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The "net" of the Internet: Risk Factors for Cyberbullying among Secondary-School Students in Greece

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Abstract Cyberbullying is one of the most common threats an adolescent might face online with serious negative consequences at the social, emotional and educational level. Despite the intense study of the phenomenon over the past decade, most researchers ask for new directions in research that will focus on risk and protective factors. This study attempted to investigate the predictive effect of internet use, parental mediation, school-bullying and victimisation, gender and empathy on cyberbullying and cybervictimisation in two measurements, 4 months apart. Data collection was conducted using a self-report questionnaire. Four hundred and forty secondary school students, aged 12–14, participated in the study. The students were randomly selected from six public schools located in the Greater Metropolitan Area of Thessaloniki in Greece. Results showed that involvement in traditional bullying as a victim or as a perpetrator is the factor with the highest predictability for cyberbullying and cybervictimisation, which also remains stable across time. This finding points to the urgent need for designing and implementing programmes against all forms of bullying both offline and on line.

Keywords Cyberbullying · Cybervictimisation · Longitudinal data · Risk factors · Secondary-school students

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Introduction

Cyberbullying has been defined as a repeated aggressive act by individuals or groups intended to inflict harm or discomfort on others through the means of contemporary Information and Communication Technologies (i.e. cellular phones, smart phones, emails, social networks, chat rooms, instant messaging programmes, etc.) (Patchin and Hinduja 2012; Smith et al. 2008; Willard 2007). Such actions are among the most common threats adolescents might face while using the internet with serious negative consequences at the social, emotional and educational level (Cassidy et al. 2013; Hinduja and Patchin 2007, 2009; Livingstone et al. 2011).

According to Hinduja and Patchin (2012, p. 539), cyberbullying is "neither an epidemic nor a rarity" since they have found that approximately one in four adolescents have experienced or engaged in some form of cyberbullying behaviours. Other studies point to percentages that range between 4 and 33 % for the cyberbullies and 4 to 49 % for the cybervictims (Kowalski and Limber 2007; Mishna et al. 2010; Ybarra and Mitchell 2004a). The above variations are attributed to differences in measurements and definitions used along with differences in time parameters and age groups (Kowalski et al. 2014; Menesini and Nocentini 2009). Although cyberbullying can be experienced at any age, studies confirm that junior high school students between the ages of 12–14 are the most susceptible to victimisation (Tokunaga 2010; Williams and Guerra 2007).

Even though there is a plethora of studies on cyberbullying among youth during the last decade, most researchers request new directions in research, alternative methodologies or further clarification on issues pertaining to the definition, measurements and theories used for assessing cyberbullying and its consequences to children and adolescents (Bauman and Bellmore 2015; Dehue 2013; Kowalski et al. 2014; Tokunaga 2010). In addition, there are also variable (and sometimes inconsistent) data on gender differences, the relationship between school bullying and cyberbullying, and the psycho-social factors, which predict cyberbullying and/or cybervictimisation, such as empathetic concern, moral disengagement and global self-esteem (Cassidy et al. 2013; Chisholm and Day 2013; Erdur-Baker 2010; Kowalski et al. 2014; Notar et al. 2013; Slonje et al. 2012; Sticca et al. 2013).

Taking into account the limitations of contemporary empirical research, namely the shortage in longitudinal studies as well as the variability of results, this study focuses on risk factors affecting involvement with cyberbullying, cross-sectionally and over time, among a group of early adolescent students in Greece. In particular, the study examines, through a short-term longitudinal research design (two measurements, T1 and T2, 4 months apart), a number of risk factors that have proven to correlate with cyberbullying and cybervictimisation, such as frequent internet use, parental mediation, school bullying and school victimisation, empathy and gender.

Research in Greece has pointed out that the majority of youngsters spend on average 90 min per day online, while at least 10 % of adolescents stay online more than 3 h daily (Haddon et al. 2012; Makri-Botsari and Karagianni 2014). This excessive (as well as risky) online behaviour of Greek youth seems to be exacerbated by the limited discussions of online safety issues with parents and teachers compared with relevant data from other countries (Athanasiades et al. 2015). Moreover, there is evidence of a significant rise in reported experiences of cyberbullying through the internet over the last few years (Floros et al. 2013). However, epidemiology of cyberbullying among adolescents in Greece is similar to that of other western countries, with percentages ranging from 3 to 20 % for the victims and from 2 to 25 % for the bullies depending on the type and frequency of cyberbullying and cybervictimisation (Athanasiades et al. 2015; Kapatzia 2008; Tsorbatzoudis and Aggelakopoulos 2012).

Frequent internet use has been associated with a variety of risky internet activities, which increase the likelihood of being involved in cyberbullying (Kowalski and Limber 2007; Hasebrink et al. 2011; Smahel and Blinka 2012; Sticca et al. 2013). In addition, excessive internet use has been found to predict participation in cyberbullying both as a perpetrator and as a victim (Raya et al. 2012). Studies also report significant gender differences in relation to internet use (Erdur-Baker 2010); that is, frequent online use was found to predict mostly female involvement in cyberbullying, while risky internet use was found to predict mostly male involvement in similar behaviours.

