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Cyberbullying in Germany – an exploration of prevalence, overlapping with real life bullying and coping strategies

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Abstract

A new phenomenon of violence among pupils has been spreading over Europe in the last few years: Cyberbullying, the repeated and intended hurting of weaker schoolmates via modern communication technologies.

This study shows (based on a sample of 1987 pupils), that cyberbullying exists in Germany, although the number of incidents is still rather small. It could also be shown, that the pupils who act as cyberbullies are the same as those who bully others in real life. The same overlap was found to be true for the victims. Cyberbullying can therefore be considered a subcategory of ordinary bullying instead of being considered a whole new phenomenon. The exploration of coping strategies showed, that a common factor structure underlies physical, verbal and cyberbullying. Considering the fact that the findings of the study are based on an online questionnaire with restricted representativeness, the results should however be interpreted carefully.

Key words: bullying; cyberbullying; coping strategies

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Introduction

Research on school bullying and violence has a tradition of about thirty years (Smith & Brain, 2000). Since Olweus' groundbreaking work in the 80ies (Olweus, 1993), a lot of knowledge has been gained about development, forms, gender and age differences, consequences and other features of bullying (Petermann, 2003).

- To distinguish bullying from other acts of aggression and violence, four key criteria have to be fulfilled:
- There has to be the *intention to hurt* the victim in any kind of physical, psychological or social aspect.
- The aspect of *repetition*: We only speak of bullying, when those hurtful actions happen repeatedly and over a longer period of time.
- There has to be an *imbalance of power*, meaning that the bully is physically, mentally or socially stronger than the victim. This causes the victims to be (or at least feel) unable to defend themselves.
- A consequence of this is a form of helplessness of the victim, who feels defenceless and doesn't see or even try to find a way to escape the situation (Olweus, 1993; Smith & Brain, 2000).

Traditionally, bullying involves such acts as harassing someone verbally, physical bullying (beating, punching, kicking etc.), teasing, excluding someone from social activities, and threats of harm (Seals & Young, 2004). Usually, those actions are polled on three different scales, one for physical, one for verbal and one for relational bullying (Olweus, 1993; Petermann, 2003). Little et al. (2003) go a step further and distinguish between two dimensions: the “whats” (overt and relational aggression) in contrast to the “whys” (instrumental and reactive aggression).

However, for some years a new type of bullying has been spreading over wide parts of Europe, and has also been reported in the United States (for a discussion of this phenomenon see Ortega, Mora-Merchán & Jäger, 2007). As the internet and other new media have begun to play an increasingly important role in children's and adolescents' everyday life, information and communication technologies are also abused as an instrument for bullying and harassing others. In this case we speak of cyberbullying. The exact definition of cyberbullying is (according to Smith et al., 2008) “negative or hurtful repetitive behaviour, by the means of electronic communication tools, which involve an imbalance of power with the less-powerful person or group being unfairly attacked”(p.1).

Of course, there are several subtypes of cyberbullying. Because cyberbullying is a rather new phenomenon, a consensus has not yet been reached on how to categorize it. Some authors (e.g. Smith, 2008) classify by type of medium, i.e. they distinguish between cyberbullying via SMS, via e-mail, via instant messaging and so on. However, considering the increasing overlap between those technologies Ortega, Mora-Merchán and Jäger (2007) recommend the categorization by type of action, such as the taxonomy by Willard (2006). Willard defines eight subcategories of cyberbullying. Nevertheless, not all of them can really be considered cyberbullying if one keeps in mind, that bullying always demands the aspect of repetition. Willard herself acknowledges that fact by pointing out, that some of the phenomena she lists should rather be called “online social cruelty”. The strict definition of cyberbullying only applies to four of Willard's subtypes (see also Riebel, 2008).

- *Harassment* can be defined as repetitiously sending insulting or threatening messages to another person by e-mail, SMS, instant messaging or in chatrooms.
- *Denigration* is the spreading of rumours via electronic communication devices. Unlike with gossip in real life, by means of the internet, information can be sent to thousands of people within seconds.
- *Outing & trickery* is similar: a message revealing personal information, which the victim sent to someone in confidence, is forwarded to other people in order to compromise the victim.
- *Exclusion* is equivalent to exclusion in real life and means withholding the opportunity of taking part in social activities. In an online context this could be excluding someone from multiplayer games, chats, or platforms.

