

# Cyberbullying experiences on-the-go: When social media can become distressing

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## Abstract

The current study examines the differences between those who have been cyberbullied online and on mobile devices (on-the-go) and those who have been cyberbullied online but not on mobile devices. Additionally, country differences in cyberbullying on-the-go are explored. Analyses were carried out employing a random stratified sample of 25,142 children aged 9-16 from 25 European countries. A multilevel stepwise logistic regression with cyberbullying mode (online and mobile phone vs. online only) as the dependent variable showed that among online bully victims being cyberbullied on-the-go was less likely in Bulgaria and Denmark and more likely in Sweden when compared to the odds across all countries. Moreover, being cyberbullied on-the-go was associated with being older, female and using the internet on-the-go (step 1), higher sensation seeking, psychological difficulties and being more upset by the experience (step 2) as well as a higher likelihood of being bullied via social networking sites (SNS) and instant messages (IM) but not the range of cyberbullying types experienced (step 3). In this last step of the analysis being upset by the experience as well as psychological difficulties ceased to be related to the mode of cyberbullying suggesting that cyberbullying experiences on SNS and IM are potential mechanisms by which cyberbullying on-the-go is experienced as more distressing.

Keywords: cyberbullying; bullying; adolescence; aggression; social networking

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## Introduction

Adolescent bullying is a significant social concern for the majority of countries worldwide (e.g., Due et al., 2005; Kowalski, Limber, & Agatston, 2008; Nansel, Overpeck, Haynie, Ruan, & Scheidt, 2003). Results of bullying are compounded due to the increasing use of the Internet and mobile phones (Perren, Dooley, Shaw, & Cross, 2010; Smith et al., 2008). This yields what is often referred to as cyberbullying. Despite the lack of consent in the definition of cyberbullying (cf. Slonje, Smith, & Frisen, 2013) most researchers employ definitions similar to the one of traditional or face-to-face bullying, which is as an act of aggression that is intentional, repetitive, and towards an individual of lower power (cf. Olweus, 1993), but they extend it to electronic forms of contact (Perren et al., 2010; Smith et al., 2008). Cyberbullying can take various forms such as sending unwanted, derogatory, or threatening comments, spreading rumours, sending pictures or videos that are offensive or embarrassing by text, email, chat, or posting on websites including social networking sites (SNS) (e.g. Ybarra & Mitchell, 2004a).

Recently, possibilities of online bullying via mobile phones are on the rise. In the UK, for example, the Office for National Statistics [ONS] (2011), has reported a rapid increase of adolescents going online by mobile technology. More than 70% of 16-24 year-olds accessed the Internet via a mobile phone in 2011, up from 44% the previous year. In the US the proportion of 8 to 18 year olds who own a mobile phone has increased from 39% to 66% between 2004 -2009 (Rideout, Foehr, & Roberts, 2010). Yet it is not known what this increase of Internet use on mobile devices might mean in terms of cyberbullying experiences.

The current study set out to investigate the differences between those adolescents who have been cyberbullied online and by mobile phone (on-the-go) from those who have been cyberbullied online but not by mobile phone using contemporary data across 25 European countries. In addition, country differences due to differential uptake of mobile phone use are explored.

## **Background**

Definitions and measurement of cyberbullying is not consistent across studies. Hence it is not surprising that reported incidences of cyberbullying vary from study to study. A meta-analysis found that across studies, youths report experiencing anywhere from 6.5% to 72% of cyberbullying (Tokunaga, 2010). Europe-wide, about 18% of Internet using children experienced bullying or harassment online (ranging from 10% to 52%) (Hasebrink, Livingstone, Haddon & Ólafsson, 2009).

Traditional forms of bullying may lead to a range of problems, for example internalizing disorders (Hawker & Boulton, 2000), externalizing disorders (Nansel et al., 2003), social difficulties (Forero, McLellan, Rissel, & Bauman, 1999), physical health problems (Kumpulainen, Räsänen, & Henttonen, 1998) and suicide ideation (Kim, Koh, & Leventhal, 2005). Cyberbullying in some cases has shown to exacerbate these consequences. For example, cyberbullying has accounted for higher depression rates and other negative mental health symptoms and evoked stronger negative feelings over and above traditional bullying victimisation (Gradinger, Strohmeier, & Spiel, 2009; Juvonen & Gross, 2008; Perren et al., 2010; Spears, Slee, Owens, & Johnson, 2009).

