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Nice or naughty? The role of emotions and digital media use in explaining adolescents' online prosocial and antisocial behavior

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Abstract

The opportunities and mostly the risks of digital communication technologies for adolescents have been documented extensively in the last two decades, but less is known about how adolescents interact with each other online, especially regarding positive interactions. Moreover, since online prosocial and antisocial behavior have rarely been assessed simultaneously, it is hard to obtain a balanced view of adolescents' online behavior. Therefore, in this study, we examined both dimensions of online social behavior and how these are related to adolescents' experienced emotions and their uses of digital media. Findings indicated that participants performed and received more prosocial than antisocial behavior online. Experiencing negative as well as positive emotions was related to online social behavior, and these associations were mediated by adolescents' use of social and audiovisual media, but not by gaming or functional internet use. The social sharing of emotions and mood management theory are used to discuss the results.

Nice or Naughty? The Role of Emotions and Digital Media Use in Explaining Adolescents' Online Pro- and Antisocial Behavior

In the last decades, digital technologies have assumed increasing importance in the lives of adolescents, who have grown up as “digital natives”. Although some studies, such as EU Kids Online and Net Children Go Mobile (Livingstone & Haddon, 2009; Mascheroni & Ólafsson, 2014), have documented both the opportunities and the risks of the online world for children and adolescents, most research on digital communication technologies is devoted to the negative aspects of these technologies (de Leeuw & Buijzen, 2016). For instance, abundant research attention and media coverage has been allocated to adolescents' experience with *content risks* (e.g., their exposure to pornography) (Staksrud & Livingstone, 2009; Vandoninck, D'Haenens, & Donoso, 2010) and *contact risks* (e.g., the grooming activities directed at them) (Whittle, Hamilton-Giachritsis, Beech, & Collings, 2013a, 2013b).

With regard to *conduct risks* (i.e., risks related to adolescents' own online behavior, especially towards peers), cyberbullying appears to be one of the most studied topics. This behavior constitutes a particular form of antisocial behavior, characterized by an intentionality to hurt, repetitiveness, and an imbalance of power. Survey studies show that this behavior is quite common (Cappadocia, Craig, & Pepler, 2013; Kowalski, Giumetti, Schroeder, & Lattanner, 2014; Tsitsika et al., 2015), and has an important (negative) impact on adolescents' well-being (Hamm et al., 2015). Studies that investigate positive online interactions amongst adolescents, and their (positive) outcomes are less numerous. Recently, de Leeuw and Buijzen (2016) have drawn attention to the dominance of research on negative over positive media effects in children and adolescents and have proposed to restore this balance by introducing positive psychology to the field of children and media. In this regard, Valkenburg and Peter (Valkenburg & Peter, 2007, 2008, 2009), for instance, have shown how communicating via digital media can enhance adolescents' social competence, the closeness of their friendships,

and social connectedness. Moreover, in their study with UK adolescents, Livingstone and Helsper (2010), have clearly shown that online opportunities and risks are strongly positively related and should be studied together.

Nevertheless, research that tries to map both antisocial and prosocial online behaviors simultaneously, and looks at how these are related to negative and positive emotions resulting from adolescents' daily experiences (e.g., hassles and uplifts or more significant life events), is currently lacking. Yet research on offline social behavior already indicates that anti- and prosocial actions are often intertwined, and that (different) combinations may also result in (different) outcomes (i.e., lower or higher status within the peer group) (Veenstra, 2006). Furthermore, theories and empirical studies focusing on explaining adolescents' (online) behavior clearly point to the importance of emotions (and emotion regulation).

The current study will therefore aim to shed light on adolescents' antisocial and prosocial online behaviors simultaneously. Moreover, we will attempt to uncover possible processes behind these behaviors by examining associations with the emotions adolescents experience (and with their use of digital technologies, as emotion-regulative behavior).

Offline Pro- and Antisocial Behavior in Adolescence

Definition and determinants.

Research about offline social behavior can inspire the study of online social behavior. In the literature of offline social behavior, antisocial behavior is often defined as acting in a way that diminishes the well-being of other people or damages other people's property (Patterson, DeBaryshe, & Ramsey, 1990). Prosocial behavior can be defined as voluntary behavior that is carried out with the aim of benefitting others (Eisenberg, Fabes, & Spinrad, 2006). Prosocial behavior is not the same as altruism. Altruism is the opposite of egoism and entails the motivation to increase someone else's well-being (instead of one's own) (Batson & Powell, 2003). Prosocial behavior can be motivated by altruism and altruism can motivate

prosocial behavior, but there is no necessary correspondence between the two (Batson & Powell, 2003). Research on the personality and family characteristics that influence the development of social behaviors have shown a large overlap in contributing factors, which affect prosocial and antisocial behavior in opposite directions, although there are also some differences in the determinants of these behaviors (for a review, see Veenstra, 2006). For example, hyperactivity, impulsivity, negative emotionality, sensation seeking, low intelligence and ineffective parenting have been linked to antisocial behavior, whereas cognitive skills, social intelligence, self-control and parental warmth are associated with prosocial behavior (Veenstra, 2006).

Association between antisocial and prosocial behavior.

The imbalance in the attention devoted to negative versus positive behaviors via digital technologies is also evident in research about offline antisocial and prosocial behavior (Bierhoff, 2002). Moreover, studies examining both antisocial and prosocial behavior at the same time are scarce and more research is needed to explore their dynamics in social development (Fabes, Carlo, Kupanoff, & Laible, 1999). In fact, although the predictors of both types of behavior show some overlap (albeit in opposite directions), antisocial and prosocial behavior are not necessarily two poles of one dimension. Veenstra (2006) summarized studies in which both behaviors were examined in the same sample. He concluded that anti- and prosocial behavior represent two dimensions, and that youngsters can show any combination of both behaviors (both prosocial and antisocial, neither prosocial nor antisocial, prosocial and not antisocial, antisocial and not prosocial, and all degrees in between).