One might argue that denigration as well as outing and trickery are not to be considered as bullying if such incidents happen only once. Still, it should be kept in mind, that such actions include the aspect of repetition per se. Whenever a further classmate receives the hurtful message, the victim is ridiculed anew (Ortega et al., 2007).

Some research has been conducted on cyberbullying so far, including Li (2006), Beran and Li (2005) as well as Kowalski et al. (2005) and Patchin and Hinduja (2006) in the United States; Slonje and Smith (2008) in Sweden and Smith et al. (2008) in the United Kingdom. Up to now, research in Germany and German-speaking countries such as Austria and Switzerland have been limited to one single study (see below).

Research questions

Research question A: prevalence of cyberbullying

It is hard to make a statement about the exact prevalence of cyberbullying: First, rates highly depend on the questionnaire and items that have been used. Second, studies on bullying are hardly ever really representative. Third, due to the fact that there is no fixed criterion to operationalize the aspect of repetition, it lies within the judgement of the author where to fix the cut-off point for when an aggressive act should be considered bullying. According to what has been discussed above, the aspect of repetition needs to be given when we speak of bullying. Still, it is up to the researcher to define, how many incidents need to be given in order to state that the aspect of repetition is being fulfilled.

However different the prevalences might be, those few studies that exist allow the conclusion that cyberbullying indeed is a problem in several countries, although it happens much more seldom than traditional bullying. We hardly know anything about the situation in Germany. Katzer and Fetchenhauer (2007) conducted an exploration of the situation in chatrooms, but cyberbullying in a broader sense includes many other aspects, which have so far not been researched in Germany. Therefore our main intention was to find out if cyberbullying exists in Germany and how often it occurs.

Research question B: overlapping with real life bullying

The crucial question about cyberbullying is, if it is just another new method in the repertoire of bullies or if it is a completely different phenomenon. Why is this question important?

Let's assume cyberbullying has nothing in common with traditional bullying that goes beyond the common components of their definitions. If this was true, it would imply that bullies and victims have different characteristics, the causes and consequences would be different and as a result, new and different methods for prevention and intervention would be needed.

If, on the other hand, bullying and cyberbullying involved the same group of people (Beran and Li (2005) speak of "old wine in new bottles"), the arising consequences would be quite different: It would not be necessary to go back to the drawing board in order to explore the features of cyberbullying. On the contrary, one could use the excellent knowledge that has been gained about traditional bullying and transfer it to cyberbullying. So, particularly with regard to further research, we have to find out if the "old wine in new bottles" hypothesis can be empirically confirmed, or not.

The data of Beran and Li (2005), Kowalski and Limber (2008) and Ybarra and Mitchell (2004) seem to confirm this hypothesis. Ybarra and Mitchell (2004) found out in a telephone study – representative for the American student population – that 49% of online aggressors were aggressors in real life as well. There was an overlap of 44% between victims in cyberspace and real life victims. However, this study focused on "online aggression" and not specifically on cyberbullying. So it is questionable, if the results can be transferred to the problem of cyberbullying.

Beran and Li (2005) and Kowalski and Limber (2008) asked about cyberbullying and found an overlap of around 60% between being a victim in real life and being a cybervictim. Still, if 60% of cybervictims are also bullied in real life, that leaves an amount of 40% who are not victimized in real life. Therefore, we can still not be quite sure if cyberbullying is really just another form of traditional bullying.

Research question C: coping strategies

Apart from those aspects that describe cyberbullying itself, we also have to take a look at the question of how pupils react once they have become victims of cyberbullying.

We know from traditional bullying, that victims often feel angry, sad or hurt after an incident of bullying (Seals & Young, 2004). Similar feelings seem to occur in victims of cyberbullying: according to Patchin and Hinduja (2006), many victims of cyberbullying feel frustrated, sad or angry.

However, the mere feelings victims have do not tell us what they actually do after having been bullied. How do they react? How do they try to cope with their negative emotions?

