Toward an Integrated and Differential Approach to the Relationships between Loneliness,

Different Types of Facebook Use and Adolescents' Depressed Mood

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Abstract

Although a variety of studies have examined the predictors or outcomes of adolescents'

social networking site use, these studies did not incorporate (1) *an integrated, longitudinal*

approach to examine these relationships longitudinally in a single comprehensive model or

(2) *a differential approach* to distinguish between different types of social networking site

use. Therefore, this two-wave panel study ($N = 1,612$) developed an integrated and

differential model to provide a deeper understanding of the relationships among loneliness,

types of Facebook use, and adolescents' depressed mood. Using structural equation

modeling, the results point to the presence of *a poor-get-richer effect* regarding active public

Facebook use but reveal *a poor-get-poorer effect* regarding passive Facebook use. The

discussion focuses on the explanation and understanding of these findings.

    Keywords: adolescence, loneliness, types of Facebook use, depressed mood

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Various scholars have pointed to the increasing importance of social networking sites (SNSs) in many adolescents' lives, with Facebook being the most popular and frequently used social media platform among teens. According to a recent study, 71% of 13- to 17-year-old adolescents reported having a Facebook account (Lenhart, 2015). Although researchers agree that SNSs are widely integrated into young people's lives, scholars disagree about the predictors and outcomes of the adolescents' Facebook use.

On the one hand, researchers (e.g., Morahan-Martin & Schumacher, 2003) believe that loneliness could positively predict individuals' social uses of the Internet because the anonymity, lack of physical presence and lurking possibilities may allow users to control their social interactions and promote disinhibition (i.e., reduction of self-presentation concerns); and therefore in particular attract lonely people. However, recent empirical findings, which focus on Facebook use in particular, are rather mixed. Although some studies have reported that loneliness is predictive of more Facebook use (e.g., Clayton, Osborne, Miller, & Oberle, 2013), others suggest that loneliness is an important predictor of not creating a Facebook account (e.g., Sheldon, 2012).

On the other hand, in 2011, the American Academy of Pediatrics (AAP) expressed their concern about the potential negative mental health effects of children's and adolescents' SNS use (O'Keeffe & Clarke-Pearson, 2011). In line with these concerns, various scholars have examined this claim, as some assumed that the low quality of interpersonal SNS connections (Pantic et al., 2012) or the negative social comparison behaviors with Facebook friends (Chou & Edge, 2012) could explain an increase in adolescents' depressive feelings. However, subsequent studies reported inconsistent findings (e.g., Jelenchick, Eickhoff, & Moreno, 2013; Pantic et al., 2012), which reveals a much more complex reality.

We believe that these mixed findings could be partly explained by the focus of previous studies on overall Facebook use, such as the amount of time spent on Facebook or Facebook intensity (i.e., a combination of the number of Facebook friends, frequency of Facebook use, and emotional attachment to Facebook). Facebook, however, offers their users a wide variety of opportunities, which range from wall posting to news-feed reading (e.g., Burke, 2011). In line with a scholarly call for more nuanced measures of SNS use (e.g., Ahn, 2011; Burke, 2011; Smock, Ellison, Lampe, & Wohn, 2011) and to provide a more nuanced insight into the predictors and outcomes of adolescents' Facebook use, the present study examines loneliness as a specific predictor and depressed mood as a specific outcome of three types of Facebook use: active private, active public, and passive.

In addition, the mixed findings with regard to the potential outcomes of adolescents' social media use could be further explained by the focus of previous studies on direct social media effects. The present study therefore explores the role of perceived social support within the association between specific types of Facebook use and adolescents' depressed mood to provide deeper insight into potential indirect pathways. Perceived emotional support refers to "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).

Taken together, to provide greater insight into the relationships between loneliness and adolescents' depressed mood, the primary aim of the present study is to combine (1) *an integrated, longitudinal approach,* which examines the relationships between loneliness, Facebook use, and adolescents' depressed mood longitudinally in a single comprehensive model, and (2) *a differential approach*, which examines the role of different types of Facebook use within this loneliness-depression association.

Loneliness, Avoidant Coping, and Adolescents' Depressed Mood

The relationships among loneliness, avoidant coping and adolescents' depressed mood served as the starting point of the present study. Depressive symptoms, including depressed mood (i.e., the presence of sad, unhappy, or blue feelings for an undefined period of time), are common during adolescence. Before the end of adolescence, approximately 20% of girls and 7% of boys are confronted with depressive symptoms (e.g., Angold, Erkanli, Silberg, Eaves, & Costello, 2002), which puts them at particular risk for various negative health outcomes, including depression later in life (e.g., Copeland, Shanahan, Costello, & Angold, 2010). An important predictor of adolescents' depressive symptoms is loneliness (e.g., Vanhalst, Luyckx, Teppers, & Goossens, 2012), which Peplau and Perlman (1982) described as the unpleasant state that results from a perceived discrepancy between one's actual and desired relationships. Loneliness increases sharply during adolescence (Perlman & Landolt, 1999) because during this time, adolescents struggle with concurrent physical, social, and cognitive changes, which can create a sense of uncertainty regarding their self-concept (Sippola & Bukowski, 1999). Although studies have demonstrated that loneliness and depressive symptoms are interrelated, they are conceptually distinct (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006), with loneliness being a more consistent predictor of depressive symptoms than vice versa (Vanhalst et al., 2012).

This impact of loneliness on adolescents' depressive symptoms can be partly explained by individuals' ways of coping (Vanhalst et al., 2012), which refers to the use of emotional, cognitive or behavioral strategies for dealing with pressures, demands, and emotions in response to distress (Lazarus & Folkman, 1984). Avoidant coping (i.e., cognitive or behavioral attempts to deny and minimize the problem) in particular has frequently been examined as an outcome of loneliness (e.g., Heinrich & Gullone, 2006) and a predictor of depressive symptoms (e.g., Calvete, Camara, Estevez, & Villardón, 2011). According to the literature review of Heinrich and Gullone (2006), lonely people tend to passively cope with

their feelings of loneliness because they tend to believe that they are powerless to change their situation and are thus more likely to avoid the problem. These avoidant coping strategies, in turn, have been shown to increase adolescents' depressive symptoms (e.g., Calvete et al., 2011). For example, Vanhalst et al. (2012) showed that passive coping, but not active coping, mediated the association between loneliness and depressive symptoms.

The Role of Specific Types of Facebook Use

The primary aim of the present study is to further elucidate the relationships between loneliness, avoidant coping and adolescents' depressive symptoms, by examining the role of specific types of Facebook use within these associations. In line with scholars' suggestions (Burke, 2011; Matook, Cummings, & Bala, 2015; Verduyn et al., 2015), the present study differentiates between passive and active Facebook use. *Passive Facebook use* or 'passive consumption' includes the monitoring of other people's lives by viewing the content of others' profiles without direct exchanges between the users (Burke, 2011; Verduyn et al., 2015). Passive Facebook use thus refers to the extent to which a user consumes Facebook content but does not communicate with the content owner about it (e.g., viewing other users' profiles) (Krasnova, Wenninger, Widjaja, & Buxmann, 2013; Matook et al., 2015; Shaw, Timpano, Tran, & Joormann, 2015).

Active Facebook use refers to activities that facilitate interactions between the user and other Facebook friend(s) (Burke, 2011; Verduyn et al., 2015). In other words, active Facebook use refers to both targeted one-on-one exchanges (i.e., directed communication; Burke, 2011) and non-targeted exchanges (i.e., broadcasting; Burke, 2011). In line with Manago, Taylor, and Greenfield (2012), the present study made an additional distinction between active *public* Facebook use or 'public communication' (i.e., activities that facilitate direct interactions between the user and other Facebook friend(s) in a public setting) and active *private* Facebook use or 'private communication' (i.e., activities that facilitate direct

interactions between the user and other Facebook friend(s) in a private setting). Similar to the classification of Manago et al. (2012), active public Facebook use is comprised of those activities that occur in a public Facebook setting, i.e., status updating and sharing of photos, pictures and videos, whereas active private Facebook use contains activities that occur in a private Facebook setting, i.e., messaging.