A Greek study on parental online security practices, showed that parents of adolescents managed to protect their children from being cyberbullied yet failed to prevent the perpetration of online victimisation (Floros et al. 2013). In another study among Greek secondary school students, results indicated that parenting style was a significant predictor of cyberbullying, though not of cybervictimisation (Makri-Botsari and Karagianni 2014). Other studies revealed the limited effect of parental mediation, which is based mostly on restrictive practices, in the association between children's online participation and exposure to online risks (Lee and Chae 2012; Mesch 2009). Even though previous research data are not conclusive, most studies point to the effectiveness of parental practices that are characterized by active mediation, a thorough parent–child discussion about and evaluation of social networking and of web sites' function (Floros et al. 2013; Lee and Chae 2012; Mesch 2009).

Many researchers support that cyberbullying and traditional school bullying share three basic features: aggression, power imbalance and repetition (Kowalski et al. 2014; Smith et al. 2008). Yet, others insist that cyberbullying has a number of distinct characteristics compared with face-to-face bullying, such as the anonymity of the perpetrator, the lack of physical interaction, the accessibility of the victim, the breadth of the potential audience, the availability and duration of the threat (Kowalski and Limber 2013; Slonje et al. 2012; Sticca and Perren 2013; Ybarra and Mitchell 2004a). Despite these conceptual differences, which are theory driven, most researchers agree that there is a considerable overlap between the two phenomena. For example, several studies show a clear relationship between school bullying and cyberbullying, since bullies and victims seem to extend (or alternate) their roles from the schoolyard to the cyber world and vice versa (Hinduja and Patchin 2009; Kowalski et al. 2012; Patchin and Hinduja 2012; Varjas et al. 2009; Ybarra and Mitchell 2004b). Furthermore, both phenomena have been associated with serious negative effects (i.e. anxiety, low self esteem, health problems, absences from school etc.), while participants (bullies and victims) in both cases show high levels of emotional and behavioural problems and poor mental health (Gradinger et al. 2010; Kowalski and Limber 2013; Thomas et al. 2014).

In terms of gender differences, there is evidence that girls are more frequently victims of cyberbullying (especially of hurtful electronic messages and online rumours), while boys engage more in cyberbullying behaviours as offenders (Barlett and Coyne 2014; Cole et al. 2011; Erdur-Baker 2010; Li 2006; Hinduja and Patchin 2008; Patchin and Hinduja 2012; Slonje and Smith 2008; Smith et al. 2006). This is also the case in most Greek studies on cyberbullying (Athanasiades et al. 2015; Floros et al. 2013; Touloupis and Athanasiades 2014).

Finally, empathy as "the ability to understand and share another's emotional state and context" (van Langen et al. 2014, p. 180), has been proven to be negatively related with offending and violent behaviour (Jolliffe and Farrington 2004, 2007). Empathy has two dimensions: a cognitive one, which refers to the ability to understand another's emotions as well as an affective one, which refers to the ability to share or experience another's feelings

(van Langen et al. 2014). Meta-analytic studies systematically confirm that cognitive empathy is more strongly associated with offending behaviour than affective empathy (van Langen et al. 2014; Jolliffe and Farrington 2004).

In terms of cyberbullying, researchers indicate that bullies show less empathy than non-bullies and suggest that a lack of empathy may be a risk factor for cyberbullying (Steffgen et al. 2011). When witnessing cyberbullying, adolescents who either "join in" or "do nothing" have lower levels of empathy compared to those who help the victim (Van Cleemput et al. 2014). Finally, it seems that there is an association between empathy, gender and cyberbullying, since males tend to cyberbully more than females do because of lower affective and cognitive empathy levels (Topcu and Erdur-Baker 2012). Another study showed the significant buffering effect of high affective empathy on cyberbullying behaviour, only for girls and not for boys, even when cognitive empathy is low (Ang and Goh 2010).

Using a simple two-wave longitudinal design (two measurements, 4 months apart), this study examines whether the above risk factors, that is, internet use, parental mediation, school bullying, school victimisation, gender and empathy, may affect cyberbullying and cybervictimisation, in accordance with other related studies (Fanti et al. 2012; Dowell et al. 2009; Sticca et al. 2013). Therefore, in line with previous research, it is expected that:

Hours spent online will predict involvement in cyberbullying, as a perpetrator, in T1 (hypothesis 1a) and T2 condition (hypothesis 1b). Furthermore, hours spent online will predict cybervictimisation both in T1 (hypothesis 2a) and T2 condition (hypothesis 2b).
Parental mediation (i.e. whether parents discuss with children online safety issues) will predict adolescents' cyberbullying behaviour both in T1 (hypothesis 3a) and T2 condition (hypothesis 3b). Parental mediation will also predict adolescents' cybervictimisation both in T1 (hypothesis 4a) and T2 condition (hypothesis 4b).
Involvement in school bullying as a perpetrator will predict cyberbullying both in T1 (hypothesis 5a) and T2 condition (hypothesis 5b). Also, school victimisation will predict cyberbullying both in T1 (hypothesis 6a) and T2 condition (hypothesis 6b). Moreover, involvement in school bullying as a perpetrator will predict cybervictimisation both in T1 (hypothesis 7a) and T2 condition (hypothesis 7b). Also, school victimisation will predict cybervictimization both in T1 (hypothesis 8a) and T2 condition (hypothesis 8b).
Gender will predict cyberbullying both in T1 (hypothesis 9a) and T2 condition (hypothesis 9b). In particular, it is expected that boys will be more likely to express cyberbullying behaviours than girls. On the contrary, gender is not expected to predict cybervictimization both in T1 (hypothesis 10a) and T2 condition (hypothesis 10b).
Empathy will predict perpetration of cyberbullying, both in T1 (hypothesis 11a) and T2 condition (hypothesis 11b).