There are some studies concerning coping strategies that victims of bullying use in general or when confronted with bullying (Andreou, 2001; Bijttebier & Vertommen, 1998; Hunter & Boyle, 2004; Olafsen & Viemerö, 2000; Sharp, 1995; Wilton, Craig & Pepler, 2000). Andreou (2001) for example reported that those who bullied and have been victims before showed the lowest score for problem-solving. Only victims of bullying showed lowest scores on externalising, whereas only victims and victims who bully have higher internaliza-

tion scores. Also, there is knowledge about general coping strategies (Fischer, 2006; Moos, 1993; Wills & Hirky, 1996), which can be used to get a few first clues about coping in the context of bullying and cyberbullying. On the one hand, problem-focused, cognitive and social (searching for and using social support) coping can all be classified as approach coping, because they all call for an active effort for the coping process and focus on a direct solution to the problem. On the other hand, there is avoidance coping, which includes reactions like distraction, running away, daydreaming and mostly emotional uploading (e.g. crying, aggression against other persons, objects or oneself). This is equivalent to the concept of Lazarus and Folkman (1984), who differentiate between emotion-focused and problem-focused coping. When it comes to coping strategies of pupils, Seiffge-Krenke (Seiffge-Krenke, 1989; Seiffge-Krenke & Shulman, 1990) empirically identified the following general coping strategies: active coping (including usage of social support) avoidance coping and internal (cognitive) coping. We expect a more or less similar structure for coping strategies regarding bullying and cyberbullying.

We also know, that rather few students report bullying to their teachers or parents (Bosworth, Espelage, & Simon, 1999). Once again, the same seems to be true for cyberbullying (Riebel, 2008). Although only a small percentage of students tries to get help from adults, this is one possible coping strategy. One aim of this study was to find other kinds of coping strategies and try to find out if those were the same in bullying and cyberbullying.

Hypotheses

Corresponding to the three research questions outlined above, we can formulate the three following hypotheses;

- A) Although the data can hardly be considered representative, it can still be used as a rough first estimate for the prevalence of cyberbullying in Germany. We expect the prevalence in Germany (π_G) to differ significantly from zero.
- B) If the hypotheses “old wine in new bottles” is true, then we have to assume, that persons who bully in cyberspace are the same as those who bully in real life. The same is true for the victims. Therefore we expect a ϕ -correlation of at least .5 between being a cyberbully and being a real life bully (ϕ_b), and between being a cybervictim and a real life victim (ϕ_v). A correlation of .5 or more could be considered a strong effect. A criterion as strict as this is necessary if we want to make sure, that not only a few persons act as bullies as well as cyberbullies, but that this is true for the majority of people (the same applies for victims and cybervictims).
- C) The question of how students react to cyberbullying and if the reactions can be compared to those of traditional bullying (physical and verbal) will be analysed in an explorative manner. However, we expect similar factors for different kinds of bullying. This means a restrictive testing of an equivalent confirmatory structure for physical, verbal and cyberbullying.

Method

The sample consisted of $N = 1987$ German pupils, of which 64.3% were female, 35.7% male. The age ranged from 6 to 19 years, the mean age was 13 years ($SD = 2$).

The online-questionnaire used to assess the situation of bullying and cyberbullying enclosed several parts:

- A general part asked about how often pupils had been bullied or cyberbullied and how often they had bullied or cyberbullied others in the course of the last two months. The answers were captured on a 5-point-Likert-scale ranging from 1=never to 5=several times per week.

Later, the scale was divided into just two categories: being bullied/cyberbullied vs. not being bullied/cyberbullied. As mentioned above, there are no explicit rules, where to cut off between bullying and no bullying. In order to fulfil the criteria that define bullying, the authors however find it crucial to use a rather strict criterion. In this study, someone was only classified as a victim/cybervictim if at least one incident per week had occurred. Of course there is no point in denying that it might be interesting how many people are subject to a few incidents only (as in the approach of Kowalski & Limber, 2008), but in this case we cannot speak of cyberbullying.