The present study aims to distinguish between private and public Facebook communication for various reasons. First, time on Facebook can be filled by interacting with other Facebook users in a public setting (e.g., sharing a photo with all Facebook friends), a semi-public setting (e.g., sharing a photo with a specific group of Facebook friends) or a private setting (i.e., chatting with a specific Facebook friend). Given these possibilities, it is likely to expect differences *between* Facebook users with respect to the level of publicness of their Facebook communication. Second, the level of publicness of Facebook communication can be simply managed because Facebook users can easily switch between the private and public Facebook platforms (or use them simultaneously) and can restrict what information is visible to others within the public platform. Therefore, differences are also likely to occur *within* Facebook users and may depend on the content of what the user aims to communicate. Given these reasons, it is highly relevant to further differentiate between active private and active public Facebook use within the present study.

To understand the relationships among loneliness, these specific types of Facebook use, and adolescents' perceptions of social support, the present study combines insights from Uses & Gratifications (U&G) theory (Katz, Haas, & Gurevitch, 1973) and social media affordances. We believe that U&G theory can provide a valuable theoretical framework to explain the hypothesized differential role of loneliness as a predictor of specific types of Facebook use and that Facebook affordances could explain the hypothesized differential impact of specific types of Facebook uses on adolescents' perceptions of social support. By

combining these theoretical insights, the present study aims to contribute to a more nuanced overview of the predictors and outcomes of adolescents' Facebook use.

Loneliness and Facebook use: A Uses & Gratifications Approach

To understand the relationships between loneliness and specific types of Facebook use, the present study employs a *U&G approach* (Katz et al., 1973). U&G theory examines how individuals use media, including social media, to fulfill their personal needs. This approach argues that audiences actively select media and media content to satisfy their individual needs. Papacharissi and Mendelson (2011) uncovered several motivations for why individuals use Facebook, including expressive information sharing, habitual passing of time, relaxing entertainment, companionship, professional advancement, escape, and social interaction. However, audiences differ in the gratifications that they seek from the media. For example, individuals with specific psychological characteristics, such as a high level of loneliness, could seek different gratifications from the media compared with people who do not have to cope with feelings of loneliness. These different gratifications, in turn, are believed to differently affect individuals' media use. To determine lonely people's use of media, we thus need to identify their individual needs.

First, research has shown that lonely individuals perceive themselves as being incapable of changing their situation (e.g., Heinrich & Gullone, 2006) and thus prefer avoidant coping strategies rather than problem-focused coping strategies (e.g., Vanhalst et al., 2012). Early research found that greater loneliness was associated with higher levels of passive television use (e.g., Perse & Rubin, 1990). As found for television use, Facebook could be similarly capable of distracting users from their daily distress (Papacharissi & Mendelson, 2011) because it offers users a wide range of possibilities to passively fill their time and could, therefore, especially attract lonely individuals. In line with this assumption, Sheldon (2008) found that college students who were anxious or felt fear in their face-to-face

communication used Facebook more to pass time and relieve their lonely feelings. We

therefore believe that by using Facebook passively, lonely peoples' specific coping needs

might be fulfilled.

Although only a few studies have examined the relationship between loneliness and

individuals' passive Facebook activities (Clayton et al., 2013; Ryan & Xenos, 2011), the

results were in line with these expectations. For example, Ryan and Xenos (2011) reported a

positive correlation between loneliness and Internet users' preferences for passive

engagement on Facebook (e.g., groups, fan pages). Therefore, based on these studies and in

line with U&G theory (Katz et al., 1973), we hypothesize the following:

H1: Loneliness will positively predict adolescents' passive Facebook use

Second, studies have reported that lonely adolescents often struggle with their identity

and self-concept (e.g., Sippola & Bukowski, 1999) and report lower levels of perceived social

competence (e.g., DiTommaso, Brannen-McNulty, Ross, & Burgess, 2003). We argue that

the public Facebook platform can offer lonely users new opportunities for satisfying these

specific needs. This assumption is based on Walther's (1996) *hyperpersonal model of*

computer-mediated communication (CMC). This model argues that the reduced cues of

CMC allow users to carefully select information that they prefer to present. However, with

the advent of SNSs, the public Facebook platform, in particular, can offer their users various

techniques to manage their online self-presentation, such as photo sharing, photo editing or

status updating. Research (e.g., Michikyan, Dennis, & Subrahamanyam, 2014) has shown

that Facebook users apply these self-presentation tools in different ways, which can result in

different online self-presentations. Although some present their real self on Facebook, others

present an ideal or even a false self. Given that lonely individuals often struggle with their

identity and self-concept (Sippola & Bukowski, 1999), these opportunities for online self-

presentation experimentation could particularly attract lonely adolescents because these

online tools might best fulfill their need for identity exploration. In line with this assumption, Michikyan, Subrahmanyam, and Dennis (2014) found that introverts reported engaging in greater self-exploratory behaviors on Facebook.

The hyperpersonal model (Walther, 1996) further suggests that the asynchronous nature of CMC allows time to compose and edit information. With the widespread use of Facebook, we suggest that the public Facebook platform in particular could offer users an ideal setting to compose, edit and easily spread information. The asynchrony of public Facebook conversations allows users to carefully think over and select what to post as well as to edit this information after it has been posted, whereas messages sent through private Facebook channels cannot be edited once they have been sent. Therefore, public Facebook features are expected to especially attract lonely individuals because these individuals often show deficits in social skills (e.g., Schinka, Van Dulmen, Mata, Bossarte, & Swahn, 2013) and therefore find it highly important to have ample time to select what to post and to have the possibility to edit this information, once it has been posted. Thus, we expect that lonely peoples' specific needs for self-presentation and editing, which could stem from their identity struggle and social skills deficits, can be fulfilled through actively using the public Facebook platform.

However, few studies have examined the relationship between loneliness and Facebook (e.g., Sheldon, Abad, & Hinsch, 2011), including active forms of Facebook use (e.g., Clayton et al., 2013), with no study thus far having examined the relationship between loneliness and specific types of active Facebook use. Therefore, based on U&G theory (Katz et al., 1973) and Walther's (1996) hyperpersonal model, we can hypothesize the following:

H2: Loneliness will positively predict adolescents' active *public* Facebook use

H3: Loneliness will negatively predict adolescents' active *private* Facebook use

Facebook Use and Perceived Social Support: An Affordance-Based Approach

To understand the hypothesized impact of different types of Facebook use on adolescents' perceptions of social support, the present study uses an affordance-based approach. According to Gibson (1986), affordances are used as a means to understand what 'an object' can afford, i.e., "what the object is good for". Scholars (e.g., Boyd, 2011; Ellison & Vitak, 2015; Treem & Leonardi, 2012) have argued that SNSs offer their users a variety of affordances, such as *visibility* (i.e., the ability to make previously invisible knowledge, preferences, and behaviors visible), *persistence* (i.e., the ability to access content), *replicability* (i.e., the ability to duplicate content), *searchability* (i.e., the ability to search content), *editability* (i.e., the ability to craft a message before posting it and to edit it after it has been posted), *broadcasting* (i.e., the ability to distribute content) and *association* (i.e., the ability to connect with other users/the content that the other users post).

SNS users can adapt to different affordances by engaging in different types of Facebook activities, such as passive Facebook use (i.e., browsing through others' Facebook profiles) or active Facebook use (e.g., wall posting, private messaging). While passive Facebook activities could enable users to easily access and search Facebook content, actively using Facebook could facilitate the visibility and broadcasting of (edited) Facebook content, which could connect users with each other. Scholars (e.g., Ellison, Steinfield, & Lampe, 2011; Ellison & Vitak, 2015; Vitak & Ellison, 2012) argue that these Facebook affordances could, in turn, affect users' social support perceptions. We, however, especially believe that while *some* Facebook affordances could enable users to passively use Facebook and could thus harm their perceptions of social support, *other* affordances could enable users to actively use Facebook to request social support, which could increase their perceptions of social support.