Method

Participants

Four hundred and forty (440) secondary school students (53.9 % boys) participated in the study. They were between 12 and 14 years of age ($M = 12.74$, $SD = .66$) and attended the first (50.5 %) and second (49.5 %) grade of the Greek junior high school (which corresponds to the second and third grade of the U.S. middle school). Students had been randomly selected from

six public schools located in the Greater Metropolitan Area of Thessaloniki, the second largest city in Greece.

A large number of students (88.4 %) reported that they had at least one profile in a social network, mainly Facebook, and almost 90 % (89.7 %) stated that they used the internet up to 4 h per day. The average number of friends they reported having on social networks was 210 ($M = 210.40$, $SD = 270.05$). The majority of the participants (62.1 %) claimed that they knew personally half or less than half of their online friends, while only 25 % claimed that they personally knew them all or almost all. Most of the participants (80.7 %) reported that they had a parent or a significant adult among their online friends.

Measures and Statistical Analysis

The questionnaire used in the study is a self-report checklist that evaluates internet use (primarily social networks) and the level of risk adolescents run of becoming involved in cyberbullying either as perpetrators or as victims. The questionnaire consisted of 65 questions that were divided in eight parts. The first part consisted of 15 items referring to demographic characteristics, such as gender, age, school-class, country of origin and country of residence. The second part comprised of ten items investigating students' use of social networks and the level of risk characterizing this use. The third part was a cluster of 19 items exploring students' involvement in traditional and cyberbullying incidents during the past 4 months, either as victims or as bullies. The last five parts of the questionnaire consisted on the whole of 21 items assessing students' knowledge of the cyberbullying phenomenon, their excessive or pathological use of internet, empathetic responses, moral disengagement as well as the probability of their future involvement in bullying incidents (both offline and online).

Only a number of the aforementioned items, which are in accordance with the hypotheses of this study, were used. These are:

Hours spent on line. Students' frequent internet use was measured by a single item: "On average, how many hours a day are you on internet?" Participants were offered five choices from '0 = 0−1 h' to '4 = more than 12 h' to record their answers.

Parental mediation. A single item was also used to assess parental mediation, "Do your parents speak with you about internet security?" using a 5-point scale ranging from '0 = not at all' to '4 = very much'.

Involvement in school bullying. Students' involvement in traditional bullying incidents during the past 4 months either as victims or as bullies was explored through two items: (a) "At school, in the last 4 months, have you ever been victim of bullying acts?" and (b) "At school, in the last 4 months, have you ever been perpetrator of bullying behaviours?". Responses were rated on a 5-point Likert-type scale ranging from '0 = It has never happened' to '4 = It happened several times a week'.

The following three factors resulted from Principal Component Analysis with varimax rotation that was conducted on 37 items of the questionnaire; this was necessary because the questionnaire used in the study is not a full-blown scale but a checklist with independent items. The analysis revealed 11 factors, but for the purposes of the present research only three of them have been used (see Table 1). These three factors explained 13.66 % of the total variance. The Kaiser-Meyer-Olkin (KMO) = .714 and Bartlett's Test of Sphericity ($p < .05$) were satisfactory. Data analyses were performed with SPSS v22.0.

Table 1 Factor analysis of the TABBY checklist

	F1	F2	F3
Empathy			
59. My friend's emotions don't affect me much	**.54**	−.15	−.01
60. I don't become sad when I see other people crying	**.69**	−.09	−.04
61. Other people's feelings don't bother me at all	**.77**	−.04	.01
62. My friend's unhappiness doesn't make me feel anything	**.50**	.06	.06
Cybervictimisation			
30. Received online messages that made you very afraid for your safety	−.02	**.46**	−.01
31. Been put down online by someone who has sent or posted cruel gossips, rumours or other harmful material	−.10	**.48**	.27
32. Someone created a fake profile and send or post material that damaged your reputation or friendships	−.01	**.33**	.03
34. Been excluded from an online group out of spite	−.03	**.43**	.24
Cyberbullying			
35. Sent mean or nasty messages to someone	.07	.14	**.40**
36. Put down someone else online by sending or posting cruel gossips, rumours or other harmful material	−.02	.02	**.38**
39. Helped to exclude someone else from your online group	.02	.16	**.37**
Eigenvalue	2.315	1.379	1.360
% of variance explained	6.26	3.73	3.67

F1 "Empathy", *F2* "Cyberbullying", *F3* "Cybervictimisation"

Empathy. Four questions constituted factor F1 = "Empathy", which refer to the ability to understand or experience another's feelings and emotions. Internal consistency coefficient (Cronbach's alpha) was $\alpha = .71$ in the T1 condition and $\alpha = .70$ in the T2 condition.