- In the following parts, pupils answered scales measuring physical, verbal and relational bullying in detail, asking about several concrete incidents of bullying in detail. Those were German adaptations of the Olweus-Questionnaire (Olweus & Smith, 1995). These answers were also captured on a 5-point-Likert-scale.
- As there is no established instrument for the assessment of cyberbullying, a new questionnaire was created. Its quality still has to be evaluated. The questionnaire is based on the taxonomy by Willard (2006) and contains one item each for harassment (“How often did it occur during the past two months, that someone sent you threatening, insulting or other discomforting messages in the internet or on your cell phone?”), denigration (“[...] that someone spread rumours or insults about you throughout the internet or on other peoples’ cell phones?”), outing & trickery (“[...] that someone passed on private e-mails, chat messages or pictures of you, in order to expose you?”) and exclusion (“[...] that your classmates excluded you from chats or online games?”), also captured on a 5-point-Likert-scale.
- One 4-point-Likert scale for each physical, verbal and cyberbullying asked about how pupils react to incidents of bullying. The items for physical and verbal bullying were identical and came from the questionnaire once developed for the LAPSuS project (Jäger & Jäger, 1996). However, the scale for cyberbullying contained only partly the same items. Items about actions that are impossible or unlikely in cyberspace were exchanged for coping strategies that are specific for cyberbullying (Willard, 2006).
- A sociodemographic part asked about a few pieces of personal information such as age, sex, school grade and use of information and communication technologies.

In cooperation with the childrens network www.seitenstark.de, the online questionnaire was advertised widely over the internet and in a German newsmagazine for parents, teachers and pupils (Focus Schule). The survey was accessible from February to August 2007.

As there is hardly any control in online surveys over who fills out a questionnaire, several measures were taken in order to cleanse the data. Data sets in which only the first page

had been filled out were deleted from the sample. Also, respondents were deleted who had finished the questionnaire in less than 150 seconds or filled out less than six items. In a second step, cases were deleted in which the subjects gave questionable answers with destructive and sexual content to almost every open question and in a third step, the data was checked for several illogic answers (e.g. a difference greater than 3 years between age and the usual school grade for that age). The cases containing such illogic answers were also deleted.

All in all, 50 cases had to be excluded from further analyses based on those criteria; this corresponds to 2.5% of the data.

The remaining data were analysed using SPSS (version 14), STATISTICA (version 8) and Mplus (version 4.1).

Results

The results of the study are presented along the different research questions:

Research question A: prevalence of cyberbullying

$$H_0: \pi_G = 0$$

$$H_1: \pi_G \neq 0$$

Cyberbullying does indeed exist in Germany: 5.4% of pupils in the sample reported being victimised once a week or even more often. This is a rather small percentage. However, table 1 shows, that 14.1% of students also experience the kinds of incidents (harassment, denigration, outing & trickery and exclusion) that constitute cyberbullying, although those acts do not happen quite often enough to speak of cyberbullying in itself.

The percentage of 5.4% was tested against zero with the statistical test for the difference between percentages in STATISTICA. The results show, that the prevalence of cyberbullying differs significantly ($p < .001$) from zero and therefore we can reject the H_0 for hypothesis A.

Table 1:
Prevalence of cyberbullying and incidents of Online Social Cruelty

	Frequency	Percentage
No Incidents	1599	80.5
Occasional Incidents	280	14.1
Cyberbullying	108	5.4

N = 1987

Research question B: overlapping with real life bullying

$H_0: \varphi_b < .5$ and $\varphi_v < .5$

$H_1: \varphi_b \geq .5$ and $\varphi_v \geq .5$

Is cyberbullying a completely new phenomenon or is it just “old wine in new bottles”? One way to get an idea is crosstabulating the data. Crosstabulating bullying and cyberbullying from the bullies’ perspective produces the following results (s. Table 2).

Even at first glance, one can see that there clearly is a correlation between bullying in real life and in cyberspace. Only 3.96% of pupils in the overall sample reported being cyberbullies. However, in the subgroup of real life bullies, the amount of cyberbullies rises to 45%. What we can also read from the crosstable is, that out of 77 cyberbullies 63 also report being bullies in real life. This is equal to a proportion of 81.81%.

The χ^2 -value with $\chi^2(1, N=1946) = 668.683, p < .001$ clearly reflects that. Transforming the χ^2 -value into a φ -coefficient yields a significant correlation of $\varphi_b = .586, p < .001$. For the bullies’ perspective, the H_0 can be rejected.

With respect to the marginal distribution it must be seen that the φ -coefficient has to be qualified in that way, that there is no doubt of its significance on the basis of its value.

What about the victims? The crosstable for victims and cybervictims looks slightly different (s. Table 3).