## **Cyberbullying via Mobile Devices**

Some of the mechanisms through which bullying victimisation occurs are inherent to cyberbullying only. In the following we will outline some particular features of cyberbullying which we argue might be enhanced when cyberbullying is taking place via mobile devices.

## ***Mobile Internet usage***

The more time adolescents spend online the more likely they are to be cyberbullied (Berson, Berson, & Ferron, 2007; Blair, 2003). In the present context 'going online' is defined as accessing the Internet, be it through a web browser or any application that facilitates web based interaction. This can happen from a computer as well as a mobile device. Similarly, cyberbullying via mobile phones should be more likely for those who use the mobile phone to go online.

It has been hypothesised that higher incidences of cyberbullying associated with an increase in age might be related to onset of dating (Ortega, Elipe, Mora-Merchan, Calmaestra, & Vega, 2009). In addition, cyberbullies are expected to be older, as younger children do not yet use as much technology for communication (cf. Livingstone, Haddon, Görzig, & Ólafsson, 2011a). However, others posit a curvilinear relationship between cyberbullying and age with a peak around mid-adolescence (7<sup>th</sup>/8<sup>th</sup> grade) (cf. Tokunaga, 2010). Furthermore, adolescents' access to both Internet and mobile phone is expected to rise (Lee, 2005). The relationship between age and cyberbullying via mobile devices has not yet been investigated directly. A study by Ortega et al. (2009) showed victim rates in cyberbullying via mobile phones to be higher for older students while this was not the case for cyberbullying via the Internet; however, this study does not consider cyberbullying via the Internet through mobile devices. In addition, it has been shown that communication modes widely used via mobile devices such as instant and text messaging are increasingly used for cyberbullying as children get older (Kowalski & Limber, 2007). Given the above it is expected that during adolescence cyberbullying via mobile as opposed to other devices will increase with age.

Girls show higher or equal rates of cyberbullying than boys when compared to traditional bullying (more boys) (e.g., Görzig, 2011; Görzig & Ólafsson, 2013; Slonje & Smith, 2008; Williams & Guerra, 2007; Ybarra & Mitchell, 2004b). It has been argued that this is the case because electronic bullying is constrained to relational aggression (e.g., social exclusion and gossip; Raskauskaus & Stoltz, 2007) which has been observed in females more so than males (Coyne, Archer, & Eslea, 2006). In line with

this argument girls might be more likely to be cyberbullied due to the fact that they place more importance on social contacts and friendships developed through ICT than boys (Thelwall, 2008). In addition, the relational aggression observed in cyberbullying frequently occurs via SNS (Mesch, 2009) and this is more common among girls (Görzig & Ólafsson, 2013; Smith, 2011). With SNS being readily available on mobile devices it might be expected that girls' experience of cyberbullying victimisation will increase via mobile devices. In fact, it was shown that girls were 2.6 times as likely to be victims of cyberbullying via mobile phones but only 1.5 times as likely to be victims of cyberbullying via the Internet when compared to boys (adapted from descriptive data reported in Ortega et al., 2009). Hence, it is likely that cyberbullying via mobile as opposed to other devices occurs more often for girls than for boys.

### ***Psychological factors***

Psychological factors related to cyberbullying experiences are twofold. Firstly, cyberbullying experiences are bound to be greater among those who have a tendency to seek out new and potentially more risky experiences, i.e. sensation seekers (Stephenson, Hoyle, Palmgreen, & Slater, 2003). Sensation seeking is associated with a lack of inhibition, as well as an attitude of risk-taking (Zuckerman, 1979). Consequently, sensation seeking is linked to more risk, online and offline (Dowell, Burgess, & Cavanaugh, 2009; Slater, Henry, Swaim, & Cardador, 2004; Wolak, Finkelhor, & Mitchell, 2008). In addition, the motivational inclination of sensation seekers is associated with puberty-specific, maturational changes such as romantic motivation and emotional intensity (Steinberg et al., 2008). As mobile devices offer an additional outlet and opportunity for new and, in particular, relational experiences it is anticipated that those higher in sensation seeking will be more likely to experience cyberbullying on mobile as opposed to other devices.