Cybervictimisation. Factor F2 = "Cybervictimisation" was constructed by four questions, which correspond to four types of bullying someone had suffered through the internet during the last 4 months (i.e. cyber- harassment, denigration/outing, impersonation and exclusion). Internal consistency coefficient (Cronbach's alpha) was $\alpha = .49$ in the T1 condition and $\alpha = .68$ in the T2 condition.

Cyberbullying. Three questions that loaded on factor F3 = "Cyberbullying" referred accordingly to three types of bullying someone had inflicted onto other(s) through the internet during the last 4 months (i.e. cyber- harassment, denigration/outing and exclusion). Internal consistency coefficient (Cronbach's alpha) was $\alpha = .40$ in the T1 condition and $\alpha = .80$ in the T2 condition.

A Confirmatory Factor Analysis was also conducted in order to test the proposed three-factor structure. To assess the factor structure two models were compared. Model 1 was a two-factor model, in which the seven cyberbullying-cybervictimisation items and the four empathy items were assumed to measure two correlated dimensions. Model 2 is the oblique three factor model in which the four empathy items, three cyberbullying items, and four cybervictimisation items were assumed to measure three correlated dimensions. Results showed that the proposed three-factor model fitted perfectly to the data (RMSEA = 0.03, GFI = 0.97) and fitted better than the two-factor model ($\Delta\chi^2$ (41) = 22.313, $p < .001$). All items loaded significantly on the expected factors. The full output of these analyses is available by the authors upon request.

Procedure

Data were collected in situ between October 2013 and April 2014, through the online administration of the questionnaire. First, official approval of the Greek Ministry of Education was obtained in order to implement our research within a number of junior high schools in the Municipality of Thessaloniki. Participating schools were randomly selected, while school administrators as well as the students themselves were scholastically informed about the research objectives. At the same time, the students' legal guardians were also informed, in writing, about the research objectives and procedures in order to secure their consent for the students' participation. Participation in research was voluntary and anonymous.

According to the research plan, the same questionnaire was administered online twice to the same group of junior high-school students in a total of six public schools. The first administration (T1 condition) took place between October and November 2013, while the second (T2 condition) was completed between March and April 2014, after a 4 months interval. Students were asked to fill in (anonymously) a personal code at the beginning of the questionnaire to ensure a match between the two measurements. Five-hundred and eighty-five (585) students completed the questionnaire the first time (T1); however, during the second administration only 440 questionnaires were successfully matched, which formed the final sample of the study. Questionnaires were administered in groups at the computer lab of each school. Completion of the questionnaire took approximately 25–30 min. Members of the research team were present during both measurements to offer assistance when needed.

Results

Descriptive Statistics on School Bullying and Cyberbullying

Participants answered a number of individual items (see Measures section and Table 1) regarding their involvement in both school bullying and cyberbullying incidents. Most of the participants reported they had never experienced as victims (92 %) or inflicted as bullies (92.7 %) any type of bullying behaviour at school during the past 4 months. However, 6.1 % reported that they had been victimised at school, at least one or two times during the past 4 months, while 1.8 % revealed that they had been bullied much more often (i.e. one to several times a week) during the same period of time. In addition, 5.2 % of the students admitted that they had bullied others at school one or two times during the past 4 months, while 1.6 % revealed that they did the same at least one or several times a week during the same period of time.

The majority of the participants also stated that they had never experienced any type of cybervictimisation, with responses ranging from 85 to 95.2 %, depending on the form of cybervictimisation. However, significant numbers of students reported that they had been victimized on line, at least once or more times during the past 4 months. Specifically, 10.4 % of the students reported that had received nasty or mean messages online, 15 % claimed that they had been denigrated, while 4.8 % reported that they had suffered from impersonation and 11.6 % from exclusion.

Furthermore, most of the participants reported that they had never bullied somebody else online during the past 4 months, with responses ranging from 88.9 to 97.7 %, depending on the

form of cyberbullying. However, 11 % of the students admitted that they had sent nasty or mean messages, at least once or more times during the same period of time, while 5 % of the students admitted that they had been involved in online denigration and 10.4 % in exclusion.

Correlations with Cybervictimisation and Cyberbullying in T1 and T2

(a) *Cybervictimisation in T1 and T2*

Correlation coefficients displayed that cybervictimisation in T1 condition significantly correlated with hours spent online, school victimisation and school bullying in T1 condition. Moreover, cybervictimisation in T1 condition and cybervictimisation in T2 condition were significantly correlated. On the other hand, cybervictimisation in T2 condition was significantly correlated with gender, parental mediation, school victimisation and school bullying both in T1 and in T2 condition. Finally, cybervictimisation in T2 condition and cyberbullying in T2 condition were significantly correlated (see Table 2).

