Bullying goes online: definition, risk factors, consequences, and prevention of (cyber)bullying

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BULLYING GOES ONLINE: DEFINITION, RISK FACTORS, CONSEQUENCES, AND PREVENTION OF (CYBER)BULLYING

Thesis (cumulative thesis)
Presented to the Faculty of Arts and Social Sciences
of the University of Zurich
for the Degree of Doctor of Philosophy

By Fabio Sticca

Accepted in the Autumn Term 2013
on the Recommendation of the Doctoral Committee
Prof. Dr. Sonja Perren (main advisor)
Prof. Dr. Peter Titzmann

Zurich, 2013
BULLYING GOES ONLINE: DEFINITION, RISK FACTORS, CONSEQUENCES, AND PREVENTION OF (CYBER)BULLYING

Paper 1: Is cyberbullying worse than traditional bullying? Examining the differential roles of medium, publicity, and anonymity for the perceived severity of bullying.

Paper 2: Peer victimisation and depressive symptoms: Can specific coping strategies buffer the negative impact of cybervictimisation?

Paper 3: The chicken and the egg: Longitudinal associations between moral deficits and bullying. A parallel process latent growth model.

Paper 4: Longitudinal risk factors for cyberbullying in adolescence.

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II

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Abstract

Cyberbullying is a topic that has attracted much attention during the last decade both in the media and in scientific discourse. Cyberbullying is defined as an electronic version of traditional bullying that encompasses a variety of different behaviors, ranging from sending offensive text messages to spreading embarrassing videos through YouTube or Facebook. Therefore, cyberbullying can be interpreted as an unfavorable by-product of the social change towards digital communication. The present thesis gives an overview of the research on traditional and cyberbullying with a focus on definition, prevalence, risk factors and consequences, and possibilities for prevention and intervention. The leading research question is whether cyberbullying is a conceptually new form of aggressive behavior or if it is comparable to traditional forms of bullying. Moreover, four additional research questions are going to be answered and discussed on the basis of results from four studies. The first study addresses the question if cyberbullying is perceived as worse than traditional bullying. Study number two examines longitudinal associations between cybervictimization and depressive symptoms. The third study explores the longitudinal link between the development of moral deficits and the development of bullying behavior (traditional and cyber). In the fourth and last study, longitudinal risk factors for becoming a cyberbully are examined. Results from these four studies are summarized and discussed within the framework of traditional bullying and cyberbullying research. The central finding of the present thesis is that cyberbullying can be considered as a new facet of a well-known problem, namely traditional bullying, rather than a conceptually new form of aggressive behavior. Therefore, cyberbullying needs to be integrated into both research on, and prevention of bullying.
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1 Theoretical background

"Sometimes we overlook the real damage that bullying can do, especially when young people face harassment day after day, week after week." Barack Obama

1.1 Introduction on traditional bullying and cyberbullying

The issue of bullying in schools is probably as old as schools themselves. Even so, scientific research on this topic goes back only about three decades. Dan Olweus is considered to be the father of bullying research, owing to his book Forskning on Skolmobbning (Olweus, 1973), which was translated into English as Aggression in Schools: Bullies and Whipping Boys (Olweus, 1978). However, the first publication on bullying was written by Peter-Paul Heinemann (1972) some years before. His book was entitled Mobbning – Gruppvåld bland barn och vuxna, which can be translated into Mobbing – Group Aggression Against Boys and Girls. Heinemann used the term mobbing because he was interested in group-aggression and conceptualized bullying within an ingroup-outgroup framework. Olweus, however, moved away from the term mobbing and used the term bullying. He chose to do so because the concept of bullying is not limited to group aggression, but also encompasses one-on-one aggressive interactions that can indeed be observed in the context of bullying (Olweus, 2010). With time, the term bullying was accepted by the scientific community and is now widely used. However, there are still many different terms that are used to describe bullying in different parts of the world (Smith, Cowie, Olafsson, & Liefooghe, 2002). For instance, the term Mobbing and prepotenza are still used as a synonymous of bullying in German and Italian speaking countries, respectively.

During the last decades, interpersonal communication and interaction has changed dramatically (Valkenburg & Peter, 2009). E-mails, SMS/MMS, WhatsApp, Facebook, Twitter, and Skype are just some examples of electronic forms of communication that have become the order of the day. Many of the changes that came with electronic media are positive, such as easier access to, and exchange of information and knowledge. But there are also downsides. In recent years, reports have heaped about electronic media being used as tools for bullying. Cyberbullying among youngsters is currently a topic that is discussed and explored all around the world and continuously makes headlines.

The main aim of the present thesis is to explore similarities and differences between the well-known problem of traditional bullying and its modern version: cyberbullying. After a short theoretical overview on definitions, risk factors and consequences, and possibilities for
prevention and intervention, four studies will be presented and discussed within the theoretical framework of bullying research.

1.2 Definitions and forms of traditional bullying and cyberbullying

Olweus (1993) defined bullying as a particular form of aggressive behavior that can be distinguished from other forms of aggressive behavior by mainly two of its salient features, namely repetition and power imbalance. Repetition means that the behavior needs to be performed repeatedly in time in order to be considered bullying (as opposed to aggression). Therefore, bullying has an intrinsic chronic component. How often a behavior needs to be repeated in order to call it bullying has been discussed extensively (e.g., O’Moore, 1994). To date, most researchers agree that a behavior that is performed at least once a week can be considered as repeated and, accordingly, as bullying. The other core feature of bullying is power imbalance. Power imbalance means that the bully has some sort of power that allows him to repeatedly offend the victim without the latter having any chance to defend against the attacks. This power can have many forms, such as physical power or higher social status. Thus, besides the chronic component, bullying has an unfair component, too. The combination of these two features, repetition and power imbalance, makes for a very aggressive behavior that usually manifests itself as a group phenomenon, is maintained for a long time and has much more serious consequences than occasional aggressive confrontations or conflicts (Alsaker, 2012). Thus, bullying needs to be distinguished from other forms of aggressive behavior both from a theoretical and from a practical point of view.

After more than a decade of research into cyberbullying, there still is no agreed upon definition of cyberbullying (David-Ferdon & Hertz, 2007; Kowalski & Limber, 2007; Patchin & Hinduja, 2006). An overview of the definitions of cyberbullying and the aspects they include or exclude was given by Tokunaga (2010). The definition that seems to prevail is the one that defines cyberbullying as an intentional aggressive behavior that is performed by a person or group of persons using electronic forms of communication repeatedly and over time against a victim who cannot easily defend him or herself (Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippett, 2008). This understanding is based on the definition of traditional bullying (see above) and, therefore, also contains the two features of repetition and power imbalance. As with traditional bullying, these two aspects characterize cyberbullying as a particularly severe form of aggressive behavior (Alsaker, 2012). However, it is much harder to differentiate cyberbullying from cyberaggression or from online conflicts because repetition and power imbalance are harder to conceptualize in the virtual context, as Menesini and Nocentini
Theoretical background: Definitions, forms, roles, and prevalence

(2009) have described in detail. In sum, cyberbullying is often defined as the electronic pendant of traditional bullying, which suggests that the two forms of bullying (cyber and traditional) are two faces of the same coin.

1.2.1 Traditional bullying versus cyberbullying

Although traditional bullying and cyberbullying share the same definition, cyberbullying has several characteristics that appear to distinguish it from traditional forms of bullying, namely: (1) a wider audience can be reached in the course of seconds, (2) the offender can remain anonymous more easily, (3) there are less time and space constrains, (4) it is often indirect, (5) it occurs more often outside of the school context, (6) unknown persons are attacked more often, (7) there is less supervision by adults, (8) the target is perceived as constantly accessible (Li, Smith, & Cross, 2012), and (9) there are more tools available (e.g., videos). It must be noted, however, that most of these differences are not absolute differences between cyberbullying and traditional bullying. Instead, the difference can be seen in the extent to which these characteristics can be observed in cyberbullying behaviors compared to traditional bullying behaviors (Patchin & Hinduja, 2006; Pyzalski, 2011; Runions, 2013; Slonje & Smith, 2008).

During the last few years, some theoretical concepts about the difference between traditional bullying and cyberbullying have been developed. Runions (2013) integrated Howard’s quadripartite violence typology (Howard, 2011), the social information processing (SIP) model (Crick & Dodge, 1994) and the theory of planned behavior (Ajzen, 1991) with knowledge on cyberbullying. Based on this mix between theoretical models and accumulated scientific knowledge on cyberbullying, Runions (2013) identified a number of aspects of the cyber context that might help to understand why some forms of cyberbullying are performed. These aspects are activation of hostile schema, fatigue effects on effortful self-control and self-efficacy, hostile rumination processes, empathic failure, sensation seeking and excitation transfer. Moreover, Reynolds, Henson, and Fisher (2011) showed that the cyberlifestyle-routine activities theory could be applied to cyberstalking. This latter theoretical approach might be interesting to apply to cyberbullying both from a bullying and from a victimization (i.e., being a victim of cyberbullying) perspective. These two examples represent some of the first attempts to develop theoretical concepts about the difference between cyberbullying and traditional bullying. Thus, the question if cyberbullying can be considered as similar to traditional bullying is still an open debate.
1.2.2 Forms of traditional and cyberbullying

Bullying can manifest itself in many different forms. There are mainly five forms of bullying that can be differentiated (Jordan & Austin, 2012; Wang, Iannotti, & Luk, 2012): physical (e.g., hitting, pushing), verbal (e.g., insults, embarrassing jokes), social (e.g., exclusion, ignoring), rumors (e.g., spreading rumors, stealing friends), and cyber (e.g., SMS, chats). Furthermore, bullying can be direct, where the bully directly attacks its victim (e.g., hitting, insulting), or indirect, where the bully attacks the victims through other people (e.g., spreading rumors). These forms of bullying partly overlap or are enacted simultaneously. For instance, if an individual insults someone and makes fun of his appearance or behavior, this can be considered as direct, verbal, relational and also social. Wang et al. (2012) identified three latent classes of bullying patterns. A first class was composed of bullies that showed high scores on all five forms of bullying (10.5% for boys, 4% for girls). A second class was composed of bullies that were high on verbal and moderately high on social bullying (29.3% for boys, 29.4% for girls), and a last class included all those individuals that were low on all forms of bullying (60.2% for boys, 66.6% for girls). These results show that most bullies show a repertoire of different bullying behaviors.

A wide range of very heterogeneous behaviors fall under the definition of cyberbullying. Willard (2006) listed the most common ones: written, visual and verbal abuse (harassment), spreading rumors (denigration), theft of virtual identities (impersonation), disclosure of secrets or embarrassing information (outing), persecution and threats (cyberstalking) and disputes (flaming). However, disputes would not be considered as cyberbullying according to the definition given above, since both sides are equally active in a dispute (no power imbalance). Patching and Hinduja (2006) found that the most common forms of cyberbullying were being ignored (60.4%), disrespected (50%), called names (29.9%), threatened (21.4%), picked on (19.8%), being made fun of (19.3%), and rumors being spread about oneself (18.8%). The channels through which these behaviors are transmitted are also as numerous and diversified: SMS, MMS, chats, forums, blogs, websites, social networking sites, phone calls, apps, games, images, videos and sound recordings. The forms and channels of cyberbullying are subject to constant changes that are driven by technological development. This is also part of the reason why different researchers use different definitions of cyberbullying and of the reason why they obtain different prevalence rates. The rates of technological innovation during the last decades suggest that more innovation is still to come. Besides all the advantages that we will gain thanks to these new technologies, we will also have to deal with new forms of cyberbullying (Spears, Slee, Owens, & Johnson, 2009).
1.2.3 Bullying in different contexts

Bullying not only takes on different forms (e.g., traditional vs. cyber), but also happens in many different contexts, although it has mainly been studied in the school context (Aleva et al., 2008; Alsaker & Brunner, 1999; Baldry, 1998; Batsche & Knoff, 1994; Beaty & Alexeyev, 2008; Boulton & Underwood, 1992; Olweus, 1993). From a theoretical point of view, bullying can be observed in any context where groups of individuals gather and interact with each other, such as preschool, school, work, family, military service, prisons, or institutions of any kind (Alsaker, 2012; Monks & Coyne, 2011). The likelihood of bullying is highest if the individuals did not choose in which group they want to be, with whom they want to spend time, and if there is no easy way to withdraw from unpleasant situations (Alsaker, 2012). Accordingly, the likelihood that bullying occurs in school settings is comparatively high. Research on bullying in these different contexts has begun to emerge and there is also some effort to bring results from different fields together. Understanding bullying in different contexts is a central task of bullying research since it not only fosters our understanding of bullying as a whole, but also helps in improving prevention and intervention programs (Monks & Coyne, 2011; Monks et al., 2009).

1.2.4 Roles in traditional and cyberbullying dynamics

Bullying has been described as group phenomenon in which different individuals take on different roles within the group dynamic (Salmivalli, Lagerspetz, Björekqvist, & Oesterman, 1996). On one hand, there are the typical four roles that were described early in bullying research (i.e., bullies, victims, bully-victims, and passive onlookers). On the other hand, there are other roles that were described in detail only some years later (i.e., bystander roles). These roles are described in the following.

In traditional bullying dynamics, there are four main roles that can be distinguished: bullies, victims, bully-victims, and noninvolved individuals (Alsaker, 2012; Olweus, 1978). Bullies (or perpetrators) are those who perform bullying behavior without being bullied by their peers. Victims (or targets) are those who are bullied by their peers without bullying them. Note that the term traditional victimization is often used to indicate involvement in traditional bullying as a victim. As the name already suggests, bully-victims are those who both bully and are bullied by their peers. Finally there are noninvolved individuals, which are those who neither bully, nor are bullied by their peers. Besides the four main roles presented above, in most bullying episodes there are so called bystanders. In a given bullying situation, bystanders are individuals who take on specific roles, without being the primary bully or victim.
There are mainly four bystander roles: assistant of the bully, reinforcer of the bully, defender of the victim, and passive onlooker (Salmivalli et al., 1996). Assistants of the bully actively support the bully by directly helping her/him in her/his intent. For instance, an assistant might hold the victim while the bully hits it and steals its lunch box and money. Reinforcers of the bully do not directly help the bully, but stand around and provide the bully with moral support by cheering and laughing. Defenders of the victim are those who stand up for the victim and directly or indirectly help the victim in getting out of, or coping with the bullying situation. This includes behaviors like directly stopping the bullying by getting in her/his way, which indeed represents a somewhat risky behavior (Gini, Pozzoli, Borghi, & Franzoni, 2008), telling a teacher, getting help from an adult, or just emotionally supporting the victim after the incident. Finally, passive onlookers observe what happens and do nothing. Nevertheless, passive onlookers’ behaviors indirectly reinforce the bully by showing her/him that they either tolerate what s/he is doing or just do not have the courage or the means to intervene. Either way, the bully will learn that s/he will get away with it. It is important to recognize that bullying does not only involve the bully and the victim, but also a given number of bystanders in most cases. These bystanders not only play an important role in the onset, but also in the prevention of bullying, as will be discussed below.

The same main roles of traditional bullying can be found in the context of cyberbullying. There are cyberbullies, cybervictims, cyberbully-victims and noninvolved individuals. Note that the term cybervictimization is often used to indicate involvement in cyberbullying as a victim. Bystander roles can also be observed in the context of cyberbullying. A cyberassistant of the bully might, for instance, actively help to create a hate site. A cyberreinforcer of the perpetrator could like an embarrassing video on Facebook or express his approval as a comment. A cyberdefender of the victim might not like said video on Facebook, or report a given inappropriate content to parents, teachers, website owners or even to the police. A passive cyberonlooker could be present when the perpetrator posts a nasty message in a forum, when the victim reads it, or could simply witness what happens online without intervening. Unlike in traditional bullying, cyberbystanders are usually not directly visible. Thus, there is an increased potential for diffusion of responsibility, which reduces the likelihood for defender behavior (Latane & Darley, 1970; Thornberg, 2007). Furthermore, the potential for a large audience in the context of online communication might also reduce the likelihood of bystander behavior in general (Macháčková, Dedkova, Sevcikova, & Cerna, 2013). Even so, bystander behavior could be performed anonymously, which might increase the likelihood of cyberdefending, but also of cyberassisting and cyberreinforcing behavior. In sum, the same
bystander roles of traditional bullying can be identified in the context of cyberbullying, with some difference in the way individuals are motivated to take on these roles. However, research on bystander behavior in the context of cyberbullying is still at its very beginning.

The complexity of involvement in bullying (traditional and cyber) increases if we consider that main and bystander roles of the traditional context, and main and bystander roles of the cyber context can be combined in all possible manners. For instance, an adolescent might be a traditional bully and a cyberassistant, or a cyberdefender and a cyberreinforcer at the same time. Nevertheless, one of the most consistent findings across different studies on cyberbullying is the high overlap between involvement in traditional bullying and involvement in cyberbullying. Most individuals reporting experiences of cyberbullying or cybervictimization (i.e., being a victim of cyberbullying) also report experiences of traditional bullying or traditional victimization (i.e., being a victim of traditional bullying), respectively (Kowalski, Morgan, & Limber, 2012; Monks, Robinson, & Worlidge, 2012). For example, Olweus (2012) reported that almost 90% of cyberbullies were also traditional bullies and that roughly 90% of cybervictims were also traditional victims. Juvonen and Gross (2008) reported similar findings, showing that 85% of the cybervictims also experienced traditional victimization. Furthermore, cyberbullies were found to be high on all other forms of bullying, too (Wang et al., 2012). Given this high overlap, it is imperative to study cyberbullying together with traditional bullying in order to obtain a complete picture of bullying dynamics (Li, 2007; Olweus, 2012).

1.3 Prevalence of traditional and cyberbullying

During the last decades, the phenomenon of bullying has become a major issue in many countries (Lawson, Alameda-Lawson, Downer, & Anderson, 2013; Sutton & Smith, 1999). Besides the scientific reports on the consequences of bullying for both bullies and victims (which will be addressed below), there are two main reasons why bullying is major topic in both scientific research and in the public debate. First, there were reports of suicide attempts and suicide deaths that were at least partly motivated by severe experiences of victimization (Luukkonen, Rasanen, Hakko, & Riala, 2009). Likewise, bullies were also found to have an increased risk for suicide attempts (Kaltiala-Heino, Rimpela, Marttunen, Rimpela, & Rantanen, 1999). Second, Vossekuil, Fein, Reddy, Borum, and Modzeleski (2002) reported that in 71% of the 42 school-shooting cases that happened between 1974 and 2000 in the U.S., the shooter was a victim of bullying. The topic of bullying in the context of schools has received much attention during the last decades and to date there are prevalence estimations
The theoretical background: Definitions, forms, roles, and prevalence

for many countries. In a relatively old review on the prevalence of bullying and victimization, Wolke (2001) reported that the prevalence of traditional bullying among primary and secondary school students ranged between 3% and 23%, while the prevalence of traditional victimization ranged from 8% to 46%. As Alsaker (2012) pointed out, more recent studies used stricter definitions of bullying (i.e., using a cut-off criteria of at least once a week) and reported lower percentages and narrower prevalence ranges. In a recent paper, Olweus (2012) presented data from a large-scale study carried out in the U.S. (N ≈ 450’000) together with recent data from Norway (N ≈ 9000). The prevalence of traditional bullying in the U.S. sample was 9.6%, while the prevalence of traditional victimization was 17.6%. The prevalence in the Norwegian sample was 4.2% and 11%, respectively. It must be noted that there is a large variation in the prevalence of both bullying and victimization between both different countries and different studies (Currie et al., 2008). The variation in prevalence between the different countries and studies does, however, show no systematic pattern and may reflect both international differences in prevalence rates and differences in the methods used to assess the prevalence of both bullying and victimization (i.e., definition, measurement and categorization). For a detailed discussion of definitions, assessments and categorization, see Olweus (2010).

Regarding the association between involvement in bullying and age, aggressive behaviors and delinquency are known to increase during adolescence, peaking around the age of 17-18 years, and to decrease during emerging adulthood (Windle, 2000), therefore describing an inversely u-shaped development. Taken together, results from international studies showed that a significant proportion of children and adolescents suffered and/or performed some sort of bullying behavior or at least witnessed it.

The prevalence of cyberbullying is a prominent topic in the media all over the world. The impression that one might have when reading newspapers and watching the news is one of a very prevalent and steadily increasing problem. Indeed, there are some studies that reported rates of cybervictimization as high as 72% (Juvonen & Gross, 2008). However, results on the prevalence of cyberbullying are even more variable than those of traditional bullying. David-Ferdon and Hertz (2007) reported that the prevalence of cyberbullying varied between 9% and 34%, while rates of cybervictimization varied between 4% and 21%. Kowalski, Limber, and Agatston (2010) showed that rates of cyberbullying varied between 4% and 53%, and cybervictimization varied between 3% and 23%. Twyman et al. (2010) stated that 4% to 15% of children are cyberbullies while 19% to 42% are cybervictims. Even so, studies using stricter definitions of cyberbullying reported lower percentages of involvement. For example, in the data from the U.S. large scale study and the Norwegian study presented by Olweus
(2012), the prevalence of cyberbullying in the U.S. sample was 2.8%, while the prevalence for cybervictimization was 4.5%. The prevalence in the Norwegian sample was 1.4% and 3.4%, respectively. These recent results show that cyberbullying is not as prevalent as first studies on the topic suggested. Moreover, a comparison of the recent results on the prevalence of traditional bullying and those on the prevalence of cyberbullying, shows that the prevalence of cyberbullying and cybervictimization are lower than the prevalence of traditional bullying and traditional victimization, respectively (Brunstein Klomek, Sourander, & Gould, 2010; Erentaitė, Bergman, & Zukauskienė, 2012; Juvonen & Gross, 2008; Olweus, 2012; Raskauskas & Stoltz, 2007). Finally, Olweus (2012) showed that the prevalence of both traditional and cyberbullying was stable in the time period from 2006 to 2010 both in the U.S. and in Norway. Regarding the role of age in the prevalence of cyberbullying, no longitudinal studies exist that give strong evidence on the association between age and involvement in cyberbullying. Tokunaga (2010) concluded that the involvement in cyberbullying peaks around the age of 13-14 years and then steadily decreases. In line with research on traditional bullying, variations in prevalence of cyberbullying can be attributed to both international prevalence differences and methodological differences. Furthermore, the prevalence has dropped during the last years because more representative samples have been recruited in the different studies and because a stricter definition of cyberbullying was adopted (i.e., single incidents of cyberaggression are not included in the prevalence estimation any more). In sum, cyberbullying seems to be less prevalent than traditional forms of bullying and to be relatively stable, which is in contrast to the picture that the media proposed during the last years (i.e., high prevalence and increasing). Nonetheless, as with traditional bullying, the phenomenon of cyberbullying needs to be taken seriously, since it is often associated with a number of risk factors and consequences that can drastically affect an individual’s life.
1.4 Risk factors and consequences of traditional and cyberbullying

Involvement in traditional bullying and cyberbullying is associated with a number of risk factors and consequences. These are briefly reviewed in the following for both bullies and victims.

1.4.1 Risk factors of involvement in traditional and cyberbullying as a bully

Traditional bullying. Risk factors for being a traditional bully include being male (Espelage, Bosworth, & Simon, 2000; Jansen, Veenstra, Ormel, Verhulst, & Reijneveld, 2011; Jolliffe & Farrington, 2006; Smith, 2011a), externalizing and internalizing problems, low other-oriented and self-related cognitions, low peer influence (Cook, Williams, Guerra, Kim, & Sadek, 2010), high social competence (Nation, Vieno, Perkins, & Santinello, 2008), moral deficits, such as low moral values, low moral responsibility, high moral disengagement, less feelings of remorse, and lack of empathic concern (Ang & Goh, 2010; Caravita, Di Blasio, & Salmivalli, 2009; Hymel, Rocke-Henderson, & Bonanno, 2005; Jolliffe & Farrington, 2006, 2011; Malti & Latzko, 2010; Mesini et al., 2003; Obermann, 2011; Perren & Gutzwiller-Helfenfinger, 2012; Shechtman, 2002; Sontag, Clemans, Graber, & Lyndon, 2011), aggressive attitudes and personality (Eliot & Cornell, 2009; Jansen et al., 2011; Olweus, 1993; Unnever, 2005), normative beliefs about aggression (Burton, Florell, & Wygant, 2013; Huesmann, Guerra, Zelli, & Miller, 1992), manipulativeness (Sontag et al., 2011), low academic achievement (Hemphill et al., 2012; Spriggs, Iannotti, Nansel, & Haynie, 2007), substance use (Carlyle & Steinman, 2007; Sourander, Helstelä, Helenius, & Piha, 2000; Yang, Kim, Kim, Shin, & Yoon, 2006), anger towards others and parental anger (Lovegrove, Henry, & Slater, 2012; Shetgiri, Lin, & Flores, 2013), experiences of child abuse, physical punishment, and domestic violence (Bowes et al., 2009; Espelage et al., 2000; Shields & Cicchetti, 2001), poor parent- and peer-relationships, negative peer influences, and living in an unsafe neighborhood (Burton et al., 2013; Espelage et al., 2000; Hemphill et al., 2012; Spriggs et al., 2007; Veenstra et al., 2005), low family socio-economic status and good preschool motor functioning (Jansen et al., 2011), interparental conflict and family break up (Jablonska & Lindberg, 2007; Spriggs et al., 2007). Living in intact families (Jansen et al., 2011), parents talking to their child and meeting their friends (Shetgiri et al., 2013), and positive adult role models were found to be associated with lower scores in bullying behavior (Espelage et al., 2000).

