Comparison between face-to-face bullying and cyber-bullying amongst elementary school students and how they cope

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Abstract – English

Face-to-face bullying has been described as aggression from two or more students against a student repeatedly and over time (Olweus, 1996). The increasing availability of internet and an extensive technology development in cell phones has given adolescents a new way to bully. Cyber-bullying is a new form of bullying and can damage adolescents' social and emotional development (Raskauskas & Stoltz, 2007). The main focus of the current study was to examine the relationship between face-to-face bullying and cyber-bullying and whether cyber-bullying has a similar influence on adolescent feelings as face-to-face bullying. The present study used archival data, *Youth in Iceland 2011*. Participants were elementary students in Iceland. The sample size was 2,000 and there were 982 boys and 996 girls in the study (22 participants did not register their sex). The questionnaire was administered to students in all middle schools in Iceland. The hypothesis was that face-to-face bullying and cyber-bullying would have similar emotional impact on elementary school students. Results from multiple hierarchal regression models (controlling for gender, age, and family structure) revealed that face-to-face bullying and cyber-bullying were significantly related to bad feelings, feeling unsafe, quitting school and social isolation. These results indicate that face-to-face bullying and cyber-bullying might be risk factors for bad emotional impacts on elementary school students.

Key words: face-to-face bullying, cyber-bullying, emotional impact

Abstract – Icelandic

Hefðbundið einelti hefur verið skilgreint sem árásargirni frá tveimur eða fleiri nemendum gagnvart einum nemanda sem á sér stað ítrekað í langan tíma (Olweus, 1996). Tilkoma aukinnar netnotkunar og hröð tækniþróun í farsímum hefur opnað unglingum fleiri leiðir til þess að leggja einhvern í einelti. Einelti á netinu er ný útgáfa af einelti og getur skaðað félagslegan og tilfinningalegan þroska unglinga (Raskauskas & Stoltz, 2007). Tilgangur rannsóknarinnar var að rannsaka tengslin á milli hefðbundins eineltis og eineltis á netinu og kanna hvort einelti á netinu hafi svipuð tilfinningaleg áhrif og hefðbundið einelti. Í rannsókninni voru notuð fyrirliggjandi gögn, *Ungt fólk 2011*. Þátttakendur voru grunnskólanemendur á Íslandi. Úrtakið sem unnið var með í ritgerðinni var 2000 þátttakendur og voru 982 drengir og 996 stúlkur í rannsókninni (22 þátttakendur gáfu ekki upp kyn). Könnunin var lögð fyrir í öllum grunnskólum á Íslandi. Tilgátan var að hefðbundið einelti og einelti á netinu hafi svipuð tilfinningaleg áhrif á grunnskólanemendur. Niðurstöður margvíðrar aðhvarfsgreiningar (þar sem stýrt var fyrir kyni, aldri og fjölskyldumyntstri) leiddi í ljós að hefðbundið einelti og einelti á netinu spáði fyrir um slæma líðan, óöryggistilfinningu, brottfall úr skóla og félagslega einangrun. Niðurstöðurnar gefa til kynna að hefðbundið einelti og einelti á netinu gætu verið áhættuþættir sem orsaka slæma líðan nemenda í grunnskóla.

Lykilorð: hefðbundið einelti, einelti á netinu, tilfinningaleg áhrif

Comparison between face-to-face bullying and cyber-bullying amongst elementary school students and how they cope

Face-to-face bullying has been described as aggression from two or more individuals that repeatedly targets a person who cannot defend himself or herself (Olweus, 1996). This can be in the forms of intimidation, exclusion, harassment, or mistreatment and can be direct (physical or verbal) or indirect (threats, insults, etc.) (Ortega, Elipe, Mora-Merchán, Calmaestra, & Vega, 2009). Olweus (1996) mentions that aggression plays a big part in bullying and anger is associated with aggression and Sigfusdottir, Gudjonsson and Sigurdsson (2010) examined the relationship between bullying (bullies and victims) and non-violent delinquency (theft and burglary) and how anger played a mediating role. Their results showed that both bullying behavior and bully victimization increased the likelihood of delinquent behavior and that anger was a mediator for that kind of behavior. Aggression and bullying are different acts: aggression is a single act while bullying is a series of repeated acts; and victims of bullying are deprived of power (power imbalance) while aggression can be between individuals with the same amount of power (Dooley, Pyżalski, & Cross, 2009).