Passive Facebook features (e.g., browsing others' profiles) could enable users to search, at any point in time, through the (edited) behaviors, knowledge and preferences that

have been made visible by other Facebook users. We believe that this *visibility*, *persistence and searchability* of (passive) Facebook (use) could decrease adolescents' social support perceptions. This expectation can be explained by *social comparison theory* (Festinger, 1954). According to this theory, individuals are driven by a desire to evaluate their opinions and abilities. In the absence of an objective base for comparison, this self-evaluation motive is served through comparison with (similar) others. Facebook can provide a useful and popular base for such social comparison behaviors, given the visibility, persistence and searchability of the Facebook content. In addition, due to the *editibality* of Facebook content, Facebook users can present themselves in their best possible way (Manago, Graham, Greenfield, & Salimkhan, 2008; Vogel, Rose, Robert, & Eckles, 2014). As a result, upward comparison behaviors (i.e., comparison with those we believe are better off) are especially well stimulated through Facebook (Chou & Edge, 2012). We believe that such feelings (e.g., "other Facebook users are happier and have better lives") could limit the request for social support when needed because social support seekers might be afraid to request support from those who are believed to be better off, as research has shown that support seekers might turn more easily to online health-related support groups (e.g., Wright & Miller, 2010) because those who participate might be in a more similar situation. Given that such upward online comparison behaviors have been linked with various negative outcomes, including depressive symptoms (Feinstein & Hershenberg, 2013) and negative emotions (Haferkamp & Krämer, 2011), we can expect a similar negative impact on adolescents' social support perceptions.

Despite empirical evidence that reports that there is a significant impact of general types of Facebook use on individuals' levels of perceived social support (e.g., Akbulut & Günüç, 2012; Liu & Yu, 2013), few studies have investigated the specific impact of passive Facebook use. Although several studies have reported a negative relationship between non-social SNS use and young people's well-being (e.g., Wang, Jackson, Gaskin, & Wang, 2014),

the relationship between passive Facebook use and individuals' social support perceptions is less clear. While Facebook users' passive consumption was found to be negatively related to bridging social capital (Burke, Marlow, & Lento, 2010; Burke, 2011), this passive Facebook use was unrelated to users' levels of social support (Burke, 2011). Thus, although the empirical evidence regarding the relationship between passive Facebook use and users' social support perceptions has been somewhat mixed, Facebook affordances and social comparison theory (Festinger, 1954) gives us sufficient reason to expect a negative association between both constructs. We therefore hypothesize the following:

H4: Passive Facebook use will decrease adolescents' perceptions of social support

Active Facebook features (e.g., wall posting, private messaging) can facilitate quick distribution of content across one's entire network (i.e., through public Facebook use) or across a part of one's network (i.e., through private Facebook use) and a connection with other users or the content that the other users post. We believe that this *broadcasting* and *association* could increase adolescents' social support perceptions. More specifically, when social support is needed, some adolescents turn to close ties, such as friends or family (Bokhorst, Sumter, & Westenberg, 2010), but others might turn to weak ties because they are expected to have more experience and information about certain problems compared with strong ties. Given that a Facebook network consists of both strong and weak ties, Facebook is a perfect source of social support when such support is needed (Frison & Eggermont, 2015a). Moreover, through the broadcasting of Facebook content, users can easily request support from this network. The ability to connect both with other users and with the content of other users could further contribute to increased social support perceptions. We therefore suggest that broadcasting and association, which are typical for active Facebook use, might lower the barriers for connecting with strong and/or weak ties, which in turn could positively affect users' perceptions of social support.

However, prior studies that address the relationship between Facebook use and adolescents' perceptions of social support have reported rather inconsistent findings. Although some have reported positive associations between the time spent on Facebook (Akbulut & Günüç, 2012), Facebook intensity (Liu & Yu, 2013), having a family member on Facebook (Vitak, Ellison, & Steinfield, 2011) and young people's level of perceived social support, others have found no empirical support for such a relationship (Oh, Ozkaya, & LaRose, 2014). Although only a few studies considered the impact of specific types of Facebook use on young people's perceptions of social support (Frison & Eggermont, 2015b; Manago et al., 2012), the impact of specific Facebook communication practices on users' level of social capital (Burke, Kraut, & Marlow, 2011; Ellison, Gray, Lampe, & Fiori, 2014; Ellison et al., 2011) has received much more research attention. Research has shown that Facebook communication (Burke, 2011), social information-seeking behaviors on Facebook (Ellison et al., 2011), and the public posting of mobilization requests on Facebook (Ellison et al., 2014) are positively associated with individuals' social capital. Given that social support and bonding social capital are closely linked because both constructs rely on a similar resource, i.e., close personal relationships (e.g., friends and family) (Vitak & Ellison, 2012), a similar impact of active Facebook use on teens' perceived level of social support is likely. Therefore, in line with prior studies (e.g., Frison & Eggermont, 2015b) and based on Facebook affordances, we hypothesize the following:

> H5: Active *public* Facebook use will increase adolescents' perceptions of social support
>
> H6: Active *private* Facebook use will increase adolescents' perceptions of social support

Hypothesized Model

Taken together, by applying the premises of U&G theory (Katz et al., 1973) and

social media affordances to a Facebook context and combining these theoretical insights in a

single comprehensive model, we hypothesize that loneliness could differently predict specific

types of Facebook use, which in turn could differently predict adolescents' social support

perceptions. Furthermore, we expect that social support perceptions play an important role in

maintaining individuals' psychological health because they can either directly or indirectly,

through the choice of a specific coping strategy, decrease individuals' depressive symptoms.

According to the main effects model of social support (Cohen & Wills, 1985), social support

perceptions can *directly* enhance an individual's sense of well-being, regardless of the

experienced amount of stress. In line with this hypothesis, social support perceptions have

been shown to decrease the symptoms of depression (e.g., Rueger, Malecki, & Demaray,

2010). In addition, perceiving social support could also *indirectly* heighten adolescents' well-

being, as scholars (e.g., Aldwin, 2007) have suggested that perceiving social support could

facilitate adaptive coping, which in turn could enhance adolescents' well-being. In line with

this suggestion, a high availability of support from friends was found to positively predict

adolescents' adaptive coping (i.e., social support seeking) (Bal, Crombez, Van Oost, &

Debourdeaudhuij, 2003). This adaptive coping, in turn, has been shown to decrease

adolescents' depressed mood (e.g., Murberg & Bru, 2005). Figure 1 summarizes the above

hypotheses and expectations.

[Figure 1 about here]

By integrating these hypotheses and expectations into a single comprehensive model,

and testing them longitudinally, the present study is believed to extend prior research. On the

one hand, the present study investigates a model that considers a specific antecedent (i.e.,

loneliness) and a specific outcome (i.e., depressed mood) of three different types of Facebook

use because incorporating antecedents and outcomes into a single comprehensive model

might offer a better representation of the data compared with considering single processes alone. On the other hand, the present study tests these hypotheses longitudinally and hereby serves as a scholarly call (Ahn, 2011) for more longitudinal research on the predictors and outcomes of adolescents' SNS use.