Cyberbullying. Risk factors for being a cyberbully encompass being a traditional bully (Gradinger, Strohmeier, & Spiel, 2009; Hinduja & Patchin, 2008; Juvonen & Gross, 2008;
Theoretical background: Risk factors and consequences

Kowalski et al., 2012; Raskauskas & Stoltz, 2007; Smith & Slonje, 2010; Smith, 2011a; Twyman et al., 2010; Vandelbosch & Van Cleemput, 2009), being a cybervictim (Bauman, 2010; Law, Shapka, Hymel, Olson, & Waterhouse, 2012; Mitchell, Finkelhor, Wolak, Ybarra, & Turner, 2011; Vandelbosch & Van Cleemput, 2009), rule-breaking behaviors and conduct problems (Brunstein Klomek et al., 2010; Ybarra & Mitchell, 2004), normative beliefs about aggression (Ang, Tan, & Talib Mansor, 2011), being part of a cyberaggressive peer group, low perceived likelihood of sanctions by adults (Hinduja & Patchin, 2013), hyperactivity (Sourander, 2010), lower levels of both affective and cognitive empathy (Ang & Goh, 2010; Spears, Slee, Owens, & Johnson, 2009), moral disengagement (Bauman, 2010; Pornari & Wood, 2010), low self-esteem and depressive symptoms (Modecki, Barber, & Vernon, 2013; Patchin & Hinduja, 2010), proactive aggression, justification of violence and low perceived peer support (Burton et al., 2013; Calvete, Orue, Estévez, Villardon, & Padilla, 2010), frequency and pattern of online communication (Erdur-Baker, 2010; Mesch, 2009; Twyman et al., 2010; Valkenburg & Peter, 2009; Ybarra & Mitchell, 2004), and having a computer in the own bedroom (Law, Shapka, & Olson, 2010), although the latter result may have lost relevance with the newer generations of smart phones and tablets. Further, there is still a debate on the role of being a traditional victim as a risk factor for being a cyberbully. Some authors found that being a victim of traditional bullying increases the risk of being a cyberbully (Ybarra & Mitchell, 2004), but these results were not replicated in newer research (Slonje & Smith, 2008; Vandelbosch & Van Cleemput, 2009). Finally, gender was not found to be systematically associated with being a cyberbullying (Tokunaga, 2010).

In sum, there are many risk factors for traditional bullying and for cyberbullying, including both interpersonal characteristics and intrapersonal characteristics. Many of these are common to both forms of bullying, such as externalizing problems and normative beliefs about aggression. Others seem to be specific to cyberbullying (e.g., online communication). However, it is still unclear to which extent the risk factors for the two forms of bullying are similar. In particular, considering that being a traditional bully is a strong risk factor for being a cyberbully, the risk factors of cyberbullying over and above those of traditional bullying are poorly understood.
1.4.2 Risk factors of involvement in traditional and cyberbullying as a victim

Traditional victimization. Risk factors for being a traditional victim include being male (Smith, 2011a), depressive symptoms (Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999), externalizing and attention problems (Schwartz et al., 1999), normative beliefs about aggression (Burton et al., 2013), isolation, low peer status, lack of peer acceptance, low social competence, high other-related cognitions, low academic performance, and bad school climate (Cook et al., 2010; Lovegrove et al., 2012; Schwartz, Dodge, Pettit, & Bates, 2000; Veenstra et al., 2005), peer-rejection and social problems (Hodges, Malone, & Perry, 1997; Ladd & Troop Gordon, 2003; Schwartz et al., 1999), submissiveness (Perry, Perry, & Boldizar, 1990), deficits in other-oriented social skills (Perren & Alsaker, 2009), lack of empathic concern (Steffgen, König, Pfetsch, & Melzer, 2011), preschool aggressiveness, low family socio-economic status, and poor pre-school motor functioning (Jansen et al., 2011), low parental support (Perren & Hornung, 2005), high parental demandingness and low responsiveness (Ladd & Ladd, 1998), and being part of an ethnic minority (Graham & Juvonen, 2002; Strohmeier, Kärnä, & Salmivalli, 2011).

Cybervictimization. Risk factors for being a cybervictim encompass being a cyberbully (Bauman, 2010), being a traditional victim and taking more Internet-related risks (Katzer, Fetchenhauer, & Belschak, 2009; Kowalski et al., 2012; Vandebosch & Van Cleemput, 2009; Wright & Li, 2013), using the Internet for instant messaging (Ybarra, Mitchell, Wolak, & Finkelhor, 2006), low self-esteem and depressive symptoms (Modecki et al., 2013; Patchin & Hinduja, 2010), normative beliefs about aggression, low peer attachment and peer rejection (Burton et al., 2013; Wright & Li, 2013), Internet dependence, and low social status (Vandebosch & Van Cleemput, 2009). Finally, gender does not appear to be a risk factor for cybervictimization, since most studies find boys and girls to be almost equally represented in the cybervictims group (Tokunaga, 2010).

Summing up, the risk factors of experiencing the two forms of victimization only partly overlap. In particular, the risk factors of cybervictimization include some risk factors that are specific to the online context (e.g., Internet dependence). Nonetheless, since one prominent risk factors of cybervictimization is traditional victimization, we might assume that risk factors for traditional victimization indirectly represent risk factors for cybervictimization, too. However, risk factors for cybervictimization are less well studied and understood than those
of traditional victimization. Therefore, knowledge on which risk factors for cybervictimization exist over and above those of traditional victimization is still lacking.

1.4.3 Consequences of involvement in traditional and cyberbullying as a bully

Traditional bullying. Traditional bullies report violent behaviors (Litwiller & Brausch, 2013; Ttofi, Farrington, & Lösel, 2012), low self-esteem (O’Moore & Kirkham, 2001), low social competence, psychosomatic symptoms (Kaltiala-Heino, Rimpelae, Rantanen, & Rimpelae, 2000), externalizing behaviors and substance use (Litwiller & Brausch, 2013; Wang et al., 2012), hyperactivity, feelings of ineffectiveness, and interpersonal problems (Kumpulainen et al., 1998), criminal offences (Sourander et al., 2006), unsafe sexual behavior, and suicidal ideation (Brunstein Klomek et al., 2010; Litwiller & Brausch, 2013).

Cyberbullying. Knowledge on the consequences being a cyberbully is widely lacking because only few longitudinal results on the short and long term consequences of involvement in cyberbullying as a bully have been published so far. To date cyberbullying was found to be associated with not feeling safe at school (Sourander, 2010), cybervictimization (Bauman, 2010; Mitchell et al., 2011; Vandebosch & Van Cleemput, 2009), externalizing problems, unsafe sexual behavior, and substance use (Litwiller & Brausch, 2013; Pelfrey & Weber, 2013; Wang et al., 2012), suicidal ideation (Brunstein Klomek et al., 2010), and less empathic responsiveness (Steffgen et al., 2011).

In sum, the consequences of involvement in the two forms of bullying show some similarities and mostly consist in externalizing problems and other problem behaviors. Sontag et al. (2011) found that the group of combined bullies (traditional and cyber) was the one that suffered from the most severe consequences, suggesting that the frequency of bullying behavior plays an important role regarding the consequences of bullying behavior. Taken together, differences in the consequences of involvement in traditional bullying as a bully and involvement in cyberbullying as a bully were found to be small (Sontag et al., 2011; Twyman, Saylor, Taylor, & Comeaux, 2010).

1.4.4 Consequences of involvement in traditional and cyberbullying as a victim

Kaukiainen, Kaistaniemi, & Lagerspetz, 1999), psychosomatic symptoms and physical health complaints (Gini & Pozzoli, 2009; Kaltiala Heino et al., 2000; Natvig, Albrektsen, & Qvarnström, 2001), violent behaviors (Ttofi et al., 2012), running away from home (Tyler & Bersani, 2008), alcohol and drug use (Sullivan, Farrell, & Kliwer, 2006; Tharp-Taylor, Haviland, & D’Amico, 2009), self-harm (Hay & Meldrum, 2010), school refusal and absenteeism (Lawson et al., 2013), social withdrawal and difficulties in social relations (Graham, Bellmore, & Juvonen, 2003), and suicidal ideation (Kaltiala-Heino et al., 1999; Luukkonen et al., 2009).

Cybervictimization. Cybervictims report increased depressive and psychosomatic symptoms (Didden et al., 2009; Sourander, 2010; Ybarra & Mitchell, 2004), anxiety (Juvonen & Gross, 2008), lower levels of self-esteem (Didden et al., 2009; Katzer et al., 2009; Yang, Stewart, Kim, Kim, Shin, Dewey, Maskey, & Yoon, 2013), emotional distress, anger, sadness (Patchin & Hinduja, 2006; Topcu, Erdur-Baker, & Capa-Aydin, 2008; Ybarra & Mitchell, 2004), social difficulties (Tokunaga, 2010), academic problems, school absenteeism (Beran & Li, 2008; Yang et al., 2013), suspensions from and weapon carrying at school (Ybarra, Diener-West, & Leaf, 2007), deterioration of home life (Patchin & Hinduja, 2006), substance use (Pelfrey & Weber, 2013), and suicidal ideation (Brunstein Klomek et al., 2010).

Taken together, the consequences of cybervictimization seem to be similar to those of traditional victimization and mainly consist in internalizing symptoms. Nonetheless, the differences between traditional bullying and cyberbullying described above (see 1.2.1 Traditional bullying versus cyberbullying) suggest that cyberbullying might have a stronger impact on victims than traditional bullying. Nonetheless, a systematic comparison of emotional responses to different forms of bullying showed that direct bullying and text message bullying led to similar emotional reactions. The same was found for indirect bullying and Internet bullying (Ortega, Elipe, Mora-Merchan, Calmaestra, & Vega, 2009). Smith et al. (2008) found that picture and video clip bullying were rated as worse than traditional forms of bullying (e.g., verbal, physical). In contrast, email, instant messaging, website, and chat room bullying were rated as equal to traditional forms of bullying. Further, phone call and text message bullying were rated as less severe than traditional forms of bullying. Slonje and Smith (2008) reported similar results with the exception of email bullying being rated as less severe than traditional forms of bullying and phone call bullying being rated as comparable to traditional forms of bullying. In a qualitative study with focus groups, Vandebosch and Van Cleemput (2008) found that the nature of the behavior is more relevant than the medium itself. Bauman and
Newman (2013) came to the same conclusion using severity ratings of item pairs (one traditional and one cyber). A number of studies compared the psychosocial correlates (e.g., depressive symptoms) of traditional victims to those of cybervictims. Some studies found that cybervictims show more psychosocial correlates than traditional victims (Beckman, Hagquist, & Hellström, 2012; Campbell, Spears, Slee, Butler, & Kift, 2012), while other studies found no significant difference (Lester, Cross, & Shaw, 2012; Menesini, Calussi, & Nocentini, 2012). It is important to note that consequences originating from one or the other victimization experience are hard to disentangle. Furthermore, these consequences can be expected to be largely similar (Juvonen & Gross, 2008; Kowalski & Limber, 2007; Slonje & Smith, 2008; Smith et al., 2008; Steffgen, et al. 2011) and the frequency of victimization might be more important for the consequences of victimization than the form of victimization itself (Sontag et al., 2011).

1.4.5 Risk factors and consequences for bully-victims

Research on bully-victims has been less prominent than research on bullies or victims, especially in the context of cyberbullying. Burk (2008) gives an overview of child and family risk factors for being a bully-victim and shows that this subgroup shared many risk factors of both bullies and victims as well as consequences of both being a bully and a victim. Therefore, this group seems to be the group with the highest risk for maladjustment and thus needs special attention in prevention and intervention programs (Burk et al., 2008; Haynie et al., 2001; Schwartz, Dodge, Pettit, & Bates, 1997).

1.4.6 Conclusion on risk factors and consequences

The findings on risk factors and consequences of bullying and victimization suggest that cyberbullying seems to be an additional form of bullying rather than a conceptually different one. Nonetheless, there are still a number of open questions and unsolved methodical and theoretical problems (Dooley, Pyzalski, & Cross, 2009; Runions, 2013; Tokunaga, 2010), especially considering that the tools for cyberbullying (e.g., smartphones) are in constant evolution (Spears et al., 2009). In particular, it is still unclear if the negative effects of involvement in cyberbullying described above are consequences of cyberbullying or markers of a more general maladjustment (Bender & Loesel, 2011).

It should be noted that results regarding risk factors and consequences of bullying and victimization differ between studies, although some of the associations are more stable than others. Furthermore, there are appreciable differences in these associations based for instance on gender, age, ethnicity, SES, and social context. Additionally, results largely depend on sample
size, choice of analysis strategy, and inclusion/exclusion of relevant covariates. Moreover, many of the results reported above stem from cross-sectional studies and need replication in longitudinal studies with representative samples in order to disentangle cause and consequence. Therefore, a conclusion on causes and consequences would require a more detailed analysis of all study designs, its strengths and weaknesses. Finally, bullying is a complex social phenomenon that always takes place in a given social context characterized by a number of variables. These variables interact with risk and protective factors, and what might be a risk factor in one context could be a protective factor in another context (Masten & Obradović, 2006). In sum, there are no simple mechanisms in bullying dynamics and, therefore, a picture as detailed as possible is needed in order to plan and carry out prevention and intervention programs aimed at reducing bullying and other problem behavior alike (Cicchetti, 2010).


1.5 **Prevention of bullying**

Prevention of bullying and other forms of aggressive behavior is of crucial importance for the safety and well being of children, adolescents, and adults. Bullying is a particular form of relationship problem (Pepler, Smith, & Rigby, 2004) that takes place within a specific context. Accordingly, it is important to take a socio-ecological perspective in order to maximize the effectiveness of a program (Hong & Espelage, 2012). Designing prevention and intervention programs means to identify risk and protective factors and mechanisms leading to bullying behavior and to identify an effective method of reducing risk factors and bolstering protective factors and resilience (Beelmann, 2011; Coie et al., 1993; Coie, Miller-Johnson, & Bagwell, 2000; Rutter, 2013). Furthermore, a prevention program needs to target the school environment as a whole, and not just single bullies or victims (Smith, Schneider, Smith, & Ananiadou, 2004). Eisner and Malti (2013) listed a total of six general principles of prevention of both aggressive and bullying behaviors. First, prevention needs to start from early childhood in order to promote resilience and to reduce risk factors from the very beginning. Second, programs need to be tailored to the development of the child/adolescent/adult and to accompany them throughout the whole development. Third, prevention needs to be embedded into a comprehensive program targeting not only aggressive behavior, but also other related problem behaviors and negative outcomes such as school dropout, early pregnancy, and substance use. Fourth, it is important to combine universal, indicated and selective prevention strategies in order to maximize efficiency and to allocate resources where they are needed most. Fifth, prevention should be based on a socio-ecological model that recognizes the role of individuals, families, peers, and the broader social context. Sixth, researchers, policy makers and governments need to work together in order to reduce aggressive behaviors. This list shows that the prevention of bullying is a very ambitious goal that requires a wide knowledge on the problem, a long-time and intensive commitment of resources, and collaboration between many institutions.

To date, there are a number of bullying prevention programs in different countries (Baldry & Farrington, 2007; Smith, 2011b; Ttofi & Farrington, 2011). In their meta-analysis, Merrell, Gulender, Ross, and Isava (2008) gave an overview of a number of prevention programs and described them shortly. The elements of the prevention programs encompassed social skills, empathy, and problem-solving trainings, involvement of social workers, peer supporters, teacher and parent trainings, increasing of warmth and authoritative adult involvement, positive environment, meetings and discussions, role-play, reflective journals, and social-cognitive curricula. The authors concluded that important effects were found for one third of
the elements and that changes in attitudes, knowledge and self-perceptions were more likely than changes in actual bullying behavior. More recently, Ttofi and Farrington (2011) reported results from a meta-analysis encompassing a total of 44 evaluations of intervention studies with either a randomized experimental design, an intervention-control comparison with pre-post design, other intervention-control designs, or an age-cohort design carried out between 1983 and 2009. The main result of this meta-analysis was that bullying behaviors were reduced by 20-23%, while experiences of victimization were reduced by 17-20% on average. Therefore, the authors concluded that bullying prevention is effective. Moreover, the authors identified both elements of the prevention programs that were effective in reducing the prevalence of bullying and victimization, and elements that increased the prevalence of bullying and victimization. Elements that decreased the prevalence of bullying were parent trainings and meetings, information for parents, enhanced playground supervision, disciplinary methods, classroom management and rules, teacher trainings, school conferences, cooperative working groups, and a whole-school anti-bullying policy. Moreover, the number of elements in the program, and the duration and intensity of the program yielded a significant decrease of bullying. Finally, programs worked best if they were based on work by Olweus, if they were older in terms of conceptualization, if they were implemented with older participants, and if bullying was operationalized as being bullied at least two times a month. The elements that were found to be associated with a decrease in victimization were disciplinary methods, parent trainings and meetings, video material, cooperative group work, and extensive duration and high intensity of the program. Notably, only work with peers (engagement of peers in combating bullying) was associated with an increase in victimization and with a small but not statistically significant increase in bullying. In sum, there are a number of elements that are useful in reducing bullying and victimization and they work best if they are combined, frequent and extensive, and if they target children/adolescents, teachers, and parents (whole-school approach). However, it must be noted that most of the studies lack one or more central methodological aspects, such as control conditions, randomization, accounting for clustered data using multilevel methods, multi-method and multi-informant assessments, high quality psychometric characteristics of employed measurement tools, implementation monitoring, proper sample size, attrition analysis, and sophisticated methods of missing data imputation (Kärnä et al., 2011). Accordingly, there is still much to be done in research on prevention and intervention of traditional and cyberbullying.

Eisner and Malti (2013) pointed out the need for more high-quality research on bullying and violence prevention, and gave nine recommendations for a European research policy de-
signed to reduce the prevalence and incidence of bullying and violence across Europe. First, high quality experimental evaluation research needs to be supported. Second, high-quality prevention and intervention measures need to be developed and evaluated. Third, collaborative work between researchers and practitioners need to be supported. Fourth, embedded prevention and intervention practices need to be evaluated. Fifth, situational and developmental approaches need to be combined. Sixth, studies evaluating the differential effectiveness of different delivery formats need to be supported. Seventh, training programs for practitioners and policy makers need to be implemented. Eighth, new evaluation designs are needed that are able to isolate the most promising aspects of a prevention or intervention program. Last but not least, large-scale field trials need to be supported together with translational research exploring how small-scale prevention and intervention can be brought to a large-scale level. These recommendations show that it is central to bring the antibullying agenda to a larger scale in order to effectively combat bullying. This is particularly true in light of the problem of cyberbullying and its potential to extend across countries.

An outstanding example of an effective anti-bullying prevention program is the *KiVa Antibullying Program* (Kärnä et al., 2011; Salmivalli, Kärnä, & Poskiparta, 2011). This program is based on findings of research on the social standing of aggressive individuals and on findings of research on participant roles. In particular, the program places great emphasis on bullying as a group phenomenon and includes both universal and indicated elements for bullying prevention and intervention (Kärnä et al., 2011). Universal elements include raising awareness on bullying as a group process, increasing empathy for victims, and enhancing self-efficacy to defend the victims. These elements are delivered by teachers in the classroom setting through discussions, workshops, computer-based games (which is an innovative element of the KiVa Antibullying Program), role-play, and short movie sequences. Indicated elements include setting up a three-persons strong teachers team that addresses all known cases of bullying in collaboration with the respective classroom teacher. More specifically, cases are addressed within group discussions with victims and bullies (including follow-up meetings). Moreover, two to four selected peers are tasked with accompanying and supporting the victim. Other strengths of the KiVa Antibullying Program are regular training days for teachers and intervention groups, and regular meetings with a trained person of the KiVa Antibullying Program. The reduction in self-reported victimization achieved in the KiVa Antibullying Program was between 17% and 50% (Kärnä et al., 2011; Salmivalli et al., 2011). This result places the KiVa Antibullying Program among the most effective bullying prevention programs ever implemented in the school setting, together with the *Olweus Bullying Prevention*
Program (Olweus, 2004), which was found to reduce bullying by 50%. In sum, whole-school approaches were found to be an effective way to combat bullying, although there remains a large percentage of bullying behavior that these programs were not able to tackle. Therefore, more research and large scale, early-beginning, long-term interventions are needed in order to increase the effectiveness of bullying prevention programs.

Besides reducing bullying and victimization, bullying prevention programs also tackle a number of other problem behaviors, such as vandalism, theft and truancy, and increase overall school satisfaction (Olweus, 1991). Considering the overlap between traditional bullying forms and cyberbullying, and the fact that many cyberbullying cases originate within the school context (Olweus, 2012), it can be assumed that traditional bullying prevention will also reduce the prevalence of cyberbullying. Indeed, there are studies reporting that traditional bullying prevention programs are effective in preventing cyberbullying, too (Salmivalli et al., 2011). Furthermore, the new media do not seem to have created many new bullies or victims (Olweus, 2012). These results suggest that there is no urgent need for completely new prevention and intervention concepts. Instead it is important to integrate some particular aspects of cyberbullying prevention and intervention into existing whole-school bullying prevention approaches.

1.5.1 Peculiarities of cyberbullying prevention

Perren et al. (2012) reviewed a total of thirty-six studies on cyberbullying prevention strategies. The authors proposed three domains of responses to cyberbullying: reducing risks, combating cyberbullying, and buffering the negative impact. Strategies for reducing risks include traditional antibullying programs and its various components that were found to be effective (see above). Moreover, it includes specific Internet safety strategies (e.g., not giving away and using different passwords), and parental mediation of children’s and youth’s online activities (e.g., accompanying them online, talking to them about their Internet experience). Combating cyberbullying encompasses coping strategies that can be used when experiencing cyberbullying. These can be divided in technical solutions (e.g., blocking), confronting the cyberbully (e.g., constructive discussion or revenge), active ignoring (e.g., pretend that nothing happened, forgetting about it), instrumental support (e.g., asking peers, parent, or teachers for help). Lastly, buffering the negative impact includes emotional support from peers, parents, and teachers, and emotional coping, such as self-blame (maladaptive) and perpetrator blame (adaptive). Although Livingstone, Haddon, Görzig, and Olafsson (2011) concluded that children’s coping strategies can be expected to be effective, Perren et al. (2012) conclude
their overview by stating that there is very little empirical evidence on the effectiveness of coping strategies in the context of cyberbullying and that research in this field is at its very beginning.

One particular aspect of cyberbullying prevention is that most of the cybervictims and bystanders do not report cyberbullying incidents to teachers, parents or other adults (Aricak et al., 2008; Dehue, Bolman, & Vollink, 2008; Li, 2007; Slonje & Smith, 2008). There are mainly three reasons for this. First, many adolescents think they need to learn how to cope with cyberbullying without the help of adults (Juvonen & Gross, 2008). Second, they fear to be deprived of their privileges of media use (Agatston, Kowalski, & Limber, 2007). Lastly, they rely on peer support because they think that adults will not understand the problem or even make it worse (Aricak et al., 2008; Dehue et al., 2008; Slonje & Smith, 2008; Topcu et al., 2008). Accordingly, it is important to counteract in particular the first two points. This means that adolescents need to know that seeking help from adults is a viable and desirable behavior (Alsaker, 2012) and that they will not lose their privileges of electronic media use.

Since many instances of cyberbullying originate in the school context (Olweus, 2012), schools are situated in a particular position regarding the prevention of cyberbullying. On one hand the use of and skill in using the new media (e.g., computers) should clearly be fostered (Diamanduros, Downs, & Jenkins, Stephen, 2008) and on the other hand a responsible and appropriate use of the new media should be taught. Thus, it is the responsibility of the schools (and of the parents) to teach media skills and to actively prevent cyberbullying (and traditional bullying). Central aspects of cyberbullying prevention in school are education about risks, consequences, rights and laws, and the promotion of moral values, empathy, behavioral norms (netiquette), and an open communication between adolescents and teachers (Campbell, 2005). The overall goal is to create a positive school climate where all forms of bullying are not tolerated by peers, parents, and teachers alike, and where cyberbullying has clear consequences for the perpetrators (Hinduja & Patchin, 2013).

In light of the technological development that is to be expected in the future, of the consequent change in forms of cyberbullying, and of the assumption that the origin of aggressive behavior is not bound to a particular medium (Swartz, 2009), what we need to aim for are flexible and comprehensive prevention programs. Furthermore, we need more research and intervention studies that help us to develop knowledge about prevention of different forms of antisocial behavior, including cyberbullying.
2 Research questions and study design

2.1 Research questions

The main aim of the present thesis was to explore the phenomenon of cyberbullying and in particular its similarities with and differences to traditional bullying. We aimed to examine whether cyberbullying is perceived as worse than traditional bullying, whether cybervictimization is an additional risk factors for the development of depressive symptoms, and if specific coping strategies can buffer the negative impact of cybervictimization experiences. Furthermore, we focused on the longitudinal association between moral deficits and bullying behavior (traditional and cyber). Lastly, we examined if a number of interpersonal and intrapersonal characteristics increase the risk of becoming a cyberbully over time.

The following research questions were examined in the present thesis:

1. Is cyberbullying perceived as worse than traditional bullying, when taking into account the role of publicity (private vs. public) and anonymity (bully known vs. unknown?) (Study 1)
2. Is cybervictimization an additional risk factor for depressive symptoms? If so, which coping strategies do buffer the negative effect of such experiences? (Study 2)
3. How are moral deficits and bullying behaviors (traditional and cyber) associated in the longitudinal view? (Study 3)
4. Which interpersonal and intrapersonal characteristics can be considered to be risk factors for future involvement in cyberbullying as a bully? (Study 4)
5. Is cyberbullying a conceptually new form of aggressive behavior or is it a new version of a well-known form of aggressive behavior, namely traditional bullying? (Studies 1 to 4)

2.2 Study design

These research questions were addressed using data from a Swiss longitudinal study carried out between November 2010 and May 2012. The Study was funded by the Swiss Science Foundation and was supervised by Prof. Dr. Sonja Perren (University of Konstanz & Thurgau University for Teacher Education) and Prof. Dr. Françoise Alsaker (University of Berne). The study design consisted of four assessments with time intervals of six months. A total of 960 seventh-grade students from 12 schools (45 classrooms) from three Swiss cantons, namely Ticino, Thurgau, and Wallis, participated in the study. The mean age at the first assessment in
November 2010 was 13.2 years ($SD = 0.64$) and 49% were female. As required by Swiss legislation, passive consent was gathered from the parents of all students, and all school administrators and students were informed on the aim of the study and on the conditions of participation, and gave their informed consent for participation in the study. Only four students were not allowed to participate because their parents refused to do so. The respective teachers offered these students alternative activities. All students that were not present during the day of assessment were given a unique login name and password in order to access an online version of the questionnaire. A little present was given to all students after completing the questionnaire.