According to Rigby (2007) there are several main types of bullying and aggression and the most common forms are physical, verbal, and indirect or relational. Physical bullying or aggression includes hitting, kicking, punching, shoving, etc. (Raskauskas & Stoltz, 2007; Slonje & Smith, 2008). Verbal bullying or aggression involves insults, teasing, taunting, and name calling (Olweus, 1996; Raskauskas & Stoltz, 2007; Slonje & Smith, 2008). Both of these forms are direct or face-to-face bullying. Direct bullying is an attack on another individual but indirect bullying is more like excluding someone from a group (social isolation) (Aluede, Adeleke, Omoike, & Afen- Akpaida, 2008). Relational bullying or aggression involve damaging someone else's peer relationship or friendship with the purpose of damaging their self-esteem and/or social status by exclusion or the spreading of rumors (Slonje & Smith, 2008; Snakenborg, Van Acker, & Gable, 2011). The goal of a bully is to

cause physical, emotional, or psychological harm to another individual (Snakenborg et al., 2011).

In the school environment a lot of students who are victims of bullying avoid being in public areas of the school, such as the cafeteria and restrooms, to avoid being attacked by a bully (Aluede et al., 2008). This fear of being at school can become so intense that they avoid being at school altogether (Aluede et al., 2008; Chibbaro, 2007; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Mason, 2008). There are studies that have shown that impaired social interactions and escalation of child dysfunction can result in conflict and violence with family members which can lead to problematic relationships outside the home (Slomkowski, Rende, Conger, Simons, & Conger, 2001). In addition, studies have shown a relation between bullying behavior and bad parenting styles (e.g., no parental support) (Low & Espelage, 2013) whereas bullies are often the results of broken homes (Aluede et al., 2008). Studies have shown that bullies have more friends, are popular and have excellent social skills (Aluede et al., 2008). Students who are victims are lonely and are rejected by peers but if they are able to make friends they are more able to fight the bullies, as they are not alone anymore (Mouttapa, Valente, Gallaher, Rohrbach, & Unger, 2004).

According to Olweus (1996) and Aluede et al. (2008) boys are more likely to use overt bullying (physical attacks) and they bully both boys and girls, while girls are more likely to use covert bullying (e.g., spreading rumors) (Snakenborg et al., 2011). Covert bullying is one form of face-to-face bullying but has not been defined clearly in the literature (Spears, Slee, Owens, & Johnson, 2009). Covert bullying sometimes refers to "behind the scenes" behaviors which is another term for indirect, relational and social bullying (Archer & Coyne, 2005). Covert bullying can be related to cyber-bullying as both are indirect; with the arrival of the internet, covert bullying has in a way branched off into cyberspace as a form of cyber-bullying, which occurs "behind the screens" (Spears et al., 2009).

The increasing availability of Internet and an extensive technology development in cell phones has given individuals a new way to bully. Cyber-bullying is a threat to adolescents and their emotional development (Raskauskas & Stoltz, 2007). There are different definitions of cyber-bullying. Smith et al. (2008) defined cyber-bullying as an aggressive and intentional act where individuals or groups use electronic devises (cell phones and computers) repeatedly and over time to bully another individual who cannot defend himself or herself. Raskauskas and Stoltz (2007) define cyber-bullying as peers using electronics to taunt, insult, threaten, harass and/or intimidate a peer. Vandebosch and Van Cleemput (2008) define cyber-bullying as an individual or group who repeatedly sends or posts material about another peer or group that is commonly seen as cruel, threatening, embarrassing, harassing, frightening, or harmful. Cyber-bullying takes two forms: direct bullying and indirect bullying by proxy (Wong-Lo & Bullock, 2011). The direct form of cyber-bullying is when messages are sent by the bully to the victim but the indirect form is when the perpetrator gets others to bully the victim (Snakenborg et al., 2011).

A lot is similar in face-to-face bullying and cyber-bullying as both include intentional, repetitive, and power imbalance. Studies (Gradinger, Strohmeier, & Spiel, 2009; Ybarra & Mitchell, 2004) have shown that face-to-face bullying and cyber-bullying are related. Ybarra and Mitchell (2004) studied whether face-to-face bullying had a connection to Internet harassment. They used the data from the Youth Internet Safety Survey (Finkelhor, Mitchell, Wolak, 2000), where they found that physical abuse of a student by another student predicted the victim becoming a bully of Internet harassment the following year. Aggression online is for example insults and threatening language that is written online. These aggressors feel that they are stuck in some social expectations in a normal communication, but feel free when they talk online, where the abuser can be anonymous. Whereas bullying is an outburst towards an individual to whom the bully is known, online bullying may be directed at a victim who may

never know who their bully is (Ybarra & Mitchell, 2004). The results indicated a connection

between cyber-bullying and depressive symptoms. Students who experienced more

depression were more likely to have experienced being cyber-victims than those students with

fewer symptoms. They also found that being a face-to-face victim predicted significantly that

the victim would act in Internet harassment, becoming a cyber-bully. They found that students

who are face-to-face victims at school will become cyber-bullies and use the anonymity of

cyberspace to fight back against their bullies because it will give them a safe environment.