Secondly, the types of bullying taking place online and on mobile devices such as verbal and psychological bullying may have more negative long term effects for mental health outcomes than traditional (e.g., face-to-face and physical) forms of bullying (Reid, Monsen, & Rivers, 2004). Explanations for the stronger or additional negative psychological consequences of cyberbullying compared to traditional bullying range from challenges that the anonymity of the perpetrator poses on individuals (Dooley, Cross, Hearn, & Treyvaud, 2009), to the wide reach of cyberbullying strategies such as posts on SNS profiles (Cross et al., 2009), and the 24-hour presence of the potential humiliation (e.g., Willard, 2007).

The immediate, constant presence of the online world and SNS in particular are even more enhanced when additionally accessed via a mobile device. This phenomenon has been well captured by statements of the Kaiser Family Foundation report (p. 2, Rideout et al., 2010) :“Try waking a teenager in the morning, and the odds are good that you'll find a cell phone tucked under their pillow—the last thing they touch before falling asleep and the first thing they reach for upon waking.” as well as by statistics provided by **Online Schools**: “48% of 18-34 year olds check Facebook when they wake up, with 28% doing so before even getting out of bed.” (Digital buzz blog, 2011). It stands to reason that the psychological consequences of cyberbullying are accelerated if taking place via a mobile device and even more so when accessing SNS on-the-go. Indeed, in the UK, for example, SNS are accessed more often via mobile phone than a PC (GSMA Mobile Media Metrics, 2010). Furthermore, children are visiting SNS more often on their mobiles, driven by the increase in smart phone ownership. Half of 12-15 year olds with a smartphone visit them weekly compared with 33% in 2010 (Ofcom, 2011). Due to the near constant nature of **checking in** via mobile technology, it is predicted that those cyberbullied via mobile as opposed to other devices will be more likely to experience psychological difficulties and be more upset by the experience, i.e. will experience higher intensities of harm from being cyberbullied.

### ***Cyberbullying experiences***

In terms of the modes of cyberbullying used when on mobile devices, a study by Kowalski & Limber (2007) showed that victims of on-the-go bullying are most frequently reached via IM. Others have found that cyberbullying occurs mainly via text (National Children's Home, 2002; Smith, et al., 2008). In line with this, when comparing seven types of media, Smith et al. (2008) found that cyberbullying incidences were most common via phone calls, text messages and IM. Considering that SNS are increasingly widely

used via mobile devices (Smith et al., 2008) and most recent phones are delivered with IM applications pre-installed, creating new platforms for **always on** technologies (GfK, 2012), it is expected that cyberbullying via IM and SNS will be associated with bullying via mobile phones to a greater extent than exclusively via other more stationary internet platforms.

In addition, modern smartphone technologies, combining cameras and Internet access with instant availability, yield themselves to some specific types of cyberbullying where pictures and videos of embarrassing, derogatory or a sexual nature can be instantly and anonymously uploaded and distributed. Some forms of cyberbullying such as **happy slapping**, a form of bullying where victims are filmed via mobile phones (Mann, 2009; Smith et al., 2008), are associated with mobile phone use rather than other online platforms. Hence, it is likely that those cyberbullied via mobile devices will experience a wider range of cyberbullying types than those exclusively bullied elsewhere.

### ***Cross-national variation***

Since cyberbullying is an exchange between two or more individuals it appears likely that incidences are higher the more cyber technology is used in an individuals' environment. It seems plausible that youths in countries where access and use of the Internet via mobile phone technology is high will be at greater risk of engaging in as well as being a victim of cyberbullying on-the-go. To our knowledge there is neither evidence nor explanations demonstrating the existence of cross-national variation in cyberbullying on-the-go. The current study will assess between country differences in cyberbullying on-the-go and explore the relation to adolescents' average use of the Internet on-the-go per country.

### **Hypotheses and Research Questions**

Given the above we argue that cyberbullying via mobile phones will be related to variables associated with a) mobile internet usage, b) psychological factors, c) the bullying experience and lastly d) mobile internet usage in a particular country. We posit the following four hypotheses.

H1: Mobile Internet usage - cyberbullying via mobile phones as opposed to other technological devices will be more likely to take place for older children, girls and those who use the Internet on-the-go.