The questionnaire was programmed using *Lime Survey*, which is an open source tool for programming questionnaires. The questionnaire was installed on 25 netbooks. All students were given a login and a password in order to directly access the questionnaire. The questionnaire encompassed a battery of scales including demographic data, involvement in traditional bullying (as a bully and as a victim), involvement in cyberbullying (as a bully and as a victim), bystander roles, rule-breaking behaviors, causal attributions, depressive symptoms, life satisfaction, self-esteem, moral values, moral disengagement, moral responsibility, moral emotions, empathic concern, peer and parent support, perceived severity of bullying and emotion recognition. Data assessments that required names, such as peer nominations and social cluster mappings, were instead printed on paper and students were asked to write their unique login and password on top of each sheet. This data was then typed in by master students and merged to the data from the netbooks.

A graduate and an undergraduate student accompanied the assessments. They travelled to the respective schools with the 25 netbooks and the remaining material for the assessments. The netbooks were installed in the classroom and students received a short standardized instruction before completing the questionnaire during one school hour (between 45 and 60 minutes). After one classroom had completed the assessment, the next one was ready to do so. Between three and seven classrooms were assessed during one single day.
3 Studies included in the present thesis

The present thesis includes a total of four studies. The manuscripts of these four studies are reproduced below. Note that the last version of the respective manuscripts is reproduced (i.e., in the form in which they were submitted to the respective journals).

3.1 Study 1


Abstract

Cyberbullying, a modern form of bullying performed using electronic forms of contact (e.g., SMS, MMS, Facebook, YouTube), has been considered as being worse than traditional bullying in its consequences for the victim. This difference is mainly attributed to some specific aspect that are believed to distinguish cyberbullying from traditional bullying: an increased potential for a large audience, an increased potential for anonymous bullying, lower levels of direct feedback, decreased time and space limits, and lower levels of supervision. The present studies investigated the relative importance of medium (traditional vs. cyber), publicity (public vs. private), and bully’s anonymity (anonymous vs. not anonymous) for the perceived severity of hypothetical bullying scenarios among a sample of Swiss seventh- and eight-graders (study 1: 49% female, mean age = 13.7; study 2: 49% female, mean age = 14.2). Participants ranked a set of hypothetical bullying scenarios from the most severe one to the least severe one. The scenarios were experimentally manipulated based on the aspect of medium and publicity (study 1), and medium and anonymity (study 2). Results showed that public scenarios were perceived as worse than private ones, and that anonymous scenarios were perceived as worse than not anonymous ones. Cyber scenarios generally were perceived as worse than traditional ones, although effect sizes were found to be very small. These results revealed that the role of medium is secondary to the role of publicity and anonymity when it comes to evaluating bullying severity. Therefore, cyberbullying is not a priori perceived as worse than traditional bullying. Implications of the results for cyberbullying prevention and intervention are discussed.

Keywords: cyberbullying, traditional bullying, perceived severity, publicity, anonymity, experimental.
Is Cyberbullying Worse Than Traditional Bullying? Examining the Differential Roles of Medium, Publicity, and Anonymity for the Perceived Severity of Bullying

Introduction

The way people communicate has been subjected to radical changes during the last decades and is still in constant evolution. New hardware and software continuously are being developed and optimized allowing people to exchange information in an easier, more entertaining, and faster fashion. In Switzerland, almost all adolescents own a mobile phone and have Internet access at home. Furthermore, three out of four Swiss adolescents have access to the Internet from their own room (Willemse, Waller, & Süß, 2010). Youth growing up in the middle of this technological evolution see tools such as the Internet and mobile phones as critical to their social life (Kowalski, Limber, & Agatston, 2008). As a result, these tools have become an essential part of daily life and social interaction for today’s youth.

Although most of the communication through these new technologies is of positive or neutral valence (Mitchell, Finkelhor, & Wolak, 2003a), there are also some undesirable side effects. One of these undesirable effects is known as cyberbullying. To date, many different scientific definitions of cyberbullying can be found in the literature (for review, see Tokunaga, 2010). One of these definitions is based on the definition of traditional bullying, which is defined as an aggressive behavior that is repeatedly and intentionally carried out against a defenseless victim (Olweus, 1993). Thus, cyberbullying is defined as an aggressive behavior that is repeatedly and intentionally carried out against a defenseless victim using electronic forms of contact (e.g., cell phones, Internet; see Menesini, Nocentini, Palladino, Frisén, Berne, Ortega et al., in press; Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippet, 2008).

According to the definition of cyberbullying presented above, the difference between traditional bullying and cyberbullying is the use of electronic forms of contact (i.e., the medium). However, this difference comes along with some specific aspects of cyberbullying that derive from the use of electronic media: an increased potential to reach a large audience (publicity), an increased potential for anonymity of the bully (anonymity), a decreased level of direct feedback between the bully and the victim, decreased time and space limits (Slonje & Smith, 2008), and lower levels of supervision (Patchin & Hinduja, 2006). Due to these aspects, cyberbullying is believed to pose an even greater threat to the psychosocial adjustment of victims than traditional forms of bullying (Campbell, 2005; Dooley, Pyzalski, & Cross, 2009; Tokunaga, 2010). The present study examines the differential role of medium, publicity and anonymity for the perceived severity of bullying.
Consequences of Cyberbullying for the Victim

Experiences of cyberbullying are associated with a number of negative outcomes. Results from different studies show that victims of cyberbullying report lower levels of academic performance, lower family relationship quality, a number of psychosocial difficulties, and affective disorders (Machmutow, Perren, Sticca, & Alsaker, 2012; Tokunaga, 2010). However, these outcomes are very similar to those reported by victims of traditional bullying (Li, Smith, & Cross, 2012; Tokunaga, 2010). Therefore, it is still unknown if there are any differences between cyberbullying and traditional bullying regarding the negative outcomes for the victims. Further, it is unknown if possible differences are due to the medium per se or to other specific aspects of cyberbullying (e.g., publicity and anonymity).

The exploration of potential differences between cyberbullying and traditional bullying is associated with a number of methodical issues. First, there is a high degree of overlap between involvement in cyberbullying and involvement in traditional bullying and only few individuals experience cyberbullying only (e.g., Juvonen & Gross, 2008; Perren & Gutzwiller-Helfenfinger, 2012; Smith, 2011b; Sticca, Ruggieri, Alsaker, & Perren, 2013). Second, there are so many different forms of bullying that it is almost impossible to assess them all and to compare them systematically. Lastly, the aspects that are believed to distinguish cyberbullying from traditional bullying are hard to implement in a standard cyberbullying and traditional bullying scale in such a way that makes systematic comparisons possible. These issues call for a tool that allows us to assess the severity of different forms of bullying and to compare them systematically. Moreover, this tool should be able to account simultaneously for a number of aspects that may influence the severity of the bullying experience, such as the medium used to bully, the publicity, and the bully’s anonymity. One possible way to do this is to assess the perceived severity of hypothetical bullying scenarios that are manipulated experimentally based on different aspects (e.g., medium, publicity, and anonymity).

Perceived Severity of Bullying

The perceived severity of bullying has received poor attention in past research on traditional bullying and cyberbullying. Nonetheless, this topic is of high relevance. Victims often do not report traditional bullying and cyberbullying experiences to an adult at school or to their parents mainly because they think that adults lack the specific knowledge to help them, and because they fear restrictions on the access to their devices (Bauman, 2009; Blake & Louw, 2010; Juvonen & Gross, 2008; Mishna, Saini, & Solomon, 2009); instead, they seek support from their peers. This support, however, may not be received if the experience of the
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victim is not perceived as severe enough to deserve attention (Slonje & Smith, 2008). As a consequence, victims of bullying may not get the help they need to cope with their experiences and feel misunderstood by those in their environment, resulting in a higher potential for negative outcomes. Accordingly, it is important to know how adolescents perceive different forms of bullying in order to inform peers, parents, and teaching staff where help is needed most. In fact, a central element of many interventions against all forms of bullying is to raise awareness of the seriousness and the consequences of different forms of bullying among youngsters, and to encourage them to stand up for the victim and not to reinforce the bully (e.g., Salmivalli, Kärnä, & Poskiparta, 2010).

Further, knowledge about the severity of different forms of bullying may be used to raise awareness of how seemingly harmless bullying acts (i.e., acts that are made for fun) can have huge impacts on victims. This awareness may, in turn, reduce the likelihood of bullying, especially of severe forms, since potential bullies would be more conscientious about consequences of their behavior (Perren & Gutzwiller-Helfenfinger, 2012). In sum, we need to know if and how cyberbullying differs from traditional bullying in order to address it through prevention and intervention (Li et al., 2012), and knowing about the severity of different forms of bullying is an important element of such knowledge.

Until now, no study has examined if cyberbullying is perceived as worse than traditional bullying in its consequences for the victim using an experimental approach that systematically combined more than one aspect at a time (e.g., medium and publicity). In particular, the differential role of medium, publicity and anonymity has not yet been examined. The aim of the present study is to compare the perceived severity of different cyberbullying and traditional bullying scenarios with a specific focus on the role of medium (cyber vs. traditional), publicity (public vs. private), and anonymity (anonymous vs. not anonymous bully).

The Role of Medium in the Evaluation of Bullying

To our knowledge, the perceived severity of cyberbullying versus traditional bullying has been investigated in two studies. Smith et al. (2008) asked 533 students aged 11-16 years to compare different forms of cyberbullying to traditional bullying and to state which one they perceive as worse. Picture and video clip bullying was perceived as worse than traditional bullying, while email, instant messaging, website, and chat room bullying were perceived as comparable to traditional bullying. Moreover, phone call and text message bullying were perceived as less severe than traditional bullying. A study by Slonje and Smith (2008) found similar results except for email bullying being evaluated as less severe than traditional bullying.
and phone call bullying being as severe as traditional bullying. In sum, it is not yet known if cyberbullying is perceived as worse than traditional bullying, although the role of the medium seems to be secondary to the bullying form. The authors discussed that picture and video clip bullying may be the top scorer on perceived severity because the content is very salient and because these media are able to reach a larger audience with comparably low effort. Therefore, the central aspect may be the publicity instead of the medium. Nevertheless, the forms of bullying that were found to be worst in both studies were cyber forms.

The Role of Publicity in the Evaluation of Bullying

Another aspect that plays a central role in the evaluation of bullying is the publicity of the act (i.e., public vs. private bullying). Slonje and Smith (2008), and Nocentini, Calmaestra, Schultze-Krumbholz, Scheithauer, Ortega, and Menesini (2010) found that public forms of bullying (e.g., phone calls) are perceived as more severe than private forms of bullying. These results suggest that the more people acknowledge the bullying, the higher the severity of the consequences for the victim (Smith & Slonje, 2010). However, to date no study has examined experimentally the role of publicity while at the same time taking into account the role of medium. Therefore, we do not know about the relative weight of the two dimensions and how they interact.

The Role of Anonymity in the Evaluation of Bullying

A further aspect of the evaluation of bullying that has not yet been studied systematically is the role of the bully’s anonymity (i.e., anonymous bully vs. not anonymous bully). In particular, no study has yet examined the effect of anonymity on the perceived consequences for the victim, while also taking the medium into account. Nonetheless, qualitative studies on cyberbullying have found that anonymity increases the level of experienced fear, since potentially anyone could be the bully, including friends or other trusted people (Badiuk, 2006, Mishna et al., 2009). Further, anonymity also increases the level of frustration, insecurity, fear, and powerlessness (Dooley et al., 2009; Nocentini et al., 2010; Slonje & Smith, 2008, Smith et al. 2008; Vandebosch & Van Cleemput, 2008). A contrasting point of view is that an anonymous text may have been addressed to someone else, and therefore be received by chance (Slonje & Smith, 2008), which makes it less severe. Furthermore, there is evidence that being bullied by someone you know and trust may be even more severe than by someone you do not know (Nocentini et al., 2010). In sum, evidence on the role of anonymity for the evaluation of bullying is mixed.
Current Studies and Hypotheses

The present article reports results from two studies. The aim of the two studies was to investigate the role of medium and publicity (study 1), and medium and anonymity (study 2) for the perceived severity of hypothetical bullying scenarios. This aim was addressed using an experimental approach that simultaneously considered more than one aspect at a time.

The differential roles of medium and publicity are going to be examined in study 1. Based on results from previous studies, we hypothesize that cyber scenarios are perceived as worse than traditional ones and that public scenarios are perceived as worse than private ones. Moreover we expect that the effect size of medium is smaller than the effect size of publicity. The interaction between medium and publicity also is going to be explored.

The differential roles of medium and anonymity are going to be examined in study 2. Based on results from previous studies, we hypothesize that cyber scenarios are perceived as worse than traditional ones and that anonymous scenarios are perceived as worse than not anonymous ones. Moreover, we expect that the effect size of medium is smaller than the effect size of anonymity. The interaction between medium and anonymity also is going to be explored.

Method

Procedure

This article presents data from a longitudinal study that was carried out in Switzerland (netTEEN). Two studies were conducted. Data for study 1 was collected during the second assessment (May 2011), while data for study 2 was collected during the third assessment (November/December 2011).

In line with Swiss legislation, permission to carry out the study was obtained from the respective school councils. Furthermore, parents were informed about the study and were asked to inform the teachers if they did not want their children to participate (passive consent). The parents of four adolescents declined to participate in both studies. Finally, the participants were informed about the survey’s procedure and goal, and were given the opportunity to refrain from participation without any negative consequences (informed oral consent). Students who did not want to participate were offered another activity during the respective school hour. Five participants declined to participate in both studies.

An electronic self-report questionnaire was administered in classrooms on netbooks. A personal login and password were distributed for students who were absent during the class-
room assessment. These students completed an online version of the questionnaire a few days later at home or in school.

**Sample**

The participants belonged to 43 (45 in study 2) seventh-grade (eight-grade in study 2) classrooms from 12 secondary schools. The schools were randomly selected from 3 Swiss cantons, which in turn were selected from the 26 Swiss cantons. The criterion of inclusion of a canton was the nature of its school system. In Switzerland there are integrative and non-integrative school systems. In integrative school systems all students of the same grade attend the same classrooms, while in non-integrative school systems students with different performance levels are divided into higher and lower performance classrooms. In order to avoid effects due to the performance level of the class, only integrative school systems were considered for the selection.

In study 1, a total of 838 Swiss adolescents participated (49% females, mean age = 13.8, SD = 0.63). In study 2, two more classrooms were included (due to changes in the structure of the classrooms in the transition from grade seven to eight) and a total of 881 adolescents participated (49% females, mean age = 14.3, SD = 0.61). Note that most adolescents who participated in study 1 also participated in study 2.

**Measures**

To disentangle the impact of medium and publicity (study 1), and of medium and anonymity (study 2), an experimental design was used. A set of hypothetical bullying scenarios was developed in written form (see appendix 1 to 4). Each scenario described an aggressive act carried out by a hypothetical schoolmate against another hypothetical schoolmate. The gender of both actors was matched to the participant’s gender. The ranking tool was used in both study 1 and study 2. The perceived severity was assessed using the ranking tool, which is described in detail below.

**Study 1 ranking tool.** The hypothetical bullying scenarios were manipulated based on the aspects of medium (cyber vs. traditional), publicity (public vs. private), and aggression form (exclusion vs. humiliation). A total of eight (2x2x2) scenarios resulted from the combination of these aspects (see appendix 1 and 2). In a first step, these eight scenarios were divided into two blocks of four scenarios. The aggression form was used to divide the two blocks. Therefore, block one included four exclusion scenarios (appendix 1) and block two included four humiliation scenarios (appendix 2). In a second step, each block was divided into a stem containing the aggression form (e.g., *Someone from your school gives a popular birthday party*...
this evening. One of your schoolmates reads that he is not invited. He reads it…), and four leafs containing the aspects of medium and publicity (e.g., …on a letter he found in his personal closet). The four leafs were labeled using a keyword from the scenario (e.g., email). Within each of the two blocks, the participants were asked to put the four leafs into a rank order going from the most severe one to the least severe one. Participants were also instructed not to use the same leaf twice.

**Study 2 ranking tool.** The hypothetical bullying scenarios were again manipulated based on the aspects of *medium* (cyber vs. traditional), *anonymity* (not anonymous vs. anonymous), and *aggression form* (threatening vs. humiliation). Again, a total of eight (2x2x2) scenarios resulted from the combination of these aspects (appendix 3 and 4). As in study one, the eight scenarios were divided into two blocks. The aggression form was again used to split the eight scenarios into two blocks (i.e., block one threat vs. block two humiliation; see appendix 3 and 4). The two blocks were further divided into one stem (containing the aggression form) and four leafs (containing the aspects of medium and anonymity). The four leafs were labeled using a keyword from the scenario (e.g., desk). In line with study 1, the participants were asked to put the four leafs into a rank order going from the most severe one to the least severe one within each of the two blocks. Participants were also instructed not to use the same leaf twice.

As a result, every participant ended up with two severity rankings of four elements each in study 1 and with two severity rankings of four elements each in study 2.

**Analysis strategy**

**Study 1.** IBM SPSS 19 was used to analyze the data. Data was prepared for the analysis using the following procedure: In a first step, data was recoded in such a way that the severity rankings would turn into severity scores for the four leafs. The leaf selected as being the most severe was given a score of 4. The leaf in the second position was given a score of 3. The leaf in the third position was given a score of 2. Lastly, the leaf selected as being the least severe was given a score of 1. This was done within each of the two blocks. In a second step, data was restructured to obtain one perceived severity variable and eight observations of perceived severity for every participant (four for each of the two blocks). In a third step, dummy variables for medium, publicity, and aggression form were created. Those participants who used the same leaf twice were given missing values for the whole block. The analyses were split by aggression form in order to compare the results of the two blocks.
Finally, data was analyzed using general estimating equations (GEE). Perceived severity was used as an ordinal dependent variable. Medium and publicity were used as independent variables. Interactions between the independent variables were also computed in order to examine if the difference between cyber and traditional scenarios is bigger, equal or smaller in private than in public scenarios. To obtain a complete picture of the conditional main effects (i.e., main effect of one interaction variable when the other interaction variable equals zero), all models were run again with reversed codings (i.e., to obtain the conditional main effect when the other variable equals 1). This resulted in four conditional main effects and one interaction effect for each model. For simplicity, these are all shown in the same table together with the respective effect sizes (Omega $\omega$). Effect sizes were computed to account for the large sample and to compare the magnitude of the effects.

**Study 2.** The same procedure of study 1 was applied to data from study 2. Herein, the ordinal dependent variable was perceived severity, while the independent variables were medium and anonymity. The analyses were split by aggression form.

**Results**

**Results of study 1**

**Descriptive results.** Table 1 and table 2 show the means and standard deviations of the four scenarios in the exclusion and the humiliation block, respectively (see also figure 1 and figure 2). These results suggest that public scenarios were perceived as more severe than private ones, while cyberbullying scenarios seemed to be perceived as comparable to traditional bullying scenarios. GEE-analyses were computed to test for significance of these differences and for possible interactions. Results for the exclusion block are presented first, followed by the results for the humiliation block.

**Multivariate results for the exclusion block.** Table 3 shows the results of general estimating equations (GEE). Regarding the role of the medium, results showed that there was no significant difference between the cyber and the traditional scenario in private scenarios. In contrast, cyber scenarios were perceived as worse than traditional ones in public scenarios, although the effect size was found to be small. Regarding the role of publicity, results showed that public scenarios were perceived as worse than private ones in both traditional and cyber scenarios, with large effect sizes. Furthermore, the interaction between medium and publicity was found to be significant: The difference between public and private scenarios was stronger in cyber scenarios than in traditional ones. However, the interaction was found to have a small effect size.
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Multivariate results for the humiliation block.

Table 4 shows the results of general estimating equations (GEE). These results were found to be almost identical to those found in the exclusion block. For the medium, results showed that there was no significant difference between the cyber and the traditional scenario in private scenarios. In contrast, cyber scenarios were perceived as more severe than traditional ones in public scenarios, although the effect size was found to be small. For publicity, results showed that public scenarios were perceived as worse than private ones in both traditional and cyber scenarios, with very large effect sizes. Furthermore, the interaction between medium and publicity was found to be significant: The difference between public and private scenarios was stronger in cyber scenarios as opposed to traditional ones. However, the interaction was found to have a small effect size.

Results of study 2

Descriptive results. Table 5 and table 6 show the means and standard deviations for the threatening and the humiliation block, respectively (see also figure 3 and figure 4). These results suggest that anonymous scenarios were perceived as worse than not anonymous ones, and that cyberbullying scenarios were perceived as worse than traditional bullying scenarios. Again, GEE-analyses were computed to test for significance of these differences and for possible interactions. Results for the threatening block are presented first, followed by the results for the humiliation block.

Multivariate results of the threatening block. Table 7 shows the results of general estimating equations (GEE). Regarding the role of the medium, results showed that cyber scenarios were perceived as worse than traditional scenarios in both anonymous and not anonymous scenarios, with small effect sizes. Regarding the role of anonymity, results showed that anonymous scenarios were perceived as worse than not anonymous ones in both traditional and cyber scenarios, with moderate effect sizes. Furthermore, the interaction between medium and anonymity was found to be significant: The difference between anonymous and not anonymous scenarios was stronger in cyber scenarios than in traditional ones. However, the interaction was found to have a small effect size.

Multivariate results of the humiliation block.

Table 8 shows the results of general estimating equations (GEE). Again, these results were found to be very similar to those found in the threatening block. For the role of the medium, results showed that cyber scenarios were perceived as worse than traditional scenarios in both anonymous and not anonymous scenarios, with small effect sizes. Regarding the role of ano-
nymity, results showed that anonymous scenarios were perceived as worse than not anonymous ones in both traditional and cyber scenarios, with moderate effect sizes. Furthermore, the interaction between medium and anonymity was found to be significant: The difference between anonymous and not anonymous scenarios was stronger in cyber scenarios than in traditional ones. However, the interaction was found to have a small effect size.

**Discussion**

Cyberbullying has been discussed as being worse than traditional bullying in its consequences for the victim (Campbell, 2005; Dooley, Pyzalski, & Cross, 2009; Tokunaga, 2010). The aim of the present studies was to investigate the role of medium, publicity, and anonymity for the perceived severity of hypothetical bullying scenarios. Accordingly, the hypothetical bullying scenarios were manipulated based on the aspects of medium (cyber vs. traditional) and publicity (public vs. private) in study 1, and based on medium (cyber vs. traditional) and anonymity (anonymous vs. not anonymous) in study 2. In both studies, participants were given two blocks of four scenarios each (see appendix 1 to 4) and were asked to put the four scenarios within each block into a rank order going from the most severe one to the least severe one. Our findings showed that when it comes to choosing what is worse, adolescents consider publicity and anonymity as primary aspects, while the medium plays a secondary role. Therefore, cyberbullying is not a priori perceived as worse than traditional bullying.

**The Role of Publicity**

Public bullying was perceived as much worse than private bullying in both traditional and cyberbullying. This is in line with our hypothesis and with results of other studies (Nocentini et al., 2010; Slonje & Smith, 2008; Smith & Slonje, 2010) that also found that the aspect of publicity is more important than the medium itself and that public bullying is perceived as worse than private bullying. Our results extend the present literature and show that the differential role of publicity is more important than the role of medium, which is also in line with our hypotheses.

Public cyberbullying was found to be the scenario that adolescents perceive as most severe, closely followed by public traditional bullying. This may indicate that what adolescents fear most are public attacks against their social status. Public bullying has the potential to cause a large amount of damage to one’s image because one’s whole environment potentially may be aware of what happened and why. Furthermore, the publicity of the act also means that information may spread very quickly since many people witnessed it and may tell someone else or spread the content in other ways, thereby increasing the potential for harm (Kow-
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alski & Limber, 2007; Nocentini et al., 2010). Accordingly, it is not surprising that adolescents are aware that public cyberbullying is a very severe form of aggression that has the potential to cause a large amount of damage in little time.

Another aspect that may increase the perceived severity of public bullying is the controllability of the situation. In public interaction there is less controllability than in private interaction: If one is privately offended, nobody else will know and maybe forward the information; if it is public, then the whole classroom (or maybe even the whole school, neighborhood, etc.) knows what happened, which drastically reduces the means to effectively prevent information diffusion. This is especially true if information is already available online. Lack of control over negative events is associated with feelings of helplessness, helpless reactions, and helpless coping strategies (Asarnow, Carlson, & Guthrie, 1987; Spears, Slee, Owens, & Johnson, 2009), which are in turn associated with depressive symptoms (Machmutow et al., 2012; Seiffge-Krenke & Klessinger, 2000). Therefore, lack of control in public bullying may contribute to explaining why cyberbullying experiences are cross-sectionally and longitudinally associated with depressive symptoms over and above experiences of traditional bullying (Machmutow et al., 2012; Ybarra, 2004).

The Role of Anonymity

Anonymous bullying was perceived as worse than not anonymous bullying in both traditional bullying and cyberbullying, which is in line with our hypotheses. This confirms a number of previous results (Badiuk, 2006; Dooley et al., 2009; Nocentini et al., 2010; Slonje & Smith, 2008, Smith et al. 2008; Vandebosch & Van Cleemput, 2008) that discussed anonymous forms of bullying as causing more negative emotions such as frustration, insecurity, and fear (Li et al., 2012). Our results also showed that anonymity is more important than the medium for the perception of bullying severity, which is also in line with our hypotheses. This extends the present literature and shows that anonymity is perceived as more important than the medium itself.