The emotional impact of face-to-face bullying and cyber-bullying can be very

devastating. Sometimes the victims defend themselves and by doing so cut off the

pathological relationship, dependence on the perpetrator is diminished and negative effects

may be minor (Ortega et al., 2009). However, if the victim is not able to defend himself or

herself over a long time, then the effects can become very negative and the effects on the

mental health can be very damaging (Aluede et al., 2008; Dyer & Teggart, 2007). Victims

always have some vulnerability that bullies utilize to their advantage. Victims are afraid on

account of being defenseless and often they respond with anger which promotes a stress

reaction (Ortega et al., 2009). According to Lazarus (2000) when stress is associated with

anger the victim either confronts the bully or avoids and flees. Some victims adapt better to

emotional impact of bullying which gives them better control of coping while other victims

have no control over it and it affects their well-being and has a great impact on their

environment and relation to others (Ortega et al., 2009). Research has shown that students

who are victims of bullying are at an increased risk for negative psychosocial outcomes and

studies about cyber-bullying have shown similar effects as face-to-face bullying (Raskauskas

& Stoltz, 2007).

The purpose of the present study is to compare face-to-face bullying and cyber-

bullying amongst elementary school students and see how they cope. There is one hypothesis

being examined by this study. The hypothesis was that face-to-face bullying and cyber-bullying would have a similar emotional impact on elementary school students

Method

Participants

The present study used archival data, *Youth in Iceland 2011*, from the Icelandic Centre for Social Research and Analysis (ICSRA) (Hrefna Pálsdóttir, Inga Dóra Sigfúsdóttir, Jón Sigfússon, and Álfgeir Logi Kristjánsson, 2011). The participants were a sample of 2,000 pupils from a population of 10,971 who enrolled in the 5th, 6th and 7th grade (nine to 13 years old students). There were 982 (49.1%) boys and 996 (49.8%) girls in the study (22 participants did not register their sex). Students received no payments or school credits for their participation.

Procedure

The questionnaire was administered to all middle schools in Iceland and the teachers administered the questionnaire to the students according to instructions from ISCRA (Hrefna Pálsdóttir et al., 2011). The instruction given to the teachers was to tell the students that they should not write down their names or their social security number. Also, if the students had any troubles answering the questionnaire they should not hesitate to ask for help (Hrefna Pálsdóttir et al., 2011). When the students finished answering the questionnaire they turned it in to their teachers in blank envelopes.

Measures

The questionnaire used in the study is described in detail by Hrefna Pálsdóttir et al. (2011). The Ministry of Culture and Education has supported the questionnaire, *Youth in Iceland* since 1992 and for the last 10 years ICSRA has been in charge in the process of developing the questionnaire (Hrefna Pálsdóttir et al., 2011). The questionnaire consists of 69 questions but the researcher used 14 questions (see Appendix A).

Three variables were used as control variables in the study, gender (1 = "males", 2 = "females"), age (grades: 1 = "5th grade", 2 = "6th grade", 3 = "7th grade"), and family structure (father: 0 = "not marked", 1 = "marked"; stepfather and or foster-father: 0 = "not marked", 1 = "marked"; mother: 0 = "not marked", 1 = "marked"; stepmother and or foster-mother: 0 = "not marked", 1 = "marked"; siblings (one or more): 0 = "not marked", 1 = "marked"; grandfather and/or grandmother: 0 = "not marked", 1 = "marked"; one or more relatives: 0 = "not marked", 1 = "marked"; one or other un-relatives: 0 = "not marked", 1 = "marked").

Six questions were used to measure emotional impact on school students. Three questions asked whether students felt bad in classrooms, class brakes, and at home (*bad feelings*) (responses to each statement ranged from 1 to 6 with higher score meaning worse feelings). One question asked whether students felt safe on the school grounds and in the classroom (*feeling safe*) (responses ranged from 1 to 4 with higher score meaning less safe). One question asked whether students wanted to quit school (*quit school*) (responses ranged from 1 to 5 with higher score meaning wanting more to quitting school). One question asked how many friends student have at school (*social isolation*) (responses ranged from 1 to 5 with higher score meaning more friends at school).

Four questions were used to measure bullying at school. Three questions asked whether students had been bullied or left behind by two or more students or a group, and where they were bullied (*face-to-face bullying*) (responses to each statement ranged from 1 to 5 with higher score meaning more bullying). One question asked whether students were bullied online (internet) or by phone (e.g., text messaging) (*cyber-bullying*) (responses ranged from 1 to 5 with higher score meaning more bullying).

Two questions were used to measure protective factors for bullying. *Parental support* (Gudjonsson, Sigurdsson, Sigfusdottir, & Asgeirsdottir, 2008), which measured how hard or easy it is for students to get warmth and caring from their parents, and get advice and help

with their studies (responses ranged from 1 to 4 with higher scores meaning more support).

