

Cybergrooming: Risk factors, coping strategies and associations with cyberbullying

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The use of information and communication technologies has become ubiquitous among adolescents. New forms of cyber aggression have emerged, cybergrooming is one of them. However, little is known about the nature and extent of cybergrooming. The purpose of this study was to investigate risk factors of being cybergroomed, to identify various coping strategies and to explore the associations between being cyberbullied and cybergroomed. The sample consisted of 518 students in 6th to 10th grades. The computer assisted personal interview method (CAPI method) was implemented. The «Mobbing Questionnaire for Students» by Jäger et al. (2007) was further developed for this study and served as the research instrument. While being a girl, being cyberbullied and willingness to meet strangers could be identified as risk factors; no significant age differences were found. Furthermore, three types of coping strategies – aggressive, cognitive-technical and helpless – with varied impacts were identified. The findings not only shed light on understanding cybergrooming, but also suggest worth noting associations between various forms of cyber aggression.

Cybergrooming: factores de riesgo, estrategias de afrontamiento y asociación con cyberbullying. El uso de tecnologías de información y comunicación se ha convertido en ubicuo entre los adolescentes y, por consiguiente, han emergido nuevas formas de agresiones cibernéticas, como cybergrooming. Sin embargo, es poco lo que se sabe sobre la naturaleza y la extensión del cybergrooming. El propósito de esta investigación era: investigando los factores de riesgo de ser sometido a un cybergrooming, identificando diferentes estrategias de afrontamiento y explorando las asociaciones con cyberbullying. La muestra estuvo compuesta por 518 estudiantes de los grados 6 a 10. El estudio se realizó mediante el método CAPI. El «Mobbing Questionnaire for Students» fue desarrollado adicionalmente para evaluar el cybergrooming. Siendo una niña expuesta a ciberacoso y existiendo voluntad de conocer a extraños pudo identificarse como factor de riesgo, pero no se encontraron diferencias significativas entre las edades. Además, tres dimensiones de estrategias de afrontamiento: se identificaron afrontamientos tipo agresivo, cognitivo-técnico y desprotegido. La manera de efectuar el afrontamiento parece tener una diferencia con respecto a la efectividad. Los hallazgos proveen aún más evidencia de que el cybergrooming debe ser tomado seriamente y sugieren que existen asociaciones entre la victimización a través de varias formas de agresiones cibernéticas.

The use of information and communication technologies (ICTs) has become ubiquitous among individuals in the western countries (OECD, 2011), and therefore new forms of cyber aggression have emerged (e.g., in this special issue, del Rey, Elipe, & Ortega, 2012; Heirman & Walrave, 2012; Palladino, Nocentini, & Menesini, 2012). Apart from types of peer-to-peer cyber aggression (i.e., cyberbullying; happy slapping) that are mainly carried out among adolescents, types of cyber aggression initiated by adults against minors can be observed. Cybergrooming, also known as online grooming, is one example for this type of cyber aggression.

Reviewing previous research on cybergrooming (e.g. Berson, 2003; Brå, 2007; Kierkegaard, 2008; Shannon, 2008; Davidson & Gottschalk, 2009; Choo, 2009; Dooley, Cross, Hearn, & Tryvaud 2009; Davidson et al., 2011a, 2011b) the following definition can be derived: Cybergrooming means establishing a trust-based relationship between minors and usually adults using ICTs to systematically solicit and exploit the minors for sexual purposes. The three components repetition, misuse of trust, and the specific relationship between victim and cybergroomer must be considered to distinguish the phenomenon of cybergrooming from a single occurrence of sexual solicitation or exploitation.

The cybergroomers exploit the need for attention and affection of their victims and the emergence of a natural puberty interest in sexual topics. Thus, the cybergroomers are using Internet platforms that are primarily attended by adolescents, such as chat rooms or social networking sites in order to get in contact with their victims (Choo, 2009; Dooley et al., 2009). In contrast to traditional grooming, lack of geographic boundaries, increasing possibilities

of contact and the wider range of number of contacts through the Internet are favourable conditions for cybergrooming (Davidson et al., 2011a; Berson, 2003).