(b) *Cyberbullying in T1 and T2*

As shown in Table 2, cyberbullying in T1 condition significantly correlated with gender, age, hours spent online, parental mediation and school bullying in T1 condition. Cyberbullying in T1 and cyberbullying in T2 condition were also positively correlated. Last but not least, cyberbullying in T2 significantly correlated with hours spent online, school victimisation and school bullying, both in T1 and in T2 condition. Unexpectedly, cyberbullying in T2 condition positively correlated with empathy in T2. Finally, cyberbullying in T2 condition positively correlated with cybervictimisation, both in T1 and T2 condition (see Table 2).

Predicting Cybervictimisation and Cyberbullying in T1

Two stepwise multiple regression analyses (one for cybervictimisation and one for cyberbullying) were conducted to examine whether the variables, which correlated with cybervictimisation (i.e. school bullying, school victimization and hours online) and cyberbullying (i.e. school bullying, gender, hours online, age and parental mediation) in T1 condition, were also able to predict these variables.

In the first multiple regression model, cybervictimisation in T1 condition was the criterion variable. The results of the analysis showed that school victimisation was significantly related to cybervictimisation ($\beta = .179$, $p = .000$, $F\ (1438) = 15.22$, $p < .000$), verifying hypothesis 8a, as well as hours spent online ($\beta = .099$, $p = .035$, $F\ (2437) = 10.10$, $p < .000$), confirming hypothesis 2a. The multiple correlation coefficient was .21, indicating that 4.6 % of the variance of cybervictimisation in T1 condition could be accounted for by school victimisation and hours spent online (Table 3).

In the second multiple regression model, cyberbullying in T1 condition constituted the criterion variable. It was found that school bullying significantly related to cyberbullying ($\beta = .383$, $p = .000$, $F\ (1438) = 89.55$, $p < .000$), confirming hypothesis 5a. Also, gender predicted cyberbullying ($\beta = -.149$, $p = .001$, $F\ (2,437) = 52.39$, $p < .000$), verifying hypothesis 9a of the study, as well as hours spent online ($\beta = .104$, $p = .018$, $F\ (3,436) = 38.34$, $p < .000$), confirming hypothesis 1a. Finally, age was found to significantly relate to cyberbullying ($\beta = .088$, $p = .045$, $F\ (4435) = 29.97$, $p < .000$). The multiple correlation coefficient was .47,

Table 2 Means, standard deviations and correlations among the study variables ($N = 440$)

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	12.74	.66															
2. Gender	.46	.50	−.07														
3. Hours online pre	.70	.74	.23**	−.01													
4. Hours online post	.78	.81	.20**	.00	.54**												
5. Parental mediation pre	1.75	1.24	.06	−.20**	.21**	.17**											
6. Parental mediation post	3.55	1.24	−.09	.13**	−.19**	−.19**	−.59**										
7. Empathy pre	.98	.84	−.03	−.19**	−.03	−.02	.17**	−.09*									
8. Empathy post	1.80	.76	.04	−.15**	−.00	.06	.14**	−.14**	.45**								
9.School victimisation pre	.03	.25	.01	−.04	.06	.03	.05	.04	.04	.13**							
10. School bullying pre	.08	.42	.00	−.09	.15**	.09	.11*	−.05	.07	.13**	.42**						
11. School victimisation post	.13	.47	.06	−.03	.01	−.01	.04	.07	.04	.09	.46**	.15**					
12. School bullying post	.13	.52	.12**	−.15**	.12*	.07	.18**	−.09	.07	.15**	.27**	.57**	.18**				
13. Cybervictimisation pre	.13	.37	.03	.02	.11*	.06	.05	−.03	−.07	.02	.19**	.11*	.16**	.13**			
14. Cybervictimisation post	.07	.31	.05	−.11*	.09	−.02	.11*	−.02	−.02	.10*	.73**	.40**	.34**	.33**	.27**		
15. Cyberbullying pre	.06	.26	.12*	−.19**	.18**	.18**	.13**	−.09	.06	.09	.01	.41**	.03	.34**	.08	.06	
16. Cyberbullying post	.07	.38	−.01	−.08	.14**	.06	.09	−.03	.06	.12*	.47**	.97**	.17**	.54**	.12*	.44**	.37**

Pre: T1, Post: T2, **Correlation is significant at the .01 level (2-tailed), * Correlation is significant at the .05 level (2-tailed)

Table 3 Stepwise multiple regression models with cybervictimisation and cyberbullying in T1 as dependent variables

Criterion variable	Predictors	*Beta*	*t*	*p*	R^2 change
Cybervictimisation T1	School victimisation	.179	3.83	.000	.034
	Hours online	.099	2.11	.035	.010
	School bullying	.028	.54	*ns*	
Cyberbullying T1	School bullying	.383	8.90	.000	.170
	Gender	−.149	−3.48	.001	.023
	Hours online	.104	2.37	.018	.015
	Age	.088	2.01	.045	.007
	Parental mediation	.031	.70	*ns*	

For ease of presentation, only statistics from the final models are presented

indicating that 21.6 % of the variance of cyberbullying in T1 condition could be accounted for by school bullying, gender, hours spent online and age (Table 3).