Friends (Gudjonsson et al., 2008) measured how often a student is with his or her friends after

school or on weekends (responses ranged from 1 to 5 with higher scores meaning spending a

lot of time with friends).

Design and data analysis

In the current study a multiple linear regression was tested. The researcher ran

separated hierarchical regression (block-wise entry) models for the four dependent variables

bad feelings, feelings safe, quit school, and social isolation. The researcher ran two Models

for face-to-face bullying on the one hand and cyber-bullying on the other hand. For Model 1

the first block included the control variables and in the second block the independent

variables parental support, friends, and face-to-face bullying were added. Model 2 included in

the first block the control variables and in the second block the independent variables parental

support, friends, and cyber-bullying were added. The assumptions of multiple regression were

tested for these models and two of them were broken, residuals were not normally distributed

and there were indications of heteroscedasticity. However, the Durbin-Watson statistic does

fall within Field's (2009) recommended boundaries of 1-3, which suggests that errors are

reasonably independent.

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Results

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The descriptive statistics and Cronbach's alpha for scales used in the study are shown

in Table 1. The results for Cronbach's alpha for bad feelings, feeling safe, quit school and

social isolation indicated good reliability for five measures used in the study except for one

(parental support).

Table 1
Descriptive statistics for scales used in the study

	N	Mean	Std. Deviation	Range	Cronbach's alpha
Gender	1978	1.50	.50	1-2	n/a
Age	1981	1.98	.84	1-3	n/a
Family structure					
Father	2000	.77	.42	0-1	n/a
Stepfather or foster-father	2000	.15	.36	0-1	n/a
Mother	2000	.94	.23	0-1	n/a
Stepmother or foster-mother	2000	.05	.22	0-1	n/a
Siblings (one or more)	2000	.86	.35	0-1	n/a
Grandfather and/or grandmother	2000	.06	.24	0-1	n/a
One or more relatives	2000	.03	.17	0-1	n/a
One or other un-relatives	2000	.03	.16	0-1	n/a
Parental support	1813	5.22	1.08	0-6	.50
Friends	1984	4.28	.93	1-5	n/a
Cyber-bullying	1913	.25	.86	0-8	.92
Face-to-face bullying	1748	4.51	7.69	0-60	.95
Bad feelings	1962	2.40	2.70	0-15	.87
Feeling safe	1884	5.09	1.51	0-6	.73
Quit school	1969	2.28	1.40	1-5	n/a
Social isolation	1976	3.98	.96	1-5	n/a

Note: n/a = not available

The correlation matrix in Table 2 demonstrates that face-to-face bullying ($r = .62$, $p < .01$), and cyber-bullying ($r = .32$, $p < .01$) were positively related to *"bad feelings"* in the study. Face-to-face bullying ($r = -.41$, $p < .01$), and cyber-bullying ($r = -.19$, $p < .01$) were negatively related to *"feeling safe"*. In addition, face-to-face bullying ($r = .29$, $p < .01$), and cyber-bullying ($r = .18$, $p < .01$) were positively related to *"quit school"*. Furthermore, face-to-face bullying ($r = -.37$, $p < .01$), and cyber-bullying ($r = -.19$, $p < .01$) were negatively related to *"social isolation"*.

Table 2

Pearson *r* bivariate correlations for the variables in the study

	Bad feelings	Feeling safe	Quit school	Social isolation
Gender	.01	.06**	-.14	-.00
Age	-.09**	.05	-.01	.04*
Family structure				
Father	-.09**	.06*	-.08**	.07**
Stepfather or foster-father	.03	-.04	.02	-.02
Mother	-.03	.04	-.03	-.02
Stepmother or foster-mother	.02	-.04	.03	-.06**
Siblings (one or more)	-.04	.04	-.06**	.04
Grandfather and/or grandmother	-.07**	-.08**	.03	-.08**
One or more relatives	.10**	-.06**	.02	-.08**
One or other un-relatives	-.30**	.15**	-.11**	.43**
Parental support	-.37**	.30**	-.24**	.28**
Friends	-.30**	.15**	-.11**	.43**
Cyber-bullying	.32**	-.19**	.18**	-.19**
Face-to-face bullying	.62**	-.41**	.29**	-.37**

*p < .05 (two-tailed test)

**p < .01 (two tailed test)

In Table 3 the multivariate linear regression for Model 1 is presented predicting

emotional impact (bad feelings, feeling safe, quit school, and social isolation). Model 1

focuses in particular on face-to-face bullying, to see if it predicts emotional impact on

students. Looking at Model 1 in Table 3 the results show that face-to-face bullying had a

significant effects on emotional impact (bad feelings: $\beta = .55$, $p < .001$; feeling safe: $\beta = -.37$,

