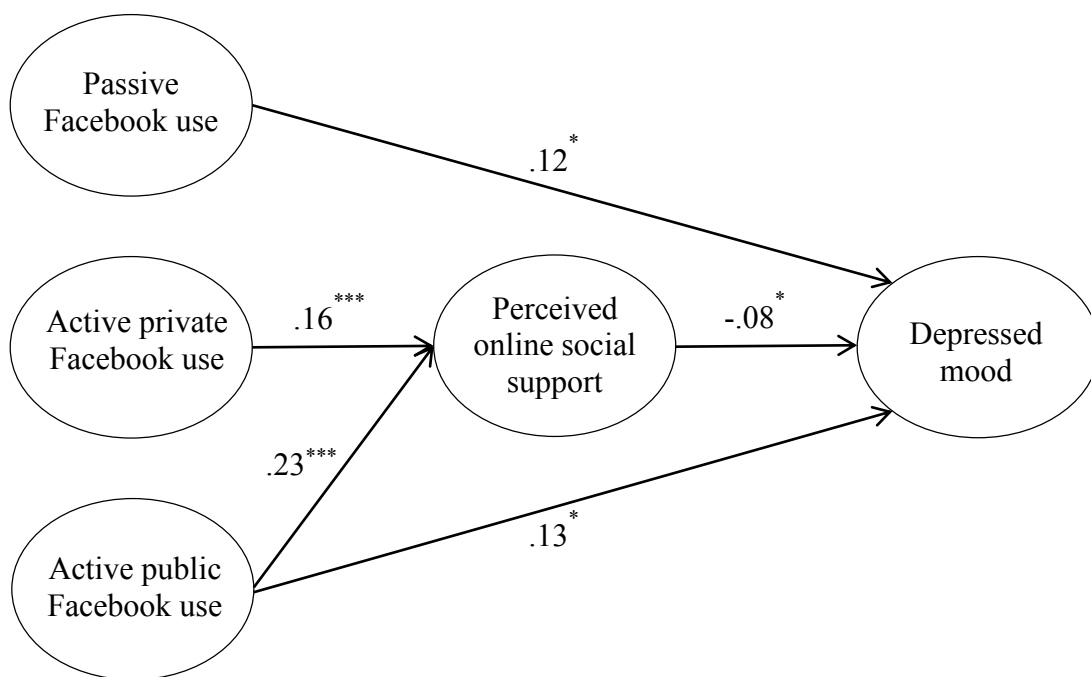
Zero-Order Inter-Correlations for Boys and Girls

	Boys	Passive FB use	Active private FB use	Active public FB use	Perceived online social support	Depressed mood
Girls						
Passive FB use		1	.45***	.44***	.22***	.03
Active private FB use		.46***	1	.35***	.20***	-.02
Active public FB use		.27***	.26***	1	.25***	.17**
Perceived online social support		.16**	.22***	.27***	1	-.06
Depressed mood		.21***	.11*	.31**	-.06	1

Note. Facebook (FB); $N = 910$; * $p < .05$; ** $p < .01$; *** $p < .001$; Correlation coefficients below the diagonal are from girls; coefficients above the diagonal are from boys.