Method

Sample and Participant Selection

A two-wave panel study with a 6-month interval was conducted among 12- to 19-year-old adolescents. Data were gathered through a two-step sampling method. First, fifteen high schools were randomly selected from the secondary school list of the Flemish government. Schools that were located in different parts of Flanders (i.e., the northern part of Belgium) and that offered different types of schooling levels were selected. Second, the schools that gave permission to participate were visited in October 2013. Approval for the study procedures was received from the institutional review board of the host university. The students who did not return a refusal form that was signed by their parents or legal guardian at the time of the researchers' visit were asked to complete a paper-and-pencil survey. The participants were informed that the questions would be about their emotions and social media use. A second questionnaire was administered in March 2014 in the fifteen schools that had participated in October 2013. The respondents were asked to fill out separate identification forms at Time 1 and Time 2, to track them over time

A total of 1,866 students completed the questionnaire at baseline, and 1,840 students participated in wave 2. A total of 1,612 students completed the questionnaire for both waves (86% of the first wave). At baseline, 55% of the participants were boys, and 45% were girls, with a mean age of 14.30 years ($SD = 1.43$). In total, fifteen Flemish high schools participated, with 46% of the sample following a general educational program, which is

representative of the overall Flemish secondary school population (45%; Flemish Department of Education, 2015).

To examine whether attrition biased our sample, we examined the differences between those who participated in both waves and those who participated in one wave. More specifically, using Pillai's trace, a multivariate analysis of variance (i.e., MANOVA) showed significant differences ($V = .02$, $F(8, 1380) = 3.23$, $p < .001$, $h_p^2 = .02$). Follow-up univariate analyses revealed that adolescents who participated in both waves scored significantly lower on emotional loneliness ($M = 2.13$; $SD = .84$ versus $M = 2.28$; $SD = .87$), $F(1, 1773) = 5.18$, $p < .01$, $h_p^2 = .004$ and depressed mood ($M = 1.69$; $SD = .66$ versus $M = 1.84$; $SD = .74$), $F(1, 1795) = 10.43$, $p = .001$, $h_p^2 = .006$, but higher on perceived friend support ($M = 5.86$; $SD = 1.14$ versus $M = 5.59$; $SD = 1.40$), $F(1, 1840) = 11.61$, $p = .001$, $h_p^2 = .006$.

Measures

Demographic Variables. The participants responded to questions about gender and age.

Daily Time Spent on Facebook. The participants completed four questions about their time spent on Facebook. On a 11-point Likert scale, which ranged from *0 hours* (= 0) to *I am always logged in to Facebook* (= 11), they estimated how much time they spent on Facebook on a regular *weekday*, *Wednesday*, *Friday*, and *weekend day (*Sat–Sun). We distinguished Wednesdays from regular weekdays because Wednesday is the only weekday when participants have a half day at school and thus might spend more time on Facebook compared to a regular weekday. A composite score of the average daily time on Facebook was computed by calculating the average of the time spent on a typical weekday, weekend day, Wednesday, and Friday.

Loneliness. The 11-item Loneliness Scale (de Jong-Gierveld & Kamphuls, 1985) was used to examine the adolescents' level of loneliness. Using a 5-point scale (*Strongly*

disagree (= 1) – *Strongly agree* (= 5)), the adolescents' level of social and emotional

loneliness was assessed. The present study focused on the dimensions of emotional

loneliness, which includes six items, such as "I experience a general sense of emptiness" and

"I often feel rejected" (α = .86). By summing the item scores of this subscale and dividing

the sum by the total number of items, an estimate of the adolescents' emotional loneliness

was created.

Types of Facebook use. To measure the respondents' use of different types of

Facebook activities, we developed the 'Multidimensional Scale of Facebook Use' (MSFU).

Using a 7-point Likert scale, which ranged from *never* (= 1) to *several times per day* (= 7),

the respondents rated 10 different types of Facebook activities The validity and reliability of

this self-developed scale was measured using a two-step approach. First, we conducted an

exploratory factor analysis (EFA). Using principal components analysis with an oblique

rotation, a three-factor solution was obtained that accounted for 74.60% of the total variance.

Based on the item content, the three factors were labeled *active private Facebook use*, *active*

public Facebook use and *passive Facebook use*. The factor loadings for the items that

assessed active private Facebook use (i.e., "How often do you send someone a personal

message on Facebook"; "How often do you chat with someone on Facebook"; r = .59), active

public Facebook use (i.e., "How often do you post a message on your own Facebook

timeline"; "How often do you post a photo on your own Facebook timeline"; "How often do

you post something else (e.g.., a picture or video) on your own Facebook timeline"; α = .86)

and passive Facebook use (i.e., "How often do you visit a Facebook profile of a Facebook

friend"; "How often do you visit a Facebook profile of a non-Facebook friend"; "How often

do you watch photos of a Facebook friend"; "How often do you watch photos of a non-

Facebook friend"; α = .86) were satisfactory, ranging between .549 and .947. No cross-

loadings were reported. Although one item (i.e., "How often do you read your news feed")

was expected to load highly on passive Facebook use, this item, surprisingly, loaded highly on private Facebook use. Because the item content of this specific item did not match the item content of the active private Facebook use items, we excluded this item from the analysis. Second, we conducted a confirmatory factor analysis (CFA), using AMOS, to further confirm that these three types of Facebook use are legitimately distinct. A CFA with the three factors explained by the nine items produced an acceptable fit, with a chi-square value of 98.47 that had 23 degrees of freedom, $p < .001$; $\chi^2/df = 4.28$, $p = .000$, CFI = .99, RMSEA = .04.

Perceived friend support. To measure the respondents' perceptions of friend support, we consulted the 4-item friend subscale of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). On a 5-point scale that ranged from *Strongly disagree* (=1) to *Strongly agree* (= 5*)*, the respondents evaluated four items (e.g., "When you are feeling down or in a difficult situation … my friends really try to help me") ($\alpha = .94$). By summing the item scores and dividing the sum by the total number of items, an estimate of the adolescents' perceptions of friend support was created.

Avoidant coping. The 29-item Coping Scale for Children and Youth (Brodzinsky et al., 1992) was used to assess respondents' coping strategies. To measure the respondents' tendency to avoid a problem, the present study used the 'Behavioral Avoidance Subscale'. On a 4-point Likert scale (*Never* (= 1) – *Very often* (= 4)), the respondents rated six items, such as "I stayed away from things that reminded me about the problem" and "I went to sleep so I wouldn't have to think about it" ($\alpha = .78$). An estimate of adolescents' avoidant coping was produced by summing the item scores and dividing the sum by the total number of items.

Depressed mood. Using a 4-point scale (*Not at all* (= 1) – *A lot* (= 4)), The Center for Epidemiological Studies Depression Scale for Children (CES-DC) measures depressive symptoms. Olsson and von Knorring (1997) investigated the psychometric properties of the

20-item CES-DC in a Swedish adolescent sample and found support for one strong

underlying factor, i.e., depressed mood (e.g., "During the past week, I wasn't able to feel

happy, even when my family or friends tried to help me feel better") ($\alpha = .88$). An estimate

of adolescents' depressed mood was created, based on the average of the selected six items.

Receiving positive public Facebook feedback. To measure the extent to which the

participants received positive Facebook feedback, we asked them to evaluate two items.

First, on a 7-point scale that ranged from *never* (= 1) to *always* (= 7), the adolescents

indicated how often they received positive public reactions on Facebook. Second, on a 9-

point scale that ranged from *0 till 5 likes* (= 1) to *more than 40 likes* (= 9), the participants

rated the number of average likes that they received. Before an estimate of adolescents'

positive public Facebook feedback could be created, we recoded the item about receiving

likes into a 7-point scale. Next, the item scores were summed and divided by the total

number of items ($r = .39$, $p < .001$) .

Analysis

The hypothesized relationships were tested with structural equation modeling

(AMOS), using the maximum likelihood method. The chi-squared-to-degrees-of-freedom

ratio (χ^2/df), root mean square error of approximation (RMSEA) and comparative fit index

(CFI) were used to address the fit of the models (Byrne, 2010). We controlled for the

baseline values of the participants' gender, age, and daily time spent on Facebook, by adding

them as predictors for all of the hypothesized endogenous variables in our model (i.e., types

of Facebook activities at Time 1, perceived friend support at Time 2, avoidant coping at Time

2 and depressed mood at Time 2). We further allowed the baseline values of the participants'

gender, age, and daily time spent on Facebook to covariate with one another and allowed

covariance with the remaining Time 1 variables (i.e., emotional loneliness at Time 1,

perceived friend support at Time 1, avoidant coping at Time 1 and depressed mood at Time

1). Furthermore, we added prior values as control variables. More specifically, perceived friend support at Time 1 predicted the perceived friend support at Time 2, avoidant coping at Time 1 predicted the avoidant coping at Time 2, and depressed mood at Time 1 predicted the depressed mood at Time 2.