Due to lack of representative studies and an estimated large amount of unrecorded cases, the exact prevalence rates are still unknown. Since cybergrooming begins with an initial contact, studies containing information about accidental contact by strangers can provide first indications. In the US, the Youth Internet Safety Surveys revealed that in 2010 one in ten adolescents received unwanted sexual solicitations through ICTs in 2010 (Jones, Mitchell, & Finkelhor, 2012). In Germany, a study conducted in 2007 with 1,700 adolescents (aged 10 to 19) reported that 38% of the participants were asked questions about sexual topics, 11% received sexual content through ICTs and 7% were online solicited repetitively (Katzner, 2009).

A wide spread stereotype is that online victims are generally innocent and naïve children, who trust in lies and trickery. This is indeed incorrect (Wolak, Finkelhor, & Mitchel, 2004; Wolak et al., 2008). Findings from the US National Juvenile Online Victimization Study showed that most victims of Internet-initiated sex crimes were between 13 and 14 years old. The majority of the victims knew that they were conversing with an adult and were aware of the sexual motives of the online offenders (Wolak, Finkelhor, & Mitchel, 2004; Wolak et al., 2008). A European study also demonstrated that adolescents were more vulnerable in becoming victims online than young children (Staksurd & Livingstone, 2009). This fact may be explained by media consumption and habits of young children. They use ICTs less for social activities but more play-orientated; and are monitored more often by parents and educators (Wolak et al., 2008).

Previous research showed girls were more likely to be cybergroomed than boys (Davidson et al., 2011a; Shannon, 2008; Brå, 2007). A possible explanation is: girls mature earlier (Hurrelmann, 2010), are using social network sites more intensively and chat more frequently on these sites (Feierabend & Rathgeb, 2011). Additionally, girls tend to be more honest to strangers and their social network ID names are more likely to have implications on their sexuality (Katzner, 2009). Finally, cybergroomers seem to be often heterosexual males who are looking for girls (Shanon, 2008).

Some adolescents seem to behave online in a more risky way than others. Wolak et al., (2007) showed that 25% of young people interacted and shared information with strangers online, and 5% reported that they talked with strangers online specifically about sexual topics. Hasebrink, Görzig, Haddon, Kalmus, and Livingstone (2011) found that 9% of adolescents met online contacts offline. Davidson and colleagues (2011a) suggested further risk factors which contributed to the probability of an adolescent to be cybergroomed: low self-esteem, loneliness, self-harming behaviour and facing family problems.

Adolescence is a crucial stage for ones' personality development. In this stage, teenagers learn how to cope with risk situations and become eventually resilient (Hurrelmann, 2010). Most adolescents coped with sexual solicitations by leaving the situation, blocking, warning or ignoring the solicitor, avoiding chat or game rooms or simply avoiding using the computer (Wolak et al., 2007). In general, coping strategies of online risk situations differed between victims depending on their gender, age, socialization, types of online risks – whether it would be sexual solicitations, cyberbullying or cybergrooming and the combination of online and offline contact between the victim and the perpetrator (Staksrud & Livingstone,

2009). However, there is no specific study so far which focuses on coping strategies dealing with cybergrooming, which is one of the issues we are addressing in our study.

Cyberbullying and cybergrooming are two different phenomena but share similarities. Perpetrators in both cases use new medias to carry out attacks. Their relationships to victims are shaped mainly by an imbalance of power. Attacks in both cases are intentional with a repetitive character. In regard to the aspect of repetition, a cyberbullied victim can be revictimised by a cybergroomer. For instance, one is cybergroomed and is confronted with denigrating material distributed through ICTs by his/her former cyberbully. A further similarity may consist in the group of victims. Various studies showed victims of traditional bullying and cyberbullying display social difficulties. They are more frequently rejected (i.e., Nansel, et al., 2004), more often excluded from online peer activities (i.e., Wachs & Wolf, 2011) and they have fewer friends to talk about everyday problems with (Ladd & Troop-Gordon, 2003). Therefore, it can be assumed that bullied and cyberbullied adolescents seem to be more vulnerable and targeted by cybergroomers who fake friendships. Currently, the question whether cyberbullied students are more likely to be cybergroomed still remains contemplated and unanswered.

Thus, for our study it was all the more important to point out the associations between cyberbullying and cybergrooming. In order to develop a prevention program, we also looked into the risk factors of being cybergroomed. Furthermore, we identified existing coping strategies among survey participants. With reference to various impacts of coping strategies against cybergroomers, we intended to make a contribution to a future conceptualization of an effective intervention program against cyber aggression.

