

ORIGINAL ARTICLE

The Individual or the Group: A Multilevel Analysis of Cyberbullying in School Classes

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In this study, we focus on the relevance of social influence to explain cyberbullying experiences among German high school students. Social influence is discussed in the context of computer-mediated communication. To obtain individual and sociostructural data, we conducted a survey study among German high school students (N = 4,282). Using multi-level modeling, we found that the attributes of the school class only contributed to the risk of being involved in cyberbullying to a small extent. Still, procyberbullying norms in class did enhance the risk of perpetration and victimization for students, even more so than their individual beliefs. Previous experiences with bullying and intensive, unrestricted use of the Internet were the strongest individual predictors of cyberbullying involvement.

Keywords: Cyberbullying, Computer-Mediated Communication, Social Norms, Peer Influence, Multilevel Analysis, Social Network Analysis.

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Recent reviews and meta-analyses of cyberbullying show that up to now, most studies have focused on psychological aspects and individual beliefs and attitudes (e.g., Slonje, Smith, & Frisen, 2013; Smith, 2012; Tokunaga, 2010). However, cyberbullying is by definition a social phenomenon: Following the description of traditional bullying by Olweus (1993) and Smith, Mahdavi, Carvalho, Fisher, and Russell (2008, p. 376), for example, define cyberbullying as “an aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself.” Moreover, like traditional bullying, cyberbullying frequently occurs between people who know each other outside the online context. Previous findings regarding cyberbullying show that the perpetrators and victims often know each other and come from the same school (Dehue, Bolman, & Völlink, 2008; Slonje & Smith, 2008). These parallels imply that attributes of the school class may not only be important in context of traditional bullying, but also in terms of explaining cyberbullying involvement.

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Traditional bullying research already includes a large number of studies that provide a sociostructural perspective on the phenomenon (e.g., Salmivalli, Huttunen, & Lagerspetz, 1997; Salmivalli, Lagerspetz, Björkqvist, Österman, & Kaukiainen, 1996). These approaches refer to different kinds of direct or indirect forms of social influence within classrooms. Regarding the concept of indirect social influence, a certain amount of social resources are expected to enable or favor the perpetration of deviant behavior. This line of social influence was especially discussed in traditional aggression research in terms of a person's social position (see Neal, 2010). Direct social influence was not only considered in terms of injunctive classroom norms (classmates' expectations about the acceptability of bullying, e.g., Salmivalli & Voeten, 2004), but also in terms of the actual behavior of relevant others ("descriptive norms," e.g., Moutapa, Valente, Gallaher, Rohrbach, & Unger, 2004). However, this socio-structural line of research has only rarely been transferred to the context of cyberbullying.

When analyzing the role of classroom norms in the context of cyberbullying involvement, this local social influence appears in a more global, anonymous online environment. Previous studies have generally confirmed that, based on communication and interaction, a strong social identity can also develop in computer-mediated groups in which visually anonymous individuals can easily exchange messages (e.g., Postmes, Spears, & Lea, 2000). Following the *Social Identity Model of Deindividuation Effects* (SIDE; Spears & Lea, 1994), social norms in these groups may exert a strong influence on the behavior of the members. Thus, an online environment without direct physical contact does not negate the forms of normative behavior; online communication and behavior can be even more strongly guided by social mechanisms than the individual features of the people involved. Moreover, Postmes et al. (2000) found that even preexisting groups, such as school classes, develop new ways of interacting when they enter a mediated context, which may dramatically change group dynamics and the social identity of its members.

Summarizing these considerations, we expected that individual beliefs and attributes, which have been the focus of most previous studies on cyberbullying, are even less salient in an online communicational environment, where cyberbullying behavior usually takes place. Following the general assumptions of SIDE theory, a sociostructural perspective may be a more promising approach when explaining cyberbullying experiences. In the present study, we therefore focus on the relevance of (injunctive and descriptive) classroom norms to explain cyberbullying experiences among German high school students. We analyze the role of sociostructural factors on cyberbullying involvement as compared to individual aspects, such as attitudes and personal experiences.

Previous research on cyberbullying

The individual level of influence

Previous research on cyberbullying has mainly concentrated on the individual—for example, how differences in personality, attitude, experience, and Internet use relate to

cyberbullying behavior. Many of these individual factors can be confirmed as relevant levels of influence when explaining perpetration and victimization via the Internet (see Table 1).

Summarizing the previous findings, older adolescents seem especially likely to engage in cyberbullying, whereas there are no consistent results regarding gender differences as of yet. In line with the general findings on offline and computer-mediated behavior (see Reich, Subrahmanyam, & Espinoza, 2012), a strong overlap between traditional bullying and cyberbullying could be identified. This may be due to the basic underlying probullying attitudes that have previously been identified as relevant predictors of cyberperpetration (Salmivalli & Voeten, 2004). A strong influence of previous experiences was also identified by Walrave and Heirman (2009). They found that students who already perpetrated cyberbullying were also more likely to be victimized in the Internet. And, reversely, cyber victims had a higher risk of becoming a cyberbully. This might reflect general tendencies and motives of retaliation within the context of cyberbullying. However, these results were detected in a cross-sectional design, so that statements on causality could not be answered.

Only a few studies have analyzed the communication conditions and situations in which cyberbullying takes place. Slonje and Smith (2008) found that about one-third of victims did not know the gender and age of their bullies and that only 10% of the perpetrators were not from the same school. However, Dehue et al. (2008) also showed that although bully and victim typically attend the same school, most of the attacks are perpetrated from home, either alone or, to a lesser extent, with friends. Because many schools restrict the use of the Internet (see Smith et al., 2008), the perpetration of cyberbullying from home is not very surprising.