The bootstrapping method was used to assess the significance of indirect pathways (Cheung & Lau, 2007). Given that the bootstrapping method does not allow the sample to include missing values, multiple imputation was performed (Honaker & King, 2010). Multiple imputation produces multiple data sets in which the missing values are imputed based on the available data. The SPSS multiple imputation procedure was used to impute the missing values. To test for indirect effects, the five imputed data sets were analyzed using the AMOS bootstrapping procedure (i.e., 200 bootstrap samples; 95% confidence interval (CI)). To calculate the separate indirect effects, we created user-defined estimates.

Results

Descriptive Statistics

As this study examines the role of different types of Facebook use within the relationship between loneliness and adolescents' depressed mood, we only included the 89% of respondents ($N = 1,423$) who had a Facebook account at Time 1 and Time 2 in our analyses. Table 1 displays descriptive statistics. Results showed that, at Time 1, adolescent FB users spent on average between 1,5 and 2 hours daily on Facebook ($M = 5.06$; $SD = 2.86$). During their time on Facebook at Time 1, online interaction in a private Facebook setting was the most popular Facebook activity, followed by respectively passive Facebook use and active public Facebook use. Participants indicated to engage several times per week in private Facebook activities ($M = 5.05$, $SD = 1.58$), once per week in passive Facebook activities ($M = 3.74$, $SD = 1.38$) and once till twice per month in public Facebook activities

($M = 2.83$, $SD = 1.28$). At Time 2, adolescents received regularly positive public feedback on Facebook ($M = 4.57$, $SD = 1.62$).

[Table 1 about here]

A MANOVA on Facebook use at Time 1 (i.e., daily time spent on Facebook, active public Facebook use, active private Facebook use, passive Facebook use, and positive public Facebook feedback) revealed significant multivariate main effects for gender, [Pillai's Trace $= .02$, $F(5, 1086) = 3.49$, $p < .01$, $h_p^2 = .02$, power $= .92$] and age, [Pillai's Trace $= .08$, $F(10, 2174) = 13.28$, $p = .000$, $h_p^2 = .04$, power $= 1$]. No significant interactions were found ($p > .05$).

In general, girls scored higher on all types of Facebook uses. In addition, late adolescents spent more time on Facebook, compared to middle adolescents, but young adolescents use Facebook in a more active public way, compared to middle adolescents. Late and middle adolescents use Facebook in a more private way, compared to young adolescents, whereas middle adolescents use Facebook in a more passive way than young adolescents. All these differences were significant at level $p < .05$. Mean values are reported in Table 2.

[Table 2 about here]

Zero-order inter-correlations among all variables in the analyses are presented in Table 3.

[Table 3 about here]

Testing Hypothesized Model

The hypothesized model tested the relationships among adolescents' level of emotional loneliness, different types of Facebook activities, positive public Facebook feedback, perceived friend support, avoidant coping and depressed mood. The final model, presented in figure 2, showed a good fit of the data and yielded a chi-square value of 4397.81 with 1117 degrees of freedom, $p < .001$, RMSEA $= .04$; CFI $= .92$; $\chi^2/df = 3.94$.

First, in line with hypothesis 1 and 2, results showed that emotional loneliness at Time 1 positively predicted adolescents' *passive* Facebook use at Time 1, $\beta = .07$, B = .11, SE = .05, $p < .05$, and adolescents' active *public* Facebook use at Time 1, $\beta = .10$, B = .17, SE = .05, $p < .001$. However, results found no support for a significant relationship between emotional loneliness at Time 1 and adolescents' active *private* Facebook use at Time 1, $p > .05$. Hypothesis 3 could therefore not be confirmed.

Third, results demonstrated that *passive* Facebook use at Time 1 decreased adolescents' perceptions of friend support at Time 2, $\beta = -.09$, B = -.08, SE = .04, $p < .05$, whereas active *private* Facebook use at Time 1 enhanced adolescents' perceptions of friend support at Time 2, $\beta = .10$, B = .09, SE = .04, $p < .05$. However, results found no support for a significant relationship between active *public* Facebook use at Time 1 and adolescents' perceptions of friend support at Time 2. Thus, while hypothesis 4 was fully confirmed, hypotheses 5 and 6 could only be partially confirmed.

Furthermore, in line with our expectations, perceived friend support at Time 2 both directly, $\beta = -.10$, B = -.04, SE = .01, $p < .001$, and indirectly, negatively predicted adolescents' depressed mood at Time 2. More specifically, results showed that perceived friend support at Time 2 was negatively associated with adolescents' avoidant coping at Time 2, $\beta = -.08$, B = -.03, SE = .01, $p < .01$. Avoidant coping at Time 2, in turn, was negatively related with adolescents' depressed mood at Time 2, $\beta = .27$, B = .22, SE = .03, $p < .001$. Lastly, emotional loneliness at Time 1 indirectly enhanced adolescents' depressed mood at Time 2, as results showed that emotional loneliness at Time 1 increased adolescents' avoidant coping at Time 2, $\beta = .09$, B = .06, SE = .02, $p = .01$, which in turn positively predicted adolescents' depressed mood at Time 2. In addition, all predictors in the model explained 46% of the variance in adolescents' depressed mood ($R^2 = .46$).

[Figure 2 about here]

Post-Hoc Analyses. Contrary to our expectations, results found no support for a significant positive impact of active *public* Facebook use on adolescents' perceptions of friend support. This may be partly explained by the fact that active public Facebook use (e.g., wall posting) is often accompanied by public interpersonal online feedback (i.e., likes and comments) or feedback given and observed by one's entire Facebook network. For instance, Hampton, Goulet, Rainie, & Purcell (2011) revealed that 21% of Facebook users (18-22 years old) comment Facebook posts several times a day. Given that adolescents are especially vulnerable for feedback of others (Thomaes, Reijntjes, Orobio de Castro, Bushman, Poorthuis, & Telch, 2010), receiving feedback in an online public setting may influence adolescents' well-being (Lee, Kim, & Ahn, 2014; Tobin, Vanman, Verreynne, & Saeri, 2014; Valkenburg, Peter, & Schouten, 2006). In line with this suggestion, Valkenburg et al. (2006) found that receiving *negative* online feedback decreased adolescents' well-being, whereas Lee et al. (2014) showed that receiving *positive* feedback on Facebook (e.g., liking) increased individuals' bonding social capital. Given that the majority of adolescent SNS users receives only positive feedback (Koutamanis, Vossen, & Valkenburg, 2014), we expect an important role of positive feedback within the association between public Facebook use and adolescents' perceived level of social support.

To test this assumption, the variable 'receiving positive public feedback on Facebook' at Time 2 (i.e., positive reactions and likes) was entered into the hypothesized model. The model showed a good fit of the data and yielded a chi-square value of 4795.51 with 1211 degrees of freedom, $p < .001$, RMSEA $= .04$; CFI $= .92$; $\chi^2/df = 3.96$. In line with our expectations, results showed that public Facebook use at Time 1 increased receiving positive public Facebook feedback at Time 2, $\beta = .09$, B $= .07$, SE $= .03$, $p < .05$, which in turn positively predicted adolescents' perceptions of friend support at Time 2, $\beta = .17$, B $= .19$, SE $= .04$, $p < .001$.