Implications of behaving prosocial and antisocial

An individual's position on both social behavior dimensions has important implications for social status, well-being, and relationships with parents, peers and teachers

(Veenstra, 2006). Individuals combining a high level of antisociality with a low level of prosociality are often rejected by peers whereas individuals with the opposite combination are usually well-liked (sociometrical popularity). Nevertheless, youth who demonstrate antisocial as well as prosocial behavior tend to be perceived as popular by their peers (peer-perceived popularity). Thus, it is important to take both dimensions into account when studying adolescent social behavior.

Online Behavior in Adolescence

Online prosocial and antisocial behavior.

As mentioned earlier, previous research has revealed several opportunities and risks of communication via digital media. And although there is plenty of research on negative behaviors in cyberspace, much less research has focused on prosocial online behavior, that is on how adolescents can use digital technologies to increase *others'* – instead of, or next to their own – well-being. As there are excellent reviews on (forms of) online antisocial behavior (e.g., Kowalski et al., 2014; Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014), we will not elaborate here on this behavior, but instead focus on online prosocial behavior.

To our knowledge, the first study on the topic of online prosocial behavior was conducted by Wang and Wang (2008), who examined why players help others in online games. The results of their online survey showed that altruism and reciprocity both influenced prosocial behavior among gamers. Next, Wright & Li (2011) investigated the relationship between online and offline prosocial behavior among young adults. Offline prosocial behavior was assessed with four prosocial behavior items from Prinstein and Cillessen's (2003) measure of aggressive and prosocial behaviors. Online prosocial behavior was assessed with four items adapted and created specifically for this study ("say nice things", "offer help", "cheer someone up", "let someone know I care about them"). The results of the survey revealed a positive association between engagement in offline and online prosocial behaviors,

after controlling for gender and time spent using digital technologies. Furthermore, the more time adolescents spent using a specific digital technology, the more prosocial behaviors they displayed through that technology. The authors concluded that digital technologies also afford positive interactions and that more research on online prosocial behaviors is needed. The strong positive association between online and offline prosocial behavior was replicated in a survey among a large sample of Internet users in Bosnia and Herzegovina, Croatia and Serbia (Bosancianu, Powell, & Bratović, 2013). Prosocial online behavior was measured with a scale designed by the authors, which consisted of two factors assessing “institutionalized” (e.g., “How often do you contribute to Wikipedia or a similar site?”) and “non-institutionalized” (e.g., “How often do you reply to an e-mail from someone you know who seeks help or information?”) prosocial behavior. The authors interpreted the positive offline-online association as “limited evidence for the existence of a global ‘pro-social’ factor which can manifest itself in interpersonal interactions both online and offline” (2013, p. 59), although they nuanced their position by pointing out the considerable degree of unexplained variance in the association between online and offline prosocial behavior. Finally, a study by Wright (2014) investigated online prosocial and antisocial (cyber aggression) behavior simultaneously. The author conducted a longitudinal study using peer nominations and self-reports to analyze the relationship of perceived popularity and social preference with online social behaviors among adolescents. Online antisocial behavior was assessed on two dimensions: cyber verbal aggression (CVA) and cyber relational aggression (CRA). Online prosocial behavior (OPB) was measured by the same items as in the previously mentioned study by this author. The correlations between peer-nominated and self-reported cyber aggression and online prosocial behavior were negative, except for four associations that were not significantly related (T2 self-rated CVA with T2 peer-nominated OPB, T1 self-rated CVA with T1 self-rated OPB, T2 self-rated CVA with T1 self-rated OPB, and T2 self-rated CVA

with T2 self-rated OPB). Thus, this study provided evidence for a negative association between online antisocial and prosocial behavior, but more research is needed to confirm these preliminary findings. The results of the study further indicated that perceived popularity and social preference linearly predicted later online prosocial behavior, whereas later online antisocial behavior was linearly and curvilinearly predicted by both types of popularity.

In sum, the few studies examining online prosocial behaviors have indicated (a) associations of online prosocial behavior in gaming with altruism and reciprocity (Wang & Wang, 2008), (b) a strong positive correlation between online and offline prosocial behavior (Bosancianu et al., 2013; Wright & Li, 2011), and (c) the prediction of online prosocial behavior by perceived popularity and social preference (Wright, 2014). What remains unclear is whether and how online prosocial and antisocial behaviors are related, as only one study (Wright, 2014) has investigated both behaviors simultaneously and found mixed results for their correlations. Moreover, although some predictors and associated variables have been identified, online social behaviors are likely to be influenced by other variables that have not been researched yet. Investigating the processes involved in online prosocial and antisocial behavior can reveal important insights into why and how these behaviors are enacted and experienced, and how they can be inhibited or stimulated.

Determinants of Social Behavior in Adolescence

This study examines prosocial and antisocial behavior simultaneously. Moreover, the study aims to shed light on possible antecedents of online social behavior. Since there is an endless range of possible antecedents of this behavior, we decided to narrow our scope to the role of emotions, as emotions have already been shown to be antecedents of offline social behavior and of online antisocial behavior.

In research on offline social behavior, on the one hand it has been shown that negative emotionality, which means easily experiencing negative emotions such as anxiety, fear and

anger, is related to delinquent behavior (Caspi et al., 1994), which is a form of antisocial behavior. On the other hand, studies have reported that depressive affect is negatively related to adolescents' offline prosocial behavior (Chen, Li, Li, & Li, Bo-shuLiu, 2000; Wentzel & Mcnamara, 1999).

In recent years, research attention has broadened from a focus on negative emotions and (offline) antisocial behavior, to a wider view that also includes positive emotions and (offline) prosocial behavior (Mikulincer & Shaver, 2010). These studies have revealed the important role of positive emotions, such as gratitude, forgiveness and empathy, in the development of and engagement in prosocial behavior (Bartlett & DeSteno, 2006; Eisenberg, 2015; Karremans, 2005).

With regard to online social behavior, abundant research has explored the determinants of online antisocial behavior, such as cyberbullying. Some of those studies have examined the link of this behavior with emotions, and it has been found for instance that anger in particular predicts perpetration and victimization of cyberbullying (Ak, Özdemir, & Kuzucu, 2015; Lonigro et al., 2015; Pabian & Vandebosch, 2015). Regarding online prosocial behavior, to the best of our knowledge, only the association of social status (popularity and peer-liking) with this behavior has been documented (Wright, 2014).