H2: Psychological factors – those cyberbullied via mobile devices as opposed to online elsewhere will be more likely to be higher in sensation seeking, psychological difficulties and experience higher intensities of harm from cyberbullying.

H3: Bullying experiences - cyberbullying via mobile as opposed to other technological devices will be more likely to occur on SNS and IM as well as be associated with a wider range of types of online bullying.

H4: Country factors – incidences of cyberbullying via mobile phones will be higher in countries for which the use of the internet on-the-go is higher.

### **Method**

A random stratified sample of approximately 1000 Internet-using children aged 9-16 years was interviewed in each of 25 European countries (Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Turkey and the UK). The total sample size for children was 25,142 (12,501 girls).

The questionnaire, translated and back-translated from English into 24 languages, underwent cognitive testing and pilot testing to aid completion by children. Interviews took place during spring and summer 2010 in children's homes, conducted face-to-face but with private questionnaire completion for sensitive questions (for further details see also Görzig, 2012; Livingstone et al., 2011a; Livingstone, Haddon,

Görzig & Ólafsson, 2011b).

The analyses reported in the following were conducted on a subsample of 1,300 children (768 girls) who had indicated to have been bullied online either by mobile phone or elsewhere on the Internet and given valid answers<sup>1</sup> to all other variables included in the analyses.

### Dependent Measure

**Cyberbullying on-the-go** - respondents were given the following introductory text: "Sometimes children or teenagers say or do hurtful or nasty things to someone and this can often be quite a few times on different days over a period of time, for example. This can include: teasing someone in a way this person does not like, hitting, kicking or pushing someone around, leaving someone out of things." followed up by the question "Has someone acted in this kind of hurtful or nasty way to you in the PAST 12 MONTHS?" those who had chosen "yes" as the response option for this question were further asked how this has happened and given the response options "In person face to face", "By mobile phone calls, texts or image/video texts", "On the Internet", "Other way(s)".

Those who had chosen the response options "By mobile phone [...]" and "On the Internet" were grouped as **cyberbullying victims on-the-go** and those who had chosen "On the Internet" but not "By mobile phone [...]" were categorised as having been bullied exclusively elsewhere online (henceforth referred to as **cyberbullying victims elsewhere**).

### Independent Measures

#### **Individual level variables**

**Online on-the-go** was derived when the question "Which devices do you use for the Internet these days?" was answered with "a mobile phone" and/or "Other handheld portable devices (e.g., iPod Touch, iPhone or Blackberry)" and/or when the question "tell me WHERE you use the Internet these days" was answered with "When 'out and about' (e.g., via a mobile phone, iPod Touch, Blackberry etc.)".

**Sensation seeking**, a two-item version of the Sensation Seeking Scale-Form V (SSS-V; Stephenson et al., 2003) ( $r = .64$ ,  $p < .001$ ).

**Psychological difficulties**, adapted from Goodman's (1997) **Strengths and Difficulties Questionnaire** using items measuring psychological difficulties only (16 items,  $\alpha = .71$ ; for scale properties see Livingstone, Haddon, & Görzig, 2012).

**Intensity of harm from being bullied** – children who had indicated that they had been bullied online were further asked "Thinking about the last time this happened to you, how upset did you feel about what happened (if at all)?" with response options ranging from 0 (**not at all upset**) to 3 (**very upset**).

**Bullied via SNS** and **bullied via IM** - children who had indicated that they had been bullied online were further asked "And in which ways has this happened to you in the LAST 12 MONTHS?". Bullied on SNS was indicated for those children who chose the response option "On a social networking site" and bullied by IM for those who chose the response option "By instant messaging" (multiple responses allowed).

**Types of online bullying** was assessed by the question "which of these things happened to you in the last 12 months" with the number out of five response options ("Nasty or hurtful messages (e.g. words, pictures or videos) were sent to me on the Internet", "Nasty or hurtful messages (e.g. words, pictures or videos) about me were passed around or posted on the Internet where others could see them", "I was left out or excluded from a group or activity on the Internet", "I was threatened on the Internet", "Other nasty or hurtful things on the Internet").

**Demographic variables** were entered with gender (male = 0, female = 1) and age ( $M = 13.23$ ,  $SD =$

2.09).