Aims of the study

The study aimed to investigate which factors shape the risk to become a victim of cybergrooming; another aim was to investigate association between being cyberbullied and being cybergroomed; finally, the last aim of the research was to identify various coping strategies and their effectiveness.

Methods

Participants

The study was conducted in summer 2011 and analysed data from self-reports of 518 students from four schools. 49.0% (n= 254) of the participants were male and 50.8% (n= 263) were female; 0.2% (n= 1) did not answer this question. 40.5% (n= 210) of all participants had a migration background. 2.7% (n= 14) students attended the 5th grade, 23.4% (n= 120) attended the 6th grade, 31.3% (n= 162) students attended the 7th grade, 19.3% (n= 100) attended the 8th grade, 15.1% (n= 78) attended the 9th grade and finally 8.3% (n= 43) attended the 10th grade. In terms of access to ICTs, it can be reported that 28.8% (n= 149) of the participants owned a smartphone, 87.6% (n= 454) possessed their own mobile phone. 76.3% (n= 395) have a PC and 73.6% (n= 381) accessed Internet in their bedroom.

Instruments

This questionnaire started with an explanation of cybergrooming and cyberbullying to improve the validity of responses.

Cybergrooming was explained to the students by the behaviour of a cybergroomer:

“A cybergroomer is a person who is at least 7 years older than you and who you know over a longer time exclusively through online communication. At the beginning, the cybergroomer seems to be interested in your daily life problems, but after a certain time s/he appears to be interested in sexual topics and in the exchange of sexual fantasies and/or nude material (pictures or video chats). Also, a cybergroomer often tries to meet you in real life.”

The definition of cyberbullying was referred to Smith et al., (2008): “aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and overtime against a victim who cannot easily defend him- or herself” (p. 376).

Since there is no established instrument for the assessment of cybergrooming, new items were developed by the authors. The specific questions used for the current study were: ‘How many times did you have contact with a cybergroomer?’ for measuring the prevalence rate for victimization through cybergrooming. With response options on an ordinal five-point rating scale (‘Never’, ‘At least once a year’, ‘At least once a month’, ‘At least once a week’, ‘Several times a week’). Participants who reported an incidence with cybergrooming were asked: ‘Which media was used by the cybergroomer to get in contact with you?’, ‘Did the cybergroomer try to meet you in real-life?’, ‘Are you willing to meet strangers you only knew online before?’ and ‘Do you talk with online contacts about real-life problems?’. Participants were then asked how they cope with cybergrooming. The used scales partly followed the “Mobbing Questionnaire for Students” by Jäger, Fischer, and Riebel (2007) and were developed originally for assessing coping strategies in cyberbullying. For each item, participants indicated on a 4-point-Likert scale (‘Yes’, ‘Rather yes’, ‘Rather no’, ‘No’) how they reacted once they had become victims of cybergrooming.

The measurement of traditional and cyberbullying based also on the “Mobbing Questionnaire for Students” by Jäger et al. (2007). Traditional bullying was assessed with each one item for both bully side and victim side. For victim side the question was ‘How many times have you been bullied in the last twelve months?’. Two scales for measuring cyberbullying with each four items for each side (cyberbully/cybervictim) were applied. The reliabilities for the cyberbullying scales for the current study using Cronbach’s alpha were: .899 for the cyberbullying scale and .876 for the cybervictimisation scale. Both traditional and cyberbullying was responded to using a five-point ordinal scale, with options of ‘Never’, ‘Once or twice’, ‘Twice or thrice’, ‘About once a week’ or ‘Several times a week’. The report period of time in this study was within the last twelve months.

Finally, participants were asked for demographic information such as sex, migration background, grade, access and usage of ICTs. The survey closed with a list of counselling information on the Internet on cyberbullying and cybergrooming and professional help was listed.

Procedure

Before the study was conducted, a pre-test of the questionnaire by means of a free online survey (N= 78) was run to determine

the effectiveness, strengths and weaknesses of the survey and questionnaire format, wording and order were readjusted accordingly. Then schools in Bremen, Germany, were approached randomly until 4 different schools agreed to participate. The data were then collected by online questionnaires using the Computer Assisted Personal Interview method (CAPI method). The study was conducted in school computer labs during school hours. A research assistant gave an introduction to students participating in the survey.

The data protection officer of the federal state and the parents association of the participating schools approved this procedure. Since the students were under eighteen years old, their parents had to sign a written consent form entitling them to participate. The participants in the survey were informed that the data collection was anonymous and participation was voluntary. Any single questions could be skipped and the participants could leave at any time without giving a reason during the 30 minutes duration to complete the questionnaire.

