Chapter 3

Evidence for the Cyclic Process Model of Cyberbullying in a Cross-Sectional Setting

Abstract

The present study examined the role of media use in adolescents' cyberbullying behaviors. Following previous research, we propose a *Cyclic Process Model* of face-to-face victimization and cyberbullying through two mediating processes of anger/frustration and antisocial media content. This model was tested utilizing a cross-sectional design with adolescent participants (N = 892). Exposure to antisocial media content was measured with a newly developed content-based scale (i.e., the C-ME), showing good psychometric quality. Results of structural equation modeling showed that adolescents' exposure to antisocial media content was significantly associated with cyberbullying behaviors, especially in adolescents who experienced anger and frustration due to face-to-face victimization. Goodness of fit indices demonstrated a good fit of the theoretical model to the data and indicated that exposure to antisocial media content acts as an amplifier in a cyclic process of victimization-related anger and cyberbullying behaviors.

Keywords:
cyberbullying, adolescents, antisocial media content, victimization, anger/frustration

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"Cyberbullying is very severe because it makes you feel you cannot trust anyone and you are nowhere safe" (respondent-girl, 15 years old)

Cyberbullying is a form of bullying through electronic media, including mobile devices. It may be seen as playful behavior by some and not that severe because of its virtual status (Pornari & Wood, 2010), though it often is considered very severe by its victims (Ortega et al., 2009). Although the prevalence of this type of bullying is currently debated and varies across research groups (Olweus, 2012), it is especially high among adolescents. A recent meta-analysis showed that 20-40% of the adolescents reported having been a victim of cyberbullying (Tokunaga, 2010). A majority of cybervictims do not tell their parents (Li, 2008). And among these cybervictims, the suicidal ideation is higher than among non-victims (Hinduja & Patchin, 2010; Li, 2007). In addition, 16% of adolescents admit having perpetrated acts of cyberbullying once or more often (Dehue, Bolman, & Völlink, 2008). These facts highlight the importance of expanding research on cyberbullying behaviors among adolescents.

Previous research focused on the profile of a typical cyberbully (Calvete, Orue, Estévez, Villardón, & Padilla, 2010; Vandebosch & Van Cleemput, 2009). Research showed a link between being a victim of face-to-face bullying and being a cyberbully (and vice versa) (Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippett, 2008; Ybarra & Mitchell, 2004). Furthermore, other findings suggest that this face-to-face victimization is strongly related to feelings of anger (Beran & Li, 2008; Didden et al., 2009; Ortega, Elipe, Mora-Merchán, Calmaestra, & Vega, 2009; Patchin, 2006). However, to our knowledge, no research has been conducted to connect these findings in investigating the relationships between face-to-face victimization, feelings of anger, and becoming a cyberbully. The current study aims to fill this gap. Furthermore, there is a relationship between violent media exposure and cyberbullying behaviors (Calvete et al., 2010; Fanti, Demetriou, & Hawa, 2012). However, the impact of media with antisocial content (Strasburger, 2009; Strasburger, Jordan, & Donnerstein, 2010), which has a broader scope than violent media (Konijn, Veldhuis, & Plaisier, 2013), has not yet been included, despite its popularity among adolescents. Investigating this role of media with antisocial content in cyberbullying behaviors concerns a second aim of the current study. Thus, the current investigation aims to

examine the underlying mechanisms of cyberbullying behaviors regarding how victims become bullies and the role of media herein. We propose that media with antisocial content may play a facilitating and cyclic role in the process of being bullied face-to-face and bullying in cyberspace. When victimized, the adolescent tends to seek out specific media content in the expectation that this will relief him/her from the stressful event of having been bullied. The cyclic aspect then comes into view when one realizes that media effects research in general shows that effects of exposure to violent media content result in increased aggressiveness. In turn, this may increase the chances that the victim may become a bully himself/herself. Thus, media may play a cyclic role in explaining the process from victimization to be(com)ing a cyberbully.

These results will provide valuable information for future intervention programs designed to reduce cyberbullying behaviors. In brief, the present study examines the interplay between victimization, exposure to antisocial media content, and cyberbullying behaviors in adolescents. Combining various arguments, based on the extant literature as discussed below, the current study proposes and tests a *Cyclic Process Model* in cyberbullying behaviors. This model argues that being bullied face-to-face instigates feelings of anger and frustration, which draws the adolescent to media with antisocial content, subsequently reinforcing him/her to perform acts of cyberbullying behaviors. The various steps in this process will be elaborated below.