The relevance of the communication channel in the context of cyberbullying is also reflected by findings concerning adolescents' Internet use. An obvious factor influencing cyberbullying is time spent online (e.g., Festl & Quandt, 2013; Walrave & Heirman, 2009). More intensive use of the Internet increases the risk of being involved in cyberbullying. However, some researchers contend that mere exposure is not convincing as a causal factor, especially for adolescents who are surrounded by digital media in their everyday lives (see Lenhart, Purcell, Smith, & Zickuhr, 2010).

In contrast, specific content-related aspects of media use are considered more important in explaining risk behavior online. Livingstone, Haddon, Görzig, and Olafsson (2011) showed that not only intensive use but also a varied array of online activities affects the perpetration of risky online behavior. Other studies confirmed that the social features of the Internet, such as chat rooms and social network sites, are associated with a high risk of cyberbullying involvement (Walrave & Heirman, 2009; Ybarra & Mitchell, 2008).

Finally, the various opportunities for risky Internet behavior also depend on access to the actual equipment needed. Walrave and Heirman (2009) analyzed these media use conditions and found that perpetrators and victims slightly (but not significantly) more often than not had their own computers and could use them with little or no family supervision. Moreover, the distribution of mobile phones among

Table 1 Literature Review on Individual and Sociostructural Predictors of Traditional Bullying and Cyberbullying

	Sample	Key Finding	Source
<i>Individual predictors</i>			
Age	N = 1,501 youths; 10–17 years; 48% ♀	More CB among older students	Ybarra and Mitchell (2004)
	N = 2,052 students; 10–18 years	More CB among older students	Vandebosch and van Cleemput (2009)
	Meta-analysis	Curvilinear influence of age on CB	Tokunaga (2010)
Gender	N = 1,501 youths; 10–17 years; 48% ♀	No gender differences in CB	Ybarra and Mitchell (2004)
	N = 2,052 students; 10–18 years	No gender differences in CB	Slonje and Smith (2008)
	N = 1,318 students; 12–18 years; 49% ♀	Boys more often cyberbullies; girls more often cybervictims	Walrave and Heirman (2009)
	N = 1,211 students; 13 years; 50% ♀	Boys more often cyberbullies; girls more often cybervictims	Dehue et al. (2008)
Attitudes	N = 1,220 students; 9–12 years; 49% ♀	Pro-bullying attitudes positively related to TB bullies	Salmivalli and Voeten (2004)
TB	N = 408 students; 12–19 years; 42% ♀	TB behavior positively predicted CB behavior, especially for bullies	Festl and Quandt (2013)
CB	N = 1,318 students; 12–18 years; 49% ♀	Cyberbullies more likely to be victimized; cybervictims more likely to cyberbully others	Walrave and Heirman (2009)
Internet access	N = 1,318 students; 12–18 years; 49% ♀	Cyberbullies slightly more private access to the Internet (own PC)	Walrave and Heirman (2009)
Social Internet use	N = 1,318 students; 12–18 years; 49% ♀	Higher online frequency among cyberbullies	Walrave and Heirman (2009)
	N = 1,588 youths; 10–15 years	Social use of the Internet associated with a higher risk of being cyberbullied	Ybarra and Mitchell (2008)

Table 1 Continued

	Sample	Key Finding	Source
<i>Social position predictors</i>			
Indegree/centrality	N = 408 students; 12–19 years; 42% ♀ N = 1,368 students; Ø 11 years; 53% ♀	Positive correlation between network centrality and being a CB bully/victim Indegree negatively associated with being a TB victim	Festl and Quandt (2013) Mouittapa et al. (2004)
Social preference	N = 461 students; 12–13 years; 49% ♀	Perpetration of TB associated with lower social preference	Caravita, Di Blasio, and Salmivalli (2009)
Popularity	N = 573 students; 12–13 years; 50% ♀ N = 502 students; 10–11 and 14–15 years; 55% ♀	TB victims are rather perceived as unpopular in school TB bullies are rather perceived as popular in school	Salmivalli et al. (1996) Sijtsema, Veenstra, Lindenbergh, and Salmivalli (2009)
<i>School class predictors</i>			
TB norms in class	N = 1,220 students; 9–12 years; 49% ♀	Anti-bullying norms in class negatively predicted perpetration of TB	Salmivalli and Voeten (2004)
TB behavior of classmates	N = 6,980 students; 50% ♀	Rejected and socially anxious students with higher risk of TB victimization in classrooms, where bystanders reinforce bullying	Kärnä, Voeten, Poskiparta, and Salmivalli (2010)
TB behavior of friends	N = 1,368 students; Ø 11 years; 53% ♀ N = 459; 11–12 years; 48% ♀	Friends' aggressive behaviors positively associated with being a TB bully Bullies are often friend with other bullies or supporters, whereas victims' networks often include other victims	Mouittapa et al. (2004) Salmivalli et al. (1997)
CB behavior of friends and classmates	N = 276; 13–19 years; 43% ♀	A higher number of cyberbullies in school class increase the risk of victimization	Festl, Scharnow, and Quandt (2013)

TB = Traditional bullying; CB = Cyberbullying; Ø = average value (e.g., average age in years).

adolescents can also increase the risk of being involved in cyberbullying: These devices often guarantee unrestricted use because they are normally not shared among family members.

The sociostructural level of influence

Looking at the sociostructural character of cyberbullying, there are two different dimensions to consider: indirect and direct influences. The former often relate to the social position of a person. This sociostructural concept is not immediately connected to cyberbullying, but it affects individual cyberbullying behavior by providing social resources.