Data analysis

All analyses were conducted using R Version 2.14.1 using the following libraries: MASS, car, psych, leaps, lavan, FactorMineR, e1071 and boot. A strict criterion was applied as cut-off value for prevalence reporting (Victim Yes/Victim No); only students who answered once a week or more often were classified as being involved in cyberbullying (Jäger et al., 2007; Riebel et al., 2009) or in cybergrooming.

Chi-square tests (for categorical variables), t-test and Analysis of variance (ANOVA) was used to compare prevalence of cybergrooming for different possible confounding variables including being cyberbullied, gender, age group, migration background, willingness to meet with strangers and willingness to discuss problems with strangers. Analysis of covariance (ANCOVA) was carried out to identify risk factors for being cybergroomed. The following variables went into the model selection: class, gender, migration background, willingness to meet strangers, willingness to discuss problems with strangers, access to PC at home, access to Internet at home, ownership of mobile phone, ownership of smartphone, amount of internet usage, being bullied (victim), and finally, being cyberbullied. A three-predictor model (Model 1; Table 1) and five predictor model (Model 2; Table 2) was selected using best subset regression. To account for non-normality of the cybergrooming prevalence variable these models were confirmed using a general linear model with a Poisson distribution as identity function. To identify different coping strategies a Principal Component Analysis (PCA) was carried out (Table 3). These coping strategies were added to Model 1 and analysed using ANCOVA (Model 3; Table 4).

To analyse the multivariate associations between the dependent variable (being cybergrooming victim) and the predictor variables (based on Model 1 and Model 3) a simple binary logistic regression were used using dichotomous dependent variables. Odds ratios were determined based on Model 1 and Model 3 in order to derive estimates of associations that closely shape the relative risk of being cybergroomed (Zhang, 1998).

Results

Overall, 21.4% (n= 111) of participants reported that they had contact to a cybergroomer in the last year. In regard to the

frequencies of the attacks, 10.4% (n= 54) reported of online solicitation once a year, 4.3% (n= 22) once a month, 1.9% (n= 10) once a week and 4.6% (n= 24) of the participants several times a week. That is, taking account of the repetition aspect, 6.5% (n= 34) of all respondents could be identified as victims of cybergrooming (strict criterion). Types of ICT used for cybergrooming can be arranged in regard to their frequencies as follows: 41.1% (n= 14) chat rooms, 35.3% (n= 12) social networking sites, 14.7% (n= 5) instant messenger, 8.8% (n= 3) web sites / blogs.

Concerning to cybergrooming, no difference between the grades (and therefore age differences) could be found in the data (reference grade 5th/6th grade, mean = 1.42; 7th grade: $t(512)= 0.07, p= .95$; 8th grade: $t(512)= 0.74, p= .46$; 9th/10th grade: $t(512)= 0.94, p= .33$). However, cybergrooming prevalence is significantly higher for girls than for boys (8.7% vs. 4.3% strict criterion), $t(514)= 3.28, p= .001$. There is no difference between students with or without migration background, $t(514)= 0.73, p= .47$. Students who are not willing to meet strangers have a highly significant lower level of cybergrooming prevalence (4.4% vs. 15.5%), $t(514)= 4.91, p= <.001$. The same can be reported for willingness to discuss problems with strangers (5.6% vs. 11.4%), $t(514)= 3.93, p<.001$.

Regarding cyberbullying, 5.4% (n= 28) of all participants reported being cyberbullied and 3.9% (n= 20) reported that they cyberbullied others once a week and more often. No age or gender differences could be found.

A further point of interest was to investigate the associations between cybergrooming and cyberbullying. An ANCOVA had been carried out because of the high intercorrelations of the covariates. A most parsimonious model was a three predictor solution with sex, willingness to meet strangers and being cyberbullied (see Table 1), $F(3, 512)= 23.39, R^2= 0.12, p<.001$.