$p < .001$; quit school: $\beta = .25$, $p < .001$; social isolation: $\beta = -.26$, $p < .001$). In addition, the

protective factor parental support significantly predict emotional impact (bad feelings: $\beta = -$

.20, $p < .001$; feeling safe: $\beta = .17$, $p < .001$; quit school: $\beta = -.15$, $p < .001$; social isolation: β = .14, $p < .001$) and the other protective factor friends significantly predicted emotional impact for bad feelings ($\beta = -.09$, $p < .001$), and social isolation ($\beta = .33$, $p < .001$) but not for feeling safe or quitting school. Furthermore, by adding the independent variables into Model 1 the results showed that Model 1 explained 45% for bad feelings, 22% for feeling safe, 13% for quitting school, and 14% for social isolation of the total variance of emotional impact.

Table 3

Multiple linear regression for Model 1, predicting bad feelings, feeling safe, quit school and social isolation

	Outcome							
	Bad feelings		Feeling safe		Quit school		Social isolation	
	R^2	β	R^2	β	R^2	β	R^2	β
Step 1	.03**		.03**		.03**		.02**	
Control variables[a]								
Step 2	.45**		.22**		.13**		.29**	
Parental support		-.20**		.17**		-.15**		.14**
Friends		-.09**		.01		-.02		.33**
Face-to-face bullying		.55**		-.37**		.25**		-.26**

Note: [a] Control variables included age, gender and family structure (father, stepfather or foster-father, mother, stepmother or foster-mother, siblings (one or more), grandfather and/or grandmother, one or more relatives, one or other un-relatives) (see also Appendix B).
Note: * $p < .01$; ** $p < .001$

In Table 4 the multivariate linear regression for Model 2 is presented predicting bad feelings, feeling safe, quit school, and social isolation. Model 2 focuses in particular on cyber-bullying, to see if it predicts emotional impact on students. Looking at Model 2 in Table 4 the results show that cyber-bullying had a significant effects on emotional impact (bad feelings: β = .25, $p < .001$; feeling safe: $\beta = -.16$, $p < .001$; quit school: $\beta = .16$, $p < .001$; social isolation: $\beta = -.12$, $p < .001$). In addition, the protective factors parental support (bad feelings: $\beta = -.29$,

$p < .001$; feeling safe: $\beta = .24$, $p < .001$; quit school: $\beta = -.19$, $p < .001$; social isolation: $\beta = .17$, $p < .001$), and friends (bad feelings: $\beta = -.19$, $p < .001$, feeling safe: $\beta = .07$, $p < .01$; quit school: $\beta = -.06$, $p < .01$; social isolation: $\beta = .39$, $p < .001$) significantly predict emotional impact. Furthermore, by adding the independent variables into Model 2 the results show that Model 2 explained 25% for bad feelings, 13% for feeling safe, 11% for quitting school, and 25% for social isolation of the total variance of emotional impact.

Table 4

Multiple linear regression for Model 2, predicting bad feelings, feeling safe, quit school and social isolation

	Outcome							
	Bad feelings		Feeling safe		Quit school		Social isolation	
	R^2	β	R^2	β	R^2	β	R^2	β
Step 1	.03**		.03**		.03**		.02**	
Control variables[a]								
Step 2	.25**		.13**		.11**		.25**	
Parental support		-.29**		.24**		-.19**		.17**
Friends		-.19**		.07*		-.06*		.39**
Cyber-bullying		.25**		-.16**		.16**		-.12**

Note: [a] Control variables included age, gender and family structure (father, stepfather or foster-father, mother, stepmother or foster-mother, siblings (one or more), grandfather and/or grandmother, one or more relatives, one or other un-relatives) (see also Appendix B).
Note: * p < .01; ** p < .001

Discussion

The current study offers insight into the relationship between face-to-face bullying and cyber-bullying and the emotional impact on elementary school students (5th, 6th and 7th grades). The main focus of the study was to examine this relationship and see if elementary school students cope similarly with either bullying phenomenon. The findings support the hypothesis that face-to-face bullying and cyber-bullying do result in a similar emotional

impact among elementary school students. The results show that face-to-face bullying predicted more emotional impact than cyber-bullying among elementary students.

These results are consistent with previous studies in the sense that cyber-bullying does result in a similar emotional impact as face-to-face bullying (e.g., Ortega et al., 2009) but is inconsistent with Smith et al. (2008) in the sense that cyber-bullying has been shown to cause more emotional impact than face-to-face bullying because of the all-day/all-night potential of cyber-bullying, which can lead to high distress and a negative impact on students' performance. The reason for this difference is most likely because the data for the present study had few questions about cyber-bullying but much more questions about face-to-face bullying and it could be that the students did not fully understand what cyber-bullying involves since it is a relatively new phenomenon.