Within this sociopositional approach, Neal (2010) differentiates between three concepts: social preference, network centrality, and perceived popularity. Measures of perceived popularity and social network position reflect prominence and social prestige within a peer group, whereas measures of social preference stress likeability (Neal, 2010, p. 124). These concepts are often measured using social cognitive mapping techniques by creating a co-occurrence matrix based on peer nominations (e.g., Xie, Swift, Cairns, & Cairns, 2002).

The indicators therefore describe the social attributes of a person as perceived by their peers. Victims, in general, are known to be rather unpopular in school (Mouttapa et al., 2004; Salmivalli et al., 1996), whereas the perpetration of bullying is often associated with power and dominance and therefore with the perception of a higher level of popularity (Sijtsema et al., 2009).

However, even though bullies are often perceived as popular, the perpetration of social aggression is also associated with a lower social likability (Caravita et al., 2009). Traditional victims were also found to have fewer friends in school (lower network centrality; see Mouttapa et al., 2004). However, all these results refer to traditional forms of bullying. Although one would expect that cyberbullying is experienced by adolescents who know each other, whether these social mechanisms work in an analogous way when analyzing bullying in the online context is not clear. In an initial study on social position and cyberbullying, Festl and Quandt (2013) showed that aggressive cybervictims who had already bullied someone else had more friends in school and occupied a central position in the network.

Although a person's social status can be interpreted as an individual feature, it is provided through social relations with peers and therefore falls into the sociostructural category. The availability or lack of social resources can be expected to make cyberbullying easier or more complicated, respectively, and thus encourages or prevents such behavior. In this study, we therefore control for a person's social position when analyzing cyberbullying experiences.

Moreover, the social influence of peers can also be analyzed more directly by explicitly measuring and modeling forms of peer influence, such as peer pressure or behavioral learning (see Brown, Bakken, Ameringer, & Mahon, 2008). In general, there is a large body of research on adolescent behavior that focuses on peer influence, especially in the context of substance use (e.g., Sieving, Perry, & Williams, 2000) and

other forms of risky behavior (Jaccard, Blanton, & Dodge, 2005). Salmivalli et al. (1997) combined structural indices with individual bullying behavior and found that the social networks of perpetrators often consisted of other bullies or students who supported their aggressive behavior. The friendship networks of victims more often included other victims or persons that defended the victims. Mouttapa et al. (2004) also found that friends' aggressive behavior was positively associated with being a traditional bully.

The term "peers" is generally used as a very broad catch-all concept that includes highly exclusive cliques, as well as peer crowds and other loose groups such as school classes (cf. Cotterell, 2007). Many studies have focused exclusively on close friends as the most important source of social influence and found evidence for this direct contact hypothesis (e.g., Haynie, 2001).

In contrast, other researchers argue that peer influence is not solely restricted to voluntarily chosen friendships. Adolescents are also directly or indirectly exposed to other peers (Payne & Cornwell, 2007). Juvonen and Galvan (2008) emphasized that the mechanisms of establishing social hierarchies and exerting social influence are particularly relevant in involuntary social groups, such as school classes. When students transition from elementary to higher schools, they are often confronted with a less structured system and a variety of new groups of classmates, triggering social processes such as deciding which classmates are "cool" and which are unpopular. Everyone must find his or her place in the social system of the class and is thus typically influenced by popular (and maybe bullying) classmates.

Additionally, challenging the behavior of bullies is thought to be rare, especially on the part of high-status students, because people are afraid of being bullied themselves. This silent acceptance of bullying in class then reinforces probullying group norms that may not be representative of the class itself or of the individual class members (Juvonen & Galvan, 2008). This scenario illustrates the role of bystanders when analyzing the power of peers in the context of bullying. Passive behavior in bullying situations can be interpreted in different ways. Perpetrators can perceive the attention as additional support for their behavior, and victims assume that there is solidarity with the bully (Cowie, 2000; Salmivalli, Kaukiainen, & Voeten, 2005). Kärnä et al. (2010) confirmed that rejected and socially anxious students have a higher risk of victimization in classrooms where bystanders reinforce bullying instead of helping the victim (see Table 1).

Again, these findings come from studies that have focused on traditional forms of bullying. Following the so-called "bystander-effect," even more passivity can be expected in the computer-mediated context of cyberbullying. This concept implies that the responsibility to help may be dispersed and therefore weakened in an online environment because of the larger number of bystanders involved in a particular situation. Markey (2000) confirmed these social mechanisms in a computer-mediated chat scenario. As the inclusion of a nearly unlimited audience is one of the most obvious characteristics of cyberbullying (e.g., Heirman & Walrave, 2008), the "bystander-effect" must be considered.

Summarizing these considerations, social influence in the context of cyberbullying may not be limited to close friends, but also include a more-or-less active audience that, especially in the case of social media, reflects the offline network of the bully. However, not only classroom norms on cyberbullying (see Salmivalli & Voeten, 2004) but also the classmates' behavior may be relevant to individual cyberbullying risk. Festl et al. (2013), for example, found that having a higher number of cyberbullies in a school class increased the probability of individual victimization.

Research questions and hypotheses

In this study, we analyze whether the social influence of classmates is a relevant predictor when explaining cyberbullying behavior, in addition to and perhaps even more greatly than individual beliefs and experiences. To evaluate the significance of the sociostructural level, we must first check for the relevant individual level of influence on cyberbullying involvement. As is known from sociopsychological research (e.g., Ajzen, 2005), a person's behavior is strongly guided by his or her behavioral attitudes. Salmivalli and Voeten (2004) confirmed this relationship and found that probullying attitudes positively predicted the risk of becoming a traditional bully. We assume the same effect in the context of cyberbullying:

H1a: Procyberbullying attitudes are positively related to the risk of being a cyberbully.