Adding *amount of internet usage* and *being bullied* to the model (the best five variable model, see Table 2) revealed a statistically

Table 1
Model 1 (3 predictors) beta coefficients for standardized variables

Coefficients	Estimate	Std. error	t value
(Intercept)	1.430***	0.041	34.49
Being a cybervictim	0.461***	0.085	5.42
Willingness to meet strangers: No	-0.437***	0.106	-4.10
Being a girl	0.289***	0.083	3.46

* p≤.05; ** p≤.01; *** p≤.001

Table 2
Model 2 (5 predictors) beta coefficients for standardized variables

Coefficients	Estimate	Std. error	t value
(Intercept)	0.891***	0.167	5.30
Being a cybervictim	0.240***	0.060	3.97
Willingness to meet strangers: No	-0.376***	0.107	-3.49
Being a girl	0.312***	0.083	3.76
Being a traditional victim	0.094*	0.039	2.37
Amount of Internet usage	0.055*	0.021	2.57

* p≤.05; ** p≤.01; *** p≤.001

significantly better fit, however, the effect size was small to modest, $F(2, 512)= 5.85, p= .003, \eta_p^2= 0.022$.

Doing a logistic regression on a binary variable could support both Model 1 and Model 2. For Model 1 the regression analysis reveals that girls have odds of being cybergroomed about 2.35 times higher, with 95% confidence interval 1.1 to 5.2 (p≤.001). Victims of cyberbullying had odds about 1.75 higher (p≤.001, C.I.= 1.2–2.4). Students not willing to meet strangers had odds about 0.30 lower, which can be interpreted as a protective factor (p≤.001, C.I.= 0.14-0.65).

Based on a PCA, we could identify three dimensions for coping strategies: Dimension 1 cognitive-technical coping, dimension 2 aggressive coping, and dimension 3 helpless coping. The first three main factors of variability summarize 62.1% of the total inertia (see Table 3). The item *'I show the message to an adult'* did not contribute particularly to any of these three dimensions.

We built three scales based upon these three dimensions (dimension 1 *cognitive-technical coping* with std. Cronbach's alpha: 0.82 and Guttman's lambda 6: 0.81; dimension 2 *aggressive coping* with α : 0.81 and G6: 0.67; dimension 3 *helpless coping* with α : 0.42 and G6: 0.34). Applying Chi-square test by coding dichotomous variables for coping strategies revealed that boys seem to cope more aggressively (44.4% vs. 19.4%), Pearson test: $\chi^2(1,$

Table 3
Contribution of variables to three dimensions of a principle components analysis

Item	Dimension 1 Cogn.-technical coping	Dimension 2 Aggressive coping	Dimension 3 Helpless coping
I wonder why he/she does that	12.54	0.10	0.68
I try to avoid meeting this person	13.42	3.94	9.46
I beg him/her to stop	18.21	0.31	9.54
I switch off my computer	12.30	2.12	8.20
I change my e-mail address or my nickname and only give them to people I can trust	13.74	4.72	6.12
I insult him/her	1.89	38.69	0.86
I threaten to beat him/her up	1.31	37.34	1.47
I ask him/her desperately to stop it	10.98	2.86	21.69
I don't know what to do	7.20	0.91	16.50
I don't reveal myself	2.75	3.92	20.98
<i>I show the messages to a grown-up</i>	<i>5.61</i>	<i>5.04</i>	<i>4.436</i>

Table 4
Model 3 (5 predictors) beta coefficients

Coefficients	Estimate	Std. error	t value
(Intercept)	1.4302***	0.0373	38.30
Aggressive coping	-0.7651***	0.0777	-9.84
Cognitive-techn. coping	0.3322***	0.0753	4.40
Being a cybervictim	0.3256***	0.0781	4.16
Willingness to meet strangers: No	-0.2481*	0.0974	-2.54
Being a girl	0.3268***	0.0751	4.35

* p≤.05; ** p≤.01; *** p≤.001

$N=103$) = 7.25, $p < .01$. For helpless coping and cognitive-technical coping, no significant gender differences could be found.

Then we used the three coping strategies as predictors in a regression analysis to model cybergrooming prevalence. Two scales *aggressive coping* and *cognitive-technical coping* contributed to a significantly better model fit than Model 1 with a large effect size, $F(2, 512) = 60.71$, $p < .001$, $\eta_p^2 = 0.19$ (see Table 4).