Anonymous cyberbullying was found to be the form of bullying rated as most severe. This means that being threatened or humiliated by an unknown bully that uses electronic forms of contact is especially severe. One reason may be that in such a case potentially anyone could be the bully, while if the bullying is anonymous and traditional the circle of potential bullies is much smaller. Another possible explanation may be that negative feelings arising from the anonymity are enhanced by the medium since such messages can potentially be received anywhere and at any time (Slonje & Smith, 2008), therefore inducing a state of constant fear
and helplessness. In sum, anonymity reduces the perceived control over the situation, especially in the context of cyberbullying. This may lead to increased feelings of helplessness, resulting in a higher risk for depressive symptoms (Asarnow, Carlson, & Guthrie, 1987; Seiffge-Krenke & Klessinger, 2000). Therefore, besides publicity, anonymity may explain associations between cyberbullying experiences and depressive symptoms (Machmutow et al., 2012; Roth & Cohen, 1986).

**The Role of the Medium**

In general, cyberbullying was perceived as worse than traditional bullying, although effect sizes were small and, most importantly, smaller than the effect size of the respective other aspect (i.e., publicity and anonymity). There are several possible reasons why cyberbullying was generally perceived as *slightly* worse than traditional bullying, independently from other aspects such as publicity and anonymity. First, since adolescents rate the Internet and mobile phones as critical to their social life (Kowalski, Limber, & Agatston, 2008), it may be that cyberbullying experiences ruin the pleasure of using such tools. Thus, cyberbullying not only causes harm by the bullying act per se, but also indirectly reduces the positive feelings associated with the use of electronic devices. Second, adolescents fear that adults lack the specific knowledge to help them in cases of cyberbullying (Bauman, 2009). Accordingly, reporting to an adult might only lead to further complications. Last but not least, adolescents fear restrictions on the access to their devices, which are essential to them (Kowalski et al., 2008), if they report to have experienced cyberbullying (Bauman, 2009; Blake & Lown, 2010; Juvonen & Gross, 2008; Mishna, Saini, & Solomon, 2009). To sum up, there are many possible reasons why cyberbullying might a priori be perceived as worse than traditional bullying. However, these reasons are not linked directly to the bullying act, but to other circumstances that arise from the cyberbullying experience.

The results regarding the role of medium differed between study 1 and 2. In study 1, the medium was found to be relevant in public bullying only, although effect sizes were small. A possible explanation may be that the control over the situation is especially low in the cyber context: While destroying a piece of paper and deleting an email are similarly easy, in the public context there is a huge difference. For instance, if there is an embarrassing picture posted on the blackboard it should be feasible to remove it, but if it is posted on Facebook then removal is much harder. Furthermore, public information will spread faster in cyberspace than in the real world, while private remains private independently from the medium. Therefore, the control over the situation is much lower in public cyberbullying as compared to public traditional bullying. Another, more methodical, explanation is the use of the terms *black-*
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*board* versus *Facebook* in the scenarios (see Appendix 1 and Appendix 2). It may be that Facebook is a priori perceived as worse than blackboard. A possible reason is that Facebook is perceived as a virtual place where all friends are, while the classroom may include only few friends. Accordingly, ratings may be biased in this direction, although we added *and all classmates can see it* in both public scenarios of study 1 in order to control for this bias. In contrast to the results of study 1, the medium was found to be relevant in both traditional and cyberbullying in study 2, although effect sizes were rather small. This might be due to differences in the content of the scenarios. Single acts of aggression were described in study 1, while repeated acts were described in study 2. Therefore, the medium may be more relevant when aggressive acts are suffered repeatedly: Repeated cyberbullying is worse than repeated traditional bullying. This suggests that the reduced time and space constrains of cyberbullying increase the perceived severity (Slonje & Smith, 2008), since there is no place to hide from cyberbullying, thus again reducing controllability. In sum, the differential role of the medium is quite small and may be due to other aspects bound to the medium, rather than the medium per se.

**Implications for Cyberbullying Prevention and Intervention**

Our findings have some important implications for bullying prevention and intervention. The present results suggest that special attention needs to be given to public and anonymous bullying, especially in cyberbullying. A promising way to address public bullying is to work with potential bystanders: although the publicity (i.e., the number of bystanders) was found to increase the perceived severity of bullying, bystanders are also a central resource for support. Bystanders can turn into defenders of the victim (Salmivalli, Kärnä, & Poskiparta, 2010). It is central to bolster the awareness of the seriousness of bullying, and also to encourage children and adolescents to act against it by reporting to a trusted adult, actively defending the victim, and especially by not reinforcing the bully (Salmivalli, Voeten, & Poskiparta, 2011; Sainio, Veenstra, Huizing, & Salmivalli, 2011). This also applies to the cyber context, since the potential for a large audience also means a potential for many defenders: When problematic content is posted on a website the nature of the reactions of bystanders may influence the effects of the act on the victim (e.g., make it more or less embarrassing or threatening) and also on the bully (e.g., make it more or less attractive to repeat such behaviors or to keep the material online). Observational studies showed that bystanders support victims only in 19% of aggressive acts (Craig & Pepler, 1997; Craig, Pepler, & Atlas, 2000; Hawkins, Pepler, & Craig, 2001). Hence, defending behavior needs to be encouraged and trained since it can help reduce the negative consequences of bullying for the victim there.
Besides addressing public bullying, anonymous bullying also needs special attention. In order to combat anonymous bullying, it is necessary to put effort into the identification of bullies. Therefore, victims, parents and teaching staff need to be given the legal tools and support to identify the bully both in the real world and in cyberspace. Although anonymous cyberbullying was found to be perceived as worst, it is at the same time the scenario where identification of the bully is most likely because phone numbers and IP-addresses can easily be identified. Adolescents need to be aware that anonymity in cyberspace is only virtually given: For victims, it may increase perceived control and thus reduce feelings of helplessness and fear. Bullies would maybe think twice about their behavior, since almost every action leaves some kind of traces (e.g., IP-address) that can be tracked down easily. Therefore, awareness about the nonexistence of anonymity in cyberspace plays a double role in the prevention of cyberbullying and is also very important in traditional bullying.

On a more general note, our results point to the need of informing adolescents, teachers and parents about the differences in perceived severity and actual severity of different forms of bullying (Li et al., 2012). It is especially important to increase the awareness of the severity of public and anonymous cyberbullying. This awareness might have a number of effects: Adolescents might become more cautious about their online behavior (e.g., posting private information) and potential bullies would maybe think twice before, for instance, posting compromising material online. Moreover, peers, parents, and teachers might be better informed and more self-confident about what steps to take if they witness cyberbullying and about how to prevent it in the first place (Perren & Gutzwiller-Helfenfinger, 2012; Salmivalli et al., 2010).

**Strengths, Limitations and Conclusions**

The present studies had a number of strengths. First, the sample among which the hypotheses were tested was large. Second, the participants’ age matched the age range in which the prevalence of cyberbullying experiences was found to be highest (Tokunaga, 2010). Third, these are the first studies that examined the perceived severity of hypothetical bullying scenarios using an experimental approach that simultaneously considered more than one aspect at a time. Lastly, the ranking tool developed for these studies proved to be a very useful and strong tool that can be used to assess the perceived severity of bullying scenarios in a very simple and intuitive way. The development of this tool enabled us to systematically explore of the differential role of the medium, publicity, and anonymity for the perceived severity of bullying scenarios. Therefore, our study design allowed us to make inferences about the rela-
tive importance of these aspects and their interactions, thereby expanding the knowledge about perceived bullying severity.

However, the present studies were not without limitations. First, the scenarios of study 1 and 2 only encompassed few types of cyberbullying and bullying (i.e., exclusion, humiliation, and threatening). Other forms of bullying should be included in future studies in order to obtain a more comprehensive picture of the differential roles of different aspects for the evaluations of bullying severity. Second, the role on individual and contextual variables, such as gender, age, and personal involvement in bullying, were not taken into account. However, we found that the results were very consistent for different forms of aggression and therefore also may be consistent with regard to individual and contextual variables. Third, the use of hypothetical scenarios may limit the external validity of our results. Fourth, in order to avoid highly complex scenarios, the role of publicity and of anonymity had to be analyzed in two separate studies. Last but not least, the focus of the present article is on perceived severity as opposed to the actual severity (e.g., internalizing symptoms of victims of different forms of bullying). Nonetheless, perceived severity can be considered as a good indicator of how severe bullying experiences are, since many adolescents have had first hand experiences or may have been confronted indirectly with the described situations. Therefore, their ratings can be considered as expert ratings of bullying severity.

Taken together, our findings show that, when it comes to choosing what is more severe, adolescents rate the publicity and the anonymity as central and the medium as peripheral. Therefore, cyberbullying is not a priori perceived as worse than traditional bullying. Instead, bullying is perceived as worst if it is public (as opposed to private) and if it is anonymous (as opposed to not anonymous). This is especially marked in the case of cyberbullying, since in cyberbullying the potential for reaching large audiences (e.g. on Facebook or other social networking sites) and anonymous bullying is much higher. Thus, the control over the situation is much lower, which may be a core aspect of the evaluation of bullying severity.
Study 1: Is cyberbullying worse than traditional bullying?

### Tables

Table 1: Means and SDs of the severity scores for exclusion in study 1 (n=780)

<table>
<thead>
<tr>
<th></th>
<th>Private</th>
<th>Public</th>
<th>Total Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>1.81 (0.80)</td>
<td>3.14 (0.73)</td>
<td>2.48 (1.02)</td>
</tr>
<tr>
<td>Cyber</td>
<td>1.61 (0.76)</td>
<td>3.44 (0.84)</td>
<td>2.53 (1.21)</td>
</tr>
<tr>
<td>Total Publicity</td>
<td>1.71 (0.79)</td>
<td>3.29 (0.80)</td>
<td>2.50 (1.12)</td>
</tr>
</tbody>
</table>

Table 2: Means and SDs of the severity scores for humiliation in study 1 (n=728)

<table>
<thead>
<tr>
<th></th>
<th>Private</th>
<th>Public</th>
<th>Total Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>1.74 (0.74)</td>
<td>3.11 (0.74)</td>
<td>2.43 (1.01)</td>
</tr>
<tr>
<td>Cyber</td>
<td>1.64 (0.77)</td>
<td>3.51 (0.78)</td>
<td>2.57 (1.22)</td>
</tr>
<tr>
<td>Total Publicity</td>
<td>1.69 (0.76)</td>
<td>3.31 (0.78)</td>
<td>2.50 (1.12)</td>
</tr>
</tbody>
</table>

Table 3: Results of the GEE analysis for exclusion in study 1 (N=780)

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>Wald $\chi^2$</th>
<th>$p$-value</th>
<th>$\omega$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium$^a$ (in private scenarios)</td>
<td>-0.115</td>
<td>0.067</td>
<td>2.931</td>
<td>.087</td>
<td>.06</td>
</tr>
<tr>
<td>Medium$^a$ (in public scenarios)</td>
<td>0.168</td>
<td>0.067</td>
<td>6.261</td>
<td>.012</td>
<td>.09</td>
</tr>
<tr>
<td>Publicity$^b$ (in traditional scenarios)</td>
<td>1.904</td>
<td>0.075</td>
<td>651.595</td>
<td>.001</td>
<td>.91</td>
</tr>
<tr>
<td>Publicity$^b$ (in cyber scenarios)</td>
<td>2.186</td>
<td>0.095</td>
<td>533.428</td>
<td>.001</td>
<td>.83</td>
</tr>
<tr>
<td>Medium$^a$ * Publicity$^b$</td>
<td>0.283</td>
<td>0.079</td>
<td>12.678</td>
<td>.001</td>
<td>.13</td>
</tr>
</tbody>
</table>

Notes: $^a$ Coding for medium (0 = traditional, 1 = cyber); $^b$ Coding for publicity (0 = private, 1 = public)

Table 4: Results of the GEE analysis for humiliation in study 1 (N=728)

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>Wald $\chi^2$</th>
<th>$p$-value</th>
<th>$\omega$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium$^a$ (in private scenarios)</td>
<td>0.062</td>
<td>0.069</td>
<td>0.788</td>
<td>.375</td>
<td>.03</td>
</tr>
<tr>
<td>Medium$^a$ (in public scenarios)</td>
<td>0.348</td>
<td>0.066</td>
<td>27.815</td>
<td>.001</td>
<td>.20</td>
</tr>
<tr>
<td>Publicity$^b$ (in traditional scenarios)</td>
<td>1.974</td>
<td>0.081</td>
<td>599.045</td>
<td>.001</td>
<td>.91</td>
</tr>
<tr>
<td>Publicity$^b$ (in cyber scenarios)</td>
<td>2.261</td>
<td>0.098</td>
<td>530.149</td>
<td>.001</td>
<td>.85</td>
</tr>
<tr>
<td>Medium$^a$ * Publicity$^b$</td>
<td>0.286</td>
<td>0.076</td>
<td>14.344</td>
<td>.001</td>
<td>.14</td>
</tr>
</tbody>
</table>

Notes: $^a$ Coding for medium (0 = traditional, 1 = cyber); $^b$ Coding for publicity (0 = private, 1 = public)
Table 5: Means and SDs of the severity scores for threatening in study 2 (n=775)

<table>
<thead>
<tr>
<th></th>
<th>Not Anonymous</th>
<th>Anonymous</th>
<th>Total Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>2.14 (1.14)</td>
<td>2.56 (1.05)</td>
<td>2.35 (1.11)</td>
</tr>
<tr>
<td>Cyber</td>
<td>2.31 (1.06)</td>
<td>2.98 (1.04)</td>
<td>2.65 (1.10)</td>
</tr>
<tr>
<td>Total Anonymity</td>
<td>2.23 (1.10)</td>
<td>2.77 (1.06)</td>
<td>2.50 (1.12)</td>
</tr>
</tbody>
</table>

Table 6: Means and SDs of the severity scores for humiliation in study 2 (n=782)

<table>
<thead>
<tr>
<th></th>
<th>Not Anonymous</th>
<th>Anonymous</th>
<th>Total Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>2.11 (1.15)</td>
<td>2.54 (1.04)</td>
<td>2.32 (1.12)</td>
</tr>
<tr>
<td>Cyber</td>
<td>2.33 (1.04)</td>
<td>3.04 (1.02)</td>
<td>2.68 (1.09)</td>
</tr>
<tr>
<td>Total Anonymity</td>
<td>2.22 (1.10)</td>
<td>2.79 (1.06)</td>
<td>2.50 (1.12)</td>
</tr>
</tbody>
</table>

Table 7: Results of the GEE analysis for threatening in study 2 (N=782)

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>Wald χ²</th>
<th>p-value</th>
<th>ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediuma (in not anonymous scenarios)</td>
<td>0.162</td>
<td>0.059</td>
<td>7.579</td>
<td>.006</td>
<td>.10</td>
</tr>
<tr>
<td>Mediuma (in anonymous scenarios)</td>
<td>0.387</td>
<td>0.060</td>
<td>41.619</td>
<td>.001</td>
<td>.23</td>
</tr>
<tr>
<td>Anonymityb (in traditional scenarios)</td>
<td>0.447</td>
<td>0.054</td>
<td>68.778</td>
<td>.001</td>
<td>.30</td>
</tr>
<tr>
<td>Anonymityb (in cyber scenarios)</td>
<td>0.673</td>
<td>0.051</td>
<td>170.711</td>
<td>.001</td>
<td>.47</td>
</tr>
<tr>
<td>Mediuma *Anonymityb</td>
<td>0.225</td>
<td>0.061</td>
<td>13.719</td>
<td>.001</td>
<td>.13</td>
</tr>
</tbody>
</table>

Notes: aCoding for medium (0 = traditional, 1 = cyber); bCoding for anonymity (0 = not anonymous, 1 = anonymous)

Table 8: Results of the GEE analysis for humiliation in study 2 (N=775)

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>Wald χ²</th>
<th>p-value</th>
<th>ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mediuma (in not anonymous scenarios)</td>
<td>0.242</td>
<td>0.059</td>
<td>16.824</td>
<td>.001</td>
<td>.15</td>
</tr>
<tr>
<td>Mediuma (in anonymous scenarios)</td>
<td>0.479</td>
<td>0.060</td>
<td>63.107</td>
<td>.001</td>
<td>.29</td>
</tr>
<tr>
<td>Anonymityb (in traditional scenarios)</td>
<td>0.463</td>
<td>0.056</td>
<td>67.472</td>
<td>.001</td>
<td>.30</td>
</tr>
<tr>
<td>Anonymityb (in cyber scenarios)</td>
<td>0.700</td>
<td>0.054</td>
<td>169.878</td>
<td>.001</td>
<td>.47</td>
</tr>
<tr>
<td>Mediuma *Anonymityb</td>
<td>0.237</td>
<td>0.062</td>
<td>14.864</td>
<td>.001</td>
<td>.14</td>
</tr>
</tbody>
</table>

Notes: aCoding for medium (0 = traditional, 1 = cyber); bCoding for anonymity (0 = not anonymous, 1 = anonymous
Study 1: Is cyberbullying worse than traditional bullying?

**Figures**

Figure 1: Mean severity for exclusion (study 1)

Figure 2: Mean severity for humiliation (study 1)

Figure 3: Mean severity for threatening (study 2)

Figure 4: Mean severity for humiliation (study 2)
**Appendix**

**Appendix 1: Block exclusion used in study 1**

<table>
<thead>
<tr>
<th>Stem</th>
<th>Someone from your school gives a popular birthday party this evening. One of your schoolmates reads that he is not invited. He reads it...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf “closet”</td>
<td>... on a letter he found in his personal closet.</td>
</tr>
<tr>
<td>Leaf “email”</td>
<td>... in a personal email.</td>
</tr>
<tr>
<td>Leaf “blackboard”</td>
<td>... on the blackboard, where all classmates can see it.</td>
</tr>
<tr>
<td>Leaf “Facebook”</td>
<td>... on a Facebook site, where all classmates can see it.</td>
</tr>
</tbody>
</table>

**Appendix 2: Block humiliation used in study 1**

<table>
<thead>
<tr>
<th>Stem</th>
<th>One of your schoolmates reads something very offensive about him. He reads it...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf “closet”</td>
<td>... on a letter he found in his personal closet.</td>
</tr>
<tr>
<td>Leaf “email”</td>
<td>... in a personal email.</td>
</tr>
<tr>
<td>Leaf “blackboard”</td>
<td>... on the blackboard, where all classmates can see it.</td>
</tr>
<tr>
<td>Leaf “Facebook”</td>
<td>... on a Facebook site, where all classmates can see it.</td>
</tr>
</tbody>
</table>

**Appendix 3: Block threatening used in study 2**

<table>
<thead>
<tr>
<th>Stem</th>
<th>Since few days one of your schoolmates finds threatening messages...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf “cell phone”</td>
<td>... on his cell phone and he does not know who sent them.</td>
</tr>
<tr>
<td>Leaf “email”</td>
<td>... on his email account and he knows exactly who sent them.</td>
</tr>
<tr>
<td>Leaf “closet”</td>
<td>... in his closet and he does not know who sent them.</td>
</tr>
<tr>
<td>Leaf “desk”</td>
<td>... under his desk and he knows exactly who sent them.</td>
</tr>
</tbody>
</table>

**Appendix 4: Block humiliation used in study 2**

<table>
<thead>
<tr>
<th>Stem</th>
<th>Since few days one of your schoolmates finds offensive messages...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf “cell phone”</td>
<td>... on his cell phone and he does not know who sent them.</td>
</tr>
<tr>
<td>Leaf “email”</td>
<td>... on his email account and he knows exactly who sent them.</td>
</tr>
<tr>
<td>Leaf “closet”</td>
<td>... in his closet and he does not know who sent them.</td>
</tr>
<tr>
<td>Leaf “desk”</td>
<td>... under his desk and he knows exactly who sent them.</td>
</tr>
</tbody>
</table>
3.2 Study 2


Abstract

In this longitudinal study we investigated whether cybervictimisation is an additional risk factor for depressive symptoms over and beyond traditional victimisation in adolescents. Furthermore, we explored whether certain coping strategies moderate the impact of cybervictimisation on depressive symptoms. A total of 765 Swiss seventh graders (age at t1: M=13.18 years) reported on the frequency of traditional and cybervictimisation, and of depressive symptoms twice in 6 months. At t2 students also completed a questionnaire on coping strategies in response to a hypothetical cyberbullying scenario. Analyses showed that both traditional and cybervictimisation were associated with higher levels of depressive symptoms. Cybervictimisation also predicted increases in depressive symptoms over time. Regarding coping strategies we found that helpless reactions were positively associated with depressive symptoms. Moreover, support seeking from peers and family showed a significant buffering effect: cybervictims who recommended seeking close support, showed lower levels of depressive symptoms at t2. In contrast, cybervictims recommending assertive coping strategies showed higher levels of depressive symptoms at t2.

Keywords: cyberbullying, cybervictimisation, depressive symptoms, coping, support, assertiveness, longitudinal
Study 2: Peer victimisation and depressive symptoms

Introduction

It is well established that peer victimisation has negative short- and long-term consequences for children’s and adolescents’ mental health. Depressive symptoms are amongst the most prominent negative consequences of peer victimisation (Desjardins & Leadbeater 2011; Pouwelse et al. 2011). Past research focused mainly on the influence of victimisation on emotional well-being, but during the last years the inverse relationship has also gained attention: depressive symptoms have also been considered as a vulnerability factor for victimisation (Sweeting et al. 2006). Therefore, a reciprocal relationship may exist between victimisation experiences and depressive symptoms.

Cross-sectional studies suggest that being victimised in cyberspace is also associated with psychological difficulties (Mason 2008), stronger negative feelings, fear and feelings of helplessness (Spears et al. 2009), and also with depression (Ybarra 2004). Due to the conceptual and empirical overlap between traditional and cybervictimisation (e.g. Perren and Gutzwiller-Helfenfinger 2012), the question arises whether cybervictimisation leads to similar consequences as traditional victimisation, and whether it represents an additional risk factor when traditional victimisation is controlled for. A number of cross-sectional studies have shown that cybervictimisation is an additional risk factor for depressive symptoms (Gradinger et al. 2009; Perren et al. 2010; Wang, Nansel and Iannotti 2011). Mitchell, Ybarra and Finkelhor (2007) reported even higher levels of depressive symptoms in cybervictims than in traditional victims.

Coping strategies in relation to cybervictimisation

Coping defined as the ability to manage stress and related emotions is relevant for the sustenance of emotional and psychological well-being in the presence of adversity (Lazarus 2006). Coping strategies may therefore buffer the negative impact of cybervictimisation on depressive symptoms. Several types of coping strategies have been investigated in relation to experiences of cybervictimisation: supportive strategies (e.g., seeking social support by adults, teachers, friends or external institutions), reactions towards cyberbullies (e.g., retaliation, confronting), technical strategies (e.g., report abuse buttons, blocking the sender), and avoidant and emotion-focused strategies (e.g., doing nothing, ignoring, helplessness).

Support seeking

Many students recommend asking their parents for help in case of a cybervictimisation incident (Aricak et al. 2008; Bhat 2008; Slonje and Smith 2008; Smith et al. 2008; Stacey 2009; Topcu, Erdur-Baker and Capa-Aydin 2008). Other adolescents recommend not to consult
adults because they fear losing enjoyable privileges (e.g., having and using mobile phones and an own Internet access), and because they expect that their parents would simply recommend ignoring the situation or that they would not be able to help them as they are not that familiar in cyberspace (Hoff and Mitchell 2009; Kowalski, Limber and Agatston 2008; Mishna, Saini and Solomon 2009; Smith et al. 2008; Stacey 2009). In fact, Slonje and Smith (2008) suppose that adults are less aware of cybervictimisation as a problem. Therefore, parents tend to underestimate the seriousness of the problem and may be unable to give adequate support to their child. Self-reliance is another reason not to report cybervictimisation experiences to adults. In a web-based survey of 12-17-year olds (most of the adolescents had experienced at least one cybervictimisation incident in the year preceding the survey), Juvonen and Gross (2008) found that 90% of the victims did not tell their parents about their experiences and 50% of them justified it with “I need to learn to deal with it myself” (504).

Although cyberbullying is also happening outside the school context, victims often know their perpetrators from school (Smith and Slonje 2010), and teachers and the school, as a functional system, should not overlook or belittle cybervictimisation. Therefore, assistance from teachers and principals is implicitly necessary. However, students have a more negative and critical attitude to teachers’ support: a large percentage of them consider telling a teacher or the school principal as rather ineffective (Aricak et al. 2008; DiBasilio 2008; Mishna et al. 2009; Mitchell, Finkelhor and Wolak 2003b; Price and Dalgleish 2010). Hoff and Mitchell (2009) found that although 17% of students reported to a teacher after a cybervictimisation incident, in 70% of the cases the school did not react to it. Asking for help from peers is commonly used and recommended (Aricak et al. 2008; Bhat 2008; DiBasilio 2008; Stacey 2009; Topcu et al. 2008), although prevalence rates vary to a large extent. Slonje and Smith (2008) found that cybervictims were more likely to contact friends than other persons. At the same time, friends were less likely to consider cybervictimisation as relevant. Nonetheless, focusing on the perceived successfulness of coping strategies, Price and Dalgleish (2010) reported Australian cybervictims to consider “telling a friend” as the most helpful strategy.

**Reactions towards the bully**

Confronting the bully is commonly reported by adolescents if the victim knows the bully or is able to contact her or him (Aricak et al. 2008; DiBasilio 2008; Stacey 2009). Although this strategy is often mentioned by those who experience victimisation, it has proved to be less helpful in retrospect (Price and Dalgleish 2010). Students consider retaliation as a less constructive way of contacting the perpetrator. When asking students what they had done to
Study 2: Peer victimisation and depressive symptoms

stop cybervictimisation, Hoff and Mitchell (2009) reported answers containing active and physically retaliatory behaviour, especially in boys. The assumption that bullying back through cyberspace is easier and therefore more often used than a face-to-face contact was not confirmed by Juvonen and Gross (2008): 60% of cybervictims defended against the bully in school using traditional means, whereas only 12% retaliated in cyberspace and 28% used both traditional and cyber retaliation.