The findings from previous research about offline and online social behaviors and the influence of emotion were an inspiration for our study. Following the research on offline social behavior, we decided to adopt a broad perspective and to assess the influence of a range of emotions, negative as well as positive.

This Study

In summary, there is a dearth of research on online prosocial behavior and of research examining prosocial and antisocial behavior simultaneously. Moreover, little is known about the variables associated with online prosocial behavior. This study aims to address these gaps

in the literature by examining online prosocial and antisocial behavior together among adolescents. Furthermore, we aim to shed light on factors associated with these behaviors by investigating the relationships of online prosocial and antisocial behavior with experienced emotions. Using a self-report questionnaire in a large sample of adolescents, we set out to answer the following research questions:

RQ1. How are engagement (i.e. receiving and performing) in online prosocial and antisocial behaviors related?

RQ2. To what extent and how are emotions related to online prosocial and antisocial behaviors?

Our study is embedded in an ongoing longitudinal survey study on the online and offline experiences of adolescents. This paper reports on the findings specifically relating to online prosocial and antisocial behavior, using data from the first data collection.

Method

Participants

Participants were 1720 Dutch-speaking adolescents (784 boys, 930 girls, six participants did not indicate their gender; $M_{\text{age}} = 13.61$, $SD_{\text{age}} = 0.49$) in the seventh grade of 13 schools in Belgium. 89.24% of the students were in the general education track, 10.67% in vocational education.

Procedure

The data were collected during the first wave of data collection of an ongoing longitudinal study, in March of 2015 to May 2015. Participants were recruited through their schools. Schools were randomly selected from a province in Flanders. Twenty-nine schools were contacted and 13 of them agreed to participate. Prior to administration, we obtained written permission from the school principals and passive informed consent from the students and their parents (as is customary in Belgium. All except 13 students agreed to participate.

The study received ethical approval from the Ethics Committee of the [name of institution deleted].

The participants filled out pen-and-paper or (equivalent) electronic surveys in classrooms during school hours. In most schools, the author was present during the administration of the survey to answer questions. A few schools preferred to administer the questionnaire by their own personnel during spare hours. When the author was not present, teachers received detailed instructions on how to administer the survey and how to answer students' questions.

Measures

This study was part of a larger study on adolescents' online and offline experiences and included other measures which were not used in this analysis but are available upon request. After asking some demographic and biographic questions, we assessed online social behaviors and emotions.

Online Prosocial and Antisocial Behavior

To the best of our knowledge, so far no scale exists to assess the receiving and performing of prosocial and antisocial behavior through digital technologies. Therefore, we developed a scale to measure engagement in prosocial and antisocial behavior online. The scale consisted of two parts: The first part assessed which behaviors the adolescents had done themselves ("performing"), the second (equivalent) part assessed which behaviors the adolescents had received from others ("receiving"). Each part consisted of 11 antisocial and 14 prosocial behaviors.

The online antisocial behavior items were the items on cyberbullying and cybervictimization from the European Cyberbullying Intervention Project Questionnaire (Brighi et al., 2012; Schultze-Krumbholz et al., 2014). Although these items were originally intended to measure cyberbullying and cybervictimization, Vandebosch and Van Cleemput

(2009) have shown that not all potentially offensive practices via digital technologies are perceived as acts of cyberbullying by youngsters. Therefore, by not mentioning the word ‘cyberbullying’ nor providing a definition of the phenomenon, we obtained a measure of online antisocial behaviors, which encompass behaviors that may or may not be perceived as cyberbullying.

The online prosocial behavior items consisted of five items adapted from the items used by Wright & Li (2011) (“say nice things”, “offer help”, “cheer someone up”, “let someone know I care about them”). We split the first item into two: “say nice things *about* someone” and “say nice things *to* someone”. Then we added nine more items based on two measures of offline prosocial behavior: Caprara and Pastorelli’s Prosocial Behaviour Scale (1993) and Carlo and Randall’s Prosocial Tendencies Measure (2002). In our sample, two items (“share information with someone” and “ask someone to join a group conversation”) were poorly understood by many students, therefore we did not include them in the analysis. Thus, the final online prosocial behavior scale consisted of 12 items.

For both parts of the scale, we asked students about their engagement in the behaviors as victim/receiver and as perpetrator/sender in the past month: “How often have you experienced/performed the following behaviors via electronic media (mobile phone, computer, Internet,...) in the past month?” Participants were asked to indicate their frequency of engagement in these behaviors on a 5-point scale ranging from 1 (*never*) to 5 (*every day*). Cronbach’s alphas of the scales were .72 and .79 for performing and receiving online antisocial behavior, and .91 and .92 for performing and receiving online prosocial behavior, indicating moderate to excellent internal consistency.

Emotions

A 9-item measure of emotions was created to assess emotions experienced in the past month. Six items measured negative emotions (angry, afraid, sad, ashamed, guilty, jealous) and

three items measured positive emotions (happy, proud, loved) on a 7-point scale ranging from 1 (*never*) to 7 (*(almost) always*). Cronbach's alpha was .77 for the negative emotions subscale and .68 for the positive emotions subscale, indicating low to moderate internal consistency.

Analysis

Analyses were done in IBM SPSS 23 and Mplus 7.31 (Muthén & Muthén, 2011). We used structural equation modeling to test the association between emotions and online behavior. First, the measurement model was tested using confirmatory factor analysis. The behavior items were treated as categorical variables and therefore the weighted least square and variances adjusted (WLSMV) estimation method was used. We constructed four latent constructs for online digital behavior: receiving online prosocial behavior (ROPB), performing online prosocial behavior (POPB), receiving online antisocial behavior (ROAB), and performing online antisocial behavior (POAB). Two latent constructs were defined for emotions: negative emotions (NE) and positive emotions (PE). Maximum likelihood estimation was used to handle missing data. To determine how well the model fit the data, several goodness-of-fit indices were examined, including the χ^2 -test, the root mean square error of approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker-Lewis Index (TLI). The measurement model had an acceptable fit, except for the χ^2 (which is inflated due to large sample size): $\chi^2(1415) = 8075.004, p < .001$; CFI = 0.928; TLI = 0.924; RMSEA = 0.052 [0.051, 0.053]. Second, we tested the structural model for the regression of online behaviors on emotions.