Cyberbullying Behaviors and Victimization of Face to Face Bullying

Several studies have found that boys are more often cyberbullies than girls (Calvete et al., 2010; Dehue, Bolman, & Völlink, 2008; Erdur-Baker, 2009; Fanti et al., 2012; Li, 2006, 2007), others found girls to be more often involved in cyberbullying behaviors (Holfeld & Grabe, 2012; Kowalski & Limber, 2007; Pornari & Wood, 2010), and yet others have found no significant gender differences (Hinduja & Patchin, 2008; Smith et al., 2008). In addition to mixed findings regarding gender differences, age-related trends in cyberbullying behaviors are also mixed. For example, some studies found that cyberbullying behaviors increases with age (Vandebosch & Van Cleemput, 2009), whereas others found no significant relationship (Hinduja & Patchin, 2008; Patchin, 2006). However, reviews indicate that involvement in cyberbullying peaks during adolescence (Smith et al., 2008; Tokunaga, 2010). Accordingly, the victimization of cyberbullying peaks among the 12-14 year old adolescents (Tokunaga, 2010). Various studies showed a link between being a victim of face-to-face bullying

and being a cyberbully (Smith et al., 2008; Ybarra & Mitchell, 2004). Findings suggest that cyberbullies are also involved in face-to-face bullying, both in the role of perpetrator (Estévez, Villardón, Calvete, Padilla, & Orue, 2010; Raskauskas & Stoltz, 2007; Smith et al., 2008; Vandebosch & Van Cleemput, 2009) and in the role of victim (Estévez, Villardón, Calvete, Padilla, & Orue, 2010; Li, 2007; Smith et al., 2008; Wright & Li, 2012; Ybarra & Mitchell, 2004). A suggestion is that victims of face-to-face bullying become cyberbullies in desire for revenge (Grigg, 2010; König, Gollwitzer, & Steffgen, 2010; Varjas, Talley, Meyers, Parris, & Cutts, 2010; Wright & Li, 2012), or that they use cyberbullying as compensation for feeling unable to retaliate by means of face-to-face bullying (Smith et al., 2008; Ybarra & Mitchell, 2004). In the following, we attempt to identify the underlying mechanisms in between face-to-face victimization and bullying in cyberspace.

An explanation for the relation between face-to-face victimization and cyberbullying behaviors could be found in experiencing negative emotions such as anger or frustration. Research shows that face-to-face victimization is strongly related to feelings of anger (Beran & Li, 2008; Didden et al., 2009; Ortega et al., 2009; Patchin, 2006). In explaining their finding that adolescents who experienced anger were more likely to be involved in cyberbullying, Patchin and Hinduja suggest that this relationship can be explained by the General Strain Theory (Patchin & Hinduja, 2010). This theory argues that people who experience strain (and as a result feel angry or frustrated), are more at risk to engage in deviant behaviors (Agnew, 1992). Given that adolescence comes with higher levels of deviant behaviors anyway (Moffitt, 1993), the General Strain Theory might hold in particular for victimized adolescents whose increased strain may find an outlet in cyberbullying behaviors.

The Role of Media in Cyberbullying Behaviors

We suggest that adolescents who experience anger or frustration (e.g., because of face-to-face victimization) are more at risk to engage in cyberbullying behaviors. This is supported by studies indicating that adolescents tend to use violent media to cope with their anger (Arnett, 1996; Flammer & Schaffner, 2003; Olson et al., 2007; Olson, Kutner, & Warner, 2008). Previous research showed that media play an important role in the developmental process of identification among adolescents in search for attractive role models (Konijn, Nije Bijvank, & Bushman, 2007). Accordingly, adolescents are heavy media consumers (Rideout, Foehr, & Roberts, 2010), of more traditional media like

television and of newer social media, digital games, and YouTube. Moreover, antisocial media content seems highly popular among them (Strasburger, 2009; Strasburger et al., 2010), which may coincide with their increased need for deviant behaviors, due to their developmental stage and in search for an independent identity (Arnett, 1992; Moffitt, 1993).