**Technical solutions**

Cyberspace specific coping strategies such as deleting or blocking threatening messages are generally used and considered as helpful (Aricak et al. 2008; Hinduja and Patchin 2007; Juvonen and Gross 2008; Kowalski et al. 2008; Smith et al. 2008; Stacey 2009). Price and Dalgleish (2010) found that blocking was the most used technical strategy and was also considered as the most helpful online action exerted by the self-identified cybervictims. Technical solutions are often reported along with preventive strategies used by parents, like banning websites and age appropriate limits for the use of the computer and the Internet (Kowalski et al. 2008).

**Avoidant and emotion-focused strategies**

According to coping theory (Roth and Cohen 1986), avoidance is a likely coping strategy in situations that are not under control of the affected person. Patchin and Hinduja (2006) reported 25% of victims doing nothing after a cybervictimisation incident. Dehue, Bolman and Vollink (2008) found that 7.2% of students reported that with online victimisation they would usually pretend to ignore it, and 6.9% reported that they would ignore it. Chi and Frydenberg (2009) investigated the effects of a 10-week coping program designed to reduce the negative impact of cybervictimisation. After completion of the program the use of non-productive reactions, such as ignoring the problem, self-blaming or not coping decreased and the level of emotional well-being increased. Tokunaga (2010) suggested that ignoring can be a very effective strategy following a single incident but that other (more active) coping strategies are more effective when the frequency and severity of episodes increase.

In sum, a range of coping strategies has been investigated in relation to cybervictimisation. However, most of the studies investigated the use (and not the success) of coping strategies in real cybervictims or in relation to hypothetical cybervictimisation. A few studies asked participants whether they think a certain coping strategy is successful (see also Perren et al. 2012). However, no study has yet investigated whether specific coping strategies buffer the negative impact of cybervictimisation on victims’ emotional well-being.
Coping strategies and emotional well-being

Two main dimensions are commonly differentiated in coping theory: emotion- versus problem-oriented coping strategies (Eschenbeck 2010). Some researchers see a problem in this subdivision because some coping strategies could be defined as both problem- and emotion-focused (e.g., support seeking). Consequently, a categorization of strategies is not an ideal methodological approach (Skinner et al. 2003; Tenenbaum et al. 2011). As outlined above, current research on coping with cyberbullying has adopted a more descriptive approach and differentiates between specific behavioural and emotional reactions.

From a theoretical perspective we expect strong relationships between the use of specific coping strategies and an individual’s emotional well-being (Lazarus 2006). Empirical studies show that emotion-focused coping is associated with distressing emotions, whereas problem-focused strategies are seen in association with increased emotional regulation and positive affect (Hampel, Manhal and Hayer 2009; Yamasaki and Uchida 2006). Avoidant coping strategies are negatively associated with emotional well-being (e.g. Seiffge-Krenke and Klessinger 2000).

In studies on traditional victimisation, it has been supposed that avoidance is linked to negative outcomes such as maladjustment, loneliness, anxiety (Kochenderfer-Ladd and Skinner 2002), and other mental health problems (Ebata and Moos 1991). Lodge and Feldman (2007) found that avoidant coping partially mediated the association between appearance-related bullying problems and self-esteem among young adolescents. Kochenderfer-Ladd (2004) showed that students ignoring the victimisation (cognitive distancing) showed an increased risk for later harassment and were therefore indirectly at risk for a higher level of internalizing symptoms. By investigating the relationship between victimisation and depressive symptoms, Singh and Bussey (2010) found mediating effects of how students, when imagining a hypothetical cybervictimisation incident, would rate their self-efficacy to use different coping strategies. Students being more victimised showed decreased self-efficacy scores regarding the resistance to debilitating thoughts and the ability to engage in enabling thoughts. These lowered scores were related to a higher level of depressive symptoms.

If victimisation is seen as a stressor affecting psychological well-being, the question arises if specific coping strategies can buffer the negative outcomes of this association. Some studies aimed to test the so-called “buffering hypothesis of social support” (e.g., Jackson 1992): there is some evidence that different forms of support minimize the negative impact of victimisation on psychological well-being (Davidson and Demaray 2007; Flouri and Buchanan 2002; Holt and Espelage 2007; Kochenderfer-Ladd and Skinner 2002). In contrast, Rigby
(2000) and Pouwelse and colleagues (2011) found no evidence for the buffering hypothesis of social support, and Dooley and colleagues (2010) could not find associations between help-seeking behaviour and emotional symptoms.

All studies mentioned above focused on traditional victimisation when investigating mediating or moderating effects of coping strategies on the association between victimisation and psychological well-being. Yet, empirical evidence of the role of coping strategies on the association between cybervictimisation and depressive symptoms is missing, especially in a longitudinal context. The present study fills this gap by investigating moderating effects of different coping strategies in the association between cybervictimisation and depressive symptoms, using a longitudinal approach.

**Research questions**

The first aim of this study was to investigate whether cybervictimisation is a longitudinal risk factor for depressive symptoms. We hypothesized that cybervictimisation predicts higher levels of depressive symptoms, even when controlling for traditional victimisation. The second aim was to explore the impact of specific coping strategies in relation to cybervictimisation on adolescents’ depressive symptoms. We hypothesized that (a) support seeking (close support and distal advice) is associated with lower levels of depressive symptoms; and (b) that avoidant and helpless reactions are associated with higher levels of depressive symptoms. Lastly, we explored whether specific coping strategies buffer the relationship between cybervictimisation and depressive symptoms. We hypothesized that support seeking buffers the negative impact of cybervictimisation.

**Method**

**Procedure**

Data comes from the first (November/December 2010) and the second (May 2011) waves of data assessment in on-going longitudinal study carried out in Switzerland (netTEEN). Twelve randomly selected Swiss schools (43 classes) participated in the study. The assessments were conducted in three different cantons of Switzerland. The local languages of the schools were German (8 schools) and Italian (4 schools). For the Italian-speaking schools questionnaires were translated from German into Italian by two bilingual native speakers.

All parents were informed about the study and invited to inform the respective teachers if they did not want their children to participate. A self-report questionnaire was administered in classrooms on netbooks. The questionnaire was administered by two research assistants. Stu-
dents absent during the classroom assessment were asked to complete an online version of the questionnaire.

**Sample**

A total of 835 seventh graders participated at the first assessment and 820 students also participated in the second assessment. Attrition was mainly due to adolescents not attending the school anymore. Parents of four adolescents refused their children’s participation. Due to time constraints, the coping measure was only completed by 765 students. Only these 765 students are included in the analysis (52.1% female, age t1: M=13.18 years, SD=0.63).

**Instruments**

Students reported on the frequency of cyber and traditional victimisation (t1 and t2) and depressive symptoms (t1 and t2). The coping questionnaire was only completed at t2.

**Victimisation**

Cybervictimisation was assessed with a self-developed six-item scale (Sticca et al. 2013). Participants rated how often they suffered from specific cyberbullying behaviours in the past four months. Possible responses ranged from one (never) to five (almost daily). The dimension of publicity (private, semi-public, public) was systematically varied in the items. The first two items (private) described an interaction involving only the bully and the victim (e.g., *Did someone sent you nasty or threatening messages, i.e., text messages, msn, Facebook, Netlog etc.*). In the next two items (semi-public) the content (message, picture or video) would have been sent to groups of people (e.g., *Are there adolescents sending nasty or embarrassing messages about you to other colleagues?*). In the last two items (public) the content would have been posted on the Internet (e.g., *Are there adolescents publishing nasty or embarrassing pictures or videos on the Internet?*). Item scores were averaged to gain an overall score of cybervictimisation ($\alpha_{t1/t2}=.62/.78$) with higher scores indicating being more frequently victimised. Due to its high skewness at the upper end of the scale, cybervictimisation was log transformed.

Involvement in traditional victimisation was assessed using an adapted version of a well validated scale (Alsaker 2003; Alsaker and Brunner 1999). The items were introduced through a general definition of what bullying is. The scale consists of six items encompassing a set of different aggressive behaviours (e.g., being laughed at, insulted, excluded or hit by someone). Participants were asked how often they suffered these behaviours in the past four months. Participants rated each item from one (never) to five (almost daily). Item scores were averaged to gain an overall score of traditional victimisation ($\alpha_{t1/t2}=.76/.81$) with higher
scores indicating being more frequently victimised. Due to its high skewness at the upper end of the scale, traditional victimisation was log transformed.

**Depressive symptoms**

Students completed an eight-item scale addressing depressive symptoms at both assessment points. The scale has been validated in a longitudinal study (Alsaker 1992; Holsen, Kraft and Vitterso 2000), and taps the following constructs: sad/depressed feelings (e.g., *Sometimes I am just so depressed that I feel like staying in bed for the whole day*), lack of positive feeling, lack of motivation/energy, worthlessness of life. Participants rated how much they agree to the statements referring to the past four months. Possible responses ranged from one (not true) to four (true). Scores were averaged to obtain a single score for depressive symptoms ($\alpha_{t1/t2}=.86/.88$). Higher scores indicate higher levels of depressive symptoms.

**Coping strategies**

Based on the results of a qualitative pilot study, a 14-item scale on coping strategies in relation to cybervictimisation was developed. The items were built based on adolescents’ open answers regarding the perceived success of coping strategies in relation to cyberbullying (Machmutow and Perren 2011). Students were presented with a hypothetical cyberbullying scenario (e.g., an embarrassing video was published on YouTube) and a list of 14 coping strategies was provided; they were asked what the hypothetical victim should do in this specific situation and rated each strategy on a scale ranging from one (definitely not) to four (definitely).

Each student was randomly given one cyberbullying scenario followed by the 14 items. The scenarios varied for publicity and severity of the incident as well as for gender and victimisation experiences of the victim. The randomization of the scenarios was applied to investigate the impact of situational variables on student’s coping behaviour (Machmutow and Perren 2011). The analyses presented here were statistically controlled for the situational variations of the scenarios.

Running a factor analysis, three distinct subscales (distal advice, assertiveness, helplessness) were found, together with two further subscales (close support, retaliation), which were examined separately (items tapping close support correlated with all subscales and retaliation was measured only with one item). One item (*not to take something to heart*) turned out to be understood ambiguously and was eliminated from the following analyses.
With regard to support seeking, we specify two subscales: distal advice, e.g., attending an advice centre ($\alpha=.67$) and close support, e.g., talking to friends ($\alpha=.65$). Whereas distal advice implies the more informational and instrumental aspects of relief, close support targets the more emotional way of getting help from people (Cohen and Wills 1985). The subscale assertiveness, e.g., finding and contacting the bully ($\alpha=.49$) includes different means to defend oneself without causing harm to others (confronting the bully and using technical means). In contrast, retaliation (single item) is understood as a reaction through counter-aggression and revenge (Camodeca and Goossens 2005). Avoidant and emotion-focused coping strategies were combined in subscale helplessness, e.g., self-blaming for the incident ($\alpha=.36$). This scale consists of three items referring the attributions one can use when confronted with problematic situations (Kelley and Michela 1980): internal causes (e.g., self-blame), global causes (withdraw, e.g., because bullying is everywhere) and stable causes (ignoring, e.g., because bullying is uncontrollable and therefore there is nothing you can do against). More information or a copy of the (currently revised) coping questionnaire is available from the authors.

Results

Descriptive statistics

Main effects of time, gender and age

Means and gender differences of all study variables are shown in table 1. Regarding differences between both time points of assessment, participants showed a decrease in traditional victimisation ($t(726) = 3.79; p < 0.001$). The level of victimisation in cyberspace as well as the level of depressive symptoms did not differ between both time points of assessment. Cyber and traditional victimisation were moderately stable. Depressive symptoms showed a rather high stability. Girls reported higher levels of cybervictimisation (t1) and higher levels of depressive symptoms (both time points). Girls more frequently recommended assertiveness and close support, and less frequently recommended retaliation as coping strategies than boys.

Victimisation, depressive symptoms and coping strategies

Bivariate associations between all study variables are shown in table 2. Cyber and traditional victimisation were positively associated with each other, as well as with depressive symptoms at t1 and t2. Higher levels of retaliation and helplessness and lower levels of close support were associated with a higher level of depressive symptoms (t1 and t2). Traditional victimisation (t2) was positively associated with higher levels of assertiveness and distal ad-
vice. Cybervictimisation (t2) was positively associated with retaliation and negatively with close support.

[Table 1 and 2 near here]

**Multivariate analyses**

Cross-sectional and longitudinal generalized linear models (GLM) were used to investigate the impact of traditional and cybervictimisation on depressive symptoms. In a last step, we analyzed whether coping strategies moderate the effects of cybervictimisation (interactions). As the coping questionnaire contained cyber-specific scenarios, we were only interested in a possible moderating effect of coping strategies on the association between cybervictimisation and depressive symptoms, models with interactions concerning traditional victimisation were not calculated.

**Predictors of depressive symptoms**

Cross-sectional associations. In a first step, age, gender and both forms of victimisation (t1) were included in a model to investigate their predictive value for depressive symptoms at t1. Gender and both forms of victimisation yielded a significant effect. Being female (Wald \( \chi^2(1, 791) = 21.42; B = 0.20; p = .001; \omega = .16 \)), higher levels of traditional victimisation (Wald \( \chi^2(1, 791) = 39.35; B = 1.30; p = .001; \omega = .22 \)) and higher levels of cybervictimisation (Wald \( \chi^2(1, 791) = 24.39; B = 1.85; p = .001; \omega = .18 \)) predicted higher levels of depressive symptoms.

Longitudinal associations. For the longitudinal analyses, two models were computed: model 1 investigated the impact of victimisation at t1 on depressive symptoms at t2; in model 2 we controlled for depressive symptoms at t1 and thus investigated the impact of victimisation on changes in depressive symptoms over time (see Table 3). Age, gender, traditional and cybervictimisation (t1 and t2), and coping strategies were used as independent variables. Gender and both types of victimisation at both time points yielded significant main effects. Being female and higher frequency of victimisation were predictive of a higher level of depressive symptoms at t2. In addition, the coping strategies helplessness and close support emerged as predictors of depressive symptoms at t2. Close support predicted a lower level of depressive symptoms, whereas feeling helpless predicted a higher level of depressive symptoms. When including depressive symptoms at t1 into model 2, cybervictimisation at t2 remained a significant predictor of depressive symptoms at t2. That is, higher levels of cybervictimisation at t2 predicted an increase in depressive symptoms over time.
Moderating effects of coping strategies

To test for possible moderating effects, interactions were included in the models. For the interaction analysis variables were centered around the mean. In a first GLM-analysis interaction effects between coping strategies and cybervictimisation at t1 were tested. These analyses yielded no significant interaction effects.

Next, interactions with cybervictimisation at t2 were calculated. The analysis yielded significant interaction effects for assertiveness and close support. To interpret the significant interaction effect, we used the procedures of Aiken and West (1991). The lines represent associations (slopes) between the independent and dependent variables for high and low levels (+/-1 SD) of the moderator (Figures 1 and 2).

The GLM-analysis yielded significant effects of assertiveness x cybervictimisation on depressive symptoms at t2 ($Wald\; chi^2(1, 652) = 4.12; B = 0.68; p = .042; \omega = .08$). As can be seen in Figure 1, students with higher levels of cybervictimisation reported higher levels of depressive symptoms. This association is stronger, when students recommended assertive coping strategies. When entering depressive symptoms at t1 as a control variable into the model this moderating effect remained significant ($Wald\; chi^2(1, 643) = 10.87; B = 0.96; p = .001; \omega = .13$). Moreover, the interaction between close support and cybervictimisation was significant regarding changes in depressive symptoms from t1 to t2 ($Wald\; chi^2(1, 643) = 4.43; B = -0.61; p = .035; \omega = .08$). Figure 2 shows that cybervictimisation is more strongly associated with depressive symptoms at t2 when students report low levels of social support; i.e. higher levels of social support seem to buffer the negative impact of cybervictimisation.

Discussion

This study examined whether cybervictimisation is a longitudinal risk factor for depressive symptoms. Furthermore, the impact of recommending specific cybervictimisation coping strategies on the association between cybervictimisation and depressive symptoms was explored. Results show that cybervictimisation is a longitudinal risk factor for adolescents’ depressive symptoms above and beyond traditional victimisation. Results also suggest that social support may buffer the negative impact of cybervictimisation, whereas assertive reaction may aggravate this negative impact.
The impact of victimisation on depressive symptoms

Results show that being victimised by traditional means and in cyberspace are concurrent and longitudinal predictors of a higher level of depressive symptoms. These findings are in line with our expectations and with former cross-sectional studies (e.g., Baker and Tanrikulu 2010; Desjardins and Leadbeater 2011; Pouwelse et al. 2011; Ybarra 2004). The bivariate analyses also confirm that students who are victimised in one context (e.g., real world) are at a higher risk to become victimised in the other context, too (e.g., cyberspace). Despite this overlap, cybervictimisation emerges as an additional risk factor in regard to depressive symptoms. When analysing the effect of victimisation on changes in depressive symptoms over time, only cybervictimisation (and not traditional victimisation) at t2 emerges as a significant predictor. Therefore, being victimised online could be even more strongly related to depressive symptoms than traditional forms of victimisation. An additional and stronger negative impact of cybervictimisation on depressive symptoms could be explained by the larger audience provided in cyberspace (Kowalski and Limber 2007; Smith et al. 2008; Sticca et al. 2013), which might increase feelings of helplessness and shame in the victim. The finding might also be related to the fact that cybervictimisation is not confined by time and place. In case adolescents are victims of traditional victimisation they can withdraw from this harassment after school. Cybervictims never can rest because at home the victimisation goes on with text messages on their mobile phone, on Facebook, videos on YouTube and the like.

Coping strategies in cybervictimisation

Students indicated what coping strategies a hypothetical cybervictim should use in a specific cyberbullying situation. Close support and assertiveness were the most frequently recommended coping strategies, whereas helpless reactions and retaliation were less frequently recommended.

Talking to friends and/or parents might be one of the first ideas coming to one’s mind when thinking about what to do when experiencing cybervictimisation, since the cost associated with asking significant others for support might be comparatively low. Moreover, students emphasize the importance that significant others have the resources to help, are trustworthy, and take such incidents seriously (Hinduja and Patchin, 2007; Smith et al. 2008). However, it is important to note that cybervictimisation was negatively associated with close support, possibly indicating that cybervictims more seldom use close support as coping strategy, or that they have had unsuccessful experiences. As we only asked whether they would speak with friends or parents we do not know what kind of support they would ask for: they
might ask for (and receive) consolation and comfort (emotional support); or, they might expect instrumental help to cope with the cybervictimisation.

In contrast to close support, the coping strategy distal advice was not significantly associated with depressive symptoms or cybervictimisation. However, traditional victimisation was positively associated with distal advice. This might indicate that students who experienced traditional victimisation may be more willing to report the incident to consultants or the police. This might in turn be due to their own experiences with unsuccessful attempts to stop bullying and resulting feelings of helplessness.

Another way to cope with victimisation is fighting back. In the present sample, boys recommended retaliation more often than girls, although on a lower level than other more constructive coping strategies. Gender differences often appear regarding retaliation, but it seems that the observed/reported differences are based on the way girls (e.g., more verbal) and boys (e.g., more physical) fight back (Hoff and Mitchell 2009). In our coping scale we used only one item addressing revenge (I would retaliate against this person) and we did not differentiate between forms of retaliation. Therefore, we were not able to test such a hypothesis. However, our results showed that boys recommended retaliation more often than girls. Cybervictimisation (t2) was positively associated with retaliation. This again might indicate that victims of cybervictimisation have used such strategies. As high correlations have been reported between cybervictimisation and cyberaggression in other studies (e.g., Perren et al. 2010; Sontag et al. 2011), it is possible that some of the cybervictims are themselves rather aggressive and use this kind of reactions when facing cybervictimisation. However, we did not investigate associations between own cyberbullying behaviour and the suggested coping strategies in this study.

In line with research of avoidant coping strategies (Seiffge-Krenke and Klessinger 2000), we found that helplessness reactions (ignoring, withdrawing and self-blame) are positively associated with depressive symptoms. This finding could be explained by the general failure to use adaptive coping strategies (Asarnow, Carlson and Guthrie 1987). Also, feelings of uncontrollability of the situation (Roth and Cohen 1986) might be more relevant in cyberbullying incidents due to the perpetrator’s greater anonymity. Holahan and colleagues (2005) suggested that the use of avoidant coping strategies leads to more acute and/or chronic life stress, which in turn predicts higher levels of depressive symptoms.
Study 2: Peer victimisation and depressive symptoms

Buffering effects of coping strategies

As hypothesised and shown in other studies, seeking support by significant others predicted lower levels of depressive symptoms, whereas avoidant and emotion-focused coping (helplessness) predicted a higher level of depressive symptoms (Ebata and Moos 1991; Hay and Meldrum 2010; Seiffge-Krenke and Klessinger 2000). In addition, higher levels of retaliation were associated with higher levels of depressive symptoms.

One of our main research questions of the present study was whether recommended coping strategies regarding a hypothetical cyberbullying scenario buffer the negative impact of cybervictimisation on depressive symptoms. The analysis showed that two coping strategies (close support and assertiveness) moderate the association between cybervictimisation and depressive symptoms. Students suggesting close support as coping strategy showed lower levels of depressive symptoms at t2. This finding is in line with the buffering hypothesis of social support (e.g., Jackson 1992) and indicates that support from significant others can reduce the negative effects of stress. However, cybervictims seem to use close support less frequently than others. That is, students recommending seeking close support are not necessarily victimised and might suggest this strategy on the basis of other situations in which they have used it successfully.

Assertiveness is commonly seen as a rather constructive and helpful way to cope with victimisation incidents (Camodeca and Goossens 2005). However, our study showed an unexpected result. For cybervictims, higher levels of assertiveness (contacting and showing own pain to the bully as well as making technical precautions) were associated with higher levels of depressive symptoms. The moderating effect still remained when controlling for depressive symptoms at t1. This result suggests that any contact to the perpetrator, even a constructive one, is harmful and should be avoided to reduce negative emotions. Contacting the bully, telling him that his behaviour is bad and makes one angry could lead to the outcome the perpetrator wants to get: satisfaction. Therefore, as bullying is defined by a power differential between bully and victim, contacting a bully might not be a useful strategy. A logical conclusion would be to avoid any contact with the bully in the hope that he looses his motivation, and eventually stops bullying. Another interpretation of this finding might be associated with aggressive victims’ behaviour and difficulties: traditional bully-victims show high levels of aggressive and assertive reactions and coping behaviour (Kristensen and Smith 2003; Perren and Alsaker 2006), and also the highest level of depressive symptoms (Perren et al. 2010). Maybe traditional bully-victims are overrepresented in the group of cybervictims who rec-
ommend assertive coping strategies. Studies regarding the role of assertive coping strategies on the relationship between victimisation and emotional well-being are needed.

**Strengths and limitations**

The present study has a number of strengths. One is the rather large sample with a very low percentage of attrition. Furthermore, to our knowledge, this was the first study to investigate moderating effects of coping strategies on the impact of cybervictimisation on depressive symptoms using a longitudinal design. Therefore, not only did we assess perceived success, but measured the impact of recommended coping strategies on changes in depressive symptoms. Nevertheless, the study has limitations. The ability to generalize our results is limited because we only had two time points with a six-months interval. Moreover, coping strategies were only measured at the second assessment. Further, we exclusively relied on self-report. Therefore, the strengths of associations might be biased through shared method variance.

Our coping measure also has strengths and limitations. We asked students which coping strategies they would recommend to a hypothetical cybervictim. On one hand, this allowed us to generate data for the whole sample and not only from cybervictims. On the other hand, we do not know whether the recommended coping strategies are actually also used by the students in case of a similar cybervictimisation experiences. The items of our coping instrument were developed from a qualitative pilot study. We used students’ answers to generate the coping items. This is certainly a strength of the instrument, as we used students’ own formulations of answers and did not imply theoretical subscales, which might not be relevant for their everyday experiences (Parris et al. 2011). At the same time, this procedure is a major disadvantage because we were forced to build post-hoc subscales. Although we could identify some theoretically meaningful subscales, the internal consistencies were rather low to moderate. Furthermore, we had only one item in the retaliation scale.

**Practical and research implications**

The implications of these findings are important for intervention programs and evince the extent of negative impact of cybervictimisation. Being victimised in cyberspace proved to be an additional longitudinal risk factor for depressive symptoms in young adolescents. However, it remains unclear, whether cybervictimisation adds a unique and qualitatively different contribution to the harm caused by traditional victimisation or if its effect on youngster’s health is just additive and qualitatively comparable to that of traditional victimisation. Further studies should address this issue.
Close support as a coping strategy was found to be able to buffer the negative impact of this association. Analyses concerning the other coping strategies provided unexpected or no significant results. Therefore, further investigation is needed to clarify the specific longitudinal effect of different coping strategies on the association between cybervictimisation and depressive symptoms. For example, it needs to be clarified if there are differences of structural and functional nature between coping mechanisms in traditional and cybervictimisation, if coping strategies are more universal and therefore independent of context, and if there is an overlap between the perceived and real successfulness of coping strategies. Nonetheless, the results of this study raise important questions, as well as concerns, for those young people experiencing different forms of victimisation and suffering emotional problems.