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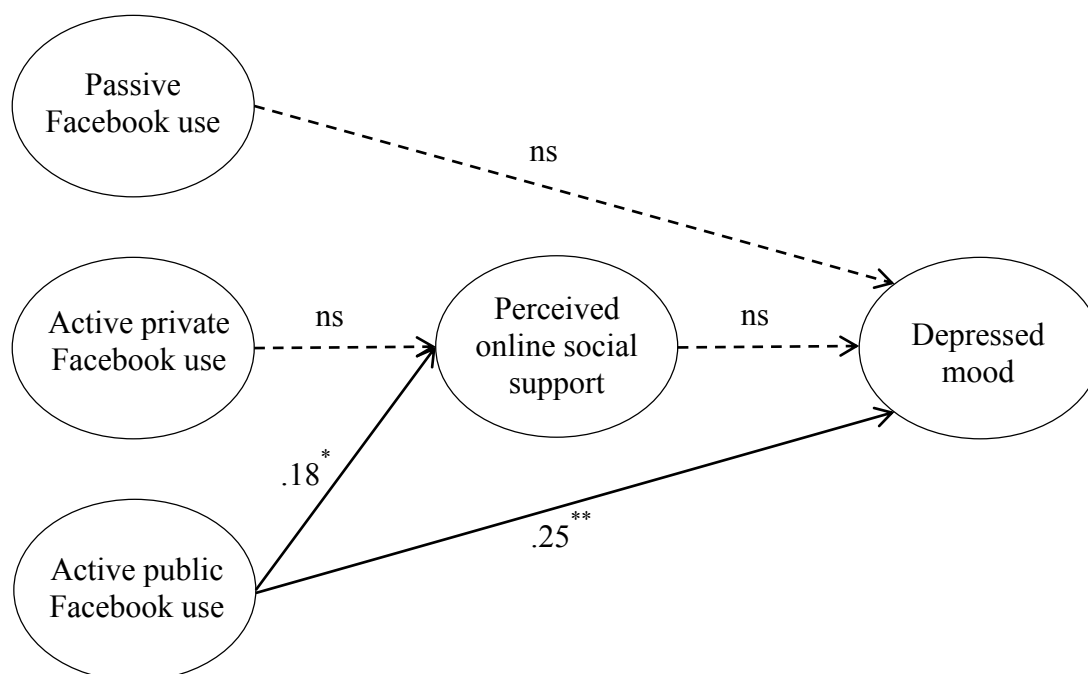
Figure 2. Final model examining the impact of different types of Facebook use on adolescents' perceived online social support and depressed mood. Note: values reflect standardized coefficients.



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

FACEBOOK USE, ONLINE SOCIAL SUPPORT, AND ADOLESCENTS' DEPRESSED MOOD

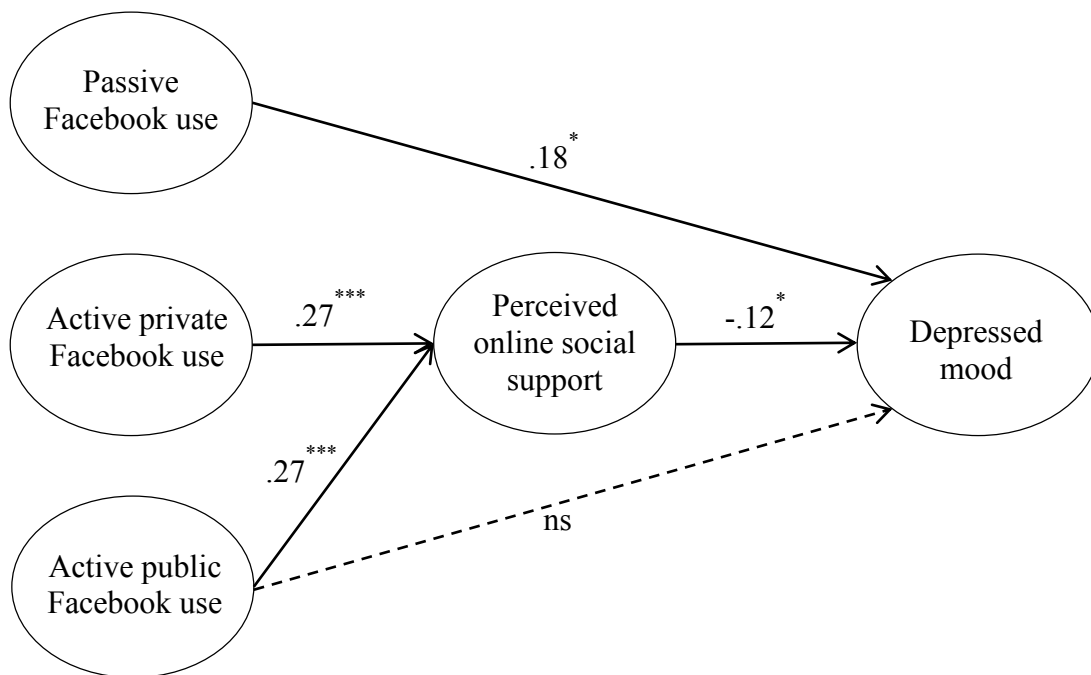
Figure 3. Final model examining the impact of different types of Facebook use on adolescent boys' perceived online social support and depressed mood. Note: values reflect standardized coefficients, ns = non-significant.



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

FACEBOOK USE, ONLINE SOCIAL SUPPORT, AND ADOLESCENTS' DEPRESSED MOOD

Figure 4. Final model examining the impact of different types of Facebook use on adolescent girls' perceived online social support and depressed mood. Note: values reflect standardized coefficients; ns = non-significant.



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