Hence, an important next step is to investigate how exposure to antisocial media content is related to cyberbullying behaviors in adolescents. This fourth assumption underlying the development of cyberbullying in adolescents finds support in a number of previous studies. Thus far, however, only a few studies are available extending the line of (violent) media effects research into the domain of (cyber)bullying. A longitudinal study showed that television exposure at age 4, regardless of content, was associated with becoming a bully at ages 6 through 11 (Zimmerman, Glew, Christakis, & Katon, 2005). In addition, recent studies reported that increased exposure to *violent* media was related to *face-to-face* bullying (Kuntsche, 2004; Lee & Kim, 2004), which was amplified by feelings of anger (Lee & Kim, 2004). Furthermore, two studies showed that exposure to *violent* media is related to *cyber*bullying behaviors (Calvete et al., 2010; Fanti et al., 2012). These findings are in line with the rich body of research showing that exposure to violent media leads to higher levels of aggressiveness (e.g., Anderson & Bushman, 2002; Anderson et al., 2010). Theories like the *General Aggression Model* (Anderson & Bushman, 2002) and *Social Cognitive Theory* (Bandura, 2001; Bandura, Ross, & Ross, 1963) suggest that observation and modeling foster vicarious learning through media in encouraging rewarding and attractive behaviors (Anderson & Bushman, 2002; Bushman & Whitaker, 2010; Hopf, Huber, & Weiß, 2008). Related, research regarding the *Downward Spiral Model* (Slater, Henry, Swaim, & Anderson, 2003) found that aggressiveness among adolescents led to higher attractiveness to violent media content. In turn, exposure to such violent content reinforced their aggressiveness, indicating a downward spiral of negativity.

The Present Study

The current study expands on the investigation of the role of media in cyberbullying behaviors in focusing on antisocial media content. Given today's broad array of antisocial media portrayals (both on television and online), including risky behaviors, substance abuse, rough language, gossiping, and the like (Brown & Witherspoon, 2002), we broadened our scope to media with *antisocial* content rather than violent content alone. In line with their

developmental stage, adolescents show an increased preference for media with this kind of antisocial content (Funk & Buchman, 1996; Roe, 1995).

Taken together, these lines of research have thus far not been integrated into a coherent chain of events and the role of media use in cyberbullying has hardly been investigated while adolescents are avid media users. Combining these lines of thought brings an integrated picture of how the various building blocks from face-to-face victimization, anger, media and cyberbullying behaviors are interrelated. In sum, the current study proposes and tests a *Cyclic Process Model* of cyberbullying. This model proposes that face-to-face victimization in adolescents instigates feelings of anger and frustration, which in turn draws the adolescent to use media with antisocial content. Such media use then reinforces him/her to perform acts of cyberbullying behaviors. Thus, the underlying mechanisms in between face-to-face victimization and becoming a cyberbully would then be the victims' feelings of anger following face-to-face victimization, and exposure to antisocial media content in response. They end up in a cyclic process because victims of bullying behaviors then become cyberbullies themselves, and the other way around (Livingstone, Haddon, Görzig, & Ólafsson, 2010; Vandebosch & Van Cleemput, 2009; Walrave
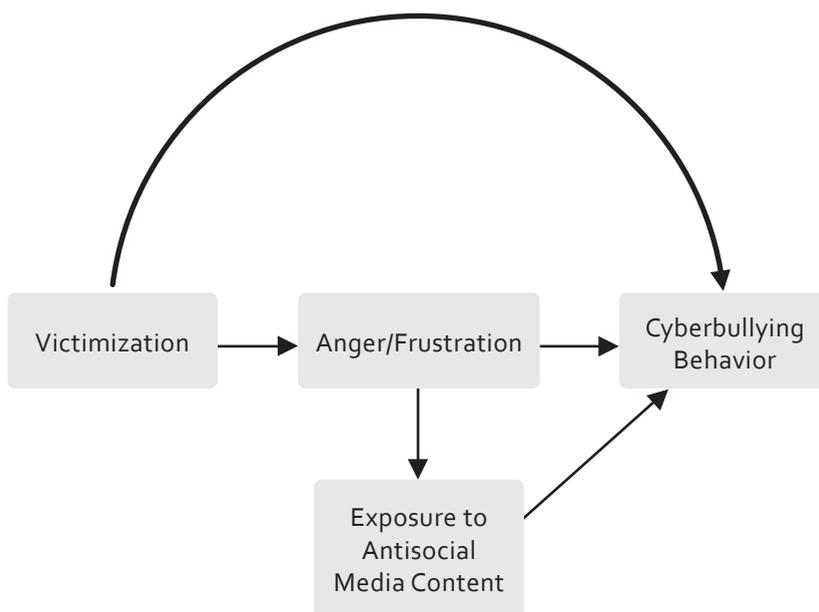

Figure 1. A cyclic process model of cyberbullying behaviors underlying the current study

& Heirman, 2011). The cyclic process model underlying the present study in explaining cyberbullying behaviors is visualized in Figure 1.