In conclusion, close support emerges as a highly adaptive coping strategy in relation to cybervictimisation. In contrast to our expectations, assertive reactions seem to aggravate the negative impact of cybervictimisation. There exists a wide range of published guidelines and recommendations to cope with cyberbullying developed by governments, schools, private or public initiatives. However, there is a severe lack of evidence regarding the success of these suggested coping strategies (Perren et al. 2012; Smith 2012). A further investigation of successful coping strategies in relation to cybervictimisation is necessary to eliminate recommendations that might be not useful or even detrimental for cybervictims’ adaptive coping and emotional well-being.
Table 1. Means (standard deviations in brackets) of all study variables ($n = 345$-$388$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>t1 Female</th>
<th>t1 Male</th>
<th>t2 Female</th>
<th>t2 Male</th>
<th>Gender differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional victimisation</td>
<td>1.33</td>
<td>1.37</td>
<td>1.28</td>
<td>1.31</td>
<td>ns.</td>
</tr>
<tr>
<td></td>
<td>(0.42)</td>
<td>(0.48)</td>
<td>(0.40)</td>
<td>(0.46)</td>
<td></td>
</tr>
<tr>
<td>Cyber victimisation</td>
<td>1.10</td>
<td>1.06</td>
<td>1.08</td>
<td>1.06</td>
<td>t1: $F(1, 729) = 6.05; p &lt; .05$</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
<td>(0.19)</td>
<td>(0.19)</td>
<td>(0.25)</td>
<td>t2: ns.</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>1.76</td>
<td>1.55</td>
<td>1.70</td>
<td>1.55</td>
<td>t1: $F(1, 719) = 19.57; p &lt;$</td>
</tr>
<tr>
<td></td>
<td>(0.69)</td>
<td>(0.62)</td>
<td>(0.66)</td>
<td>(0.67)</td>
<td>$.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>t2 $F(1, 732) = 9.55; p &lt; .01$</td>
</tr>
<tr>
<td>Distal advice</td>
<td>-</td>
<td>-</td>
<td>2.57</td>
<td>2.60</td>
<td>ns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.77)</td>
<td>(0.85)</td>
<td></td>
</tr>
<tr>
<td>Close support</td>
<td>-</td>
<td>-</td>
<td>3.23</td>
<td>2.97</td>
<td>$F(1, 740) = 24.08; p &lt; .001$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.60)</td>
<td>(0.84)</td>
<td></td>
</tr>
<tr>
<td>Assertiveness</td>
<td>-</td>
<td>-</td>
<td>3.05</td>
<td>2.95</td>
<td>$F(1, 737) = 4.36; p &lt; .05$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.61)</td>
<td>(0.73)</td>
<td></td>
</tr>
<tr>
<td>Helplessness</td>
<td>-</td>
<td>-</td>
<td>1.67</td>
<td>1.74</td>
<td>ns.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.58)</td>
<td>(0.65)</td>
<td></td>
</tr>
<tr>
<td>Retaliation</td>
<td>-</td>
<td>-</td>
<td>2.03</td>
<td>2.42</td>
<td>$F(1, 725) = 26.14; p &lt; .001$</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(0.94)</td>
<td>(1.13)</td>
<td></td>
</tr>
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</table>
Table 2. Bivariate associations between all study variables ($n = 698-820$).

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Traditional victimisation (t1)</td>
<td>.43**</td>
<td>.27**</td>
<td>.50**</td>
<td>.22**</td>
<td>.25**</td>
<td>-.04</td>
<td>-.03</td>
<td>-.01</td>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>2 Cybervictimisation (t1)</td>
<td>1</td>
<td>.26**</td>
<td>.27**</td>
<td>.22**</td>
<td>.19**</td>
<td>.01</td>
<td>-.05</td>
<td>-.01</td>
<td>-.02</td>
<td>.02</td>
</tr>
<tr>
<td>3 Depressive symptoms (t1)</td>
<td>1</td>
<td>.22**</td>
<td>.17**</td>
<td>.56**</td>
<td>-.06</td>
<td>-.10**</td>
<td>-.03</td>
<td>.09*</td>
<td>.09*</td>
<td></td>
</tr>
<tr>
<td>4 Traditional victimisation (t2)</td>
<td>1</td>
<td>.35**</td>
<td>.26**</td>
<td>.09*</td>
<td>.03</td>
<td>.12**</td>
<td>.04</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Cybervictimisation (t2)</td>
<td>1</td>
<td>.15**</td>
<td>.01</td>
<td>-.09*</td>
<td>-.04</td>
<td>.07</td>
<td>.09*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Depressive symptoms (t2)</td>
<td>1</td>
<td>-.02</td>
<td>-.07</td>
<td>.01</td>
<td>.11**</td>
<td>.08*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Distal advice</td>
<td>1</td>
<td>.37**</td>
<td>.43**</td>
<td>-.04</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Close support</td>
<td>1</td>
<td>.36**</td>
<td>-.02</td>
<td>-.22**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Assertiveness</td>
<td>1</td>
<td>-.01</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Helplessness</td>
<td>1</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Retaliation</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Note: *$p<.05$; **$p<.01$
Table 3. Results of the GLM-analyses predicting depressive symptoms at t2 
\((n_{M1} = 675; n_{M2} = 667)\).

<table>
<thead>
<tr>
<th>Depressive symptoms t2</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>p</td>
<td>B</td>
<td>p</td>
</tr>
<tr>
<td>Intercept (constant)</td>
<td>.320</td>
<td>.576</td>
<td>-.142</td>
<td>.777</td>
</tr>
<tr>
<td>Depressive symptoms t1</td>
<td></td>
<td></td>
<td>.499</td>
<td>.000</td>
</tr>
<tr>
<td>Age</td>
<td>.040</td>
<td>.298</td>
<td>.032</td>
<td>.342</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>.189</td>
<td>.000</td>
<td>.054</td>
<td>.231</td>
</tr>
<tr>
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<tr>
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<td>-.038</td>
<td>.278</td>
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<tr>
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<td>.106</td>
</tr>
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<td>Retaliation</td>
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<td>.081</td>
<td>.009</td>
<td>.659</td>
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</table>

Note: Analyses were controlled for the situational variability of the cyberbullying scenarios.
Figure 1. Interaction effect of cybervictimisation x assertiveness (on depressive symptoms at t2).

Figure 2. Interaction effect of cybervictimisation x close support (controlled for depressive symptoms at t1).
3.3 Study 3


Abstract

The present study investigated the longitudinal association between the development of bullying (traditional bullying and cyberbullying) and the development of moral deficiencies (moral disengagement, low moral responsibility, low feelings of remorse) during adolescence. A total of 960 Swiss adolescents completed an electronic questionnaire in schools four times with six months intervals. Results of a parallel process model showed that the initial levels of moral deficiencies were positively associated with higher initial scores of bullying. Furthermore, the initial levels of moral deficiencies were positively associated with initial changes of bullying, and negatively with changes in trend of bullying across time. In contrast, the initial level of bullying was not found to be associated with the slope of moral deficiencies. Accordingly, we conclude that moral deficiencies might be a trait that predicts the development of bullying behaviors and not vice versa. Implications of the findings for bullying prevention are discussed.

Keywords: cyberbullying, traditional bullying, moral disengagement, moral emotions, longitudinal data.
The Chicken and the Egg: Longitudinal Associations Between Moral Deficits and Bullying. A Parallel Process Latent Growth Model

Introduction

Bullying is an aggressive behavior that is in contrast with individual and social moral standards. This is the case for both traditional bullying (defined as a particular form of aggressive behavior that it is repeatedly performed against a defenseless victim; Olweus, 1993) and cyberbullying (defined as bullying performed using electronic forms of communication; Slonje & Smith, 2008). According to the social cognitive theory of the moral self (Bandura, 1999), if an individual performs some sort of behavior that is in contrast to his moral standards, cognitive mechanisms such as moral disengagement might be selectively activated in order to free oneself from self-sanction. Therefore, bullies might use these mechanisms to maintain a positive self-image and to escape feelings of remorse.

A body of research has addressed the question whether the social cognitive theory of the moral self can be applied to bullying behavior. More specifically, recent research has examined how bullying behaviors are associated with moral deficits such as low moral values, high moral disengagement, low moral responsibility and less feelings of remorse, thus taking an integrative approach that combines both moral cognitions and moral emotions (Malti & Latzko, 2010; Menesini et al., 2003). Regarding moral cognitions, traditional bullying was found to be positively associated with moral disengagement (Hymel et al., 2005; Menesini et al., 2003; Obermann, 2011; Perren & Gutzwiller-Helfenfinger, 2012) and negatively associated with moral responsibility (Perren, Gutzwiller-Helfenfinger, Malti, & Hymel, 2012). Furthermore, moral disengagement was found to be positively linked to cyberbullying behaviors (Pornari & Wood, 2010). However, other studies found no association between moral disengagement and cyberbullying (Bauman, 2010) or did not find any associations once moral values and feelings of remorse (Perren & Gutzwiller-Helfenfinger, 2012) or traditional bullying and rule-breaking behaviors (Sticca, Ruggieri, Alsaker, & Perren, 2013) were taken into account. Therefore, evidence on the association between moral cognitions and traditional bullying is stronger than evidence for its association with cyberbullying.

Based on a model by Lewis (1992), Menesini et al. (2003) proposed a model that combines moral emotions and moral justifications. In this model is postulated that morally responsible emotions (i.e., guilt and shame) and morally disengaged emotions (i.e., indifference and pride) are two opposite ends of a continuum and indicate attitudes of moral responsibility and disengagement, respectively. The authors showed that traditional bullies display more morally
disengaged emotions, and Menesini and Camodeca (2008) showed that they also display less morally responsible emotions. Therefore, moral cognitions and moral emotions are closely linked to each other and play a prominent role in the understanding of bullying behavior.

To date, no study has examined how the development of bullying as a construct that encompasses both traditional bullying and cyberbullying are associated with the development of moral deficits (i.e., high moral disengagement, low moral responsibility, and less moral emotions). The present study aims at filling this research gap by exploring the longitudinal association between bullying and moral deficits.

Research on the association between bullying (traditional and cyber) and moral deficits is largely cross-sectional in design and mainly explored if moral deficits can predict bullying. This body of research assumed that moral deficits might be what leads bullies to behave aggressively and what allows them to do so without showing moral emotions such as shame or guilt (Hymel et al., 2005; Menesini et al., 2003). Therefore, moral deficits were conceptualized as a trait that influences behavior. However, it might also be that levels of moral disengagement increase in bullies and cyberbullies as they keep performing behaviors that put them at risk for negative self-sanctions. Indeed, Bandura (2002) discussed that during the development of the moral self, individuals observe their actions (and the context in which it occurs) and evaluate them as a function of acquired moral standards and external circumstances. Based on this evaluative self-regulatory process, moral disengagement might selectively be activated. Thus, bullies and cyberbullies might learn how to do moral disengagement and thus how to maintain a positive self-view and to avoid negative feelings although continuously attacking their peers. Such a mechanism has also been found in past research on moral values in the context of delinquency (Hirschi, 1969). In sum, it is still unknown if moral deficits drive changes in bullying behaviors or if bullying behaviors drive changes in moral deficits or both.

The Present Study

Our aim was to explore longitudinal associations between bullying (traditional and cyberbullying) and moral deficits (moral disengagement, moral responsibility, and feelings or remorse). Specifically we aimed to test whether the development of bullying behaviors was associated with the development of moral deficits during adolescence and which development influences the other or if maybe both influence each other. In order to do so, we used a parallel process latent growth model (Chung, White, Hipwell, Stepp, & Loeber, 2010). This model
allows us to test whether growth parameters of one latent growth model (LGM) predict those of another LGM.

Based on previous findings from cross sectional research, we hypothesize that the initial levels of bullying and moral deficits are positively associated. Further, we will explore the longitudinal association between moral deficits and bullying.

**Method**

**Procedure**

The present paper includes data from a longitudinal study carried out in Switzerland (net-TEEN). Four assessments were carried out between November 2010 and May 2012 with time intervals of six months. As required by Swiss legislation, permission to conduct the study was obtained from the respective school councils. School directors and teachers from the selected schools volunteered, and parents were told about the study and asked to inform the teachers if they did not want their children to participate (passive consent). The parents of four adolescents refused to participate at each assessment. The participants were informed about the survey’s procedure and goal, and were given the opportunity to refrain from participation with no negative consequences (informed oral consent). Students who did not want to participate were offered another activity during the relevant school period.

An electronic self-report questionnaire was administered in classrooms on netbooks. For students who were absent during the classroom assessment a personal login and password were distributed. These students completed an online version of the questionnaire.

**Sample**

Three Swiss cantons were selected for study participation. In each of the three cantons, four schools with at least three classrooms were randomly selected and each school was represented in the present study by three to four classrooms, resulting in a total of 43 classrooms. At the third assessment, two more classrooms were included in the study because the same classrooms were reorganized and the participants were distributed in classrooms that did not participate in the first two assessments. A total of 960 adolescents participated in the present study (49% females, mean age at t1 = 13.2 years). Attrition between the assessments was very low and was mainly due to adolescents having moved to other schools.
Measures for Bullying Behaviors

*Cyberbullying* was assessed using a scale developed by Sticca et al. (2013). The scale encompassed a total of six items tapping different forms of cyberbullying (e.g., sending mean or threatening messages to single individuals, groups or publishing on the Internet). At each assessment, participants were asked how often they had performed these behaviors during the past four months. Possible responses ranged from one (*never*) to five (*almost daily*). A mean score of the six items was computed in order to obtain a single score of cyberbullying ($\alpha = .62/.96/.94/.95$). Higher scores indicate more cyberbullying.

*Traditional bullying* was assessed using an adapted version of a validated traditional bullying scale (Alsaker, 2003). This scale consists of six items encompassing a set of different aggressive behaviors (e.g., laughing at people, insulting, excluding or hitting someone). At each assessment, participants were asked how often they had performed these behaviors during the past four months. Participants rated each item from one (*never*) to five (*almost daily*). A mean score of the six items was computed in order to obtain a single score of traditional bullying ($\alpha = .76/.81/.85/.78$). Higher scores indicate more traditional bullying.

Measures for Moral Deficits

*Moral disengagement and moral responsibility* were assessed using a scale developed by Perren, Rumetsch, Gutzwiller-Helfenfinger and Malti (2012). Participants were given two hypothetical bullying scenarios describing an adolescent excluding and humiliating a peer, respectively. After the scenarios, the participants were given a total of eleven statements assessing moral disengagement (e.g., *That schoolmate deserved it*), and a total of six statements assessing moral responsibility (e.g., *It is not ok to hurt other people like that*). Participants were asked if they agreed with the statements. Responses ranged from one (*not true*) to four (*true*). Scores from the moral disengagement items were averaged to obtain a single score for moral disengagement (11 items, $\alpha = .86/.90/.90/.91$). Higher scores indicated higher levels of moral disengagement. Similarly, scores from the moral responsibility items were averaged to obtain a single score for moral responsibility (6 items, $\alpha = .80/.86/.87/.88$). The moral responsibility scores were reversed in order to avoid modeling complications. Accordingly, higher scores indicated lower levels of moral responsibility.

*Feelings of remorse* were assessed using a set of four hypothetical bullying scenarios that described different bullying situations and participants were asked about their feelings of remorse if they had done what was described in the respective scenarios. Response options ranged from one (*not bad at all*) to five (*very bad*). A mean score of the four items was com-
puted to obtain a single score of feelings of remorse ($\alpha = .91/.92/.93/.93$). The scores were reversed so that higher scores indicated less feelings of remorse.

**Analysis Strategy**

A parallel process latent growth model was used to test the study hypotheses. First, we estimated two separate LGMs: one for bullying and one for moral deficits. Traditional bullying and cyberbullying were included in the present analyses as two indicators of a single latent construct (i.e., bullying) because our aim was to look at the common elements of these two forms of bullying (i.e., the shared variance). Regarding moral deficits, we used moral disengagement, moral responsibility and feelings of remorse as indicators, therefore combining moral cognition and moral emotion.

For the final analyses, these two LGMs were put together and the associations between the latent growth parameters of the two processes were analyzed.

**Results**

**Model Specification for Bullying**

The LGM for bullying was modeled using the observed mean scores of traditional bullying and cyberbullying. Since the latent constructs had only two indicators, factor loadings in the measurement models were all set to 1 in order to achieve local identification. Moreover, the intercept of cyberbullying items was set to 0 in order to define the metric of the LGM. For the structural model we started with the assumption of curvilinear development. Therefore, the factor loadings of the latent intercept were all set to 1, while those of the latent slope were set to 0, 1, 2, and 3. Further, the factor loadings of the latent curvature were set to 0, 1, 4, and 9 (Bollen & Curran, 2005). Moreover, we modeled autoregressive error covariances between observed scores of the same variables. Covariances between the latent intercept, the latent slope and the latent curvature were also freely estimated.

The resulting LGM for bullying showed a good model fit ($\chi^2 = 27.35$, df = 12, $\chi^2$/df = 2.28, CFI = .99, RMSEA = .04). Parameter estimates indicated that the covariance between the latent intercept and the latent slope, and between the latent intercept and the latent curvature were not significantly different from 0. Therefore, these two covariances were set to 0 and the model was estimated again and compared to the original model. The model comparison showed that there was no significant decrease on model fit due to the new constrains ($\Delta \chi^2 = 4.06$, $\Delta$df = 2, $p = .13$).
The final LGM for bullying showed a good fit to the data ($\chi^2 = 31.41$, df = 14, $\chi^2$/df = 2.24, CFI = 0.99, RMSEA = 0.04). The latent intercept was found to be on the very low end of the possible score range (µ = 1.04, $p < .001$) and to have a significant variance ($\varphi = 0.01$, $p < .001$). This showed that adolescents generally started off with quite low latent scores in bullying and that there was significant interindividual variation in the initial level of bullying. Similarly, the latent slope was found to be quite small, although statistically significant (µ = 0.05, $p < .01$), and to have a significant variance ($\varphi = 0.09$, $p < .001$). Therefore, adolescents generally had a positive trend in their bullying behaviors at the beginning and there was significant interindividual variation in the initial trend. Finally, the latent curvature was not found to be different from 0 (µ = -0.01, $p = .12$), although a significant variance was found ($\varphi = 0.01$, $p < .001$). These results showed that the initial positive trend in bullying behavior is stable on average. However, there was significant interindividual variation in the change in the trend over time.

**Model Specification for Moral Deficits**

The LGM for moral deficits was modeled using the observed mean scores of moral disengagement, moral responsibility (reversed), and feelings or remorse (reversed). The model specification for moral deficits was the same as the one used for bullying (curvilinear latent growth model).

The resulting LGM for moral deficits showed a good model fit ($\chi^2 = 80.497$, df = 32, $\chi^2$/df = 2.52, CFI = 0.99, RMSEA = 0.04). However, the mean and the variance of the latent curve were not found to be significant (µ = 0.007, $p = .128$; $\varphi = 0.003$, $p = .072$). Therefore, the latent curve was removed from the model. The model without latent curve showed a god fit to the data (see table 1). However, the covariance between the latent intercept and the latent slope was not found to be significant and was set to 0. The model was then tested towards metric and scalar invariance. Table 1 shows the results of the invariance tests, including chi-square difference test. Metric and scalar invariance were found.

The final LGM for bullying fitted the data well (see table 1). The latent intercept of the LGM for moral deficits was found to be fairly low (µ = 1.72, $p < .001$) and to have a significant variance ($\varphi = 0.12$, $p < .001$). This showed that adolescents generally started off with relatively low scores in moral deficits and that there was significant interindividual variation in its initial level. The latent slope was found to be positive and quite small, although statistically significant (µ = 0.04, $p < .01$), and to have a significant variance ($\varphi = 0.01$, $p < .001$).
Study 3: Longitudinal associations between moral deficits and bullying

This showed that adolescents generally had a slight increase in moral deficits over the four assessments and that there was significant interindividual variation in the slope of this development.

Model Specification for the Parallel Process Model

A parallel process model was used to answer our research questions about the associations between the development of bullying and moral deficits. The two models presented above were put together and associations between the latent growth parameters were modeled. In a first step, we modeled all possible covariances between the latent growth parameters, except for those that were already found to be non-significant in the separate models (see above).

The resulting model matched the data well ($\chi^2 = 569.64$, $df = 148$, $\chi^2/df = 3.85$, CFI = .95, RMSEA = .06). The covariance between the latent intercept of bullying and the latent slope of moral deficits was not found to be significant. Furthermore, the covariance between the latent curvature of bullying and the latent slope of moral deficits was also found to be non-significant. Therefore, these covariances were set to zero and the model was estimated again.

The resulting model fitted the data well ($\chi^2 = 573.770$, $df = 153$, $\chi^2/df = 3.75$, CFI = .95, RMSEA = .05). Figure 1 shows the standardized solution of the parallel process model for bullying and moral deficits. Note that only significant correlations between the latent growth parameters are shown (straight double-headed arrows). The latent intercept of moral deficits was found to be positively correlated with the latent intercept ($r = .51$, $p < .001$) and slope of bullying ($r = .36$, $p < .001$), and negatively with its curvature ($r = -.29$, $p < .001$). Therefore, high initial scores in moral deficits are associated with higher initial scores, steeper initial trends and stronger changes in trend of bullying over time. Furthermore the latent slopes of bullying and moral deficits were positively associated ($r = .13$, $p < .05$). Accordingly, steep developments of moral deficits are associated with higher initial trends of bullying development. However, the intercept of bullying was not correlated with the slope of moral deficits, i.e. the initial level of bullying was not associated with the development of moral deficits.

In order to visualize how the initial level of moral deficits is linked to the development of bullying, we computed the predicted trajectories of bullying for individual with low (one standard deviation below the mean), average, and high (one standard deviation above the mean) scores in bullying. Figure 2 shows the trajectory of bullying as a function of moral deficits. Those adolescents who have low initial scores of moral deficits have very low scores in bullying and show not much of a change (i.e., they stay low). With increasingly higher scores of moral deficits, the initial score of bullying becomes higher, together with the initial trend in
the development of bullying. Furthermore, the higher the initial score in moral deficits, the more the initial positive trend changes and eventually changes direction (i.e., the initial increase becomes a decrease).

**Discussion**

The present study explored whether the development of bullying behaviors and moral deficits are reciprocally associated during adolescence. Our findings showed that higher bullying scores are associated with higher moral deficits scores in the cross-sectional view, which is in line with results from previous cross-sectional research (Hymel et al., 2005; Menesini et al., 2003; Perren & Gutzwiller-Helfenfinger, 2012; Sticca et al., 2013). In the longitudinal view, we were able to show that the initial levels of moral deficits predicted the development of bullying, while the contrary was not the case.

These results suggest that moral deficits are an important element in the development of bullying behavior during adolescence. Those adolescents who show moral deficits at age 13 are at increased risk of showing bullying behaviors and to increase the frequency of bullying over time, although, at a certain level, bullying behaviors will become stable or even decrease, depending on how frequent the bullying was before. This result is in line with the concept of moral deficits as a trait-like characteristic that increases the likelihood that an individual will perform bullying behavior (Hymel et al., 2005; Menesini et al., 2003). Thus, moral deficits seem to anteced e and, therefore, to be a possible cause of bullying behaviors.

The opposite hypothesis, i.e. that bullying behaviors predict the development of moral deficits, was not supported by our results. This non-significant association might be explained by a comparably high stability of moral deficits over the time period considered in the present study. Moral deficits were found to be relatively stable, which also speaks to the concept of moral deficits as a trait. This is in line with results by Henry and Guerra (2000) who found that normative beliefs about aggression are stable during adolescence. The authors discuss that normative beliefs about aggression are formed during early childhood and gain more and more stability as norms are adjusted to one’s and other’s aggressive behaviors and beliefs about aggression. This interpretation could also apply to moral deficits and bullying: Bullying behavior in childhood might form moral deficits, which in turn influence bullying behavior during adolescence. Therefore, the social cognitive theory of the moral self might explain how moral deficits develop during childhood, rather than how moral deficits influence bullying behavior during adolescence (Bandura, 1999).
The development of bullying over the four assessments was found to be curvilinear on average and its shape was found to depend on the initial level of moral deficits. On possible explanation of this finding might be that in Switzerland the transition to secondary school is often accompanied by a change in the composition of the classroom and, therefore, of the peer-group. This might lead to a new establishment of hierarchies within the classroom. Bullying behavior has been discussed as an inappropriate way to achieve social dominance over peers (Sutton, Smith, & Swettenham, 1999). Those adolescents who show moral deficits might be at higher risk of using bullying behaviors as a means to establish dominance over their peers and might drop these behaviors as soon as social dominance is established. Therefore, bullying tends to increase at the beginning and to flatten or to drop one to two years later. This curvilinear development was found to be strongest for adolescents with high initial scores in moral deficits, which also speak to moral deficits being a trait that influences bullying behavior.

In sum, our results suggest that moral deficits can be thought of as a trait that predicts the development of bullying during adolescence and not vice versa. Accordingly, prevention efforts should be undertaken as early as preschool (Monks, 2011) in order to prevent the development of moral deficits at its very beginning and, therefore, to reduce the likelihood that bullying will be displayed during adolescence.
Table 1: Model fit indices and model comparison results for moral deficits (n=960)

<table>
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<th>df</th>
<th>CFI</th>
<th>RMSEA</th>
<th>$\Delta \chi^2$</th>
<th>$\Delta$ df</th>
<th>p-value</th>
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<td>12.99</td>
<td>13</td>
<td>.055</td>
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</tbody>
</table>

Note. ¹ Factor loadings set equal across time, ² item intercepts set equal across time

Figure 1: Standardized solution of the Parallel Process Model for bullying and moral deficits.
Figure 2: Bullying development as a function of the initial scores of moral deficits
3.4 Study 4


Abstract

Cyberbullying has emerged as a new form of antisocial behavior in the context of online communication over the last decade. The present study investigates potential longitudinal risk factors for cyberbullying. A total of 835 Swiss seventh-graders participated in a short-term longitudinal study (two assessments six months apart). Students reported on the frequency of cyberbullying, traditional bullying, rule-breaking behavior, cybervictimization, traditional victimization, and frequency of online communication (interpersonal characteristics). In addition, we assessed moral disengagement, empathic concern, and global self-esteem (intrapersonal characteristics). Results showed that traditional bullying, rule-breaking behavior, and frequency of online communication are longitudinal risk factors for involvement in cyberbullying as a bully. Thus, cyberbullying is strongly linked to real world antisocial behaviors. Frequent online communication may be seen as an exposure factor that increases the likelihood of engaging in cyberbullying. In contrast, experiences of victimization and intrapersonal characteristics were not found to increase the longitudinal risk for cyberbullying over and above antisocial behavior and frequency of online communication. Implications of the findings for the prevention of cyberbullying are discussed.