Regarding previous bullying experiences, many studies confirmed a strong overlap between the perpetration and victimization of traditional bullying and cyberbullying behavior (e.g., Fanti, Demetriou, & Hawa, 2012; Festl & Quandt, 2013; Sticca, Ruggieri, Alsaker, & Perren, 2013). Moreover, in the context of cyberbullying, the findings also showed that perpetrating and experiencing cyberbullying were strongly related (e.g., Walrave & Heirman, 2009). Being a cyberbully therefore also enhances the risk of being victimized via the Internet and vice versa. Summarizing the previous findings on individual experiences, we therefore conclude the following:

H1b: Traditional bullying involvement is positively related to the respective cyberbullying involvement.

H1c: The perpetration of cyberbullying is positively related to the risk of being victimized in the Internet and vice versa.

Examining the sociostructural level, we generally expect that the mechanisms of social influence also operate in the context of computer-mediated communication. Previous findings on cyberbullying have confirmed that the involved students were typically from the same social environment, in many cases the same school. We therefore assume that offline social characteristics influence the online behavior of adolescents. However, following SIDE theory, group mechanisms and social influence should be even more pronounced in the online context because the visual anonymity and interchangeability of its members favor the group's social identity (e.g., Postmes et al., 2000). This emphasis on the group in contrast to the singular individual is also

expected to be prevalent for preexisting social groups when interacting in an online environment.

Previous research on social influence in the classroom context has mainly focused on two concepts: the expected acceptability of a behavior within the classroom (injunctive classroom norm) and the actual behavior of the classmates (descriptive classroom norm; see Henry, 2001). Following this line of research, we also expect both forms of group norms to be relevant to the individual risk of becoming a cyberbully and a cybervictim. Regarding victimization, previous findings have suggested that perpetrator and victim usually know each other from the offline world. Selecting a cybervictim, therefore, should follow the same social mechanisms that appear in traditional bullying.

According to the results of Kärnä et al. (2010), the risk of victimization was higher in classes in which bystanders supported the bully instead of the victim. In the context of computer-mediated communication, the probability of helping the victim is expected to be even lower (see Markey, 2000). Therefore, procyberbullying norms can be even more easily perceived as the predominant and desired way of acting. This can result in emotional or direct support for the perpetrators and therefore enhance the individual risk of victimization. Summarizing these considerations, we conclude the following:

H2a: Procyberbullying norms in class are positively related to the risk of being involved in cyberbullying as a perpetrator and a victim.

H2b: A higher number of traditional bullies and cyberbullies in class are positively related to the risk of being involved in cyberbullying as a perpetrator and a victim.

Finally, previous research on cyberbullying has almost exclusively concentrated on individual predictors. These individual-level predictors have been shown to be relevant factors influencing perpetration and victimization via the Internet. We therefore control for the most relevant predictors of cyberbullying, such as gender, age, education and Internet use. As additional social control variable, we also analyzed a person's social position (see Table 1).

Method

Sample and study design

To explain cyberbullying behavior on an individual and school class level, we conducted a comprehensive school survey in the southwest of Germany. Before recruiting the schools, we collected the consent of the Ministry of Education and the parents of the students. Altogether, 33 schools agreed to participate in our study. They covered the three different levels of education that are typical in Germany: lower-track education ("Hauptschule," 10 schools), middle-track education ("Realschule," 10 schools), and higher-track education ("Gymnasium," 13 schools).

Because developmental processes occur quickly during adolescence, and we were striving to obtain a homogeneous sample, we only recruited students between the 7th

and 10th grades. Moreover, this age group was identified as being the most relevant in the context of cyberbullying behavior (Tokunaga, 2010). Within this age group, we tried to reach as many classes and students as possible. For the class-level analyses, we included all classes with at least five participating students and obtained a sample consisting of 284 classes: 39 classes were from the lower track (14%), 97 classes were from the middle track (34%), and 149 classes were from higher-track schools (53%). On average, the schools provided data for nine classes ($SD = 5.1$; Min. = 1; Max. = 17). The classes had an average size of 15 participating students ($SD = 5.0$), with a maximum of 26. Overall, 5,656 students filled out the questionnaire during lessons in school.

For this study, 4,282 students (76%), 51% of whom were female and who had an average age of 13.9 ($SD = 1.3$) years, completed all relevant parts of the questionnaire. Twenty-eight percent of the students were from the 7th ($n = 1,204$), 33% were from the 8th ($n = 1,398$), 26% were from the 9th ($n = 1,109$), and 13% were from the 10th ($n = 571$) grades. Most respondents were from higher-track ($n = 2,551$; 60%) and middle-track schools ($n = 1,330$; 31%), whereas only 9% ($n = 401$) were attending a lower-track school. On average, the students reported moderate social Internet use ($M = 1.5$; $SD = 0.8$; scale 0–4), but most of them had unrestricted access to the Internet via their own mobile phones or home computers (86%). Data were collected in February and March of 2013.

Measures

Individual predictors

Procyberbullying attitudes. To measure the participants' attitudes toward cyberbullying, we used semantic differentials rated on a 5-point scale. The participants used four adjective pairs to indicate their evaluation of cyberbullying: "foolish—wise," "negative—positive," "bad—good," and "not funny—funny" ($\alpha = .78$; $\omega = .78$). A high level of agreement with the scale reflects procyberbullying attitudes.