Method

Participants. In a cross-sectional design (*N* = 892; 57% boys, around age 13, *Mage* = 13.73, *SDage* = 1.36), adolescents participated voluntarily and were recruited from 16 different schools throughout the country. Participants were all in secondary education: 43.7% first-grade (aged around 12), 24.9% second grade (aged around 13), 22.5% third grade (aged around 14), 8.9% fourth through sixth grade (aged around 15-18). The majority were White Caucasian (83%), others had a Turkish (5.8%), Surinam (2.8%), or other background.

Procedure. After permission of headmasters and section heads of the schools, pupils were reassured that the study was anonymous. Parents were asked for their consent and provided the opportunity to withdraw their child from participation at any time. Due to the class-wise procedure and the reward of providing media literacy lessons (only after completion of all questionnaires), we received 100% consent. All adolescents provided assent as well. In the classroom, participants completed the questionnaire individually and were encouraged to ask questions whenever needed. After completing all questionnaires, we discussed with the adolescents how they thought media might influence them. We proposed several statements (e.g., "gaming makes you aggressive") and further discussed how they thought about cyberbullying behaviors. We intentionally did not focus on cyberbullying behaviors alone, because we told the pupils that the questionnaire was about adolescents' media use in general.

Measures. Each measurement device as described below included 5-point Likert-type items with the following answering options: 1 (*never), 2 (happened once)*, 3 (*sometimes)*, 4 (*often)*, and 5 (*very often)*.

Cyberbullying behaviors. The Cyberbullying Questionnaire (CBQ; Calvete et al., 2010) was used to measure various categories of cyberbullying behaviors. Because of too much overlap, given today's cell phone technology, we had to combine several items of the original 16 items, resulting in a total of 12 items. For example "Sending threatening or insulting messages by e-mail" was

combined with "Sending threatening or insulting messages by cell phone". Likewise, "Hanging humiliating images of classmates on the Internet" and "Sending links with humiliating images of classmates" were combined, as well as "Writing embarrassing jokes, rumors, gossip, or comments about a classmate on the Internet" and "Sending links with embarrassing jokes, rumors, gossip, or comments about a classmate". All items loaded on one factor and explained 39.2% of the variance. Factor loadings for all items can be found in Table 1. The resulting 12-item CB-Questionnaire, in the present study, was reliable (Cronbach's alpha = .83; M = 1.11, SD = .25).

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Table 1. Factor Loadings of the Cyberbullying Questionnaire

Each item starts with "How often do you…"	Factor 1: Cyberbullying Behaviors
… send links with videos or cell phone pictures of classmates performing some kind of behavior of a sexual nature?	.74
… record a video or take cell phone pictures of classmates performing some kind of behavior of a sexual nature?	.71
… broadcast online other people's secrets, compromising information or images?	.68
… send links with videos or cell phone pictures of classmates who is being laughed at by a group and forced to do something humiliating or ridiculous?	.67
… record a video or take cell phone pictures while a group laughs and forces another person to do something humiliating or ridiculous?	.66
… record a video or take cell phone pictures while someone hits or hurts another person?	.66
… hang someone's email account humiliating images of classmates on the Internet or send links of these images to other people for them to see?	.65
… hack to send messages by e-mail that could make trouble for the other person?	.63
… send links of videos or cell phone pictures while someone hits or hurts another person?	.55
… send threatening or insulting messages by e-mail or mobile phone?	.53
… write or send links of embarrassing jokes, rumors, gossip, etc. about a classmate to other people so they can read them?	.52
… do you deliberately exclude someone from an online group?	.48
Cronbach's alpha	**.83**

Note. Items are based on the CBQ of Calvete et al. (2010).