In the overall sample, 5.5% of pupils claim to be victims of cyberbullying. Among the real life victims, the amount is 18.29%. This also indicates a rather high correlation, but it does not seem to be as strong as the one concerning the bullies. The χ^2 -value is substantially lower, though still significant ($\chi^2(1, N=1962) = 206.454, p < .001$), the correlation $\varphi_v = .324, p < .001$ is also still significant, but is far from reaching the threshold for a strong effect. We can merely consider this a medium effect (Bortz & Döring, 2002)

Table 2:
Bullies and cyberbullies

	Bully No	Bully Yes	Total
Cyberbully No	1792	77	1869
Cyberbully Yes	14	63	77
Total	1806	140	1946*

* Discrepancy between total and sample size is due to missing data.

Table 3:
Victims and cybervictims

	Victim No	Victim Yes	Total
Cybervictim No	1452	402	1854
Cybervictim Yes	18	90	108
Total	1470	492	1962*

* Discrepancy between total and sample size is due to missing data.

Formally, from the perspective of victims, H_0 has to be maintained, because the correlation does not exceed a value of .50. Nevertheless we should keep in mind that there is still a substantial overlap between being a victim and a cybervictim: 90 out of 108 (i.e. 83.33%) cybervictims are also victims in real life.

Research question C: coping strategies

How do pupils react to and cope with different types of bullying? The items on the scales for physical, verbal and cyberbullying were analysed for common factors via an exploratory factor analysis.

In order to do this, the sample was split in half. The exploratory factor analysis was conducted on the first half of the sample. As the items are distributed with skewness, the exploratory factor analysis was realized by using the software Mplus, where items were specified as categorical. A solution with four factors fitted the data best according to Kaiser's criterion. For both physical and verbal bullying, the same four factors resulted:

The first factor included the items "I get help (friends, older siblings).", "I address the supervisor at school." and "I address my form teacher or another teacher." All those items contain the aspect of introducing third parties and using social resources. Therefore, it was named *social coping*.

A second factor, aggressive coping, contained the items "I insult him/her.", "I threaten to beat him/her up." and "I physically hurt him/her."

The third factor, with the items "I don't know what to do.", "I start crying." and "I run away." was called *helpless coping*, because all three items include an aspect of helplessness. Due to a lack of active coping strategies, it reflects a more passive, emotion-focused avoidance reaction.

The items "I beg him/her to stop.", "I wonder why he/she does that." and "I resolutely ask him/her to stop." make up the fourth factor. The description of this factor is a little bit more difficult to capture. What all three items have in common, is the fact that they all include an assertive component. Instead of getting help from stronger people like teachers or siblings or getting aggressive, the victims try to deal with the problem themselves by using a diplomatic approach. They try to reason with the bully or at least they try to analyze, what could have been the motive behind the bully's behaviour. Therefore, this factor is called *cognitive coping*.

The exploratory factor analysis for physical and verbal bullying both resulted in the same solutions with the four factors described above and the same items as indicators. The exploratory factor analysis for cyberbullying also produced the factors *aggressive coping* (with the items "I insult him/her", "I threaten to beat him/her up." and "I bully him/her."), *Helpless Coping* (consisting of "I don't know what to do." and "I start crying.") and *cognitive coping* (with the identical indicators as those for the accordant factor in physical and verbal bullying). However, instead of a *social coping* factor, there resulted a factor called *technical coping*. The corresponding items are "I switch off my computer.", "I change my e-mail address or my nickname and only give them to people I can trust." as well as "I show the messages to a grown-up."

Of course, this does not reflect the existence of different coping strategies, but is simply a result of the construction of the questionnaire, where the "social" items were excluded a priori.

On the basis of the exploratory factor analysis, we got a first rough idea about the structure of coping strategies. But does this model really fit the data?

In order to answer this question, confirmatory factor analyses by Mplus were conducted on the second half of the sample. Due to the skewed distribution of the data at hand, a WLS estimator was chosen, because it does not require a normal distribution of the data (Schermelleh-Engel, Moosbrugger, & Müller, 2003).

In order to evaluate the model fit, three criteria were consulted:

- the *Root Mean Square Error of Approximation* (RMSEA), which should be $<.08$ for an adequate and $<.05$ for a good fit,
- the *Comparative Fit Index* (CFI), which indicates acceptable fit if $>.90$ and good fit if $>.95$
- the Tucker-Lewis-Index (TLI), which should be $>.95$ for an acceptable fit and $>.97$ for a good fit (Heck, 1998; Schermelleh-Engel et al., 2003).
- χ^2 values and degrees of freedom are also reported, even though due to the fact that the χ^2 test is susceptible to sample size as well as to violations to assumptions of normal distributions, it should better not be interpreted in order to evaluate model fit.