Testing indirect effects. Using user-defined estimands and bootstrapping procedure (200 bootstrap samples, maximum likelihood bootstrap, 95% CI), total indirect effects could be calculated. Results revealed a significant total indirect effect of loneliness on adolescents' depressed mood, through passive Facebook use, perceived friend support, and avoidant coping ($.0001 = .07 * -.09 * -.08 * .27; p = .01$). In addition, the total indirect effect of loneliness on adolescents' depressed mood, through public Facebook use, positive public Facebook feedback, perceived friend support, and avoidant coping was also significant ($-.00003 = .10 * .09 * 17 * -.08 * .27; p < .05$).

Discussion

The primary objective of this two-wave panel study was to further elucidate the relationships between loneliness, avoidant coping, and adolescents' depressed mood. The present study found support for the hypothesized differential role of Facebook use within the loneliness-depression association, hereby providing a greater insight into the relationships between loneliness, specific types of Facebook use, and adolescents' depressed mood and offering important contributions that can be used to guide future research.

First, the results revealed a differential role of Facebook within the investigated associations. These findings contribute to the existing literature by emphasizing the need to differentiate between various types of Facebook activities because these types were found to fulfill a central, but differential, role within this relationship. Second, by applying the premises of U&G theory (Katz et al., 1973) and social media affordances to a Facebook context and combining these theoretical insights into a single comprehensive model, the present study identified a new complexity that provides a more profound understanding of the processes at work within the loneliness-depression association. Third, the results showed that perceived friend support plays a key role within the relationship between specific types of

Facebook use and adolescents' depressed mood, which emphasizes the need for future studies to further explore the concept of perceived friend support within this relationship.

Passive Facebook Use: a Poor-get-Poorer Effect

Relying on insights from U&G Theory (Katz et al., 1973) and based on previous cross-sectional studies (Clayton et al., 2013; Ryan & Xenos, 2011), the current study hypothesized that loneliness would positively predict adolescents' passive Facebook use, whereas based on Facebook affordances in combination with Festinger's (1954) social comparison theory, it was hypothesized that this passive Facebook use, in turn, would decrease adolescents' perceived level of friend support. In line with these expectations, loneliness at Time 1 positively predicted adolescents' passive Facebook use at Time 1 (Hypothesis 1), which in turn *decreased* adolescents' perceptions of friend support at Time 2 (Hypothesis 4) and, subsequently, both directly and indirectly through avoidant coping, negatively predicted adolescents' depressed mood.

On the one hand, the results indicated that loneliness positively predicted passive Facebook use, which confirms our suggestion that passive Facebook use especially attracts lonely individuals. This finding could be because passive Facebook features (e.g., viewing other users' profiles) are ideal tools to distract users from their daily distress and could thus best fulfill lonely users' specific coping needs. On the other hand, passive Facebook use at Time 1 *decreased* adolescents' perceptions of friend support at Time 2, which supports our suggestion that the visibility, persistence, and searchability of Facebook content might stimulate upward social comparison behaviors, which in turn could harm users' social support perceptions. Thus, although our results are in line with previous studies that suggest that Facebook is a widely used base for social comparison (Chou & Edge, 2012), which could result in depressive feelings (Feinstein & Hershenberg, 2013) or negative emotions (Haferkamp & Krämer, 2011), these findings add to the current literature by showing that this

process is an *indirect* process because passive Facebook use indirectly enhanced adolescents'

depressed mood through perceived social support.

In summary, the findings showed that loneliness positively predicted adolescents'

passive Facebook use, which in turn decreased adolescents' perceptions of friend support,

over a period of 6 months. These results hereby provide evidence for *a poor-get-poorer*

effect, i.e., lonely adolescents who passively use Facebook can experience negative outcomes

from using Facebook in this way. Although studies already found empirical support for this

poor-get-poorer mechanism in a general online context (e.g., Selfhout, Branje, Delsing, ter

Bogt, & Meeus, 2009), the current study extends prior research by revealing empirical

evidence for this poor-get-poorer mechanism in a Facebook context.

Active Public Facebook Use: a Poor-get-Richer Effect

Based on insights from U&G theory (Katz et al., 1973) in combination with the

premises of Walther's (1996) hyperpersonal model of CMC, we expected that loneliness

would positively predict adolescents' active public Facebook use, whereas in line with

several Facebook affordances, we hypothesized that active public Facebook use would

enhance adolescents' perceptions of friend support. However, it was only when the concept

of positive public Facebook feedback was incorporated into our model that the results were in

line with our expectations, which shows that loneliness at Time 1 positively predicted

adolescents' active public Facebook use at Time 1 (Hypothesis 2), which in turn increased

adolescents' perceptions of friend support at Time 2 (Hypothesis 5) through positive

feedback at Time 1. Perceived friend support negatively predicted adolescents' depressed

mood both directly and indirectly. These findings reveal that status updating and wall

posting are valuable Facebook tools for lonely adolescents to improve their well-being, under

the condition that their posts are accompanied by positive public feedback.

On the one hand, the results thus confirmed that lonely adolescents are especially attracted to public Facebook use because this type of Facebook use, e.g., passive Facebook use, is believed to best fulfill lonely users' specific needs. These findings confirm our expectations that public Facebook features (e.g., photo sharing, status updating) offer users various opportunities to manage their online self-presentation as well as give users the opportunity to carefully compose and edit these statuses or photos, which thus can particularly attract users who must cope with feelings of loneliness. On the other hand, the results showed that receiving positive public feedback is an important condition under which the beneficial impact of actively using Facebook in a public setting on adolescents' perceptions of friend support could occur. Given that no study thus far has examined the role of receiving positive feedback within the association between public Facebook use and adolescents' perceived level of social support, the present study adds to the current literature by showing that public Facebook use at Time 1 positively predicted the receiving of positive feedback at Time 1, which in turn *enhanced* adolescents' perceptions of friend support at Time 2. These findings are in line with the hyperpersonal model of CMC (Walther, 1996), which suggests that the reduced cues and asynchronous nature of CMC (i.e., active public Facebook use) could stimulate optimal online interactions (i.e., positive Facebook feedback). These findings are also in line with empirical studies that show that negative feedback decreased adolescents' well-being (e.g., Valkenburg et al., 2006), while positive feedback enhanced adolescents' social capital (e.g., Lee et al., 2014).

In summary, the findings showed that loneliness positively predicted adolescents' active public Facebook use, which in turn enhanced adolescents' perceptions of friend support, over a period of 6 months. These results hereby provide support for *a poor-get-richer effect*, i.e., lonely adolescents who interact in a public Facebook setting could benefit from using Facebook in this way.

Active Private Facebook Use

Based on insights from U&G theory (Katz et al., 1973) in combination with the premises of Walther's (1996) hyperpersonal model of CMC, we expected that loneliness would negatively predict adolescents' active private Facebook use. In contrast, in line with several Facebook affordances, we hypothesized that active private Facebook use would enhance adolescents' perceptions of friend support. Although no support was found for a significant relationship between loneliness at Time 1 and adolescents' active private Facebook at Time 2 (Hypothesis 3), the results did show that active private Facebook use at Time 1 *increased* adolescents' perceptions of friend support at Time 2 (Hypothesis 6), which in turn, both directly and indirectly through avoidant coping, negatively predicted adolescents' depressed mood.

First, in contrast to our expectations, we found no support for a relationship between loneliness and adolescents' active private Facebook use. This insignificant relationship between loneliness and adolescents' active private Facebook use could be because we focused on a specific type of loneliness, i.e., emotional loneliness. Various scholars (e.g., DiTommaso & Spinner, 1993) conceptualized loneliness as a multidimensional phenomenon. For example, de Jong-Gierveld (1987) distinguished between emotional and social loneliness, whereas DiTommaso and Spinner (1993) identified family, romantic and social loneliness. The insignificant relationship between emotional loneliness and active private Facebook use might therefore suggest that other types of loneliness could be more relevant predictors of adolescents' active private Facebook use than emotional loneliness. In line with this assumption, Ryan and Xenos (2011) reported a significant negative correlation between social loneliness and the preference for active social contributions on Facebook, but non-significant associations with romantic and family loneliness. Future research should

therefore explore the impact of other types of loneliness because they could be differently related to adolescents' Facebook use.