Cyberbullying behavior. Previous studies on traditional bullying and cyberbullying either used a definition-based or a behavior-based measure of the phenomenon (e.g., Sawyer, Bradshaw, & O'Brennan, 2008). The former may be problematic in terms of social desirability, whereas questions about concrete behavior tend to provide higher prevalence estimations (Sawyer et al., 2008). In this paper, we used a mixed approach: First, we provided a brief definition of bullying and cyberbullying, including behavioral examples. Afterwards, actual cyberbullying behavior was measured based on variants of such behavior (following the classification of Vandebosch & van Cleemput, 2009). We asked the students about 11 behaviors or experiences and used a reference timeframe of the last 12 months. They rated their answers on a frequency scale ranging from 0 ("never") through 1 ("once") and 2 ("occasionally") to 3 ("often"). Following this approach, we could fulfill the definitional criteria of repetition as proposed by Smith et al. (2008). Six of these items referred to the perpetration of cyberbullying, whereas the other five items covered forms of victimization. The wording and the statistical details of the items are displayed in the results section (Table 2). If someone

Table 2 Description of the Cyberbullying and Victimization Scale

Items	Mean	SD	Proportion (% agreed at least “occasionally”)
<i>Cyberbully someone</i>			
<i>How often during the last year ...</i>			
<i>have you sent an insulting message to someone?</i>	.55	.79	14
<i>have you written something insulting about a person on a public website?</i>	.15	.48	4
<i>have you uploaded embarrassing pictures or videos of someone in the Internet?</i>	.08	.35	2
<i>have you written a message to someone using a fake identity in order to embarrass him?</i>	.20	.53	4
<i>have you spread rumors about someone in the Internet (e.g., using Facebook)?</i>	.08	.34	2
<i>have you forwarded a personal message of someone to others without his or her knowledge?</i>	.27	.65	8
<i>Being cyberbullied by someone</i>			
<i>How often during the last year ...</i>			
<i>have you been insulted while using the Internet?</i>	.47	.79	12
<i>did someone intentionally post embarrassing pictures or videos of you?</i>	.15	.47	3
<i>did you receive a message of someone who used a fake identity to embarrass you?</i>	.27	.65	7
<i>did someone spread rumor about you in the Internet (e.g., using Facebook)?</i>	.29	.67	7
<i>did someone forward personal information of you to others?</i>	.33	.68	8
Perpetration-Score	.33	.77	22
Victimization-Score	.37	.85	22

Note: $N = 4,282$; Items were rated from 0 (“never”), 1 (“once”), 2 (“occasionally”) to 3 (“often”); perpetration (Min. = 0, Max. = 6) and victimization score (Min. = 0, Max. = 5) were built on base of a sum score and dichotomized for the proportion indices.

answered at least one of the six perpetrator items with “occasionally” or “often,” the person was classified as a perpetrator. The same procedure was used for creating the victim category.

Traditional bullying behavior. The perpetration of traditional bullying in school was measured in a similar fashion as cyberbullying. Participants reported how often during the last year they had experienced each of the four behaviors described (e.g., “How often during the last year have you spread rumors about a schoolmate”) on a frequency scale ranging from 0 (“never”) through 1 (“once”) and 2 (“occasionally”) to 3 (“often”). If someone reported performing one of the perpetration items at least

occasionally, that person was classified as a traditional bully. To measure victimization in school, a dichotomous variable was created with the same rule, using the single item “How often during the last year have you been teased or insulted in school?”

Class-level predictors

Pro-cyberbullying norms. We included the procyberbullying attitudes of the students as class-level predictors by averaging the individual scores from all students in a class. Following this approach, we obtained a measure of the average (individual) acceptability of cyberbullying within each class.

Number of bullies and cyberbullies per class. As a second measure of social influence, we also analyzed the descriptive classroom norm. The actual behavior of the classmates was thus measured by counting the number of bullies and cyberbullies in class using the individual perpetration scores.

Control variables

Sociodemographics. In addition to the gender of the participants, we also controlled for the education level and the grade level of the school classes. Grade level was preferred over the individual age of the students because both indicators (age and grade level) were strongly correlated. The education level was measured using dummy variables for the middle-track and higher-track education schools with the lower-track students being the reference group in each case.

ICT use. The use of information and communication technologies was measured in two ways. As mentioned in the literature review, the use of mobile phones with Internet access is high among adolescents, and it usually guarantees unrestricted media use. Being online without parental control is also more probable if an adolescent has his or her own computer. We therefore asked the students if they had their own mobile devices or computers that enable them to access the Internet. Moreover, we calculated a formative measure for the online activities of the participants. On a 5-point frequency scale, ranging from 0 (“never”) through 1 (“seldom”) and 2 (“occasionally”) and 3 (“often”) to 4 (“very often”), they answered eight items regarding the social aspects of their Internet use (e.g., “How often during the last year have you used the Internet to visit a forum or an open chat,” “... to play online games together with others,” “... to search for new friends”) ($M = 1.5$; $SD = 0.8$; $\alpha = .72$). The items were partly adapted from Livingstone et al. (2011).

Social position predictors. The following predictors are based on various measures from social network analysis. To reconstruct the school or class networks, we asked the students to fill out several name generators. These were used to compute the following indicators of social position in the class or school. The indegree indicates a person's prestige, quantifying the rank an actor occupies within a set of actors (Wasserman & Faust, 1994). It was measured using a simple friendship generator: Students were asked to list their best friends in school (limited to 10 nominations). The indegree thus reflects the number of nominations received from all respondents in a school. Rather than focusing on these school-based social indicators, we focused on the class

level and asked the students to nominate the three classmates they liked the most. Again, the number of nominations received reflects the social preference of a person. Compared to the indegree, this indicator measures social preference, which is not necessarily associated with friendship. This procedure has been used previously in numerous bullying studies (e.g., Caravita et al., 2009). Students likewise mentioned three the classmates they thought were the most popular ones in class. A larger number of nominations indicate a higher degree of perceived popularity.