Results

Descriptive Analyses

Descriptive analyses of the latent variables were run in SPSS by computing composite variables, which represent the mean scores across indicator items for each participant. Sample means and zero-order correlations of these composite variables are presented in Table 1.

Comparing the means of the online behaviors, results showed that the participants reported more engagement in prosocial than in antisocial behavior, in terms of performing ($M_{\text{POPB}} = 3.223$; $SD_{\text{POPB}} = .803$; $M_{\text{POAB}} = 1.220$; $SD_{\text{POAB}} = .298$; $t(1717) = 103.468$; $p < .001$) as well as receiving ($M_{\text{ROPB}} = 2.863$; $SD_{\text{ROPB}} = .873$; $M_{\text{ROAB}} = 1.214$; $SD_{\text{ROAB}} = .340$; $t(1714) = 78.528$; $p < .001$). Participants also experienced more positive ($M_{\text{PE}} = 4.959$; $SD_{\text{PE}} = 1.138$) than negative emotions ($M_{\text{NE}} = 2.422$; $SD_{\text{NE}} = .903$; $t(1719) = 64.749$; $p < .001$).

Table 2 displays the five most frequently reported online prosocial and antisocial behaviors among our sample. The top 5 is largely similar across receiving and performing behaviors, with the most popular prosocial behavior being that adolescents let each other know that they like something the other did (e.g. liking on Facebook), and the most frequent antisocial behavior being that adolescents say mean things about each other.

Structural Model of Emotions and Online Social Behaviors

The result of the test of our structural model of emotions and social behaviors is presented in Figure 1. The coefficients of the parameter estimates are displayed in Table 3. All coefficients were positive, indicating that the more often students experienced emotions, the more they performed and received online prosocial and antisocial behaviors. The positive regression coefficients indicate positive associations of negative as well as positive emotions with receiving and performing both types of behavior. This is remarkable, because based on the research about offline social behaviors, we expected positive associations of positive (resp., negative) emotions with prosocial (resp., antisocial) behavior and negative associations of positive (resp., negative) emotions with antisocial (resp., prosocial) behavior. Nevertheless, the values of the parameter estimates were considerably larger for the regressions of prosocial behaviors on positive emotions and antisocial behaviors on negative emotions than for antisocial behaviors on positive emotions and prosocial behaviors on negative emotions.

Post-Hoc Analysis: Mediation by Media Use

The rather surprising finding that emotions of both valences were linked to both antisocial and prosocial behavior, elicited the question of why this could be the case. Why was the experience of positive emotions linked to involvement in prosocial as well as antisocial behaviors online, and why was the same true for negative emotions? We wondered whether there could be a mediating factor which could help explain these associations. The literature on mood management may be relevant in this regard. Mood management theory posits that media messages can influence people's mood, and that individuals often select particular media messages to regulate their mood (Zillmann, 1988). Although the theory has mainly been investigated in the context of television viewing, it has also been applied to other media, such as the internet (e.g., Leung, 2007). It has been found that depressive individuals turn to the internet to alleviate negative feelings and emotional distress (Gómez-Guadix, 2014). Furthermore, when adolescents experience stress, they use the internet to thwart anxiety and to substitute negative affect with positive affect (Leung, 2007). When stressed and in need of mood repair, adolescents seek comfort in the internet for entertainment but also for relationship maintenance and social recognition (Leung, 2007). In this way, negative moods can also have the capacity to trigger positive or prosocial online behavior, when they motivate adolescents to maintain their relationships online. However, not all uses of the internet are equally preferred to cope with negative emotions. In the same study by Leung (2007), it was found that adolescents rather used social media (ICQ) than online games to alleviate negative affect. This aligns with research by Zillmann (1988), who has shown that moods associated with high levels of arousal (such as negative moods caused by stress) are blocked best by non-arousing, calming media, whereas they are maintained by arousing, exciting media. Thus, could it be that the use of particular media may be an explaining factor in the association between emotions and online social behaviors?

In a post-hoc analysis, we investigated the mediating effect of use of digital media. Our survey contained a scale on internet use based on items used in the Belgian version of the EU Kids Online questionnaire (EU Kids Online, 2014). On a 6-point scale, participants had to indicate how often they had used digital media in the past six months for 11 activities. We used a split-half method to conduct an exploratory factor analysis, followed by a confirmatory factor analysis. Exploratory factor analysis was performed on the first random half of the sample in SPSS. Using principal axis factoring and varimax rotation, the most appropriate solution consisted of three factors: six items related to the use of social and audiovisual media (SAV, e.g., “visiting a social network site”, “watching a video online”, “downloading music or videos”), two items related to online gaming (OG, “playing online games with others”, “playing online games alone or against the computer”), and three items related to the use of digital media for functional purposes (FP, “reading or watching the news online”, “using the internet for school work”, “sending or receiving an email”). Confirmatory factor analysis was performed on the second random half of the sample in Mplus. The model fit-indices indicated poor to acceptable model fit: $\chi^2(1415) = 321.747, p < .001$; CFI = 0.930; TLI = 0.906; RMSEA = 0.092 [0.083, 0.101]. Although the fit of this model was not optimal, we chose to proceed with this factor structure because models with more or less factors yielded less clear factor structures and factors that were difficult to interpret.

A structural model was tested in Mplus with digital media use as a mediator between emotions and online social behaviors. We proceeded in the steps recommended by Zhao, Lynch Jr., and Chen (2010), using bootstrap tests for the indirect effects. The model had an acceptable to good fit, except for the χ^2 (which is inflated due to large sample size): $\chi^2(2043) = 9960.121, p < .001$; CFI = 0.920; TLI = 0.916; RMSEA = 0.047 [0.047, 0.048]. Figure 2 displays the results of the structural model (only the direct paths).