Second, the results showed that private Facebook interaction at Time 1 *increased* adolescents' perceptions of friend support at Time 2. This finding was in line with our expectations that private Facebook features (i.e., private or instant messaging) can facilitate broadcasting (i.e., the ability to distribute content) and association (i.e., the ability to connect), which in turn could stimulate connections with strong and weak ties, subsequently facilitating the request for social support when needed and thus positively impacting users' social support perceptions. In addition, the results hereby confirm the findings of a previous cross-sectional study that reported a positive association between active private Facebook use and young people's perceptions of online social support (Frison & Eggermont, 2015b).

This beneficial impact of using Facebook for private interaction is not surprising. Friends and family members are important sources of social support (Bokhorst et al., 2010). At the same time, research has shown that teens' Facebook network mainly consists of friends (who they know from the offline world) and family members (Madden, Lenhart, Cortesi, Smith, & Beaton, 2013). Given these facts, it was likely to expect that private Facebook interaction, which is most likely to occur between friends and family members, stimulates users' social support perceptions. In addition, a private Facebook setting can offer adolescent users a safe and confidential environment. Subsequently, when social support is needed, social support seekers can specifically turn to this setting because this setting offers users the possibility of selecting one or more social support providers from their list of Facebook friends with whom they can interact in a setting that guarantees optimal privacy.

Taken together, although no support was found for a significant association between loneliness and adolescents' active private Facebook use, the findings did reveal a positive impact of active private Facebook use on adolescents' perceptions of friend support over a

period of 6 months. Thus, although we expected to find support for *a rich-get-richer effect* (i.e., non-lonely adolescents who interact in a private Facebook setting could benefit from using Facebook in this way), the results did not provide evidence for a rich-get-richer pattern.

Limitations

The present study is not without limitations. First, the study is limited by the fact that we cannot rule out that other mediators or moderators could modulate our hypothesized relationships. Future studies should therefore further explore potential mediating and moderating variables, such as adolescents' personality traits or ruminative thoughts (e.g., Vanhalst et al., 2012), to provide deeper insight into the relationship between loneliness, Facebook use and adolescents' depressed mood. Second, all of our constructs were measured with self-reports, which could underestimate the participants' actual well-being and could cause shared method variance. Although future studies could benefit from combining self-report measures with other methods, for example, medical examination reports, scholars (e.g., Vanhalst et al., 2012) however argue that self-report measures are considered to be the most appropriate tools for measuring subjective experiences. Third, although the drop-out between Time 1 and Time 2 is an important limitation of the present study, similar patterns of attrition have been examined in prior studies (de Graaf, Bijl, Smit, Ravelli, & Vollebergh, 2000). In addition, our current associations would likely be even stronger when attrition would be absent because the participants who dropped out were more lonely, perceived less social support and felt more depressed. Future studies should therefore attempt to minimize attrition, to provide a more correct understanding of the actual strengths of these associations. A fourth limitation refers to the lack of focus on the level of publicness in the operationalization of the measurement of public Facebook use. Although the present study differs between active private and active public Facebook use, future studies should pay special attention to the measurement of active public Facebook use because users could vary

in their level of publicness for their Facebook profile and Facebook communication. For example, status updates that are posted on a private Facebook profile are semi-public, whereas those posted on a public profile are fully public. Therefore, to provide a more correct understanding of the role of Facebook within the relationship between loneliness and adolescents' depressed mood, future studies should use a more detailed categorization of public Facebook use.

Conclusions

Despite these limitations, the results from the present study extend prior research by developing an integrated and differential approach to the relationships between loneliness, specific types of Facebook use, and adolescents' depressed mood. More specifically, by combining two communication-based theoretical frameworks, i.e., U&G theory (Katz et al., 1973) and social media affordances, and applying insights from these approaches to a Facebook context, the present study found empirical support for *a poor-get-richer* and *poor-get-poorer effect*, hereby revealing a new complexity: Loneliness could be differently related to adolescents' Facebook activities, which in turn could differently predict adolescents' well-being.

The results demonstrated that although loneliness positively predicted both adolescents' passive Facebook use and active public Facebook use, the longitudinal impact of using Facebook in these ways significantly differed. Whereas active Facebook use leads to positive outcomes in the long run, passive Facebook use revealed a more harmful impact on adolescents' well-being. In other words, although loneliness stimulates both the posting and reading of wall posts, the impact of using Facebook in such ways is anything but similar, with *posting* leading to *positive* outcomes and *reading* leading to *negative* outcomes. These findings hereby stress the need for upcoming studies to differentiate between different types of Facebook settings.

To conclude, we argue that future studies should acknowledge that it is only by differentiating between specific types of Facebook use, applying the premises of different relevant theories to a Facebook context and integrating them into a single comprehensive model that the differential role of Facebook within the association between loneliness and adolescents' depressed mood can be clearly understood.

Acknowledgment

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Table 1

Descriptive Statistics for the Combined Full Sample (i.e., Facebook users).

	Min	Max	*M*	*SD*
Daily time spent on FB (T1)	1	11	5.06	2.86
Active public FB use (T1)	1	7	2.83	1.28
Active private FB use (T1)	1	7	5.05	1.58
Passive Facebook use (T1)	1	7	3.74	1.38
Positive public FB feedback (T2)	1	7	4.57	1.62
Emotional loneliness (T1)	1	5	2.15	.84
Perceived friend support (T1)	1	7	5.85	1.18
Perceived friend support (T2)	1	7	5.90	1.15
Avoidant coping (T1)	1	4	2.13	.68
Avoidant coping (T2)	1	4	2.13	.71
Depressed mood (T1)	1	4	1.72	.68
Depressed mood (T2)	1	4	1.74	.70

Note. FB = Facebook; T1 = Time 1; T2 = Time 2; *N* = 1,423.

Table 2

Gender and Age Differences for the Combined Full Sample (i.e., Facebook users)

	Min	Max	Boys (54%)	Girls (46%)	Young adolescents (27%)	Middle adolescents (67%)	Late adolescents (6%)
			M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Daily time spent on FB (T1)	1	11	4.66 (2.88)	5.44 (2.79)	5.03 (.16)	5.06 (.10)	6.35 (.43)
Active public FB use (T1)	1	7	2.64 (1.20)	3.02 (1.33)	3.22 (.07)	2.81 (.05)	2.87 (.19)
Active private FB use (T1)	1	7	4.76 (1.70)	5.35 (1.39)	4.90 (.09)	5.24 (.05)	5.62 (.23)
Passive Facebook use (T1)	1	7	3.65 (1.43)	3.84 (1.32)	3.61 (.08)	3.89 (.05)	4.02 (.21)
Positive public FB feedback (T2)	1	7	4.24 (1.58)	4.84 (1.33)	4.66 (.10)	4.50 (.06)	4.53 (.25)

Note. FB = Facebook; T1 = Time 1; T2 = Time 2; N = 1,423.

Table 3

Zero-Order Inter-Correlations for the Combined Full Sample (i.e., Facebook users).