Data analysis

As noted above, this study is focused on the influence of social context on the individual behaviors of students. Therefore, we modeled cyberbullying behavior as a dependent variable on the individual level. Because we obtained hierarchically nested data, in which one student can only be part of one specific class in one specific school, we applied multilevel analysis (Hox, 2010) with level 1 and level 2 predictors. The dependent variable in this study was the risk of becoming involved in cyberbullying behavior as a perpetrator or a victim. Because these were modeled as dichotomous variables, we applied the multilevel generalized linear model suggested by Hox (2010). As recommended by Enders and Tofghi (2007), we used group mean centering for the individual-level variables (level 1) and grand mean centering for the class-level variables (level 2). Missing data were removed listwise for each model. All analyses were conducted using the software R and the lme4 package (Bates, Maechler, & Bolker, 2012). When the analysis was completed, The regression coefficients were transformed into Odds Ratios (EXP(B)) for easier interpretation. Significance values are indicated as follows: $**p < .01$; $*p < .05$.

Results

Cyberbullying prevalence

In the first step, we examined the prevalence of cyberbullying among the student sample. As explained above, we used a bullying and victimization scale to measure cyberbullying behavior. Except for one item, the scales were almost identical in covering the active perpetration and the (passive) experience of cyberbullying. In general, agreement with the individual items was rather low, with sending insulting messages and forwarding personal information being the most common behaviors. Fourteen percent of the participants indicated that they had at least occasionally sent insulting messages to someone during the last year. Except for this item, all the other questions received more support in terms of perceived victimization than perpetration. Altogether, 21.6% of the respondents had already cyberbullied someone in at least one of the described ways. Almost the same percentage was obtained for victimization (22.3%). Using both perpetration and victimization scores, we could identify 12% as perpetrators (without victimization experience), 12% as victims (without perpetration experience), and a group of 10% of the respondents as having already experienced both (perpetrators/victims).

Of the 284 school classes included, we found only 2 to be completely unaffected by cyberbullying. Those classes that contained at least one cyberbully or one cybervictim included 4.2 bullies (maximum = 14) and 4.4 victims (maximum = 14) on average.

Individual-level predictors of cyberbullying involvement

Perpetration risk

First, briefly looking at the control variables, we can mainly confirm the previous findings on perpetrating cyberbullying (see Table 1). In line with earlier studies, we found a higher perpetration risk among older students ($EXP(B) = 1.30^{**}$), and female, not male, adolescents were more strongly involved ($EXP(B) = 1.85^{**}$). Additionally, students with intensive, unrestricted social use of the Internet showed an enhanced risk of perpetration. The respondents' social position also affected their perpetration risk. A higher social preference by their classmates (slightly) positively predicted becoming a cyberbully ($EXP(B) = 1.07^{**}$). Finally, we found that the individual perpetration of cyberbullying was less likely in classes of higher-track schools ($EXP(B) = 0.58^*$). The findings are summarized in Table 3.

To answer our central research question, as a first step, we analyzed the relevance of individual beliefs and experiences in the context of perpetrating cyberbullying. In line with hypothesis H1a, procyberbullying attitudes increased the risk of individual perpetration ($EXP(B) = 2.01^{**}$). Therefore, in accordance with previous research explaining individual behavior, the perpetration of cyberbullying also seems to be strongly guided by individual beliefs. However, the strongest positive predictor was a previous experience as a traditional bully in school ($EXP(B) = 4.63^{**}$; H1b confirmed). Traditional bullies had an over four times greater risk of also perpetrating cyberbullying. This finding reflects a large overlap between both forms of bullying.

Finally, we found indications of retaliation behavior among students who had previously experienced victimization on the Internet ($EXP(B) = 2.68^{**}$; H1c confirmed). This mechanism could not be observed for traditional victims in school ($EXP(B) = 1.02$); only an online communicational context seems to increase the probability that victims also become perpetrators. The central findings are illustrated in Table 3.

Victimization risk

As with perpetrating cyberbullying, the risk of victimization was also influenced by the included control variables. However, in contrast to previous studies, we did not find an effect for gender. Again, older ($EXP(B) = 1.25^{**}$) and lower-track students (middle-track education: $EXP(B) = 0.65^*$; higher-track education: $EXP(B) = 0.53^{**}$) who intensively used Internet social platforms ($EXP(B) = 2.12^{**}$) had an increased risk of being victimized on the Internet, whereas parental control of online use did not have a significant effect. Regarding the social position of a person, we also found a positive effect for social preference within a class ($EXP(B) = 1.07^{**}$). Being liked by classmates, therefore, was not only associated with a higher risk of perpetration, but also with a higher probability of becoming a cybervictim.

Table 3 Explaining the Risk of Cyberbullying Involvement by Individual- and Class-Level Predictors

	Perpetrator	Victim
Fixed effects	<i>EXP(B)</i>	<i>EXP(B)</i>
<i>Control variables</i>		
Female	1.85**(a)	1.04
Grade level	1.30**	1.25**
Middle track education	0.70	0.65*
Higher track education	0.58*	0.53**
Social Internet use	1.93**	2.12**
Unrestricted Internet use	2.36**	1.23
Indegree in school	1.00	0.99
Social preference in class	1.07**	1.07**
Popularity in class	0.95	0.99
<i>Individual predictors</i>		
Pro CB attitude	2.01**	1.13
TB perpetrator	4.63**	1.15
TB victim	1.02	4.54**
CB perpetrator	—	2.62**
CB victim	2.68**	—
<i>Class level predictors</i>		
Pro CB norm	5.36**	1.69*
No of TB perpetrators	0.97	1.03
No of CB perpetrators	—	1.01
<i>Random effects</i>		
σ^2 Null model	.31	.20
σ^2 Final model	.22	.14
Pseudo R²	.26	.18

Note: $N = 4,282$; Odds Ratios are indicated (*EXP(B)*); e.g., females have a 1.85 times higher risk of becoming a cyberperpetrator (value $> 1 =$ enhanced risk), whereas students in middle track schools have a 30% lower risk ($EXP(B) = 0.70$; value $< 1 =$ reduced risk)

** $p < .01$; * $p < .05$; McFadden pseudo R^2 was used (a) effect varies significantly across classes (random effect), likelihood ratio test; TB = Traditional bullying; CB = Cyberbullying.