The results also revealed that the protective factor of parental support predicted bad feelings, feeling safe, quit school and social isolation. When students felt that they got more support from their parents the bad feelings and quit school decreased and feeling safe and social isolation (playing with more friends at school) increased. This is consistent with previous research that students from broken families and bad parenting styles show emotional dysfunction (Low & Espelage, 2013). The other protective factor, friends, showed that playing with more friends after school or on weekends predicted fewer bad feelings, social isolation in Model 1 (which included face-to-face bullying) but predicted fewer bad feelings, feeling safe, quit school and social isolation in Model 2 (which included cyber-bullying). This means that when students have more friends they feel better, feel safer, do not want to quit school, and they are not socially isolated. This is consistent with previous research where reciprocal friendship protects students against victimization and it has positive effects on withdrawal and depression (Mouttapa et al., 2004).

Another noteworthy finding is that the results showed that face-to-face bullying had more emotional impact on students than cyber-bullying. Many would think just the opposite because cyber-victims do not have a safe place anywhere, not even at their homes. When the harassment and aggression has moved to the cyber-world there is almost nothing that can be done: it is out there where everyone can see and especially the victim. Ybarra and Mitchell (2004) found that students who experienced more depression were more likely to have experienced being cyber-victims than those students with fewer symptoms. Smith et al. (2008) found out that in some cases the effects of cyber-bullying are worse than face-to-face bullying because the bullying is 24/7 which can lead to higher distress and a negative impact on students' performance.

The present study is not without its limitations. First, the questionnaire was administered in 2011 and even though the electronic environment had by that time developed extensively, cyber-bullying was still a new phenomenon and the students might not have known what it actually involves. Second, there were only two questions in the questionnaire about cyber-bullying, but much more about face-to-face bullying, which might bias the results by giving face-to-face bullying more weight or significance. Finally, we should take into account that fewer students might report being bullies of cyber-bullying than being victims of cyber-bullying. This goes for face-to-face bullying too. Research by Espelage and Swearer (2003) on face-to-face bullying has shown that students reporting on themselves can lead to undervaluation of bullying because bullies often rate their participation less. Those students who are victims do not want to, in many cases, recall the hardship of being a victim if the experience was embarrassing or caused a disturbance (Ladd & Kochenderfer-Ladd, 2002).

Nonetheless, the results have both theoretical and applied implications. From the theoretical perspectives they add to the increasing argument about whether cyber-bullying has more emotional impact than face-to-face bullying and whether cyber-bullying is an extension

of face-to-face bullying rather than a new and separated bullying method. Results from previous research do show that face-to-face bullying are related to cyber-bullying (Raskauskas & Stoltz, 2007; Ybarra & Mitchell, 2004). From the applied perspective the findings provide valuable information regarding the relationship between cyber-bullying and face-to-face bullying as pertains to the emotional impact on elementary school students, as they indicate that cyber-bullying and face-to-face bullying are risk factors for negative emotional impact. In addition, the results show that parental support and friends are protective factors for negative emotional impact.

The role of cyber-bullying in psychological adjustments to emotional impact still remains unclear, but the present study suggests that it is a risk factor for emotional impact. This research provides an understanding about cyber-bullying and its relationship to face-to-face bullying at school. In addition, it gives a better understanding of how bullying affects students' emotional and social development. It is important that future research continue to explore cyber-bullying and there is a need for more longitudinal and cross-sectional studies about how to intervene in both cyber-bullying and face-to-face bullying (Raskauskas & Stoltz, 2007).

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Appendix A

The chosen questions

1. *"Are you a boy or a girl?" (question 1)*
   a) Boy
   b) Girl

2. *"What grade are you in?" (question 2)*
   a) 5th grade
   b) 6th grade
   c) 7th grade

3. *"Who lives in your home?" (question 3)*
   a) Father
   b) Stepfather or foster-father
   c) Mother
   d) Stepmother or foster-mother
   e) Siblings (one or more)
   f) Grandfather and/or grandmother
   g) Other relatives
   h) Others not related to your family

4. *"How many friends do you have in school?" (question 6)*
   a) No friends
   b) Few friends
   c) Couple of friends
   d) Many friends
   e) Very many friends

5. *"How easy or difficult is it for you to receive the following from your parents?" (question 12)*
   a) Care and warmth
   b) Advices about school