Table 2. Factor Loadings of the Content Based Media Exposure scale (C-ME)

Each item starts with "On television or on the Internet, how many times do you watch…"	Factor 1: Antisocial Content	Factor 2: Neutral/Social Content
… people destroying someone elses belonging?	.78	-.01
… people shooting another person?	.75	-.13
… people stealing?	.75	.15
… people who drink (too much) alcohol?	.75	.15
… people fight?	.71	-.11
… people using drugs?	.71	.21
… people having sex?	.61	-.09
… people talking about sex?	.61	.05
… people performing stunts on their scooter?	.58	-.19
… people who are making a fool about someone?	.56	-.01
… people streetracing?	.54	-.02
… people helping another person?	-.02	.86
… people standing up for another person?	.13	.84
… the news?	-.09	.52
Cronbach's alpha	.84	.64

Note. The C-ME scale is developed by Author(s).

Table 3. Factor Loadings of the Peer Victimization Scale

Each item starts with "How often do …"	Factor 1: Face-to-face Victimization
… other kids bully or pick on you?	.78
… other kids hurt your feelings?	.77
… other kids gossip or say mean thing about you?	.77
… other kids exclude you?	.76
… other kids tease or make fun of you?	.70
… other kids ignore you?	.69
… other kids hit or push you?	.44
… other kids make you feel better when you're having a bad day? (reversed)	.36
… other kids try to cheer you up when you're sad? (reversed)	.30
… other kids help you when others pick on you or tease you? (reversed)	.14
Cronbach's alpha	**.76**

Note. Item 1-7 are taken from Schwzartz et al. (2002). Items 8-10 are added by Author(s) (see measurements).

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Antisocial media exposure was measured with the newly developed Content-based Media Exposure Scale (C-ME; Den Hamer, Konijn, Plaisier, Keijer, Krabbendam, & Bushman, under review). Conventional media exposure measurements generally ask for frequency of exposure or one's favorite programs (to be coded afterwards, which is quite labor-intense), rather than measuring the specific content one is exposed to across various types of media. Therefore, we developed the C-ME-scale, asking for the *content* one has been exposed to through media use. In separate validation studies, the C-ME correlates positively, as expected, with trait aggression, general exposure to violent media, and negatively with empathy (Den Hamer et al., under review). The C-ME-scale contains 14 items and measures how often someone watches portrayals of various antisocial media content, such as violence, sex, drug abuse, reckless driving, and general antisocial behaviors (e.g., stealing, destroying someone's property). The items were based on the extant literature regarding adolescent antisocial and risk behaviors (e.g., Hopf et al., 2008). To counterbalance these items, three filler items were included reflecting pro-social behaviors such as helping another person, and neutral behaviors such as watching a quiz. Sample items are for example "On television/the Internet, how often do you watch people fighting?" and "On television/the Internet, how often do you watch people destroy someone else's property?". An Oblimin factor analysis (Table 2) revealed that 11 items belonged to one factor reflecting antisocial media content (Cronbach's alpha = .84; *M* = 2.50, *SD* = .65). Note that in this study, the first version of the C-ME was used. After conducting this study, we decided to exclude three items from the factor assessing antisocial media content (i.e., the items with factor loadings below .60), and we furthermore added more neutral filler items (for a description of the C-ME, see **Chapter 2**).

Victimization. The Peer Victimization Scale (Schwartz, Farver, Chang, & Lee-Shin, 2002) was used to measure face-to-face victimization, which contained 10 items (7 items of the original Peer Victimization Scale and 3 items added by the authors), such as "How often do classmates bully or pick on you?". Factor loadings can be found in Table 3. As can be seen, one reversed item had a relatively low factor loading. However, removing this item would not improve the Cronbach's alpha more than .05. Thus, it was kept in the scale. Cronbach's alpha = .76 (*M* = 2.01, *SD* = .55).

Anger and frustration was measured with the "anger and frustration-scale" (Patchin & Hinduja, 2010), after Brezina (1996), covering 10 items, such as "How often do you lose your temper?" (factor loadings can be found in Table 4). Cronbach's alpha = .72 (*M* = 2.46, *SD* = .64).

Table 4. Factor Loadings of the Anger and Frustration Scale

Each item starts with "How often do you…"	Factor 1: Anger and Frustration
… feel like yelling at a parent or teacher?	.69
… feel like getting even with someone who has harmed you?	.69
… feel like physically lashing out against a parent or teacher?	.65
… feel like life has given you a raw deal (has been unfair)?	.61
… feel like a powder keg ready to explode?	.53
… feel like other people are always lucky and they get all of the breaks in life?	.53
… lose your temper?	.52
… stay mad at someone who hurts you?	.47
… are jealous of other people?	.41
… let little things irritate you?	.34
Cronbach's alpha	**.72**

Note. Scale is taken from Patchin and Hinduja (2010).