Predicting Cybervictimisation and Cyberbullying in T2

In order to examine the longitudinal risk factors of cybervictimisation and cyberbullying, two stepwise multiple regressions were run. After controlling for stability effects, the variables that were found to correlate with cybervictimisation (i.e. school bullying, school victimisation, cyberbullying, hours online and parental mediation) and cyberbullying in T2 condition (i.e. school bullying, school victimisation, cybervictimisation, hours online, gender and parental mediation) were added as the independent variables in the equations.

The results of the first model, with cybervictimisation in T2 condition as the criterion variable, showed that school victimisation in T1 condition predicted cybervictimisation in T2 condition ($\beta = .772$, $p = .000$, $F\ (1438) = 1142.66$, $p < .000$), confirming hypothesis 8b. It was also found that cybervictimisation in T1 condition significantly related to cybervictimisation in T2 condition ($\beta = .137$, $p = .000$, $F\ (2437) = 630.50$, $p < .000$). In addition, school bullying in T1 condition significantly related to cybervictimisation in T2 condition ($\beta = .108$, $p = .000$, $F\ (3436) = 443.34$, $p < .000$), verifying hypothesis 7b. Lastly, the results of the model showed that parental mediation in T1 condition positively related to cybervictimisation in T2 condition ($\beta = .048$, $p = .047$, $F\ (4435) = 335.76$ $p < .000$), refuting thus hypothesis 4b. The multiple correlation coefficient was .87, indicating that 76.2 % of the variance of cybervictimisation in T2 condition could be accounted for by school and cybervictimisation, school bullying and parental mediation in T1 condition (Table 4).

Finally, in the second multiple regression model cyberbullying in T2 condition was the dependent variable. The results of the analysis revealed that school bullying in T1 condition ($\beta = .937$, $p = .000$, $F\ (1438) = 58.22$, $p < .000$) and school victimisation in T1 condition ($\beta = .076$, $p = .000$, $F\ (2437) = 3717.36$, $p < .000$), predicted cyberbullying in T2 condition, confirming hypotheses 5b and 6b, respectively of the study. The multiple correlation coefficient was .97, indicating that 94.4 % of the variance of cyberbullying in T2 condition could be accounted for by school bullying and victimisation in T1 condition (Table 4).

On a final note, since the cybervictimisation and cyberbullying factors in the T1 condition had low Cronbach's alphas, multiple linear regressions were also performed using the items'

Table 4 Stepwise multiple regression models with cybervictimisation and cyberbullying in T2 as dependent variables

Criterion variable	Predictors	*Beta*	*t*	*p*	R^2 change
Cybervictimisation T2	School victimisation T1	.772	29.07	.000	.723
	Cybervictimisation T1	.137	5.62	.000	.020
	School bullying T1	.108	4.11	.000	.010
	Parental mediation T1	.048	1.99	.047	.009
	Hours online T1	.036	1.45	*ns*	
	Cyberbullying T1	.028	1.01	*ns*	
Cyberbullying T2	School bullying T1	.937	75.44	.000	.940
	School victimisation T1	.076	6.11	.000	.004
	Cyberbullying T1	.019	1.48	*ns*	
	Gender	.003	.299	*ns*	
	Hours online T1	.000	.04	*ns*	
	Parental mediation T1	−.011	−1.01	*ns*	
	Cybervictimisation T1	−.001	−.07	*ns*	

For ease of presentation, only statistics from the final models are presented

scores instead of the mean scores of these factors in order to validate the results of the study. The *p* values and the Beta coefficients of the multiple regression models were found to be similar using both the items and the factors of cybervictimisation and cyberbullying in T1 condition.

Discussion

There is no doubt that cyberbullying is part of the daily life of Greek adolescents, as it is true for young people around the world. Results of this study indicated that a significant number of the participating students, ranging from 5 to 15 %, had been involved in cyberbullying incidents either as victims or as bullies. These rates are consistent with findings from similar studies in Greece and abroad (Athanasiades et al. 2015; Kapatzia 2008; Kowalski and Limber 2007; Mishna et al. 2010; Tsorbatzoudis and Aggelakopoulos 2012; Ybarra and Mitchell 2004a). The main objective of this study was to explore the predictive effect that certain risk factors (frequent internet use-mainly Social Network Sites [SNS], parental mediation, school bullying, empathy and gender) pointed out by empirical research data, have on cyberbullying and cybervictimisation through a longitudinal design. Students' responses on an online self-report questionnaire were measured twice: at the beginning of the school year when social groups are formed and hierarchies are negotiated (T1) and 4 months later in the middle of the school year when social groups have become more stable (T2).

Cross-Sectional Predictors of Cyberbullying and Cybervictimisation

At the beginning of the school year (T1), *involvement in school victimisation and school bullying* were the most important predictors of cybervictimisation and cyberbullying respectively, as it was hypothesized (hypotheses 8a, 7a, 6a and 5a respectively) and supported by

several studies (e.g. Kowalski and Limber 2013; Slonje et al. 2012). In simpler terms, when the school year starts, if a student suffers bullying at school (victim), he/she may suffer bullying on the internet (cybervictim) as well. Accordingly, if a student bullies other student(s) at school (bully), he/she may bully others on line (cyberbully) as well.