Key words: cyberbullying, traditional bullying, victimization, longitudinal, risk factors.
The rapid development of modern communication technologies over the last decade has led to a number of new possibilities of online interaction. Especially since smart phones conquered the market, an increasing number of people have mobile access to the Internet and may be online around the clock. In Switzerland, 95% of adolescents aged 12-19 years have Internet access at home, while 75% also have access to the Internet from their own room. Moreover, virtually every Swiss adolescent owns a mobile phone (Willemse, Waller, & Süss, 2010).

This evolution in communication technologies has also led to problematic patterns of interpersonal communication. One such problematic pattern is cyberbullying. Cyberbullying can be seen as a modern form of bullying, defined as an aggressive behavior that is intentionally (hostile intent) and repeatedly (repetition) carried out against a defenseless victim (power imbalance; Olweus, 1993). The modern element of cyberbullying is the use of electronic forms of communication (e.g., the Internet or mobile phones; Smith, Mahdavi, Carvalho, Fisher, Russell, & Tippet, 2008). However, repetition and power imbalance are features of traditional bullying that may be hard to conceptualize in the context of cyberbullying (Dooley, Pyzalski, & Cross, 2009; Nocentini, Calmaestra, Schulze-Krumholz, Scheithauer, Ortega, & Menesini, 2010; Vandebosch & Van Cleemput, 2009). In fact, repetition and power imbalance are sometimes omitted from the definition and operationalization of cyberbullying, making it hard to compare existing studies with each other (for review, see Tokunaga, 2010).

Although cyberbullying may be seen as bullying by electronic means, there are some features that distinguish cyberbullying from traditional bullying: (1) the perception of perpetrators' anonymity, (2) the potentially infinite audience, (3) the bully’s inability to observe the target’s immediate reaction, and (4) the absence of time and space constraints (Slonje & Smith, 2008).

Over the last decade, cyberbullying has attracted much attention both in the media and in scientific research. This has been fostered by a number of suicide deaths that were motivated by severe experiences of cyberbullying (e.g., ABC News, 2007). Nonetheless, research on cyberbullying is as young as the phenomenon itself, and results obtained so far are quite fragmented. According to Tokunaga (2010), current cyberbullying research suffers from several problems: (1) unresolved issues of definition and measurement of cyberbullying, (2) lack of theoretical background, (3) over-reliance on cross-sectional data, and (4) a tendency to take simplistic approaches. The present study aims to overcome some of these limitations by analyzing longitudinal data and by simultaneously investigating a range of interpersonal (e.g.,
traditional bullying) and intrapersonal (e.g., global self-esteem) characteristics as potential longitudinal risk factors for involvement in cyberbullying. Note that in the following the terms cyberbullying and traditional bullying are used to indicate bully status in cyberbullying and traditional bullying, respectively. Similarly, the terms cybervictimization and traditional victimization are used to indicate victim status in cyberbullying and traditional bullying, respectively.

Risk factors for cyberbullying

Current empirical findings on risk factors associated with cyberbullying have been obtained from cross-sectional studies (Sourander, Klomek, Ikonen, Lindroos, Luntamo, Koskelainen et al., 2010). As cross-sectional studies cannot distinguish cause and effect, we do not know which cross-sectional correlates of cyberbullying can be considered as longitudinal risk factors, i.e. as factors that increase the odds of engaging in cyberbullying in the future. The current study investigates longitudinal associations between cyberbullying and a number of potential risk factors. We included a range of variables found to be associated with cyberbullying and other forms of antisocial behavior (e.g., traditional bullying) in previous cross-sectional research. Interpersonal characteristics included antisocial behaviors (i.e., traditional bullying and rule-breaking behaviors), experiences of victimization (i.e., cybervictimization and traditional victimization), and frequency of online communication. Intrapersonal characteristics included gender, moral disengagement, empathic concern, and global self-esteem.

Traditional bullying. One of the most consistent findings in cyberbullying research is the significant overlap between involvement in cyberbullying and traditional bullying. Many cyberbullies are also traditional bullies (Smith & Slonje, 2010; Smith, 2011b). Accordingly, cyberbullying may be seen as an additional way to attack people rather than as something conceptually different (Gradinger, Strohmeier, & Spiel, 2010; Raskauskas & Stoltz, 2007). In order to investigate specific risk factors for cyberbullying over and above traditional bullying (i.e., pure cyberbullying), it is crucial to take this empirical (and conceptual) overlap into account (i.e., control for concurrent traditional bullying).

Rule-breaking behavior. Another form of antisocial behavior found to be associated with cyberbullying is rule-breaking behavior: Ybarra and Mitchell (2004) found that cyberbullies display increased rule-breaking behaviors (e.g., damaging property, consumption of cigarettes/alcohol), thus pointing to the need to elucidate the longitudinal role of this potential risk factor.
Cybervictimization and traditional victimization. Cybervictimization has been found to be positively associated with cyberbullying (Bauman, 2009; Mitchell, Finkelhor, Wolak, Ybarra, & Turner, 2011), and Ybarra and Mitchell (2004) proposed that traditional victims would use cyberbullying as a way to retaliate. However, this result was not replicated in more recent studies (Slonje & Smith, 2008; Raskauskas & Stoltz, 2007, Vandebosch & Van Cleemput, 2009). Nonetheless, Law, Shapka, Hymel, Olson, and Waterhouse (2012) have suggested that in cyberbullying dynamics there are many adolescents who are both cyberbullies and cybervictims at the same time. The authors postulate that this may be due to the fact that there is less direct contact and that power imbalances are not as salient and influential in cyberspace as in the real world. Therefore, reacting in an aggressive manner to an experience of victimization may be more likely than in the real world.

Frequency of online communication. Risky Internet usage has been found to be a significant predictor of involvement in cyberbullying (Erdur-Baker, 2010). Furthermore, cyberbullies spend significantly more time online than their peers (Erdur-Baker, 2010), especially using instant messaging programs (Ybarra & Mitchell, 2004). Frequent online communication can thus be considered as a risk factor for cyberbullying in the sense of an exposure effect.

Gender. Although previous findings clearly show that boys engage in more physical, verbal, and relational bullying than girls (Olweus, 2010), results for gender differences in cyberbullying are mixed. Some studies report higher involvement of boys (e.g., Erdur-Barker, 2010; Slonje & Smith, 2008), while some find no significant differences (e.g., Smith et al., 2008; Patchin & Hinduja, 2006) and others find girls to be more involved than boys (Kowalski & Limber, 2007).

Moral disengagement. Previous research showed that moral disengagement is associated with antisocial behavior in children and adolescents (Yadava, Shamara, & Gandhi, 2001). Traditional bullies stress the positive outcomes of aggressive acts for the self by distorting the consequences and by ignoring the victim (Menesini, Sanchez, Fonzi, Ortega, Costabile, & Lo Feudo, 2003; Perren, Gutzwiller-Helfenfinger, Malti, & Hymel, 2011). These and other moral disengagement strategies were also found to be positively associated with cyberbullying (Pornari & Wood, 2010). However, Pornari and Wood (2010) argue that although moral disengagement is a correlate of both cyberbullying and traditional bullying, cyberbullying demands lower levels of moral disengagement because of its greater anonymity and because the victim’s reactions are not directly observable. There are also studies indicating that moral disengagement may not be associated with cyberbullying at all, especially if traditional bullying is taken into account (Perren & Gutzwiller-Helfenfinger, 2011).
Empathic concern. There is strong evidence for a positive relation between antisocial behavior and low levels of empathy (Jolliffe & Farrington, 2004). However, only low affective empathy was found to be associated with bullying (Jolliffe & Farrington, 2011; Caravita, Di Blasio, & Salmivalli, 2009), while low cognitive empathy was not (Jolliffe & Farrington, 2011). These results indicate that bullies are able to understand the victim’s emotions but they do not share them (Sutton, Smith, & Swettenham, 1999). In relation to cyberbullying it was shown that cyberbullying is associated with lower levels of both affective and cognitive empathy (Ang & Goh, 2010; Schultze-Krumbholz & Scheithauer, 2009) and also with lower levels of global empathy (Steffgen, König, Pfetsch, & Metzler, 2012).

Global self-esteem. The direction of the relation between self-esteem and bullying is not consistent for bullies. Positive, negative, and non-significant associations between traditional bullying and self-esteem have all been found (for review, see Patchin & Hinduja, 2010). For cyberbullying, the results of a cross-sectional study by Patchin and Hinduja (2010) revealed that cyberbullies report lower levels of self-esteem than non-involved students. In sum, the role of self-esteem as a longitudinal risk factor for cyberbullying has yet to be explored.

Research questions

The present study aims to move beyond the cross-sectional nature of the literature on cyberbullying (Tokunaga, 2010) and give an insight into the relative importance of different longitudinal risk factors for cyberbullying.

Based on the cross-sectional results presented above, we hypothesize that interpersonal characteristics (i.e., traditional bullying, rule-breaking behaviors, traditional victimization, cybervictimization, frequent online communication) and lower levels of empathic concern increase the odds of future involvement in cyberbullying. In addition, we will explore the role of gender, moral disengagement, and global self-esteem.

As there is a strong overlap between cyberbullying and traditional bullying (Smith, 2011a), it is necessary to account for concurrent traditional bullying in order to analyze which risk factors predict changes in cyberbullying, over and above concurrent traditional bullying. Accordingly, we will control for the effect of previous involvement in cyberbullying (i.e., consider residual changes in cyberbullying), and for the effect of concurrent involvement in traditional bullying.
Method

Procedure

Data from a longitudinal study carried out in Switzerland (netTEEN) will be presented in this paper. Data from the first (November/December 2010) and the second (May 2011) wave of data assessment are included. As required by Swiss legislation, permission to conduct the study was obtained from the respective school councils. School directors and teachers from the selected schools volunteered, and parents were told about the study and asked to inform the teachers if they did not want their children to participate (passive consent). The parents of four adolescents refused to participate. The participants were informed about the survey’s procedure and goal, and were given the opportunity to refrain from participation with no negative consequences (informed oral consent). Students who did not want to participate were offered another activity during the relevant school period.

An electronic self-report questionnaire was administered in classrooms on netbooks. For students who were absent during the classroom assessment a personal login and password were distributed. These students completed an online version of the questionnaire.

Sample

Three Swiss cantons (Wallis, Thurgau, Ticino) with integrative school systems were randomly selected from the 15 cantons with integrative school systems. In integrative school systems, students are not divided into higher and lower performance classrooms. By selecting only schools with integrative school systems we therefore avoided systematic effects from the academic performance level of the class. In each of the three cantons, four schools with at least three classrooms were randomly selected and each school was represented in the present study by three to four classrooms, resulting in a total of 43 classrooms. In the first assessment 835 Swiss adolescents (49% females, mean age = 13.2, SD = 0.64) participated in the study. A total of 820 students also participated in the second assessment. Attrition was mainly due to adolescents having moved schools.

Measures

Cyberbullying. A scale covering a set of different aggressive behaviors performed using electronic means was developed for this study. A detailed list of the items can be found in the appendix. The same items were used to assess both cyberbullying (six items; \( \alpha = .62 \)) and cybervictimization (six items; \( \alpha = .76 \)). Participants rated how often they had performed (cyberbullying) and how often they had suffered (cybervictimization) these behaviors in the
past four months. Possible responses ranged from one (never) to five (almost daily). Due to its high degree of skew at the upper end of the scale, cyberbullying was dichotomized. Those participants who scored higher than one on at least one of the cyberbullying items were classified as cyberbullies. Those participants who scored higher than one on at least one of the cybervictimization items were classified as cybervictims.

Traditional bullying. Involvement in traditional bullying as a bully or as a victim was assessed using an adapted version of a validated traditional bullying and victimization scale (Alsaker, 2003). This scale consists of twelve items encompassing a set of different aggressive behaviors (e.g., laughing at people, insulting, excluding or hitting someone). Six items were used to assess traditional bullying ($\alpha = .63$) and six items were used to assess traditional victimization ($\alpha = .76$). Participants were asked how often they had performed/suffered these behaviors in the past four months. Participants rated each item from one (never) to five (almost daily). To make the data comparable, we also dichotomized the traditional bullying and the traditional victimization scale used the same cut-off we used for cyberbullying (i.e., 1-2 times).

Rule-breaking behavior. Rule-breaking behavior was assessed using an eight-item scale specifically developed for this study. The items described a variety of rule breaking behaviors (e.g., destroying things, smoking, drinking, stealing or cheating during tests). Participants were asked to indicate how often they had performed these behaviors in the past four months. Participants rated each item from one (never) to five (almost daily). Item scores were averaged to gain an overall score of rule-breaking behavior ($\alpha = .75$), with higher scores indicating more rule-breaking behavior.

Frequency of online communication. Frequency of online communication was assessed using an eight-item scale specifically developed for this study. These eight items described a set of social online activities (e.g., phone calls, chatting). Participants were asked to indicate how often they had performed these activities in the past four months. Possible responses ranged from one (never) to five (almost daily). Scores for the eight items were averaged to create an overall score of frequency of online communication ($\alpha = .80$), with higher scores indicating more online communication.

Moral disengagement. Participants were given two hypothetical bullying scenarios describing an adolescent excluding and humiliating a peer, respectively. After each scenario the participants were given five (scenario one) and six (scenario two) statements (e.g., That schoolmate deserved it) and were asked if they agreed (Perren, Rumetsch, Gutzwiller-Helfenfinger, & Malti, 2012). Responses ranged from one (not true) to four (true). Scores
were averaged to obtain a single score for moral disengagement (11 items, $\alpha = .86$). Higher scores indicate higher levels of moral disengagement.

**Empathic concern.** A scale by Zhou, Valiente, and Eisenberg (2003), slightly adapted and translated into German (Malti, Gummerum, Keller, & Buchmann, 2009), was used to assess empathic concern. Participants were given five statements about empathic feelings for other people in difficult situations (e.g., *When I see other adolescents who feel bad, I empathize with them*). Participants rated the statements on a scale ranging from one (*not true*) to four (*true*). Item scores were averaged to gain a single score of empathic concern ($\alpha = .87$), with higher scores indicating higher empathic concern.

**Global self-esteem.** An adapted German version of the Rosenberg-Scale (Collani & Herzberg, 2003) was used to assess global self-esteem. Participants rated ten statements about their global self-esteem (e.g., *All things considered, I am happy with myself*) on a scale ranging from one (*not true*) to four (*true*). A mean score of all ten items was calculated ($\alpha = .78$). Higher means indicated higher global self-esteem.

**Results**

**Descriptive results**

Table 1 shows the frequencies of the dichotomized variables, and the means and standard deviations of all other variables. Note that the mean of a dichotomized variable with scores of 0 and 1 represents the percentage of cases with a score of 1 (e.g., the percentage of cyberbullying).

The results show that cyberbullying is less prevalent than traditional bullying. The same was found for cybervictimization and traditional victimization. A comparison of involvement in cyberbullying at t1 and at t2 showed that 79.2% of participants were not involved in cyberbullying at either assessment, while 6.9% were involved both at t1 and at t2, 7.3% were involved only at t1, and 6.7% were involved only at t2.

**Bivariate associations**

Correlations between all variables were calculated to gain a descriptive overview of all associations (table 1). Cyberbullying at t1 is positively associated with all other variables except gender (no significant association), and is negatively correlated with empathic concern and self-esteem. Cyberbullying at t2 is positively correlated with all variables except global self-esteem and gender (no significant association), and is negatively correlated with empathic concern.
Analysis strategy for multivariate associations

To investigate multivariate associations between potential risk factors and cyberbullying, a hierarchical approach consisting of one logistic regression with four models was adopted. Cyberbullying at t2 was used as a dependent variable. The order of inclusion of the independent variables was based on the strength of their bivariate association with involvement in cyberbullying at t2, while maintaining the division of interpersonal and intrapersonal characteristics. In addition, interpersonal characteristics were sequentially entered in three steps in order to look progressively at the role of antisocial behaviors, experiences of victimization, and frequency of online communication. In model one, traditional bullying and rule-breaking behavior were entered as independent variables (interpersonal characteristics). In model two, cybervictimization and traditional victimization were entered as interpersonal characteristics. In model three, frequency of online communication was entered as interpersonal characteristic. Finally, in model four, gender, moral disengagement, empathic concern, and global self-esteem were entered as intrapersonal characteristics. In all models cyberbullying at t1 and traditional bullying at t2 were included as control variables.

Results of multivariate logistic regression analyses

Table 2 shows the results of longitudinal multivariate logistic regression analyses. Results from model one showed that, when controlling for cyberbullying at t1 and traditional bullying at t2, traditional bullying at t1 and rule-breaking behaviors at t1 independently increased the odds of engaging in cyberbullying at t2. Those adolescents who display antisocial behaviors at t1 are at increased risk of being involved in cyberbullying at t2.

When adding experiences of victimization to the model, neither cybervictimization, nor traditional victimization were found to significantly increase the odds of engaging in cyberbullying at t2 over and above the effects of antisocial behaviors, which were still statistically significant.

In model three, frequency of online communication was found to increase the odds of engaging in cyberbullying over and above antisocial behaviors, which again were statistically significant, and experiences of victimization, which were still not statistically significant. Therefore, the more time adolescents spend in online communication at t1, the higher the risk that they will engage in cyberbullying at t2.

Model four showed that none of the intrapersonal characteristics significantly increased the risk of engaging in cyberbullying at t2 over and above the effect of antisocial behaviors and
online communication, which were statistically significant, and experiences of victimization, which were not statistically significant. These results show that intrapersonal characteristics do not independently increase the odds of engaging in cyberbullying in the future, when interpersonal characteristics are taken into account.

In all models, both cyberbullying at t1 and traditional bullying at t2 were significant at the $p < .001$ level.

- Place Table 2 about here –

**Discussion**

The present study investigated the role of interpersonal and intrapersonal characteristics as longitudinal risk factors for cyberbullying. The results showed that the individual tendency to engage in different forms of antisocial behavior (traditional bullying and rule-breaking behavior) is the most important risk factor for cyberbullying, followed by the frequency of online communication.

Before the main results are discussed, it is worth taking a closer look at the prevalence of cyberbullying and traditional bullying.

*Prevalence of cyberbullying*

Cyberbullying was markedly less prevalent than traditional bullying at both the first and the second assessment. Furthermore, cybervictimization was found to be less prevalent than traditional victimization. These results confirm findings from previous studies (e.g., Juvonen & Gross, 2008; Li, 2007, Smith et al., 2008) and show that the picture of cyberbullying as a highly prevalent and steadily increasing problem is oversimplified. A possible reason for the difference in prevalence may be that adolescents spend most of their time directly interacting with their peers in the real world (e.g., school, after-school activities). In real world social interactions, traditional forms of bullying may be more likely to be performed than cyberbullying because a target may be directly available (e.g., is physically present) or because the social situation may be such that traditional forms of bullying are a more spontaneous response (e.g., writing an SMS would require more effort). In addition to this possible explanation, differences between the scales used to assess cyberbullying and traditional bullying may also have influenced their apparent prevalence: the cyberbullying scale contains relatively similar items (e.g., sending nasty messages to individuals or groups of individuals), while the traditional bullying scale contains more differentiated items (e.g., hitting someone, excluding someone) that may be performed in cyberspace as well. Nevertheless, the cyberbullying scale
we used in this study encompasses all major types of cyberbullying that are perceived as relevant at age 13: aggressive texting or messaging and sending problematic content in form of pictures or videos (Law et al., 2012, Smith et al., 2008).

**Risk factors for engagement in cyberbullying as a bully**

As hypothesized, bivariate analyses indicate that most of the potential risk factors show significant associations with cyberbullying. However, when controlling for past cyberbullying and concurrent traditional bullying, longitudinal analyses yielded a different picture: antisocial behaviors (traditional bullying and rule-breaking behaviors) and frequent online communication are longitudinal risk factors for cyberbullying, whereas neither experiences of victimization nor intrapersonal characteristics increase the odds of engaging in cyberbullying over and above antisocial behaviors and frequency of online communication.

Traditional bullies are at increased risk of engaging in cyberbullying in the future: those who attack others in the real world today are more than four times as likely to do so in cyberspace a few months later. Another significant longitudinal risk factor for involvement in cyberbullying was found to be rule-breaking behavior. Adolescents displaying behaviors such as smoking, drinking alcohol, hurting animals, or destroying others’ property have twice the risk of getting involved in cyberbullying a few months later. This result adds a longitudinal perspective to the cross-sectional findings of Ybarra and Mitchell (2004), who reported that cyberbullies display more rule-breaking behaviors. Taken together, these findings suggest that adolescents who display some form of antisocial behavior in real world are at increased risk of involvement in cyberbullying. These results confirm our hypotheses and show that cyberbullying may be seen as an additional way of attacking people rather than something conceptually different (Gradinger et al., 2010, Raskauskas & Stoltz, 2007).

In addition to antisocial behaviors, frequency of online communication is another central risk factor for cyberbullying. As hypothesized, the more time adolescents spend communicating online, the higher their risk of engaging in cyberbullying. Moreover, online communication also increases the risk of cybervictimization (Juvonen & Gross, 2008). Therefore, the role of online communication may be seen as an exposure effect that might be strongest for adolescents who have the possibility of communicating online from their own room (Law, Shapka, & Olson, 2010) or from mobile devices.

In contrast to the significant longitudinal role of antisocial behaviors and frequency of online communication, we found that experiences of victimization and intrapersonal characteristics did not increase the odds of engaging in cyberbullying in the future over and above
antisocial behaviors and frequency of online communication. Moreover, neither gender nor
global self-esteem was found to be associated with cyberbullying at t2 on a bivariate level. However, global self-esteem was found to be negatively associated with cyberbullying at t1. Our results therefore support those of Smith et al. (2008), and Patchin and Hinduja (2006), who also found no significant association between cyberbullying and gender, and are partly in line with those of Patchin and Hinduja (2010) who found that cyberbullies had lower levels of self-esteem. Although experiences of victimization and intrapersonal characteristics were not found to be risk factors for future involvement in cyberbullying as a bully, significant bivariate associations with cyberbullying at t1 and t2 were found for experiences of victimization, moral disengagement, and empathic concern. These variables might play a more central role as risk factors for other forms of bullying (e.g., traditional bullying; Stassen Berger, 2007). However, they have no direct link with changes in cyberbullying behaviors. The bivariate association between cyberbullying and experiences of victimization, moral disengagement and empathic concern might be mediated by antisocial behaviors: those who experienced victimization, who have high moral disengagement scores, or who lack empathic concern may be more prone to traditional forms of antisocial behaviors and, therefore, be inclined to cyberbullying in an indirect way.

It is important to note that the inclusion of cyberbullying at t1 and traditional bullying at t2 and all other predictors means that experiences of victimization, and intrapersonal characteristics have no predictive value for changes in pure cyberbullying, when all other predictors are taken into account. In sum, the present data suggest that involvement in cyberbullying does not directly depend on experiences of victimization or intrapersonal characteristics, but on the individual tendency to engage in antisocial behaviors, including past acts of cyberbullying, and on the frequency of online communication.

In the light of these findings, some conclusions about the prevention of cyberbullying can be drawn. Given that traditional bullying is the strongest longitudinal risk factor for cyberbullying, prevention programs against traditional bullying may indirectly target cyberbullying too (Salmivalli, Kärnä, & Poskiparta, 2011). Examples of such intervention programs are the Olweus Bullying Prevention Program (Olweus, 1991), which inspired most anti-bullying programs developed over the last 20 years (for review see Farrington & Ttofi, 2009), and the KiVa Antibullying Program (Salmivalli, Kärnä, & Poskiparta, 2010), which focuses on the role of bystander behavior in the effective prevention of bullying. The general prevention of antisocial behaviors also plays a key role in preventing cyberbullying. A number of programs combating antisocial behaviors, such as The First Step program (Walker, Kavanagh, Stiller,
Golloy, Severson, & Feil, 1998) or The Incredible Years program (Reid, Webster-Stratton, & Hammond, 2007), have been developed over the last decades. A central element of these programs is the development of social skills and competences and positive interpersonal relationships, to support social and school adjustment (Mcloughlin, 2009).

Finally, our results suggest that reducing the frequency of online communication also reduces the risk of engaging in cyberbullying. While this is a logical conclusion, it is important to note that electronic forms of communication are just tools and not in themselves the causes of problematic behaviors (Juvonen & Gross, 2008). Therefore the focus should be on the prevention of specific risk factors and on the promotion of safety on the Internet rather than on the frequency of online communication per se. Education in cybersafety strategies might help to reduce a variety of risky behaviors, such as publishing private content or giving away passwords. A comprehensive list of online risks and respective cybersafety strategies (e.g., raising awareness, targeting young users, creating industry support for Internet safety) was proposed by Livingstone, Haddon, Görzig, and Ólafsson (2011).

Since cyberbullying is related to other group dynamics (e.g., traditional bullying) and aggressive behaviors emerge early in childhood (Monks, 2011), there is a need for comprehensive programs that are able to target different antisocial behaviors (Bostic & Brunt, 2011) starting as early as preschool (Monks, 2011). Furthermore, preventive efforts need to involve and to actively support both the school and the parents in their efforts to deliver the prevention program (Smith, 2011b).

**Strengths and limitations**

This study considered a set of potential risk factors for involvement in cyberbullying, elucidating their independent roles. The simultaneous inclusion of traditional bullying, rule-breaking behaviors, traditional victimization, and cybervictimization as potential risk factors for cyberbullying, led to very differentiated results. Furthermore, the use of a longitudinal design enabled us to shed light on the direction of causal effects.