Results

Structural equation modeling (SEM) with maximum likelihood (ML) estimation was used to test the theoretical Cyclic Process Model (Figure 1). Goodness of fit was assessed by means of χ^2, including the degrees of freedom (*df*), the comparative fit index (CFI), and the root mean squared error of approximation (RMSEA). In general, an insignificant $\chi2$ as well as a CFI and TLI value close to .95 reflect a good fit of the empirical data to the theoretical model. An RMSEA value below .10 further indicates a good fit and a value below .06 a very good fit (Hu & Bentler, 1999). The model was tested in MPlus, using bootstrapping (1000 iterations) to test for mediation (Mallinckrodt, Abraham, Wei, & Russell, 2006).

Figure 2 shows the results of testing the model, in which both a direct and an indirect relationship of face-to-face victimization with cyberbullying behaviors was tested. A double mediation was tested with both anger/frustration and exposure to antisocial media content in between face-to-face victimization and cyberbullying behaviors.

Mean values and standard deviations of all instruments administered are shown in Table 5. In assessing the overall model fit, the fit indices suggest a good fit of the data to the hypothesized double mediation model, $\chi2(688) = 1920.13$, $p < .01$; CFI = .90, TLI = .890, RMSEA = .05. Significant positive relationships are shown between face-to-face victimization and feelings of anger and frustration ($\beta =. 24$, $p < .001$), also between anger and exposure to media with antisocial content ($\beta = .48$, $p < .001$), and between exposure to media with antisocial content and cyberbullying behaviors ($\beta = .24$, $p < .001$). Furthermore, direct positive significant relations were also found between victimization and cyberbullying behaviors ($\beta = .15$, $p < .001$) and between anger and cyberbullying behaviors ($\beta = .19$, $p < .001$). The model test indicated that anger mediates significantly between victimization and cyberbullying behaviors ($\beta = .05$, $p < .05$) and anger also mediates significantly between victimization and exposure to media with antisocial content ($\beta = .12$, $p < .001$). Finally, antisocial media exposure mediates significantly between anger/frustration and cyberbullying behaviors ($\beta = .14$, $p < .001$). Thus, support was found for both a direct relationship between face-to-face victimization and cyberbullying behaviors as well as for a double mediation model as implicated by our Cyclic Process Model.

Table 5. Percentages of Frequencies

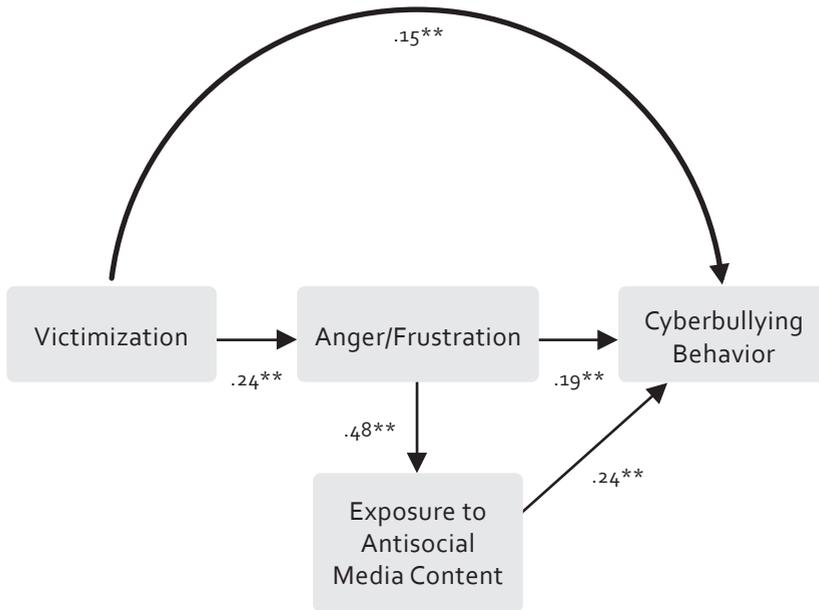| Variable	Gender	Answering categories				
		1 (never)	2 (happened once)	3 (sometimes)	4 (often)	5 (very often)
Victimization	boys	1.0 %	56.2 %	36.8 %	5.6 %	0.4 %
	girls	2.9 %	70.4 %	23.2 %	3.5 %	0.0 %
Anger	boys	0.0 %	29.3 %	56.6 %	11.9 %	2.1 %
	girls	0.0 %	27.0 %	57.5 %	13.6 %	1.9 %
Antisocial media	boys	0.4 %	16.1 %	53.9 %	26.1 %	3.5 %
	girls	1.6 %	48.3 %	43.5 %	5.6 %	1.1 %
Cyberbullying	boys	51.6 %	47.5 %	0.8 %	0.2 %	0.0 %
	girls	64.0 %	35.7 %	0.0 %	0.0 %	0.3 %