The evaluation of model fit for all three physical, verbal and cyberbullying was not satisfactory. Table 4 gives an overview of the fit indices for the three models.

As only in the case of cyberbullying, CFI and TLI indicate an acceptable fit, but the indices for the other types indicate a bad fit, the model has to be rejected.

However, a look beyond the surface reveals the reasons for the bad model fit. For example, in the case of physical bullying, there are peculiarities concerning three variables:

- For the items 03 and 10, the model only explains 14% and 13% of the variance in the variable. Modification indices clearly state that both variables should be allowed to load on a second factor.
- For item 09, too, modification indices suggest an additional loading on a second factor. Table 5 shows the results of the confirmatory factor analysis, when double determinations are allowed. The model now explains 45% and 32% of the variance in the items 03 and 10.
- Item 02 also has a rather high side loading on another factor. After the modification, the fit indices are substantially better (see Table 5), the factor loadings are shown in Table 6.

If the theory is true, that a common factor structure lies behind physical and verbal bullying, allowing double loadings for the same items as in physical bullying should result in an improvement of the model and significant factor loadings for verbal bullying (Table 7). The summary in Table 5 shows, that this strategy is really successful.

Table 4:
Fit Indices for the first solution

	RMSEA	CFI	TLI	Chi ²	df
Physical bullying	.158	.894	.902	2987	23
Verbal bullying	.170	.871	.910	3353	18
Cyberbullying	.109	.923	.955	151	24

Table 5:
Fit Indices for the second solution

	RMSEA	CFI	TLI	Chi ²	df
Physical bullying	.074	.975	.979	101	27
Verbal bullying	.084	.968	.978	3353	18
Cyberbullying	.081	.960	.975	89	23

Table 6:
CFA for physical bullying

Item	SOCI	AGGR	HELP	COGN
10: I get help (friends, older siblings).	.526	.351		
11: I address the supervisor at school.	.952			
12: I address my form teacher or another teacher.	.921			
04: I insult him/her.		.779		
05: I threaten to beat him/her up.		.937		
06: I physically hurt him/her.		.872		
13: I don't know what to do.			.779	
14: I start crying.			.856	
09: I run away.	.403		.597	
01: I beg him/her to stop.				.835
02: I wonder why he/she does that.			.237	.651
03: I resolutely ask him/her to stop.		.407		.695

Table 7:
CFA for verbal bullying

Item	SOCI	AGGR	HELP	COGN
10: I get help (friends, older siblings).	.573	.398		
11: I address the supervisor at school.	.930			
12: I address my form teacher or another teacher.	.965			
04: I insult him/her.		.772		
05: I threaten to beat him/her up.		.964		
06: I physically hurt him/her.		.877		
13: I don't know what to do.			.784	
14: I start crying.			.919	
09: I run away.	.350		.587	
01: I beg him/her to stop.				.932
02: I wonder why he/she does that.			.348	.638
03: I resolutely ask him/her to stop.		.353		.672

Only one of the problematic variables of physical and verbal bullying, item 03, was part of the questionnaire for reactions to cyberbullying. An additional loading was allowed, which led to a slight improvement of model fit (see Table 5), the factor loadings can be read from Table 8.

After these modifications all three models have substantially improved and now show acceptable or even good fit. Apart from the few discrepancies, the factors underlying physical, verbal and cyberbullying are basically the same.

One might of course argue that an a posteriori modification of the model should not be done based on the modification indices.