First, regarding the association between emotions and use of digital media, it appeared that the experience of positive and negative emotions was positively related to the use of social and audiovisual media, and using digital media for functional purposes, but not to gaming. The strength of the associations seemed strongest for the relation between the experience of positive ($b = 0.213, p < .001$) and negative ($b = .212, p < .001$) emotions with the use of social and audiovisual media, than for the relation between the experience of positive ($b = 0.173, p < .001$) and negative ($b = 0.085, p = .004$) emotions with the use of digital media for functional purposes.

Second, regarding the association between the use of digital media and online social behaviors, only gaming and using audiovisual and social media were related to online social behaviors. The use of digital media for functional purposes did not seem to be related to how adolescents behave online. Gaming was related negatively to performing ($b = -0.217, p < .001$) and receiving ($b = -0.252, p < .001$) online prosocial behavior, whereas it was positively related to performing online antisocial behavior ($b = 0.216, p < .001$). Using social and audiovisual media was strongly positively associated with performing and receiving prosocial as well as antisocial behavior online (POPB: $b = 0.768, p < .001$; ROPB: $b = 0.956, p < .001$; POAB: $b = 1.086, p < .001$; ROAB: $b = 0.776, p < .001$).

Next, the indirect effects of experienced emotions on online social behaviors were examined with a bootstrap test. The results, together with the direct effects of emotions on online social behaviors, are displayed in Table 4. The direct and indirect effects need to be evaluated together to determine whether and what type of mediation is present (Zhao et al., 2010). Our findings revealed complementary mediation via SAV of NE and PE on POPB and ROPB and of NE on POAB and ROAB. Furthermore, the results indicated indirect-only mediations of PE on POAB and ROAB via SAV.

Discussion

This study explored adolescents' involvement in online antisocial and prosocial behavior. First, the relation between performing and receiving these behaviors was examined. Next, the influence of emotions on this behavior was analyzed. Last, the mediating effect of the use of digital media was assessed in a post-hoc analysis.

Involvement in Online Prosocial and Antisocial Behavior

The adolescents in our sample reported to be more involved in online prosocial than antisocial behavior, in terms of undergoing this behavior when done by others, as well as performing this behavior themselves. It is remarkable that the amount of research devoted to online antisocial versus prosocial behavior is almost opposite to the actual occurrence of this behavior. Furthermore, participants also experienced more positive than negative emotions. Together, these findings suggest that most youngsters had more positive than negative experiences, both online as well as offline.

The fact that youngsters behaved more prosocially than antisocially online corroborates previous findings that youngsters engage more in opportunity- than risk-related activities online (Livingstone, Haddon, Görzig, & Ólafsson, 2011) and goes against the common perception of the internet as a dangerous place for children and adolescents (e.g., Whitaker & Bushman, 2009). Apparently, digital media not only provide youngsters with a range of opportunities to develop their identity, communicate with others and maintain peer relationships, youngsters also use digital media to help and benefit others. Moreover, they use the internet more often for this purpose than to harm or bother others.

Influence of Emotions

Previous literature has documented predictions of offline antisocial behavior by negative emotionality (e.g., Chen et al., 2000), of online antisocial behavior by anger (e.g., Ak et al., 2015) and of offline prosocial behavior by positive emotions (e.g., Bartlett & DeSteno, 2006). In our study, adolescents who experienced more emotions, positive as well as negative,

performed and received more online social behaviors, prosocial as well as antisocial. Even though the associations of positive emotions with prosocial behavior and of negative emotions with antisocial behavior were stronger than those of positive emotions with antisocial behavior and of negative emotions with prosocial behavior, it was surprising that the experience of negative emotions was positively related to online prosocial behavior and that positive emotions were positively related to online antisocial behavior. These findings seem to suggest that the experience of emotions per se led to more involvement in online social behaviors, receiving as well as performing, and prosocial as well as antisocial. It seems as if the experience of emotions triggered adolescents to turn to digital technologies and use these in a prosocial as well as antisocial manner. Emotions constitute changes in action readiness and motivation, which may or may not lead to action (Frijda, 2004). Online contexts invite people to act out more frequently and intensely than face-to-face contexts (cf., the online disinhibition effect, Suler, 2004), which could explain the association between increased emotionality and performing online social behaviors. What's more, somehow the experience of emotions also elicited online prosocial and antisocial behaviors from others. Could it be that adolescents reacted to their emotions by turning to digital technologies and performing prosocial or antisocial behaviors, which in turn elicited these behaviors from others? And, if so, how in particular did adolescents react to their emotions and what did they do online? Our post-hoc analysis may shed some light on these questions.

Use of Digital Media as a Mediator Between Emotions and Online Social Behavior

We analyzed post-hoc whether the different uses of digital media could be a mediator in the association between experienced emotions and online social behaviors. First of all, findings revealed that the more negative and positive emotions adolescents experienced, the more they turned to audiovisual and social media, such as instant messaging or watching videos, and the more they used digital media for functional purposes, such as watching the

news or working for school. The regression coefficients were the largest for the associations between emotions and the use of audiovisual and social media, suggesting that adolescents were particularly inclined to turn to digital media for entertainment and peer communication purposes when they felt emotional. The positive association of experienced emotions with use of audiovisual media is in line with the literature on mood management theory (Zillmann, 1988). According to this theory, media messages have the potential to influence affective states. Media messages can alter emotional states in a positive or negative direction, depending on their content and congruence with an individual's current state. In this way, media messages can be used to regulate emotion, and individuals may actively seek out particular media messages to alter their emotional state (Zillmann, 1988). Moreover, people's use of digital media is closely related to their motivations and goals, such as entertainment or social interaction (van Deursen & van Dijk, 2013). Those motivations mediate the association between emotions and the different uses of digital media, for instance, gaming or using social network sites, because they drive people to a particular activity which may meet one's goals (Kardefelt-Winther, 2014). Perhaps surprisingly, the experience of emotions was not related to online gaming, so it appears as if adolescents who liked online gaming did this regardless of their emotional state. These results are in line with a study by Leung (2007), who found that adolescents preferred to use social media over online games to alleviate negative emotions.