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Figure 2. The results of testing the theoretical cyclic process model using SEM (N = 892)

Note. * p < .05; ** p < .01.

Discussion

The goal of our study was twofold. First, to examine the role of exposure to antisocial media content in cyberbullying behaviors of adolescents. Results showed that this role is rather prominent: The higher the exposure to antisocial media content, the higher the cyberbullying behaviors. The second aim was to identify the underlying mechanisms in between face-to-face victimization and bullying in cyberspace and find support for the Cyclic Process Model. Results of structural equation modeling do support such a Cyclic Process Model in showing a good fit between the data and the theoretical model, in which face-to-face victimization instigates feelings of anger and frustration drawing adolescents to use media with antisocial content, which in turn stimulates cyberbullying behaviors.

In identifying the underlying mechanisms in between face-to-face victimization and bullying in cyberspace, we formulated the Cyclic Process Model based on the extant body of research as argued in the introduction. The first step in the model assumes that face-to-face victimization instigates feelings of anger and frustration in the adolescent victim. This relationship is clearly supported by our findings and is consistent with previous findings showing that face-to-face victimization is related to feelings of anger (Beran & Li, 2008; Ortega et al., 2009; Patchin & Hinduja, 2010). Furthermore, cognitive skills needed to regulate emotions resulting from such painful experiences are still developing, making it hard for adolescents to keep their emotions under control (Plaisier & Konijn, 2013; Steinberg, 2008). Thus, victimization comes with intensely felt emotions of anger and frustration.

As a second step in the Cyclic Process Model, findings supported the relationship between anger/ frustration in victimized adolescents and their cyberbullying behaviors. This result is consistent with findings from the Downward Spiral Model (Slater et al., 2003) showing that aggressive adolescents feel attracted to violent media content. As such, the General Strain Theory (Patchin & Hinduja, 2010) is also supported in that individuals who experience anger and frustration (i.e., co-occurring with strain according to Patchin & Hinduja, 2010) are more at risk to engage in deviant behaviors (Agnew, 1992). Cyberbullying may be seen as a form of deviant behaviors, or the least as undesired behaviors. The increased levels of strain of victimized adolescents' may find an outlet in cyberbullying behaviors.

Next, a third step in our Cyclic Process Model suggests that angry adolescents are inclined to seek antisocial media content in order to cope with their anger (Arnett, 1996; Flammer & Schaffner, 2003; Olson et al., 2007; Varjas et al., 2010). On the one hand, this finding supports in a more systematic way the results of previous qualitative research of Olson and colleagues (2007), in which participants reported that they play violent video games to 'vent their anger'. On the other hand, our findings supporting this step highlight another important underlying mechanism in between the anger/frustration as felt by the victims and being more at risk to engage in deviant behaviors as proposed by General Strain Theory (Patchin & Hinduja, 2010) in becoming a cyberbully. As such, this is an important addition to the extant body of theorizing on cyberbullying and also has important implications for future intervention in cyberbullying. That is, the role of media with antisocial content as an important underlying mechanism in between victimization-related anger/frustration and facilitating or amplifying cyberbullying behaviors has thus far hardly been investigated.

Related, as a fourth step in the Cyclic Process Model, our results supported that exposing oneself to media with antisocial content positively relates to cyberbullying behaviors. This finding further supports Bandura's Social Cognitive Theory in terms of modeling or vicarious learning through role models and examples aired through media fare (Bandura, 2001; Bandura et al., 1963). These findings relating antisocial media use to cyberbullying behaviors are further in line with and extend the results of Lee and Kim (2004) and Kuntsche (2004), who found a relationship between face-to-face bullying behaviors and use of *violent* media. Likewise, our findings are consistent with the recent findings of Calvete et al. (2010) and Fanti et al. (2012), who found a significant association between exposure to *violent* media and cyberbullying behaviors. Finally, the significant role of media with antisocial content in the process of victimized adolescents in becoming cyberbullies (and likely become cybervictims again: Smith et al., 2008; Ybarra & Mitchell, 2004), are also in line with previous research regarding the Downward Spiral Model of violent media exposure and aggression (Slater et al., 2003).