However, the authors see that there exists theoretical assistance in those modifications which were actually made:

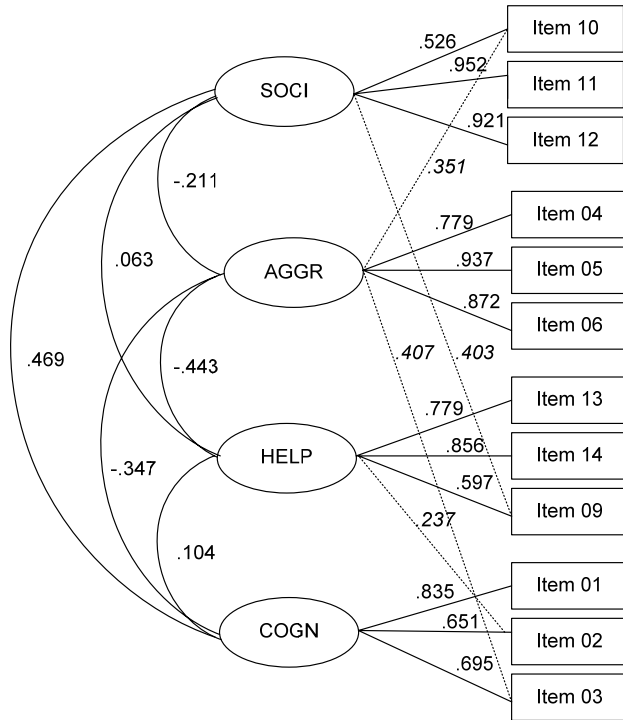
- The item “I get help.” (10) can implicate an aggressive component, if the friends or siblings are used to form a coalition in order to bully back.
- The item “I run away.” (09) can imply helplessness. It can also have a social component if the victim chooses to leave the conflict in order to come back with a mediator or supervisor.
- The item “I resolutely ask him/her to stop.” (03) can also have an aggressive component, for example when it has the touch of a threat.
- The item “I wonder/why he or she does that.” (02) shows a connection to helplessness, beside the cognitive/assertive part. Probably this is the case, if a victim doesn’t wonder in the sense of analyzing the bully’s behaviour, but simply keeps ruminating over the incident.

Figure 1 shows the measurement model for reactions to physical bullying (the other reactions are not portrayed separately, because of the apparent redundancy between the several forms) and the intercorrelations between the four factors.

Table 8:
CFA for cyberbullying

Item	TECH	AGGR	HELP	COGN
c08: I switch off my computer.	.763			
c09: I change my e-mail address or my nickname and only give them to people I can trust.	.828			
c10: I show the messages to a grown-up.	.746			
04: I insult him/her.		.915		
05: I threaten to beat him/her up.		.871		
c11: I bully him/her.		.863		
12: I don’t know what to do.			.892	
13: I start crying.			.891	
01: I beg him/her to stop.				.934
02: I wonder why he/she does that.				.865
03: I resolutely ask him/her to stop.		.323		.812

Figure 1:
Measurement model and correlations between the factors (physical bullying)



Discussion

Like in many other countries, cyberbullying is a problem in Germany. Even if only around five percent of pupils are affected, the problem cannot be ignored. Based on the assumption that a percentage of around five percent is an adequate description of the situation, this would imply that over 600.000 German boys and girls were cybervictims (based on the amount of 12,3 million German pupils in the year 2005). Such a big number clearly justifies the need to fight cyberbullying, especially considering how much the victims have to suffer (Patchin & Hinduja, 2006; Ybarra, 2004)

The question of cyberbullying being “old wine in new bottles” is of great importance. The data from this study suggest, that the hypothesis can be partly confirmed: More than 80% of cyberbullies also bully their fellow students in real life. In most cases, it seems that cyberbullying indeed is another strategy in the repertoire of the typical bully.

Even though the overlap is a little smaller on the victims’ side, the bottom line is: A large majority of the pupils that are involved in cybulying, be it in the function of bully or in the function of victim, play the same role in real life. This fact has immediate consequences for prevention and intervention. It means that we can basically use the same methods: If we

successfully stop a person from bullying in real life, chances are good that he or she will also refrain from bullying in cyberspace. For example using a modular course such as the VISTA approach by Cowie, Jennifer, Chankova, Poshtova, Deklerck, Deboutte, Ertesvåg and Samuelsen (2007) could be used in order to realize this. An additional module that specializes on cyberbullying could be created in order to reach those, who are cyberbullies or cybervictims, but do not play the corresponding roles in real life. It could also be used in order to inform pupils about the special features of cyberbullying and how to prevent it from happening. For adults the solution seems trivial: If you don't want to be cyberbullied, simply switch off your computer. But it is not as easy for children and adolescents: Information and communication technologies play an increasingly important role in their social life. Simply refraining from using them is not an option for most of them (Subrahanyam, Greenfield, Kraut, & Gross, 2001; Willard, 2006). Although there is no scientific evaluation of guidelines for protecting oneself from cyberbullying, there already exist many practical approaches, mostly listed under the keyword "cybersafety" (See for example the works of the Internet Safety Group in New Zealand, e.g. Internet Safety Group New Zealand, 2002).