### ***Country level variable***

**% online per country** is the amount of adolescents in the current sample that are going online on-the-go in each country. This variable was computed by using the variable online on-the-go as described above. The % online per country ranged from 50% in Spain to 96.8% in Greece (country weights were not applied).

## **Results**

### **Correlations of individual level variables**

All hypothesised predictors were significantly and positively correlated with being a mobile victim as opposed to an online victim. However, effect sizes were small (cf. Cohen, 1992; see Table 1).

Age and gender showed correlations confirming previous findings, such as males and older children being higher in sensation seeking and females being higher in their experience of harm (Campbell, 2005; Ortega, et al., 2009). Older children were also more likely to be online on-the-go and experience different ways (i.e., via SNS and IM) and a wider range of online bullying.

Associations between the psychological predictors were also in line with findings elsewhere that adolescents were more likely to experience risks (i.e., being bullied on-the-go) when they were higher in psychological difficulties as well as higher in sensation seeking; however, they were more likely to be upset about being bullied online when they were higher in psychological difficulties but **lower** in sensation seeking (cf. Campbell, 2005; Hasebrink, Görzig, Haddon, Kalmus & Livingstone, 2011).

Interestingly, the range of online bullying was positively and significantly correlated with all other predictors. In particular, the correlations with psychological difficulties and bullying via SNS showed small effects in the positive direction. It is not surprising that those who show higher psychological difficulties also experience a higher range of cyberbullying types. However, that being cyberbullied via SNS was associated with a higher range of types of cyberbullying was unexpected but is in line with the argument that SNS use yields itself to more cyberbullying experiences.

Table 1. Correlations among predictors and cyberbullying on-the-go.

	Range (scale) or number of items	M	SD	Correlations <sup>a</sup>											
				1.	2.	3.	4.	5.	6.	7.	8.	9.			
1. Age	9-16	13.23	2.09	1.00											
2. Gender	Male = 0	.59	.49	.04	1.00										
3. Online on-the-go	No = 0	.77	.42	.15**	.15**	1.00									
4. Sensation seeking	1-3	1.56	.61	.12**	.12**	.09**	1.00								
5. Psychological difficulties	1-3	1.55	.29	-.04	-.04	-.02	.24**	1.00							
6. Intensity of harm	0-3	2.47	1.02	.00	.00	.00	-.11**	.13**	1.00						
7. Bullying via SNS	No = 0	.45	.50	.12**	.12**	.05	.07*	.10**	.07**	1.00					
8. Bullying via IM	No = 0	.46	.50	.11**	.11**	.02	.01	.01	.09**	-.19**	1.00				
9. Types of online bullying	1-5	1.35	.72	.16**	.16**	.06*	.17**	.20**	.15**	.24**	.14**	1.00			
10. Mobile victim	Online victim = 0	.32	.47	.16**	.16**	.12**	.12**	.09**	.09**	.11**	.16**	.15**	1.00		

\* Correlation is significant at the 0.05 level (2-tailed), \*\* Correlation is significant at the 0.01 level (2-tailed).

Notes: <sup>a</sup>Coefficients for correlations between dichotomous and continuous measures are point-biserial ( $r_{pb}$ ) and between two dichotomous measures are measured by  $\chi^2$ -analyses and indicated by  $\Phi$ .

Analysis was performed on those children who had indicated to have been bullied by someone else on the internet and showed valid responses on all measures ( $N = 1300$ ).

### Correlations of country level variables

The correlation of the percentage of those being cyberbullied on-the-go out of all who were cyberbullied with the percentage being online on-the-go within each country was in the hypothesised direction (positive) albeit not statistically significant ( $r = .28$ ,  $p = .18$ ,  $N = 25$ ). The correlation and percentages for each country on both variables are shown in Figure 1.