A simple binary logistic regression revealed for Model 3 that girls are nearly 3.4 times more likely to be cybergroomed (O.R. = 3.37, $p \leq .001$, C.I. = 1.4-8.6). Victims of cyberbullying were nearly 1.9 times more likely to be cybergroomed (O.R. = 1.88, $p \leq .001$, C.I. = 1.0-3.2). However, *not* willing to meet strangers who are only known online seemed to be a protective factor (O.R. = 0.39, $p \leq .001$, C.I. = 0.2-0.9). Also, students with aggressive coping were less likely to be cybergroomed (O.R. = 0.30, $p \leq .001$, C.I. = 0.2-0.5), whereas students with cognitive-technical coping strategies were more likely to be a victim of cybergrooming (O.R. = 1.48, $p \leq .001$, C.I. = 0.8-2.4).

Discussion

This study investigates risk factors and coping strategies of the victims of cybergrooming. The relation of cybergrooming to cyberbullying is also examined. Three risk factors can be determined when predicting cybergrooming: being a girl, the willingness to meet strangers in real life and being cyberbullied. Girls run a higher risk, which is also shown in previous studies (Berson, 2003; Shanon, 2008; Davidson et al., 2011a). Talking about daily life problems with strangers is not identified as an innate risk factor, which is also in accordance with recent research on Internet-initiated sex crimes (Wolak et al., 2008). Adolescents who avoid meeting strangers are less vulnerable to be cybergroomed. Adolescents who suffer from cyberbullying appear to be more likely to be cybergroomed. Due to the cross-sectional research design, no causal direction between cyberbullying and cybergrooming can be concluded.

Previous studies (Wolak et al., 2008; Staksrud & Livingstone, 2009; Wachs & Wolf, 2011) have shown that offline coincide with online victimisation. The associations between being cybergroomed and being cyberbullied seem to be strong, while there is a less strong association between being cybergroomed and being bullied detectable.

The examination of coping strategies revealed, at least 3 dimensions. However, provided satisfactory reliability score for two of three scales only: aggressive coping and cognitive-technical. Gender differences could only be found for aggressive coping. Furthermore, adolescents who cope cognitive-technically seem to be more likely cybergroomed than students who cope aggressively.

Within this study, a number of strengths can be found. The measurement of prevalence rates has been considered accurately by giving a clear definition of cybergrooming and also measuring the repetition effect. In addition, investigating the predictive

nature of cyber-victimization provides an important insight into the influence of technology on adolescents. Furthermore, this study provided first empirical evidence of associations between cybergrooming and cyberbullying.

However, certain methodological limitations that may impair the significance of this study must be taken into account. Firstly, the sample in this study is non-representative and findings in this study cannot be generalized for the whole population of German students. Specifically, the prevalence rates should be interpreted carefully. Secondly, cybergrooming was assessed only by a single item; future studies should try to include validated scales to investigate cybergrooming in more depth. Thirdly, the study design was cross-sectional and was not able to obtain the information about the causal direction of the connection between cyberbullying and cybergrooming. Instead this information can only be acquired by longitudinal studies.

As the research on cybergrooming is still in its initial stage, there are a few methodological problems with existing research on extent and nature of cybergrooming, which future research in this field should take into consideration. Previous research on cybergrooming seems to be primarily focused on the legal aspects of cybergrooming (Kierkegaard, 2008; Davidson et al., 2011b) and analysis of anecdotal cases based on police reports (i.e., Shanon, 2008) or based on the victims/cybergroomers report (i.e., Berson, 2003). Currently, the European Online Grooming Project investigates the issue of cybergrooming with in-depth interviews from the perpetrators' perspective (Davidson et al., 2011a). A typology of cybergroomers is a major output of this project.

Future research on cybergrooming should address different issues. Quantitative studies with a representative sample should be conducted to obtain the exact prevalence rates and identify the measurements that promise the success to fight against cybergrooming. At first, we need validated instruments with consistent definition, measuring and period of time one cybergroomed to compare different results. Since the cross-sectional nature of most studies in this field, it is impossible to conclude causes and directions of predictors. Future studies should overcome this weakness by collecting information about different forms of cyber aggression at multiple time points to ensure proper temporal organization. Further, qualitative approaches that investigate the nature of cybergrooming by analysing the interaction between cybergroomer and victims are urgently necessary.

Finally, the strong limited data about cybergrooming among adolescents become even more limited when minorities among adolescents are focused upon. Such understudied groups are adolescents with special needs or lesbian, gay, bisexual, and transgender (LGBT) adolescents. ICTs may have a key function for LGBT adolescents and adolescents with disabilities to get in contact with consensual partners and also may be used for crossing physical borders. This specific use of ICTs may contribute to another important risk factor for cybergrooming and seems to be another under-researched topic in this field.

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