Second, the use of digital media for functional purposes was not, but using digital media to play games online or to access audiovisual and social media was related to online social behaviors. The more adolescents reported to engage in online gaming, the less prosocial they acted online, the less they received online prosocial behavior from others, and the more antisocial they behaved online. Research on the effect of gaming on offline social behaviors has generally shown that gaming can be linked to increases and decreases in offline prosocial

and antisocial behavior, depending on the content of the games: Violent games increase aggression and decrease prosocial outcomes, whereas prosocial games have the opposite effect (Greitemeyer & Mügge, 2014). Other authors have proposed that the effect of violence games on increasing aggressive behavior does not depend on the content of the games, but rather on the degree of deprivation of the need for competence, which causes frustration and leads to aggression (Przybylski, Deci, Rigby, & Ryan, 2014). Unfortunately, we do not know what type of games our respondents played and how much their feelings of competence were thwarted, so we cannot make inferences about the effect of the content or the degree of competence-impediment of games on online social behaviors. However, following the findings about offline gaming, it could be that the respondents primarily played violent games or games that thwarted their need for competence, possibly resulting in feelings of frustration, which increased antisocial and decreased prosocial behavior online.

Using digital media to consume audiovisual media messages or to access social media was strongly positively related to all types of online social behaviors. In other words, the more adolescents used digital technologies for entertainment or informal communication purposes, the more prosocially and antisocially they behaved online and the more prosocial and antisocial reactions they received from others. With regard to the use of audiovisual media, in line with the findings about the effect of the content of games, it is plausible that consuming violent audiovisual media messages would increase antisocial behavior and that consuming positive audiovisual media messages would increase prosocial behavior. Performing these behaviors could in turn elicit similar reactions from peers, which would explain why the receiving of these behaviors also increased after using audiovisual media. The connection between antisocial media content and subsequent antisocial behavior is also supported in a study by den Hamer, Konijn, and Keijer (den Hamer, Konijn, & Keijer, 2013), who found evidence for a cyclic process model from victimization-based anger through exposure to

antisocial media content to cyberbullying perpetration. Regarding the use of social media, social network sites and instant messaging apps are ultimate venues for prosocial and antisocial exchanges. It is not surprising that an increase in the use of these platforms led to an increase in performing and receiving online social behaviors, as their primary purpose is to enable communication and social interactions online. In support of this, research on cyberbullying has shown that the more adolescents use social network sites, the more likely they are to become involved in cyberbullying (Meter & Bauman, 2015).

Third, the analysis of the indirect effects of experienced emotions on online social behaviors via the different uses of digital media showed that there was complementary mediation via the use of social and audiovisual media of the experience of negative and positive emotions on performing and receiving prosocial behavior, and of negative emotions on performing and receiving online antisocial behavior. Complementary mediation means that there is a direct effect of experienced emotions on online behavior, and also an indirect effect in the same direction via the use of social and audiovisual media. Thus, the increase in performing and receiving online prosocial behavior associated with the experience of positive and negative emotions was partially mediated by increased use of social and audiovisual media. Likewise, the increase in performing and receiving online antisocial behavior associated with the experience of negative emotions was also partially mediated by increased use of social and audiovisual media. Furthermore, the analysis also showed that there was an indirect-only (full) mediation of positive emotions on performing and receiving online antisocial behavior via the use of social and audiovisual media. This means that the experience of positive emotions was not directly related to online antisocial behaviors, but that there was an effect via the use of social and audiovisual media. So if adolescents experienced intense positive emotions, they performed and received more online antisocial behavior only if they turned to social and audiovisual media. It thus appears as if the use of

digital media for communication and entertainment purposes played a significant role in explaining the connection between the experience of emotions and pro- and antisocial behavior online.

The theory of social sharing of emotion (Rimé, 2009) might be informative in this regard. According to this theory, the experience of emotion fuels the sharing of emotion with others. An important function of the social sharing of emotion is that it enables interpersonal emotion regulation, which involves turning to others to cope with emotions (Zaki & Williams, 2013). Social sharing of emotions can happen face-to-face but also via digital communication channels, such as social network sites (e.g., Bazarova, Choi, Sosik, Cosley, & Whitlock, 2015). Emotional communication is quite similar across offline and online environments, and is often found to be even more frequent and explicit online than offline (Derks, Fischer, & Bos, 2008). Adolescents are active users of digital technologies and also use digital technologies to share their emotions online. The online sharing of emotions can provide them emotional relief and increase their well-being and satisfaction (Bazarova et al., 2015; Dolev-Cohen & Barak, 2013). However, not all sharing of emotions online elicits positive reactions: When individuals display too much of their affective state or too negative states online, they are less likely to be liked and to receive social support (Bellur, High, & Oeldorf-Hirsch, 2008; Forest & Wood, 2012). Thus, when adolescents express their experienced emotions through social media, the content and amount of their communication influences the reactions they receive from others, and whether those reactions are more likely to be prosocial or antisocial. This could explain why even positive emotions can lead to online antisocial behaviors: If adolescents express their emotions on social media in a way that does not follow the implicit rules and norms of how they should express themselves there, they may elicit antisocial responses from others and (maybe in turn) behave antisocially themselves. It could also explain why negative emotions were associated with online prosocial behaviors: If

adolescents express their negative emotionality in a socially acceptable way on social media, they can receive positive reactions and help from others, and strengthen the relationships with their peers, resulting in increases of mutual prosocial exchanges.

Study Limitations and Recommendations for Future Research

First, caution should be applied when interpreting the results regarding the prevalence of online prosocial and antisocial behavior, as these may have been influenced by a social desirability bias. Prosocial behavior is more culturally and morally accepted than antisocial behavior, so it is plausible that participants may have underreported their experiences with antisocial behavior and overstated their experiences with prosocial behavior. More research is needed to confirm our findings. Future research could address the social desirability bias by using other-reports instead of or next to self-reports.