	1	2	3	4	5	6	7	8	9	10	11	12
1. Daily time spent on FB (T1)	1	.44**	.49**	.43**	.18**	.10**	.08*	.05	.11**	.11**	.13**	.16**
2. Active public FB use (T1)		1	.46**	.44**	.12**	.09**	.09**	.06*	.12**	.12**	.17**	.17**
3. Active private FB use (T1)			1	.51**	.26**	.02	.20**	.14**	.11**	.11**	.15**	.17**
4. Passive FB use (T1)				1	.24**	.06*	.11**	.04	.10**	.14**	.14**	.14**
5. Positive public FB feedback (T1)					1	-.12**	.23**	.22**	.07*	.09**	.04	.06*
6. Emotional loneliness (T1)						1	-.30**	-.28**	.32**	.28**	.44**	.32**
7. Perceived friend support (T1)							1	.55**	-.04	-.02	-.07**	.03
8. Perceived friend support (T2)								1	-.09**	-.12**	-.11**	-.13**
9. Avoidant coping (T1)									.1	.45**	.43**	.31**
10. Avoidant coping (T2)										1	.41**	.42**
11. Depressed mood (T1)											1	.58**
12. Depressed mood (T2)												1

Note. FB = Facebook; T1 = Time 1; T2 = Time 2; N = 1,423; *p < .05; **p < .01
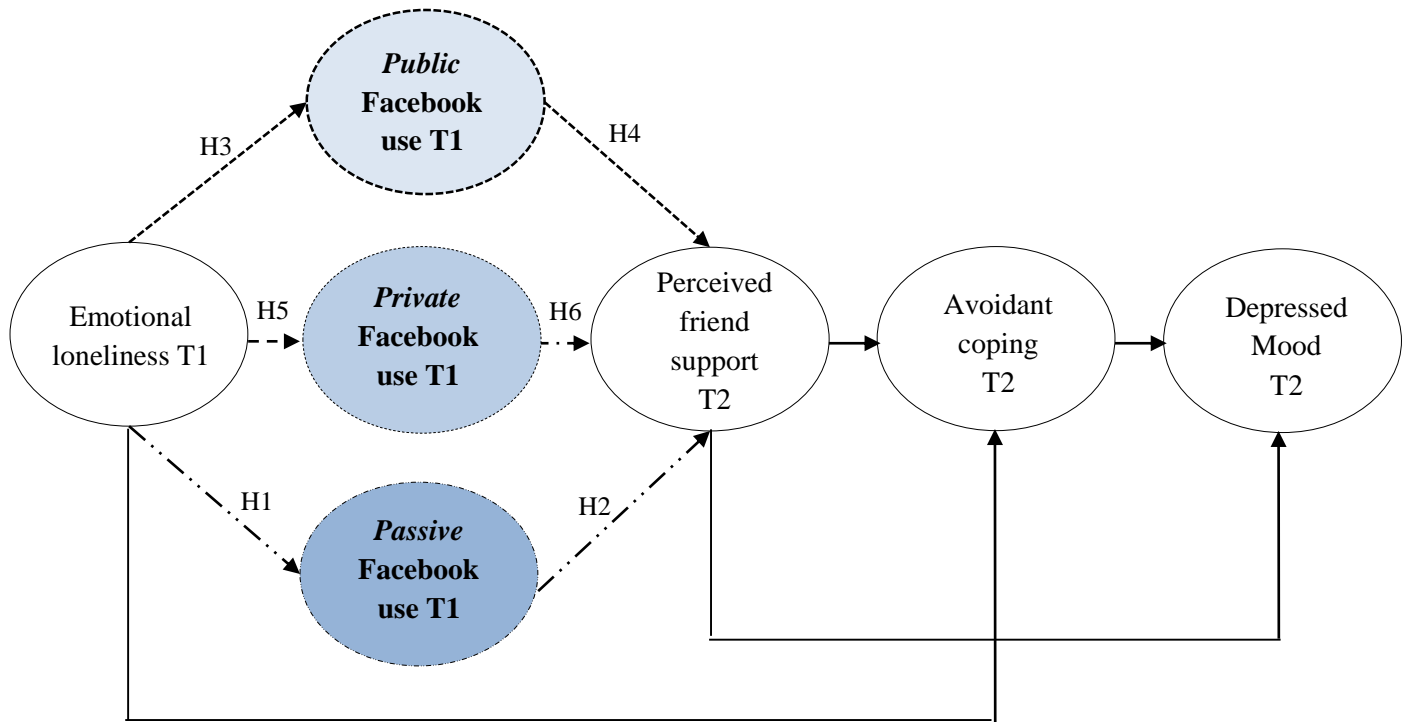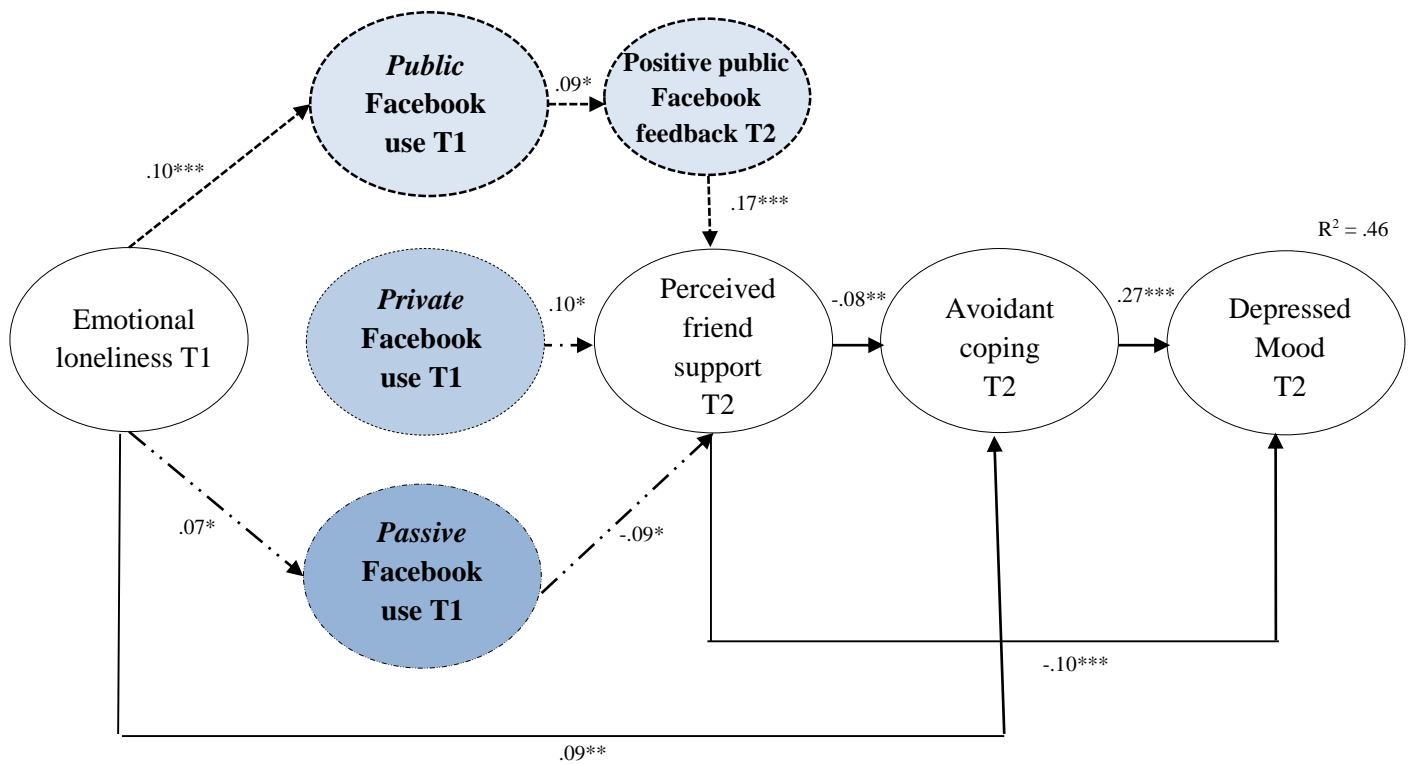
Figure 1. Hypothesized relationships between emotional loneliness, different types of

Facebook use, perceived friend support, avoidant coping, and adolescents' depressed mood.

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

Figure 2. Model examining the relationships between emotional loneliness, different types of

Facebook use, perceived friend support, avoidant coping, and adolescents' depressed mood.

Note: values reflect standardized coefficients. All paths are significant at *p* < .05. For clarity,

error terms, covariances, control variables and measurements are not shown.