Results also showed a number of other predictors of cybervictimisation and cyberbullying—although not as strong.

Frequent internet use (mainly SNS use) was a risk factor for both cyberbullying and cybervictimisation, as it was hypothesized (hypotheses 1a and 2a respectively). This finding may indicate that if a student spends many hours on line visiting SNS at the beginning of the school year, he/she runs the risk of becoming involved in cyberbullying either as a victim or as a perpetrator, which is supported by other studies as well (e.g. Erdur-Baker 2010; Raya et al. 2012). An adolescent who is on SNS many hours every day is exposed to the risks inherent in the internet, especially if he/she engages in risky online behaviours (Sticca et al. 2013). At the beginning of the school year, students might use the digital media to settle differences that started at school in an effort to (re)negotiate the hierarchy in their peer group and their status in it.

Gender predicted cyberbullying, thus confirming hypothesis 9a. Boys seem to run a higher risk than girls to bully others on line at the beginning of the school year. As for cybervictimisation, there were no differences between boys and girls as predicted (hypothesis 10a). Boys are usually the perpetrators in cyberbullying incidents according to many studies both abroad and in Greece (Athanasiades et al. 2015; Barlett and Coyne 2014; Cole et al. 2011; Erdur-Baker 2010; Floros et al. 2013; Li 2006; Hinduja and Patchin 2008; Patchin and Hinduja 2012; Slonje and Smith 2008; Smith et al. 2006; Touloupis and Athanasiades 2014). These studies also provided evidence that girls are more frequently victims of cyberbullying, a finding not supported by the current study. In general, studies so far report inconsistent results concerning gender differences in both school bullying and victimisation and cyberbullying and cybervictimisation (Erdur-Baker 2010). Further research—perhaps more qualitative studies—is needed to clarify gender differences.

Parental mediation and *empathy* did not prove as strong predictors of cyberbullying and cybervictimisation at the beginning of the school year, as it was expected. Hypotheses 3a and 4a for parental mediation and hypotheses 11a were rejected. This was an unexpected finding, which may be attributed to the instrument used to measure both constructs.

Longitudinal (short-term) Predictors of Cyberbullying and Cybervictimisation

In the middle of the school year (T2), certain changes in the predictors of cyberbullying and cybervictimisation were noted. Specifically, while involvement in school victimisation and school bullying continued to have strong predictive values for both cybervictimisation and cyberbullying, none of the other variables that correlated with cybervictimisation and cyberbullying in the first measurement (T1) predicted cybervictimisation and cyberbullying in the second measurement (T2), with the exception of parental mediation, which only predicted cybervictimisation.

In detail, *school victimisation* and *school bullying* that took place when school started were strong predictors of both cybervictimisation and cyberbullying 4 months later, a finding supported by other studies (e.g. Kowalski and Limber 2013; Monks et al. 2012; Slonje et al. 2012;

Sticca et al. 2013); Hypotheses 8b, 7b, 6b and 5b respectively were confirmed. It should be stressed that school victimisation at the beginning of the school year was by far the strongest predictor of cybervictimisation later in the year, while school bullying when school started was by far the strongest predictor of cyberbullying later in the year. This may indicate a transfer of victimization and bullying from the school to the internet as the school year progresses.

There was also a change in roles between school and the internet during the 4 months between measurements, as a student-victim, because of his/her continuing suffering at school throughout the year, might also use the internet to get back at the student(s) who abuse(s) him/her and becomes a cyberbully him/herself. Accordingly, a student-bully might also become an online victim (cybervictim) him/herself later in the year, as some of his/her victims might choose to retaliate using the anonymity that the internet provides. This interchange of roles between victims and perpetrators and between schoolyard and the cyber world has been stressed by other cyberbullying studies (Hinduja and Patchin 2009; Kowalski et al. 2012; Patchin and Hinduja 2012; Sticca et al. 2013; Varjas et al. 2009; Ybarra and Mitchell 2004b). This points to the strong relationship between school and cyberbullying, which should be taken into consideration in the development of prevention and intervention strategies (Sticca et al. 2013).

Hypotheses 1b, 2b, 9b, 10b and 11b were rejected, as *frequent internet (SNS) use, gender* and *empathy* did not predict cyberbullying and cybervictimisation. Empathy was the only variable that had no predictive value in any of the measurements. This was an unexpected result, since a lack of empathy has been suggested as a risk factor for cyberbullying (Steffgen et al. 2011). This finding may be attributed to the way the questions comprising the Empathy factor were phrased; negatively phrased Likert-type questions can be quite confusing and produce unlikely responses.