The examination of coping strategies shows more similarities between bullying and cyberbullying. Three of the four scales are almost identical. Although some adjustments of the model had to be made, the evaluation of the model fit yields that a four factor solution fits the data very well. We can conclude from this data, that there do indeed exist several different kinds of coping: social (and for cyberbullying technical coping), aggressive, cognitive and helpless coping. The fact that coping strategies do not substantially differ between physical, verbal and cyberbullying, validates the model further.

The structures as well as the categories concerning bullying, which we found, do not differ a lot from the general coping strategies found in other studies. The active coping using social support in our study focuses more on social support than the corresponding factor identified by Seiffge-Krenke (1989). This might be due to imbalance of power, a special trait of bullying, which calls for social support in order to cope adequately. Hunter, Boyle and Warden (2004) found that pupils who were victims used social support in bullying situations if they expect a positive outcome, aggression has been isolated as a separate factor. Usually, aggression is interpreted as a kind of emotion-focused coping. In the context of bullying, aggression against the initial aggressor can also be regarded as an attempt for active but insufficient coping. The factor "helpless coping" includes the cognitive reflection of helplessness and also the emotional / avoidant reaction to a situation that has been interpreted as hopeless. This factor has a high affinity to avoidance coping of other studies. In sum, the first explorative analysis of coping strategies with bullying shows a rational structure. Nevertheless, further studies have to consider more items with separation security and without double loadings in order to validate the structure more effectively. Further research is also needed to assess which of those coping strategies is most successful regarding two criteria: Which strategy is the best for reducing negative emotions in victims? And which strategy is the best in order to avoid further incidents of bullying?

Two major restrictions however have to be considered, when it comes to interpreting the results of this study.

The more crucial of those two points concerns research question A, the prevalence of cyberbullying. The data which these findings are based on cannot be considered representative, because it is hard to gain insight in who answers an online questionnaire. We hence cannot be perfectly sure about the exact amount of pupils who are victimised in cyberspace. The

estimate of around 5% should therefore only be considered a preliminary number. As for example according to Smith et al. (2008) in the UK, 6.6% of pupils are cyberbullied, the estimate seems to be rather appropriate at first glance.

A second confinement affects research question C. The question deals with how pupils react to bullying and cyberbullying. Of course we need to remember that quite large a number of pupils have never been bullied nor cyberbullied, so for them, questions about coping with such incidents remain hypothetical. Considering the fact, that only 3% of our subjects were bullied in cyberspace as well as in real life, we would have to ask over 6000 pupils in order to get a sample of 200 subjects who could be used for further analysis. As this is a rather uneconomical approach, we have to settle with the shortcomings of asking pupils, who are not actually victims to both kinds of aggression.

Putting those restrictions aside, what can we conclude from all those findings? Three important questions have been answered by this study: The first finding is, that even if we can't be a hundred percent sure of the exact prevalence, we are safe to state that cyberbullying does exist in Germany. As it is also known, that bullying has severe consequences for both bullies and victims (Petermann, 2003) it must be a prior task to protect children from this kind of harm. How can this be done if we know hardly anything about the phenomenon cyberbullying? The second result of this study gives the answer to that question: Until we have further explored cyberbullying with all its special features and their implications, we have to rely on the methods that have been developed in order to tackle traditional bullying. Due to the fact that firstly the involved persons are in many cases the same people and secondly bullying and cyberbullying both rest upon the same principles (intention to hurt, repetition, imbalance of power and helplessness), we can presume, that those methods should have a positive effect. However, interventions do not have to start from zero. Children and adolescents already have coping strategies. Those could be used as a base. As the third finding of this study suggests, the reactions towards bullying and cyberbullying are also roughly the same. So once again, as a starting point, it would probably be sufficient to teach pupils how to cope with bullying. However, before this can be realised, we first have to identify those strategies that are most successful. Strengthening of self-efficacy, understanding one's own feelings and cognitions in a situation of bullying could be taught as techniques to be used in order to reduce helplessness and the probability of inadequate reactions.

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