Another limitation of this study is that the analyses are based on cross-sectional data from a sample of Belgian adolescents. Research with adolescents from other countries and cultures is needed to corroborate or nuance our results. Furthermore, the cross-sectional nature of the data precludes drawing conclusions regarding the causal direction of the association between experienced emotions, uses of digital media and online social behaviors. Online social behaviors could *elicit* emotions and the use of particular media rather than the other way around. In fact, it is likely that there is a bidirectional association between emotions and online social behaviors, such that adolescents experience emotions, which stimulate them to act in a certain way online and which also elicit behaviors from others, consequently prompting the experience of particular emotions. For example, an adolescent might be angry after having a fight with peers in school. When he later goes online, he vents his anger by calling his peers names on a social network site. This behavior causes his peers to do the same to him, which makes him even angrier and also a bit sad. The use of cross-sectional data in mediation analysis is also debatable. Since the present paper is based on data of the first wave

of an ongoing longitudinal study, in future research we will make use of the longitudinal data to validate and extend our findings.

Third, our findings from the analysis of the indirect effects revealed complementary mediations of experienced emotions on online social behaviors via the use of social and audiovisual media. Partial or complementary mediation suggests the possible existence of other omitted mediating variables (Zhao et al., 2010). In other words, it is likely that there is or are other variable(s), which were not included in this study, that mediate the associations between emotions and online social behaviors. Future research could benefit from examining other possibly influential mediating variables, such as the content and valence of the media messages adolescents consume and of the social interactions they engage in when they go online.

Fourth, the model fit indices of the structural measurement model of emotions indicated a rather poor model fit. We also tested a model (results not reported here) with the emotion items separately instead of as indicators of the two latent factors, but this resulted in a worse model fit. A more elaborate measure with several items per emotion could enhance the quality of the emotion measurement and of the entire model.

Last, the factor structure of the digital use measure yielded three factors: online gaming, use of social and audiovisual media, and use of digital media for functional purposes. To better disentangle the effects of using social media versus audiovisual media, a measure that clearly separates those two would be useful.

Conclusion

Notwithstanding the limitations, overall the study's findings indicate that adolescents' experiences using digital technologies are more often prosocial than antisocial. Adolescents reported high involvement in both performing and receiving prosocial behavior online. These prosocial exchanges were positively, directly and indirectly, associated with experiencing

positive as well as negative emotions, whereas online antisocial behavior was directly related to negative emotions but only indirectly to the experience of positive emotions. The indirect associations of experienced emotions with online social behaviors were mediated via the use of digital media for entertainment or communication purposes (i.e., via the use of audiovisual and social media). Thus, it appears that when adolescents experience intense emotions, positive as well as negative, they turn to social and entertaining media, which is associated with performing and receiving prosocial and antisocial behavior online. Using social and audiovisual media may thus be a preferred way for adolescents to deal with their emotions, perhaps because this allows for the social sharing of emotions (Rimé, 2009) and for mood management (Zillmann, 1988), and this in turn increases pro- and antisocial exchanges online.

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Table 1

Zero-Order Correlations and Descriptive Statistics of Composite Variables

Variable	1	2	3	4	5	6
1 ROPB						
2 POPB	.806***					
3 ROAB	.205***	.268***				
4 POAB	.180***	.189***	.492***			
5 NE	.098***	.181***	.398***	.258***		
6 PE	.396***	.287***	-.099***	.007	-.258***	
<i>M</i>	2.863	3.223	1.214	1.220	2.422	4.959
<i>SD</i>	0.873	0.803	0.340	0.298	0.903	1.138
<i>Observed range</i>	1.000 – 5.000	1.000 – 3.900	1.000 – 3.910	1.000 – 3.900	1.000 – 6.500	1.000 – 7.000

Note. ROPB = receiving online prosocial behavior; POPB = performing online prosocial behavior; ROAB = receiving online antisocial behavior; POAB = performing online antisocial behavior; NE = negative emotions; PE = positive emotions.

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

Table 2

Most Frequent Online Prosocial and Antisocial Behaviors

	Behavior	<i>M</i>	Behavior	<i>M</i>	
Receiving	Prosocial		Antisocial		
	1.	Someone let me know that he/she liked something that I did	3.45	Someone said mean things about me to others	1.56
	2.	Someone said nice things to me	3.20	Some said mean things to me or called me names	1.51
	3.	Someone cheered me up	3.16	There were rumors spread about me	1.33
	4.	Someone complimented or congratulated me	3.09	I was being excluded or ignored on a social network site or in a group conversation	1.23
	5.	Someone let me know that he/she cares about me	3.01	Someone put my personal information online or passed on my personal information via messages	1.16
Performing	Prosocial		Antisocial		
	1.	Let someone know that you like something he/she did	3.97	Say mean things about someone to others	1.58
	2.	Compliment or congratulate someone	3.51	Say mean things to someone or call someone names	1.47
	3.	Say nice things to someone	3.49	Exclude or ignore someone on a social network site or in a group conversation	1.41
	4.	Cheer someone up	3.47	Spread rumors about others	1.26
	5.	Support someone	3.36	Edit videos or photos which others had put online	1.19

Table 3

Regression estimates of the structural model

Parameter	Online antisocial behavior					Online prosocial behavior				
	Est	<i>SE</i>	<i>z</i> -score	<i>p</i> -value	<i>R</i> ²	Est	<i>SE</i>	<i>z</i> -score	<i>p</i> -value	<i>R</i> ²
Perform behavior					.140					.253
negative emotions	0.699	0.082	8.566	.000		0.574	0.052	11.068	.000	
positive emotions	0.308	0.085	3.620	.000		0.849	0.064	13.248	.000	
Receive behavior					.265					.318
negative emotions	1.173	0.107	10.940	.000		0.679	0.064	10.579	.000	
positive emotions	0.175	0.082	2.131	.033		1.454	0.098	14.907	.000	

Table 4

Unstandardized Coefficients of the Direct and Indirect Paths with 95% Confidence Interval From the Bootstrap Analysis