Regarding cybervictimization, we expected the previous experiences of a person to be the most relevant predictors. In line with hypothesis H1b, we found that previous experiences with traditional bullying as a victim were the strongest predictor of being victimized on the Internet ($EXP(B) = 4.54^{**}$). Again, prior perpetration of traditional bullying did not coincide with a higher likelihood of cybervictimization, but previous cyberbullying increased the risk of becoming victimized online ($EXP(B) = 2.62^{**}$; H1c confirmed). This finding again indicates mechanisms of retaliation that may be prominent driving forces in the context of cyberbullying. However, due to cross-sectional nature of the data, we cannot test whether perpetration causes victimization or vice versa.

Class-level predictors of cyberbullying involvement

Perpetration risk

Following our central research question, we analyzed the role of norms and the behavior of classmates in an individual's involvement in cyberbullying. In line with SIDE theory, a sociostructural perspective may be even more useful in a visually anonymous online context (see Postmes et al., 2000). In general, the results of the multilevel regression analysis indicated that only a modest amount of variance in the risk of being involved in cyberbullying behavior as a perpetrator (9%) could be explained by the classes themselves (Intraclass Correlation Coefficient (ICC) = .09; see Hox, 2010, p. 128). Following these results, the class context seemed to play a rather subordinate role.

Although the general amount of variance on the class level is rather small, we found that classroom norms play an important role in predicting the individual perpetration risk. As postulated in hypothesis H2a, stronger procyberbullying attitudes in class increased the risk of individual perpetration ($EXP(B) = 5.36^{**}$). Compared to the influence of individual attitudes ($EXP(B) = 2.01^{**}$), this social effect was even larger (overall effect of classroom norms: $EXP(B) = 3.35^{**}$).

Because the average individual attitudes are negative and therefore reflect antibullying attitudes ($M = 0.47$; Min. = 0; Max. = 4), these effects can be interpreted as follows: Even for students with average (anti)bullying attitudes in class, procyberbullying classroom norms enhance the risk of individual perpetration. This risk further increases if the person also has positive attitudes toward cyberbullying. Summarizing these findings, we conclude that offline classroom norms also play an important role in an online context, in addition to the relevant individual beliefs. Contrary to our expectations, the number of traditional bullies in class did not affect the individual behavior of cyberbullies (H2b rejected).¹ Regarding the concept of descriptive norms, we found no significant effects. Therefore, previous individual experiences were clearly more important than the behavior of the relevant reference group.

Altogether, individual-level and class-level predictors, as well as control variables, explained more than half of the class-level variance and, in total, 26% of the variance in individual perpetration risk (summarized in Table 3). A series of likelihood-ratio tests indicated that only the individual effects of gender varied significantly across classes and that most such effects should therefore be modeled as random rather than fixed effects.

Victimization risk

In the next step, we turned to those students who had been attacked via the Internet. The ICC for the null model (ICC = .05) showed that only 5% of the cybervictimization risk can be attributed to the class context. In order to explain this small class-level variance, we expected group norms and the behavior of classmates to be the relevant sources of influence. Again, we found a significant effect for procyberbullying classroom norms on the individual victimization risk ($EXP(B) = 1.69^*$). Therefore, the probability of becoming a cybervictim is slightly higher in classes in which students

more positively evaluate cyberbullying. As expected, we identified no effects for attitudes on the individual level. However, as mentioned before, an individual's previous bullying experiences play an important role in the risk of becoming a cybervictim. In contrast, the bullying behaviors of classmates did not influence this individual victimization risk. The social influence in an online communicational context, thus, seems to be restricted to the expected group norms, while the actual behavior of others rather seems to be insignificant.

Based on the specified model, we could explain 18% of the risk of becoming a cybervictim. The variance on the class level was rather low, and nearly half of it remains unexplained, despite the integrated class-level predictors in the model (see Table 3).

Discussion

In this article, we followed a sociostructural perspective in order to analyze students' involvement in cyberbullying behavior. Specifically, we investigated how offline social influence on the class level affects the individual risk of being involved in online bullying as a perpetrator and a victim. Research on traditional bullying has already confirmed the relevance of expected group norms (see Salmivalli & Voeten, 2004), as well as the actual behavior of classmates (see Salmivalli et al., 1997). However, up to now, this sociostructural perspective has been only rarely transferred to the context of cyberbullying. To account for the hierarchical data structure implied in this study, we applied a multilevel analysis with individual and class-level predictors. As a general result, we found that only a relatively small proportion of variance in cyberbullying could be explained by the class context. The risk of cyberbullying perpetration and victimization is largely determined by individual factors.

As a relevant predictor on the class level, we identified the cyberbullying-related classroom norms indicated by the average attitudes of the classmates. Being part of classes with high levels of procyberbullying norms increased the individual's cyberbullying risk, both as a perpetrator and a victim. This injunctive classroom norm, moreover, had a larger effect than the individual beliefs of a student. This result is especially important when analyzing the behavior of cyberbullies. If a student perceives procyberbullying norms as the predominant opinion in class, he or she does not necessarily have to support such a behavior strongly in order to perform it.