Parental mediation predicted cybervictimisation in the second measurement, thus rejecting hypothesis 4b. This may show that students whose parents discuss online safety issues with them run the risk of becoming cybervictims as the school year progresses. This finding is difficult to be explained and adds to the non conclusive results of two other Greek studies in which either parents managed to protect their children from becoming cybervictims but did not prevent them from becoming cyberbullies (Floros et al. 2013) or parenting style predicted cyberbullying but not cyber victimisation (Makri-Botsari and Karagianni 2014). Studies outside Greece also showed the limited effect of parental mediation on children's online behaviour (Lee and Chae 2012; Livingstone and Helsper 2008; Mesch 2009), contrary to the hopes of parents and policy makers. An alternative interpretation could be that only parents of students, who already use the internet excessively, thus running the risk of cyberbullying, talk with their children about online safety issues. Another reason for the limited predictability of parental mediation may be the fact that there was only one relevant question in the questionnaire ('Do your parents speak with you about internet security?'), which was limited to parental discussion. Parental mediation is a complex concept that goes beyond simple restrictions to conversational and interpretive strategies as well as parental monitoring activities (Livingstone and Helsper 2008).

Cybervictimisation in the first measurement proved to be another longitudinal predictor of cybervictimisation. This may be indicative of the repetition of a student's victimisation online throughout the school year; once a victim, always a victim. There has been great debate among researchers regarding repetition and power imbalance as features of cyberbullying. Our findings seem to agree with Cassidy's et al. (2013, p. 580) remark that 'while the victim of cyberbullying has the power to end the interaction, victims report feeling helpless due to an

inability to escape from online postings that may seem more permanent than words shouted in the school yard.'

In short, results indicate that at the beginning of the school year: (i) students run the risk of becoming cybervictims if they are primarily victims of traditional bullying that takes place on school grounds and make heavy use of the internet especially of SNS, and (ii) students run the risk of becoming cyberbullies if they are primarily perpetrators of traditional bullying, and also if they are boys, use the internet heavily and are older. As the school year progresses, a different picture begins to form: (i) students run the risk of becoming cybervictims if they are primarily victims of traditional as well as of cyberbullying since the beginning of the school year; also if they have been themselves perpetrators of traditional bullying; and finally if they have parents who talk to them about internet security, and (ii) students run the risk of becoming cyberbullies if they are primarily perpetrators of traditional bullying and have been themselves victims of bullying incidents at school. The only two factors that steadily and across time predict the risk of becoming involved in cyberbullying incidents as victim and perpetrator are the traditional forms of bullying and victimisation that take place in school, both forms of anti-social behaviour. This relationship between school bullying and cyberbullying has been stressed by several researchers (e.g. Kowalski et al. 2012; Paul et al. 2012).

Implications for Practice

Results provided evidence that victimisation and bullying are transferred from school and real life to the virtual environment of the internet. This finding points to the need for parents, teachers, schools and policy makers to place emphasis on the importance of traditional bullying prevention and early intervention starting from the beginning of the school year, even at the very young ages (early childhood). It also disputes many teachers' argument that cyberbullying is not the school's problem, as it takes place outside its grounds. The suggestion made by Sticca et al. (2013, p. 64) that "cyberbullying can be seen as an online version of other real-world antisocial behaviours, and so prevention of cyberbullying should focus on early prevention of different forms of antisocial behaviour" must be taken into serious consideration.

Another important finding that has implication for schools is that cybervictims are likely to become cyberbullies to retaliate and cyberbullies are likely to become cybervictims themselves as their victims try to get revenge for their continuing suffering both at school and online. The internet, an environment adolescents know too well, provides them with the anonymity they need in order to abuse their abusers without revealing their identity, perpetuating in this way anti-social forms of behaviour in a global arena of an incredibly large audience. This again points to the urgent need for prevention programmes which will focus on educating students and the adults in their lives about the appropriate use of these New Technologies, training them on netiquette (the etiquette of the net), and creating and providing positive role models among peers.

Strengths and Limitations of the Study

This study attempted to identify potential longitudinal risk factors for cyberbullying and cybervictimisation, thus addressing the need for new directions in cyberbullying research (Bauman and Bellmore 2015; Dehue 2013; Kowalski et al. 2014; Tokunaga 2010). Involvement in traditional bullying as a victim or as a perpetrator emerged as the factor with the highest predictability for cyberbullying and cybervictimisation, which also remains stable

across time. This is a finding of great significance for designing and implementing programmes against all forms of bullying offline and on line. Furthermore, the longitudinal design of the study allowed some conclusions about probable causal effects.

Certain limitations that compromise the validity of the findings need to be mentioned. First of all, the two main variables, cyberbullying and cybervictimisation showed low internal consistencies, at least for the first measurement (T1); the second measurement (T2), however, provided better (moderate) internal consistencies. Second, the use of a self-report questionnaire may have led students to socially desired responses that do not provide a realistic picture of the phenomenon. A third limitation is the fact that certain important risk factors were assessed by either only one question (parental mediation) or a limited number of questions whose phrasing was confusing (empathy). Future studies should employ specialized instruments with sound psychometric properties for these important factors. Finally, the time interval of 4 months between measurements might have been too short.

The internet is still an uncharted territory; both the scientific and the education community need to work together so that they learn and teach the younger generation how to use this net to "fish" for important information and to communicate with others and not to get caught in a net of hurt and pain that has no way out.

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