   Respond choices
   1. Very hard
   2. Hard
   3. Easy
   4. Very easy

6. *"How often are you with your friends after school hours or during the weekend?" (question 15)*

   a) Never

   b) Almost never

   c) Rarely

   d) Sometimes

   e) Often

7. *"Do you want to quit school?" (question 22)*

   a) Never

   b) Almost never

   c) Rarely

   d) Sometimes

   e) Often

8. *"How often has this happened to you this school semester?" (question 25)*

   a) I was bullied

   b) I was left behind

   Respond choices

   1. Never

   2. Once or twice

   3. Three times or more in a month

   4. Once a week

   5. Many times a week

9. *"How often has this happen to you this school year?" (question 31)*

   a) Few kids bullied you alone

   b) Few kids attacked you and hurt you

   c) Few kids attacked a group you were in

   d) Many kids left you behind

   Respond choices

   1. Never

   2. Almost never

   3. Rarely

   4. Sometimes

   5. Often

10. *"Where are you bullied?" (question 33) – options a) to f), h), and j) to k)*
    were used for face-to-face bullying and options g) and i) were used for cyber-
    bullying

    a) In class

    b) In school hallways

    c) At the gym or swim class

    d) In gym locker room or in shower

    e) Class brakes on the school yard

    f) On the way to or from school

    g) Chat rooms online

    h) In your leisure time

    i) On the phone (e.g., text-message)

    j) School cafeteria or lunch brake

    k) Other

Respond choices

    1. Never

    2. Almost never

    3. Rarely

    4. Sometimes

    5. Often

11. *"In class do you feel badly?" (question 34)*

    a) Never

    b) Almost never

    c) Rarely

    d) Sometimes

    e) Often

    f) All the time

12. *"Do you feel badly in class brakes?" (question 35)*

    a) Never

    b) Almost never

    c) Rarely

    d) Sometimes

    e) Often

    f) All the time

13. *"Do you feel badly at home?" (question 36)*

    a) Never

    b) Almost never

    c) Rarely

    d) Sometimes

    e) Often

    f) All the time

14. *"How often does this happen to you in school?" (question 49 a and c)*

    a) I feel safe on the school yard

    c) I feel safe in class

Response choices

    1. Never

    2. Rarely

    3. Sometimes

    4. Often

Appendix B

Multiple linear regression for Model 1, predicting bad feelings, feeling safe, quit school and social isolation.

	B				SE B				β			
	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation
Model 1												
Constant	3.15	4.52	3.03	3.94	.43	.24	.23	.16				
Gender	.02	.17	-.35	.02	.13	.07	.07	.05	.00	.06	-.13**	.01
Age	-.24	.08	-.04	.04	.08	.04	.04	.03	-.08*	.04	-.03	.03
Family structure												
Father	-.27	.16	-.24	.17	.19	.11	.10	.07	-.04	.05	-.07	.07
Stepfather or foster-father	-.04	-.02	-.12	.08	.22	.12	.12	.08	-.01	-.01	-.03	.03
Mother	-.23	.03	.07	-.22	.35	.20	.18	.13	-.02	.00	.01	-.05
Stepmother or foster-mother	.04	-.26	.33	-.28	.33	.18	.17	.12	.00	-.04	.05	-.07
Siblings (one or more)	-.09	.18	-.09	.07	.20	.11	.11	.07	-.01	.04	-.02	.03
Grandfather and/or grandmother	.21	-.47	.07	-.22	.30	.17	.16	.11	.02	-.07*	.01	-.05
One or more relatives	1.59	-.27	.07	-.23	.42	.24	.22	.15	.10**	-.03	.01	-.04
One or other un-relatives	.84	-.72	.19	-.07	.44	.24	.23	.16	.05	-.08*	.02	-.01
Model 2												
Constant	4.26	4.25	3.49	2.34	.45	.30	.30	.18				
Gender	.32	.04	-.26	-.03	.10	.07	.07	.04	.06**	.01	-.10**	-.02
Age	.06	-.04	.04	-.04	.06	.04	.04	.02	.02	-.02	.02	-.03
Family structure												
Father	.01	.05	-.16	.08	.14	.10	.10	.06	.00	.01	-.05	.04

	B				SE B				β			
	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation
Stepfather or foster-father	-.06	-.01	-.13	.06	.17	.11	.11	.07	-.01	-.00	-.03	.02
Mother	.23	-.13	.20	-.31	.26	.18	.18	.11	.02	-.02	.03	-.07*
Stepmother or foster-mother	-.24	-.12	.25	-.22	.25	.16	.16	.10	-.02	-.02	.04	-.05
Siblings (one or more)	.04	.12	-.05	.06	.15	.10	.10	.06	.01	.03	-.01	.02
Grandfather and/or grandmother	-.25	-.31	-.05	-.01	.23	.16	.15	.09	-.02	-.05	-.01	-.00
One or more relatives	.75	.05	-.13	-.07	.32	.21	.21	.13	.05	.01	-.02	-.01
One or other un-relatives	-.01	-.42	-.03	.17	.33	.22	.22	.14	-.00	-.05	-.00	.03
Parental support	-.50	.23	-.19	.12	.05	.03	.03	.02	-.20**	.17**	-.15**	.14**
Friends	-.25	.01	-.04	.34	.06	.04	.04	.02	-.09**	.17	-.02	.33**
Face-to-face bullying	.18	-.07	.04	-.03	.01	.00	.00	.00	.55**	-.37**	.25**	-.26**

Note (bad feelings): $R^2 = .03$ for step 1; $\Delta R^2 = .42$ for step 2 ($ps < .001$). * $p < .01$, ** $p < .001$.