There are, however, some limitations to the present findings that need to be borne in mind. First, the exclusive use of self-reports may have led to underreporting of antisocial behaviors, thereby compromising the validity of the information (Brown & Zimmermann, 2004). Second, the scales of cyberbullying, cybervictimization, traditional bullying, and traditional victimization show low to moderate internal consistencies. This reflects the fact that most adolescents show/suffer only one or two behaviors listed in the respective scales and, therefore, the internal consistencies cannot be expected to be high. A third limitation is that some im-
important potential risk factors could not be included in our study (e.g., intelligence, personality, socioeconomic status, social context; Welsh & Farrington, 2007). These elements would give a more detailed picture of the characteristics that contribute independently to the development of cyberbullying. Last but not least, the time interval of six months between assessments is very short.

Conclusion

Taken together, these findings show that interpersonal characteristics such as antisocial behaviors and frequent online communication are the most prominent longitudinal risk factors for involvement in cyberbullying. The results also show that it is necessary to take a broad view of the phenomenon of cyberbullying. Models that do not include aggressive and antisocial behaviors may overestimate the independent role of certain characteristics as risk factors. Our results and those of other studies (Gradinger et al., 2010; Juvonen & Gross, 2008) suggest that cyberbullying can be seen as an online version of other real world antisocial behaviors, and so prevention of cyberbullying should focus on early prevention of different forms of antisocial behavior.
Table 1: Bivariate correlations between all study variables (Pearson’s r and Cramer’s V).

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<td>1 Cyberbullying t1</td>
<td>14%</td>
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<td>.43***</td>
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<td>.24***</td>
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<td>2 Cyberbullying t2</td>
<td>13%</td>
<td>1</td>
<td></td>
<td>.28***</td>
<td>.32***</td>
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<td>-.03</td>
<td>-.12***</td>
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<td>.35***</td>
<td>.16***</td>
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<td>4 Traditional bullying t2</td>
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<td>.19***</td>
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<td>-.10***</td>
<td>.32***</td>
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<td>-.18***</td>
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<td>.36***</td>
<td>-.12***</td>
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<td>8 Online communication</td>
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<td>.00</td>
<td>-.05</td>
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<tr>
<td>9 Global self-esteem</td>
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<td>.05</td>
<td>.04</td>
<td>-.10**</td>
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<tr>
<td>10 Empathic concern</td>
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<td></td>
<td></td>
<td>.35***</td>
<td>.33*</td>
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<td>11 Moral disengagement</td>
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<td>-.22***</td>
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<td>12 Gender (female)</td>
<td>49%</td>
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</tbody>
</table>

Note. *p<.05; **p<.01; ***p<.001; Cramer’s V was used to compute correlations between dichotomous variables; the mean score of a dichotomous variable with scores of 0 and 1 represents the percentage of cases with a score of 1.
Table 2: Summary of logistic regression analyses

<table>
<thead>
<tr>
<th></th>
<th>Model 1 OR 95% CI</th>
<th>Model 2 OR 95% CI</th>
<th>Model 3 OR 95% CI</th>
<th>Model 4 OR 95% CI</th>
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</thead>
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<td><strong>Interpersonal characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Traditional bullying t1</td>
<td>4.06*** 1.85-8.95</td>
<td>3.95*** 1.75-8.90</td>
<td>4.05*** 1.80-9.13</td>
<td>4.25*** 1.79-10.08</td>
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<tr>
<td>Rule-breaking behaviors t1</td>
<td>2.85*** 1.63-4.99</td>
<td>2.76*** 1.58-4.80</td>
<td>2.38** 1.34-4.21</td>
<td>2.16* 1.18-3.97</td>
</tr>
<tr>
<td>Cyber victimization t1</td>
<td>1.59 0.90-2.78</td>
<td>1.50 0.85-2.64</td>
<td>1.63 0.91-2.91</td>
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<tr>
<td>Traditional victimization t1</td>
<td>1.06 0.53-2.12</td>
<td>1.16 0.58-2.33</td>
<td>1.41 0.67-2.94</td>
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<tr>
<td>Online communication t1</td>
<td>1.37* 1.04-1.79</td>
<td>1.43* 1.08-1.89</td>
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<td><strong>Intrapersonal characteristics</strong></td>
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<tr>
<td>Sex (female)</td>
<td>0.81 0.46-1.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral disengagement t1</td>
<td>1.13 0.71-0.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empathic concern t1</td>
<td>0.92 0.64-1.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global self-esteem t1</td>
<td>1.23 0.79-2.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyberbullying t1</td>
<td>5.19*** 3.10-8.70</td>
<td>4.30*** 2.47-7.49</td>
<td>3.93*** 2.24-6.88</td>
<td>4.02*** 2.26-7.14</td>
</tr>
<tr>
<td>Traditional bullying t2</td>
<td>4.76*** 2.50-9.08</td>
<td>5.02*** 2.62-9.64</td>
<td>4.97*** 2.59-9.56</td>
<td>4.93*** 2.49-9.73</td>
</tr>
<tr>
<td>N</td>
<td>794</td>
<td>792</td>
<td>792</td>
<td>767</td>
</tr>
<tr>
<td>-2 Log-Likelihood</td>
<td>432.60</td>
<td>429.68</td>
<td>424.53</td>
<td>404.65</td>
</tr>
<tr>
<td>Nagelkerke R²</td>
<td>0.388</td>
<td>0.393</td>
<td>0.403</td>
<td>0.421</td>
</tr>
</tbody>
</table>

Note. *p<.05, **p<.01, ***p<.001

Appendix

Cyberbullying scale

How often did you do the following things since the beginning of the school year?

<table>
<thead>
<tr>
<th></th>
<th>never</th>
<th>1-2 times</th>
<th>1x/month</th>
<th>1x/week</th>
<th>Almost daily</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you sent mean or threatening messages to anyone (text messages, MSN, Facebook, etc.)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Have you sent mean or threatening pictures or videos to anyone (picture messages, Facebook, etc.)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Have you sent mean or embarrassing messages or spread rumours about anyone to your friends (text messages, MSN, Facebook, etc.)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Have you sent mean or embarrassing pictures or videos of anyone to your friends (picture messages, Facebook, etc.)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Have you posted mean or embarrassing messages or spread rumours about anyone on the Internet (Facebook, YouTube, etc.)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Have you posted mean or embarrassing pictures or videos of anyone on the Internet (Facebook, YouTube, etc.)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
4 Discussion

4.1 Summary of the main results of each study

Results of the first study showed that cyberbullying is not a priori perceived as worse than traditional bullying. The relevant dimensions for the evaluations of the severity of hypothetical bullying scenarios were found to be the publicity of the bullying act and the anonymity of the bully. More precisely, scenarios where there was an audience that directly witnessed what happened were rated as much worse than scenarios where there was no audience at all. Further, scenarios where the bully was anonymous were rated as much worse than scenarios where the victim knew the bully’s identity. Both of these results were independent from the medium used to bully (i.e., traditional vs. cyber). Therefore, cyberbullying was not a priori perceived as worse than traditional bullying.

In the second study we were able to show that experiences of cybervictimization are an additional longitudinal risk factor for depressive symptoms, over and above the effect of experiences of traditional victimization. Moreover, we found that seeking social support was associated with lower levels of depressive symptoms, while avoidant and emotion-focused coping were associated with a higher level of depressive symptoms. Finally, our results showed that seeking social support longitudinally reduced the effect of experiences of cybervictimization on change in depressive symptoms, whereas assertiveness (i.e., confronting the cyberbully) augmented the effect of experiences of cybervictimization on change in depressive symptoms. Accordingly, coping strategies play a prominent role in both bullying intervention and prevention.

The third study showed that the initial score of moral deficits (high moral disengagement, low moral responsibility, and weak moral emotions) predicts every aspect of the trajectory of bullying (traditional and cyber). The higher the moral deficit at the age of 13, the higher the engagement in bullying at the same age, the stronger the initial increase in bullying and the stronger the final decrease in bullying one year later. In contrast, the initial score of bullying was not found to be associated with the longitudinal development of moral deficits. Thus, moral deficits drive changes in bullying behavior and not vice versa.

The fourth and last study showed that the strongest longitudinal risk factor for involvement in cyberbullying as a bully is involvement in traditional bullying as bully. Other important longitudinal risk factors that were identified were rule-breaking behaviors (e.g., stealing, smoking) and the frequency of online communication (e.g., chatting online). A number of other variables were not found to increase the odds of becoming a cyberbully, namely, cyber
and traditional victimization, gender, moral disengagement, empathy, and self-esteem. These results suggest that cyberbullying is an extension of traditional forms of aggressive behavior rather than a completely new one.

4.2 Responses to the research questions and link to the theoretical background

Research question 1: Is cyberbullying perceived as worse than traditional bullying, when taking into account the role of publicity (private vs. public) and anonymity (bully known vs. unknown)?

Cyberbullying is not a priori perceived as worse than traditional bullying. The relevant aspects for the evaluation of the severity of hypothetical bullying scenarios are the bullying episode’s publicity and the bully’s anonymity, but not the medium itself. These results are in line with results from research using a similar approach (Bauman & Newman, 2013; Slonje & Smith, 2008; Smith et al., 2008; Vandebosch & Van Cleemput, 2008). These studies showed that when comparing different forms of bullying regarding their severity it is crucial to take a number of characteristics of the bullying act into account. Indeed, characteristics such as the publicity, the bully’s anonymity, the circumstances of the aggression, and the extent of power imbalance and of repetition might be more important than the medium itself.

Although we were able to show that the medium does not play a prominent role in the evaluation of the severity of hypothetical bullying scenarios, these results are not strong enough to claim that cyberbullying is not worse than traditional bullying in terms of actual consequences for the victim. Nonetheless, there are many findings that support the assumption that the relevant aspect for the severity of victimization is not the medium, but other characteristics of the bullying behavior. First, the consequences of cybervictimization and traditional victimization are similar (see above). Second, there are studies that found no difference in the psychosocial consequences of the two victimization forms (Lester et al., 2012; Menesini et al., 2012) and those studies that did find such differences did not explore the role of other possible relevant aspects that might be responsible for the differences (Beckman et al., 2012; Campbell et al., 2012). Third, combined victims (traditional and cyber) were found to be those with the strongest negative outcomes (Olenik-Shemesh, Heiman, & Eden, 2012; Sontag et al., 2011), suggesting that the frequency rather than the medium plays a prominent role for the severity of the victimization experience (Menesini et al., 2012). Lastly, adolescents can be considered as experts in rating the severity of bullying scenarios, which makes their opinion a good indicator of the actual severity of different forms of victimization. In
order to make a strong statement about the difference in actual severity between different forms of victimization, it would be necessary to obtain data from a large sample, where a number of victimization experiences of interest can be observed and systematically compared. Furthermore, it would be necessary to pose detailed questions about the actual victimization experience.

Besides the theoretical content of this study, the ranking tool used to compare the scenarios was found to be very useful. It requires only a few minutes to complete and enables us to efficiently compare many different scenarios. Further, it makes it possible to disentangle the role of a number of characteristics of bullying acts for the evaluation of the severity of bullying. Moreover, we believe that the approach of forcing a choice of a rank order of the severity of a given set of bullying scenarios gives us some more information on the differences in the severity of the scenarios. If we would only assess the absolute severity of single scenarios (e.g., with a likert-scale from 1 = not bad at all to 5 = very bad), there would be a much higher probability of ceiling effects (i.e., every scenarios would end up having similar and high ratings of severity). These ceiling effects would in turn make it very difficult to partial out the role of the different characteristics of the bullying scenarios. Thus, the ranking tool gives us some additional information on the relative severity of bullying scenarios. Regarding possible developments of this approach, it might be interesting to work with pictures or with short video sequences and to compare the results. These approaches would bear both advantages and disadvantages. On the advantages sides, it would be possible to look at a number of new characteristics, such as non-verbal cues, and it might be possible to reach a better level of credibility and ecological validity of the scenarios. On the disadvantages side, these tools are definitely harder to develop (drawings, video sequences). Moreover, there might be many more aspects that need to be controlled because with visual content some characteristics that are not explicitly mentioned in written scenarios might become salient and relevant for the evaluation of the bullying severity (e.g., ethnicity and gender of the bully). However, both advantages and disadvantages would help us to understand which characteristics of bullying episodes are central for its severity.

Summing up, we can tentatively state that cyberbullying is not worse than traditional bullying per se. Instead, the severity depends on the exact circumstances and on the frequency of the victimization experience.
Cybervictimization was found to be a longitudinal risk factor for the development of depressive symptoms. Moreover, we were able to show that seeking close support buffers and assertiveness enhances the longitudinal association between cybervictimization and depressive symptoms. These first results are in line with previous research (Campbell & Morrison, 2007; Cassidy, 2009; Holt & Espelage, 2007; Kaltiala-Heino et al., 1999; Swearer Napolitano et al., 2011; Swearer et al., 2001) and add a longitudinal perspective to the association between cybervictimization and consequent depressive symptoms. Furthermore, these results show that experiences of cybervictimization need to be taken seriously and deserve special attention in both prevention and intervention (Olenik-Shemesh et al., 2012; Salmivalli et al., 2011). The findings of the moderation of seeking support and assertiveness on the longitudinal association between cybervictimization and depressive symptoms add some new insights to the small body of literature on coping with cyberbullying (Perren et al., 2012). Adolescents need to be encouraged to seek support from peers, parents, and teachers in case they experience or witness cyberbullying (or traditional bullying) incidents (Alsaker, 2012). This might be an important part of cyberbullying prevention in the context of a whole-school antibullying program because cyberbullying episodes are even harder to observe for an outsider. In this context, it is important to foster trust in adults and to make clear that those who report being cybervictimized will not lose their privileges of using their cellphones and computers (Alsaker, 2012). Regarding the negative effect of assertiveness, which is a somewhat unexpected result, we conclude that confronting the bully seems to be a maladaptive coping strategy. Therefore, it might be appropriated to both encourage reporting to significant others and at the same time, to avoid any further contact with the cyberbully, since this would only make things worse (Price & Dalgleish, 2010), maybe causing even more attacks.

In sum this study is one of the first ones to examine longitudinal associations between cybervictimization and depressive symptoms, while also taking into account the moderating role of coping strategies and the overlap with traditional forms of victimization. We believe that it represents a useful method to identify coping strategies that help in reducing the negative impact of cybervictimization and also other forms of victimization. Regarding the examination of longitudinal moderations, it would be interesting to examine the role of coping strategies in the longitudinal association between experiences of traditional and cybervictimization. More specifically, it would be interesting to use a state of the art model for the analysis.
of change, such as the bivariate dual change score model (Ghisletta & Lindenberger, 2003) and to test a longitudinal linear moderation within the model itself. Such a model would be able to show how the independent variable, the moderator and the dependent variable develop and are associated over time, and how the moderations unfolds over time. However, such a model has not yet been developed.

Research question 3: How are moral deficits and bullying behaviors (traditional and cyber) associated in the longitudinal view?

Moral deficits at age 13 predict every aspect of the longitudinal development of involvement in bullying (traditional and cyber), while bullying at age 13 is not associated with the longitudinal development of moral deficits. This result shows that moral deficits drive changes in overall bullying behavior, which is in line with the view of moral deficits as trait-like characteristic that influences behavior (Hymel et al., 2005; Menesini et al., 2003). Furthermore, we found that moral deficits were very stable during early adolescence. This also speaks to a trait-like characteristic that is formed during childhood. Henry and Guerra (2000) found similar results regarding normative beliefs about aggression, which is also associated with both traditional and cyberbullying (Ang et al., 2011; Burton et al., 2013; Huesmann et al., 1992). Henry and Guerra (2000) discussed that the relationship between normative beliefs about aggression and aggressive behavior reverses at certain point during development. Regarding bullying, it might be assumed that moral deficits are formed through behavior, self-observation, and role models during childhood. With time, moral deficits crystallize and turn into a cause for bullying behavior during adolescence. Therefore, the social cognitive theory of the moral self (Bandura, 1999, 2002) seems to be better suited to explain how children develop moral deficits during childhood rather than how moral deficits influence bullying during adolescence. However, this is just an assumption and it would be interesting to examine whether the association between moral deficits and bullying or aggressive behavior reverses at a certain point during development, as proposed by Henry and Guerra (2002). Further, it would be interesting to examine how moral deficits develop during childhood and which are the risk factors for such a development. This would give us important knowledge on how to prevent the development of moral deficits or how to foster moral development during childhood and, consequently, on how to reduce bullying during adolescence and maybe also other forms of aggressive and antisocial behavior (Olweus, 1991). This study also showed that bullying prevention programs need to begin as early as possible. Ideally, prevention programs
would tackle bullying and other aggressive behaviors at their very beginning. However, the causes of aggressive behavior are extremely complex and we do not have an exhaustive knowledge on the roots and the early development of aggressive behavior. Thus, assuming that it is possible to reduce aggressive behavior to a zero level might be far from realistic. Instead we should acknowledge, that aggressive behaviors will always find a way to manifest themselves and that both prevention and intervention efforts are needed in order to try to confine the problem at its very beginning and to find ways to address it appropriately when it is encountered.

From a statistical point of view, the model in this study showed, that it is important to model the longitudinal development using modern methods of the analysis of change. These models allow us to test hypotheses on the characteristics of the development instead of just associations between single assessments over time (such as the cross-lagged model).

**Research question 4: Which interpersonal and intrapersonal characteristics can be considered to be risk factors for future involvement in cyberbullying as a bully?**

Our results suggest that the strongest longitudinal risk factors for becoming a cyberbully are being a traditional bully, showing rule-breaking behaviors, and frequent online communication. These results are consistent with results from previous research (Brunstein Klomek et al., 2010; Erdur-Baker, 2010; Gradinger et al., 2009; Hinduja & Patchin, 2008; Juvonen & Gross, 2008; Kowalski et al., 2012; Raskauskas & Stoltz, 2007; Smith & Slonje, 2010; Smith, 2011a; Twyman et al., 2010; Vandebosch & Van Cleemput, 2009; Ybarra & Mitchell, 2004) and show that cyberbullying is strongly linked to other forms of real world antisocial and aggressive behaviors. Accordingly, these different forms of aggressive and antisocial behavior need to be taken into account when examining the role of other potential risk factors. Regarding the role of frequency of online communication, it is important to note that this might be partly confounded with the pattern of online communication (i.e., risky online behaviors) rather than the frequency itself (Mesch, 2009; Twyman et al., 2010). Taken together, these results suggest that adolescents who both bully others in real world and frequently use electronic forms of contact are those with the highest risk of getting involved in cyberbullying as a bully. These results have strong implications for prevention. First, combating traditional forms of bullying might also reduce cyberbullying. Second, the way youth are expected to interact with each other online (netiquette) needs to be integrated in bullying prevention, too.
Other potential risk factors such as victimization experiences, gender, moral aspects, and self-esteem were not found to be associated with the odds of becoming a cyberbully once traditional bullying and frequency of online communication were taken into account. This might seem to be in contrast with previous results (Law et al., 2012; Patchin & Hinduja, 2010; Pornari & Wood, 2010), but it might be that these characteristics are more strongly associated with traditional forms of bullying and that they have lost their relevance once traditional bullying was accounted for. Therefore, these characteristics maintain a relevant role in both traditional and cyberbullying prevention and intervention.

Besides the importance of considering multiple risk factors together and to take the overlap with other forms of aggressive behavior into account, the present results also highlight the importance of examining longitudinal associations (Anstey & Hofer, 2004). Many cross sectional correlations were not found to be relevant anymore once the full model was analyzed. Future studies should also consider exploring potential risk factors for cyberbullying that have not yet been studied, such as intelligence and personality. Further, it would be interesting to replicate the findings of this study using data from all four waves and using more sophisticated modeling techniques that allow us to test more specific longitudinal and bidirectional hypotheses (see study 3).

Research question 5: Is cyberbullying a conceptually new form of aggressive behavior or is it more of a well-known form of aggressive behavior, namely traditional bullying?

Results from the four studies presented in this thesis support the hypothesis that cyberbullying has more communalities with, than differences to traditional bullying. In study 1, we found that the medium does not play a prominent role for the perception of the severity. In study 2, both traditional and cyberbullying were found to be associated with depressive symptoms. In study 3 we demonstrated that traditional bullying and cyberbullying can be modeled as indicators of the same latent construct and that this construct shows measurement invariance over time. Further, we found that moral deficits predict the development of overall bullying. Finally, in study 4, we showed that the strongest risk factor for becoming a cyberbully is being a traditional bully and displaying other forms of antisocial behavior. Results from different countries also suggest that cyberbullying can be seen as an additional form of bullying behavior instead of as a completely different one (Gradinger et al., 2009; Olweus, 2012; Raskauskas & Stoltz, 2007). There are many points that support this assumption. First, there is a strong theoretical overlap between the two forms of bullying, and research on cyberbully-
ing has mainly been performed within the context of traditional bullying (Smith et al., 2008; Tokunaga, 2010). Second, almost all studies found that the two forms of bullying are correlated, as are the two forms of victimization (Juvonen & Gross, 2008; Olweus, 2012; Wang et al., 2012). Third, the risk factors for the two forms of bullying are similar. The same is true for the two forms of victimization. Fourth, many cyberbullying episodes originate from dynamics that started at school (Olweus, 2012). Fifth, traditional bullying prevention was found to reduce cyberbullying (Salmivalli et al., 2011) and also a number of other problem behaviors (Olweus, 1991). Sixth, the new media do not seem to have created many new bullies or victims (Olweus, 2012). Therefore, we might conclude that cyberbullying is an electronic reflection of real world dynamics.

The similarity between the two forms of bullying has important implications for prevention and intervention. Most importantly, the overlap of risk factors for involvement in the two forms of bullying suggests that existing prevention efforts aimed at reducing school bullying and/or other forms of aggressive and antisocial behavior can be expected to tackle cyberbullying, too. Therefore, instead of implementing new prevention programs, it is important to include some new elements (e.g., media competences, netiquette, information on cyberbullying and online risks) in an integrative whole-school antibullying prevention program that starts as early as possible and is characterized by a certain degree of intensity and duration (Monks, 2011; Salmivalli et al., 2011; Slonje, Smith, & Frisén, 2013).

4.3 Strengths and limitations

The netTEEN study was one of the first studies to examine the phenomenon of cyberbullying in a large sample of Swiss adolescents using a longitudinal design with four assessments. These characteristics allowed us to provide information on the prevalence of traditional bullying and victimization and of cyberbullying and cybervictimization. Moreover, we were able to address our research questions from a longitudinal perspective, which yielded results that are closer to causality than cross-sectional results. Another strength of this thesis was the inclusion of a theoretical element, namely the comparison of the perceived severity of hypothetical bullying scenarios (study 1). This was one of the first attempts to compare different forms of bullying and yielded an interesting instrument for doing so (the ranking tool). Last but not least, a number of new scales were developed in the context of the netTEEN study, namely a scale on moral justifications (Perren at al., 2012) and a scale on coping with cyberbullying (Machmutow et al. 2012; Machmutow & Perren, 2011).
The present thesis is not without limitations. First, the sample cannot be considered as representative for the population of Swiss adolescents, since only three cantons were examined. Second, the time period examined was of only 18 months. It would be interesting to collect data on longer time periods in order to examine the development of traditional and cyberbullying during the whole adolescence. Finally, some of the scales used for the present thesis are still undergoing validation and, therefore, results need to be interpreted with caution.

4.4 Conclusion and outlook

The main aim of the present thesis was to explore similarities and differences between the well-known problem of traditional bullying and its modern version: cyberbullying. We compared the definition, the prevalence, risk factors and consequences, and possibilities for prevention as well. The picture that we obtained was the picture of a problem behavior that looks quite different at first glance (Patchin & Hinduja, 2006; Pyzalski, 2011; Runions, 2013; Slonje & Smith, 2008) and that is proposed by the media as a very prevalent and much more serious problem that what was known before it. However, our and other international results suggest that the two forms of behavior are more similar than not (Gradinger et al., 2009; Olweus, 2012; Raskauskas & Stoltz, 2007) that the prevalence of cyberbullying is significantly lower than the prevalence of other forms of bullying (Olweus, 2012), and that the severity is not bound to the medium (Swartz, 2009). To date, it is widely recognized that cyberbullying needs to be investigated in the context of traditional bullying in order to obtain a complete picture of bullying in a given setting. Likewise, it is recognized that prevention always needs to take into account both forms of bullying, since both are to be taken seriously and can result in serious consequences for all involved individuals.

Research on cyberbullying has begun about decade ago and has rapidly developed during the last few years. Tokunaga (2010) described the research on cyberbullying as being characterized by unresolved definitional and measurement problems, by a weak theoretical background, by an over-reliance on cross-sectional data, and by simplistic relationships. During the last few years, first longitudinal studies and respective results, and first theoretical concepts have been published (Hemphill et al., 2012; Lester et al., 2012; Runions, 2013; Schultze-Krumbholz, Jäkel, Schultze, & Scheithauer, 2012; Wright & Li, 2012; Yang et al., 2013). During the next years we can expect another wave of cyberbullying research including longitudinal studies, intervention studies, and theoretical considerations. One ingredient that would be of great value for cyberbullying research is a high-quality measurement tool for cyberbullying and cybervictimization that is accepted and widely used in the community of
cyberbullying researchers. This would allow for international comparisons and for a better evaluation of prevention and intervention efforts. This might in turn reduce bullying and cyberbullying and would, therefore, be a great benefit for all children, adolescents, and adults (in particular parents and teachers) all over the world.
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zation in immigrant youth in Finland. *Developmental Psychology, 47*(1), 248–258.


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Tutorat der Vorlesung Rechnergestützte Datenanalyse mit SPSS und R. Vorlesung für Bachelorstudenten der Universität Zürich gehalten im HS2012 von Dr. Christina Simone Werner.

Publications


Publications in preparation


Presentations and Posters

Presentations


Posters


**Organized Conferences**

8th conference on Applications of Social Network Analysis, 2011, Zurich, Switzerland.

9th conference on Applications of Social Network Analysis, 2012, Zurich, Switzerland.

10th conference on Applications of Social Network Analysis, 2013, Zurich, Switzerland.

**Ad-hoc-Reviewer**


**Honors**