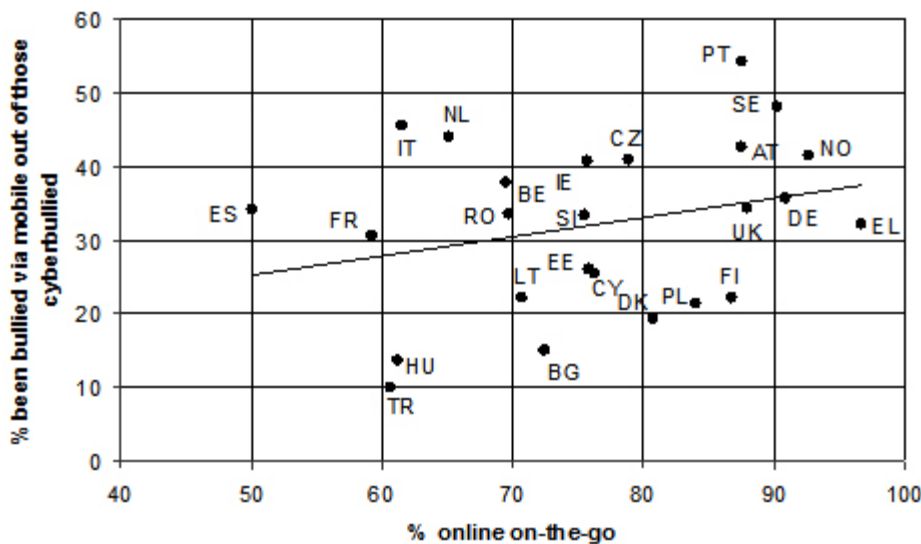


Figure 1. Percentages cyberbullied and online on-the-go by country.  $N = 25$ .

### Predicting cyberbullying on-the-go

We used multilevel modelling (with Stata/SE 11.1) for our analyses. Individuals' characteristics were our level-1 variables and country characteristics the level-2 variables. Our analytical procedure consisted of six steps (see also Kreft & De Leeuw, 1998; Raudenbush & Bryk, 2002). All variables were standardised to range from 0 to 1 in order to make odds ratios comparable between predictors. Further, non-dichotomous variables were centred at their grand-mean. We used full maximum likelihood (ML) as a method of estimation, so any pair of nested models can be tested for significant differences with a likelihood ratio test (see Tabachnick & Fidell, 2007, p. 830).

As a first step a model not including any predictors was conducted to assess whether the amount of cyberbully victims on mobile phones among cyberbully victims would vary across countries. The variation across countries was significant ( $\chi^2_{(1)} = 16.60, p < .001$ ) with 4.7% of the variation being attributable to between country differences (Variance Partitioning Coefficient; cf. Browne, Subramanian, Jones, & Goldstein, 2005). The odds of cyberbullying victims on-the-go among online bully victims was significantly lower from the overall odds across all countries in Bulgaria and Denmark while they were significantly higher in Sweden (see Figure 2).

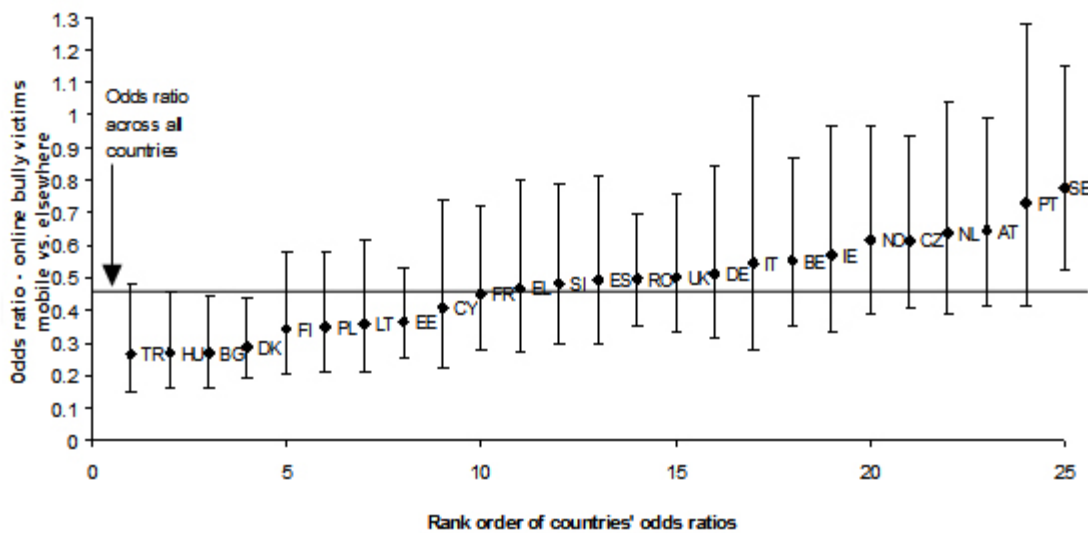


Figure 2. Predicted odds ratios of online bully victims by mobile phone versus elsewhere by country. Error bars represent 95% confidence intervals for each country's odds ratio.