In all, each of these theories, as steps in the cyclic process model, is supported by our study's findings. The Cyclic Process Model integrates and encompasses previous findings on cyberbullying in view of General Strain Theory (Patchin & Hinduja, 2010), insights from Bandura's Social Cognitive Theory (Bandura, 2001; Bandura et al., 1963), and Slater's Downward Spiral Model of violent media exposure and aggression (Slater et al., 2003). The Cyclic

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Process Model thus explains how victims may become cyberbullies and how media use following victimization plays a role in this process. The results of our analyses provided first evidence for such a Cyclic Process Model in showing that exposure to antisocial media content mediated between victimization-related anger/frustration and cyberbullying behaviors.

With the current results, we know that the various steps of the Cyclic Process Model are linked and that exposure to antisocial media has a profound impact on cyberbullying behaviors. Following previous research, we suggested that victimized adolescents use media with antisocial content to cope with their anger. Future research is warranted in studying the beliefs of adolescents in how to cope with their anger and frustration after victimization. For example, to study the extent to which they believe exposure to violent and antisocial media would relieve them from such unpleasant feelings. This is often referred to as the belief in Catharsis (Aristotle, 335 BC). However, empirical evidence supporting catharsis is lacking; findings thus far suggest that venting anger does not help to overcome the anger, it rather increases anger (Bushman & Whitaker, 2010). Nevertheless, it seems a firm belief in adolescents playing violent video games (Olson et al., 2008). Future research should investigate the role of such beliefs in adolescents' media use.

A deeper understanding of the underlying mechanisms and the process through which bullying behaviors develops and may further increase in a cyclic process plays an important role in interventions and prevention of cyberbullying behaviors and adverse media use. For example, in confronting the bullies with the consequences of their behaviors and training the victims how to cope with victimization and resulting anger and frustration. Furthermore, media literacy programming should be further developed in schools and include new and interactive media as well as educate on how media may impact behaviors.

Limitations

As most studies, our study also had some limitations. The measurement of cyberbullying behaviors was based on self-report, which can lead to an underestimation of the prevalence of cyberbullying behaviors. However, even when the occurrence of cyberbullying behaviors is underestimated, a strength of the current research is that significant relations have been found between antisocial media exposure and cyberbullying behaviors. This not only indicates the relevance but also the need for further research into this relationship.

Another limitation is that from the cross-sectional design in the current study, no firm causal inferences can be made. The overall good fit of the double mediation model, however, provides a solid indicator for the validity of such a cyclic process. Firmly testing the Cyclic Process Model in its development over time demands a longitudinal research design. We now investigated the various stages in this process in a cross-sectional design, in anticipation of a more costly longitudinal design. Testing the Cyclic Process Model in longitudinal research would further increase our understanding of how exposure to media with antisocial content and cyberbullying behaviors instigate and amplify each other.

The use of a newly developed scale (i.e., the Content-based Media Exposure scale, C-ME: Den Hamer et al., under review), can be seen as a limitation. However, in addition to its promising psychometric qualities, a strength is that this scale asks for specific content and covers a broad range of antisocial media content, including risk behaviors, substance abuse, and more 'girly' antisocial behaviors like gossiping. Compared to previous research in which merely general indicators of frequency of exposure are used, we believe this more specific and tailored measurement device is a strength and advances the field of media research.

Conclusion

This study provided empirical support to a Cyclic Process Model of cyberbullying behaviors and media use, in which exposure to antisocial media content mediates between victimization-related anger/frustration and cyberbullying behaviors in adolescents. Likely, such bullying behaviors results in being even further bullied, thus, getting caught in a cyclic process. Expanding our knowledge on the underlying processes of cyberbullying and the role of media use among adolescents is highly relevant given current prevalence of cyberbullying and its consequences for the victims. Even more so with the increasing prevalence and importance youngsters place on social media and the internet. In all, our results indicate that exposure to antisocial media content amplifies cyberbullying behaviors.