Model path			<i>b</i>	95% CI	Model path			<i>b</i>	95% CI
NE	→	POPB	0.385*	[0.275, 0.497]	PE	→	POPB	0.682*	[0.542, 0.845]
NE	→ SAV	→ POPB	0.163*	[0.110, 0.225]	PE	→ SAV	→ POPB	0.164*	[0.103, 0.237]
NE	→ OG	→ POPB	0.005	[-0.014, 0.029]	PE	→ OG	→ POPB	-0.002	[-0.034, 0.025]
NE	→ FP	→ POPB	0.005	[-0.019, 0.034]	PE	→ FP	→ POPB	0.010	[-0.038, 0.058]
NE	→	ROPB	0.432*	[0.291, 0.576]	PE	→	ROPB	1.226*	[1.1016, 1.503]
NE	→ SAV	→ ROPB	0.202*	[0.143, 0.281]	PE	→ SAV	→ ROPB	0.204*	[0.129, 0.301]
NE	→ OG	→ ROPB	0.006	[-0.016, 0.032]	PE	→ OG	→ ROPB	-0.002	[-0.041, 0.028]
NE	→ FP	→ ROPB	0.023	[-0.002, 0.068]	PE	→ FP	→ ROPB	0.047	[-0.013, 0.115]
NE	→	POAB	0.467*	[0.316, 0.636]	PE	→	POAB	0.142	[-0.022, 0.370]
NE	→ SAV	→ POAB	0.230*	[0.154, 0.312]	PE	→ SAV	→ POAB	0.231*	[0.133, 0.353]
NE	→ OG	→ POAB	-0.005	[-0.030, 0.012]	PE	→ OG	→ POAB	0.002	[-0.027, 0.030]
NE	→ FP	→ POAB	-0.038	[-0.097, -0.003]	PE	→ FP	→ POAB	-0.078	[-0.177, -0.008]
NE	→	ROAB	0.983*	[0.818, 1.201]	PE	→	ROAB	0.024	[-0.172, 0.231]
NE	→ SAV	→ ROAB	0.164*	[0.089, 0.274]	PE	→ SAV	→ ROAB	0.165*	[0.087, 0.269]
NE	→ OG	→ ROAB	-0.001	[-0.013, 0.002]	PE	→ OG	→ ROAB	0.000	[-0.006, 0.009]
NE	→ FP	→ ROAB	-0.007	[-0.054, 0.039]	PE	→ FP	→ ROAB	-0.014	[-0.150, 0.084]

Note. NE = negative emotions; PE = positive emotions; SAV = use of social & audiovisual media; OG = online gaming; FP = use of digital media for functional purposes; POPB = performing online prosocial behavior; ROPB = receiving online prosocial behavior; POAB = performing online antisocial behavior; ROAB = receiving online antisocial behavior.

* $p < .05$.

Figure 1. Structural model of emotions and online social behavior with parameter estimates. All coefficients are significant at $p < .001$, except for the regression of ROAB on negative emotions, which has a p -value of .033.

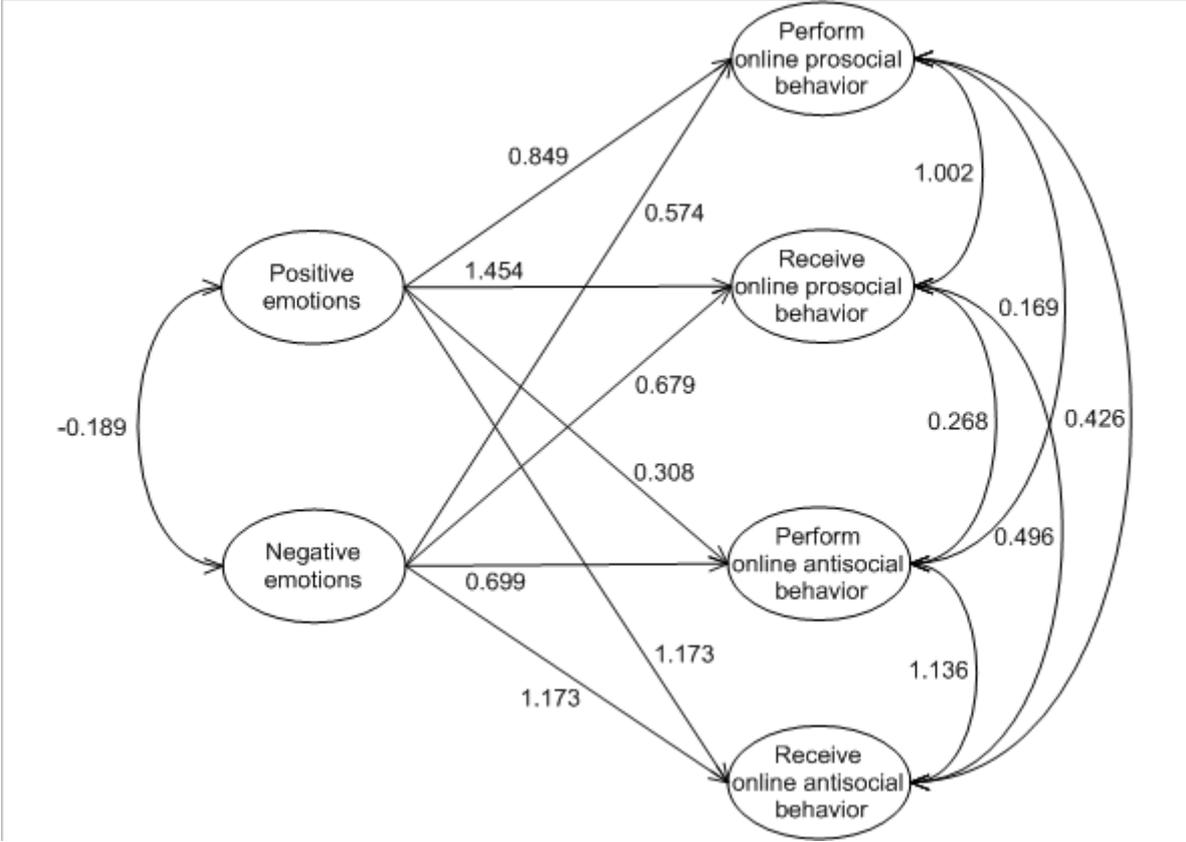


Figure 2. Full tested structural model of the regression of online social behaviors on emotions, mediated by use of digital media, with all nonsignificant paths removed. Numbers indicate unstandardized path coefficients. Dashed lines indicate negative coefficients.