Note (feeling safe): $R^2 = .03$ for step 1; $\Delta R^2 = .19$ for step 2 ($ps < .001$). * $p < .01$, ** $p < .001$.

Note (quit school): $R^2 = .03$ for step 1; $\Delta R^2 = .10$ for step 2 ($ps < .001$). * $p < .01$, ** $p < .001$.

Note (social isolation): $R^2 = .02$ for step 1; $\Delta R^2 = .27$ for step 2 ($ps < .001$). * $p < .01$, ** $p < .001$.

Multiple linear regression for Model 2, predicting bad feelings, feeling safe, quit school and social isolation.

	B				SE B				β			
	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation
Model 1												
Constant	3.24	4.94	3.19	3.91	.42	.24	.22	.15				
Gender	.04	.16	-.36	-.00	.13	.07	.07	.05	.01	.06	-.13**	-.00
Age	-.28	.07	-.05	.06	.08	.04	.04	.03	-.09**	.04	-.03	.05
Family structure												
Father	-.50	.23	-.31	.20	.19	.11	.10	.07	-.08*	.07	-.09*	.09*
Stepfather or foster-father	-.09	.00	-.11	.09	.22	.12	.11	.08	-.01	.00	-.03	.03
Mother	-.05	.02	.02	-.23	.35	.20	.18	.13	-.00	.00	.00	-.05
Stepmother or foster-mother	-.09	-.21	.25	-.29	.32	.18	.17	.11	-.01	-.03	.04	-.07
Siblings (one or more)	-.02	.13	-.06	.06	.20	.11	.10	.07	-.00	.03	-.02	.02
Grandfather and/or grandmother	.31	-.49	.08	-.24	.30	.17	.15	.11	.03	-.08*	.01	-.06
One or more relatives	1.33	-.08	-.02	-.20	.41	.23	.22	.15	.08**	-.01	-.00	-.04
One or other un-relatives	.94	-.80	.25	-.13	.44	.24	.23	.16	.05	-.08**	.03	-.02
Model 2												
Constant	8.31	2.74	4.55	1.60	.49	.30	.28	.18				
Gender	.12	.12	-.33	-.01	.11	.07	.07	.04	.02	.04	-.12**	-.01
Age	-.13	.01	-.01	.00	.07	.04	.04	.02	-.04	.01	-.00	.00
Family structure												
Father	-.18	.11	-.21	.10	.17	.10	.09	.06	-.03	.03	-.06	.04
Stepfather or foster-father	-.08	.11	-.12	.07	.19	.12	.11	.07	-.01	.00	-.03	.02

	B				SE B				β			
	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation	Bad feelings	Feeling safe	Quit school	Social isolation
Mother	.17	-.08	.09	-.25	.30	.19	.18	.11	.01	-.01	.01	-.05
Stepmother or foster-mother	-.23	-.15	.22	-.25	.29	.17	.16	.10	-.02	-.02	.03	-.06
Siblings (one or more)	.04	.09	-.04	.05	.17	.11	.10	.06	.01	.02	-.01	.02
Grandfather and/or grandmother	-.43	-.21	-.13	.01	.26	.16	.15	.09	-.04	-.03	-.02	.00
One or more relatives	1.26	-.05	-.05	-.18	.36	.22	.21	.13	.08**	-.01	-.01	-.03
One or other un-relatives	.22	-.55	.02	.10	.38	.23	.22	.14	.01	-.06	.00	.02
Parental support	-.72	.33	-.25	.16	.06	.03	.03	.02	-.29**	.24**	-.19**	.17**
Friends	-.55	.12	-.10	.40	.06	.04	.04	.02	-.19**	.07*	-.06*	.39**
Cyber-bullying	.77	-.27	.27	-.13	.07	.04	.04	.02	.25**	-.16**	.16**	-.12**

Note (bad feelings): R^2 = .03 for step 1; ΔR^2 = .22 for step 2 (ps < .001). * p < .01, ** p < .001.

Note (feeling safe): R^2 = .03 for step 1; ΔR^2 = .10 for step 2 (ps < .001). * p < .01, ** p < .001.

Note (quit school): R^2 = .03 for step 1; ΔR^2 = .08 for step 2 (ps < .001). * p < .01, ** p < .001.

Note (social isolation): R^2 = .02 for step 1; ΔR^2 = .23 for step 2 (ps < .001). * p < .01, ** p < .001.