In contrast, we found no direct social influence for the classmates' own bullying behavior. Neither the number of traditional bullies nor the number of cyberbullies in class affected the individual's cyberbullying risk. However, due to the statistical endogeneity, we could not estimate the influence of the classmates' cyberperpetration on the individual cyberperpetration in our cross-sectional design. Although the actual cyberbullying behavior of others does not seem to be influential, the individual involvement risk is strongly guided by the person's own bullying experiences. Being a traditional perpetrator or a traditional victim in school strongly increased the respective cyberbullying risks. Additionally, perpetrating or experiencing cyberbullying

were strong predictors of one another, while such cross effects could not be confirmed for the traditional bullying predictors. This seems to be in line with the assumption that status aspects lose relevance when communicating online because no longer are only socially inferior adolescents victimized (see, e.g., Dooley, Pyzalski, & Cross, 2009). However, a causal order within this relationship cannot be determined with the present cross-sectional data.

Summarizing these findings, we can indirectly confirm the “bystander effect” for cyberbullying as a computer-mediated form of communication. Not explicitly challenging cyberbullies seems to result in a class climate in which at least indirect aggression against others is tolerated or even supported. This in turn encourages students to actually perpetrate cyberbullying on their own and can result in a spiral of aggression and conformity in class. We can further conclude that norms negotiated in an offline group can influence an individual’s online behavior. This result suggests a strong overlap between offline and online communication and the relevance of a sociostructural perspective on cyberbullying. Nevertheless, only the attitudes, not the actual behavior of the classmates, affected the individual cyberbullying risk.

The lack of behavioral influence for the classmates may be due to the fact that perpetrating cyberbullying can only seldom be observed directly. Social influence in an online context therefore seems to be guided by implicit perceived peer pressure rather than direct observational learning (see Brown et al., 2008). This result is in line with SIDE theory, which suggests the importance of social norms in mediated groups with a given social identity. Although school classes already exist in the offline world, it is expected that new ways of interacting are provided via communication online (see Postmes et al., 2000). Our results seem to suggest a strong orientation toward group norms, even stronger than that toward individual beliefs.

The social position predictors did not explain cyberbullying behavior very well. However, students who were more socially preferred by their classmates showed a higher risk of becoming involved in cyberbullying as perpetrators and victims. This finding contrasts with previous studies on social aggression and traditional bullying (Moultapa et al., 2004; Salmivalli et al., 1996). The victims in our study did not fit into the classic role of an outsider normally found in traditional bullying research. Being socially accepted in class actually made the students more vulnerable to attacks via the Internet. This might be due to the composition of the victim group, which not only included “pure” victims but also persons who had already cyberbullied others. Festl and Quandt (2013) found a higher level of social prestige and centrality for those perpetrator/victims. Based on the current findings, we must also conclude that students with a higher social position—in the present case, a high level of peer acceptance in school—seem to be more involved in any kind of social interactions, whether these are positive (such as being invited to parties) or negative (such as being cyberbullied).

Despite these sociostructural findings, our results confirmed that cyberbullying involvement can still, to a large extent, be explained by individual-level predictors. As confirmed in previous studies, the risk of perpetration and victimization was higher among older and lower-track students who intensively use the Internet without

parental control. Surprisingly, we found that female students had a higher risk of being involved as perpetrators. This finding clearly contrasts with previous results that mainly confirmed male adolescents were more likely to be perpetrators and female adolescents were more likely to be cybervictims (Dehue et al., 2008; Smith et al., 2008). However, the effect is in line with traditional aggression research that found more frequent use of indirect and social aggression among girls (e.g., Björkqvist, Lagerspetz, & Kaukiainen, 1992). Thus, at least during adolescence, girls do not want to expose themselves explicitly as perpetrators who intentionally hurt other people. This may be due to gender-specific aspects of socialization. The technical features inherent in cyberbullying also enable the anonymous use of aggression, which seems to be the preference of girls.

Regarding general implications, we found that the school class (although the direct effects are rather small) is still a relevant concept for a better understanding of cyberbullying and that class-level factors should also be considered in terms of prevention and intervention strategies. Classmates perceiving cyberbullying as being socially accepted in class seem to lower the barriers for the perpetration of cyberbullying. Compared to individual attitudes, this social effect was very strong. Thus, concentrating on an individual person in order to prevent the appearance of cyberbullying is not sufficient. Even if a student does not endorse the perpetration of cyberbullying, being part of a class whose members socially accept the behavior increases his or her own risk of perpetrating and also experiencing cyberbullying. Successful strategies against cyberbullying, thus, must include a larger social group, in context of schools the whole school class. Normally, schools find it impossible to change the general class composition in order to meet other risk factors such as higher diffusion among older and lower educated students. However, “soft” criteria such as classroom norms and attitudes can be more easily revised and modified.

In general, the relevance of social influence in context of cyberbullying was only confirmed for perceived group norms, not for descriptive norms, i.e., the classmates’ behavior. As already mentioned, this might be a specific characteristic of the computer mediated communication context of cyberbullying (see SIDE-theory). Therefore, we found it was not enough to solely transfer the considerations of traditional bullying research — highlighting the relevance of peers’ behavior — when integrating these social approaches. Future research needs to focus on the specifics of the communication context when analyzing cyberbullying behavior.

Note

- 1 Due to the statistical problem of endogeneity, we could not check for the influence of the number of cyberbullies on the individual perpetration risk in a cross-sectional design.

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