We then entered the individual level predictor variables with the intercepts (country averages) varying randomly in three successive steps. First, we tested whether individuals who were bullied online by mobile phone as opposed to online elsewhere were more likely to be online on-the-go controlling for demographics. Adolescents who go online on-the-go were 1.77 times more likely to be bullied online by mobile phone than online elsewhere. In addition, the likelihood of being a mobile as opposed to an online victim elsewhere increases with age (2.8 times) and is more likely among females (1.66 times; see Model 1, Table 2).

Second, we added the individual level psychological predictor variables. Results showed that a higher likelihood of being a mobile as opposed to an online victim elsewhere was associated with higher scores in sensation seeking (i.e., 2.26 times more likely for someone with the highest as opposed to the lowest score), psychological difficulties (i.e., 2.7 times more likely for someone with the highest as opposed to the lowest score), and a higher intensity of harm from online bullying experiences (1.54 times more likely for someone with the highest as opposed to the lowest score) independent from demographics and being online on-the-go (see Model 2, Table 2). Adding these psychological predictor variables



increased the fit of the model significantly compared to Model 1 ( $\chi^2_{(3)} = 30.43$ ,  $p < .001$ ).

Third, we examined whether the experience of being bullied via mobile phones is related to different bullying experiences. Adolescents who have been bullied via SNS were 1.48 times and who have been bullied via IM were 1.91 times as likely to have been bullied online by mobile phone than online elsewhere independent of the other predictors. The range of online bullying types was only marginally significantly associated with being a cyberbullying victim on-the-go ( $Exp(B) = 2.05$ ,  $p = .05$ ). In addition, the psychological predictor variables, intensity of harm, and psychological difficulties ceased to reach statistical significance in this model suggesting that being bullied via SNS and IM are potential mechanisms by which cyberbullying on-the-go is experienced as more upsetting and associated with greater psychological difficulties (see Model 3, Table 2). Adding these predictor variables related to bullying experiences improved the accuracy of predictions significantly compared to Model 2 ( $\chi^2_{(3)} = 34.7$ ,  $p < .001$ ).

Subsequently, we tested whether the association of the predictor variables with mobile bullying might vary across countries. However, allowing the slopes of these predictors to vary randomly across countries did not increase the model fit compared to Model 3 ( $\chi^2_{(5)} = 2.34$ ,  $p = .80$ ). Hence, associations between the predictors and being a cyberbullying victim on-the-go did not differ between countries, i.e. there was no cross-country variability in odds ratios.

In the sixth and last step we added the country-level predictor to the best fitting level-1 model (i.e., Model 3) and examined whether the % online on-the-go per country accounted for cross-country differences in mobile bullying when individual differences were controlled for. No significant relation to the odds of being a cyberbullying victim on-the-go among online bully victims emerged ( $Exp(B) = 3.13$ ,  $p = .18$ ; see Model 4, Table 2). Subsequently, the fit of the model was not increased significantly between Model 3 and Model 4 ( $\chi^2_{(2)} = 1.75$ ,  $p = .19$ ).

Table 2. Multilevel hierarchical logistic regression analysis for variables predicting cyberbullying on-the-go (N = 1300).

	Model 1			Model 2			Model 3			Model 4		
Variable (Groupings)	B	SE(B)	Exp(B)	B	SE(B)	Exp(B)	B	SE(B)	Exp(B)	B	SE(B)	Exp(B)
Constant	-1.13	.13	.32	-1.17	.13	.31	-1.12	.13	.33	-1.12	.13	.33
<b>Mobile internet usage</b>												
Age	1.03	.22	2.80***	.98	.22	2.66***	.74	.23	2.09***	.74	.23	2.10***
Gender (0 = male)	.51	.13	1.66***	.54	.14	1.72***	.42	.14	1.51**	.42	.14	1.52**
Online on-the-go	.57	.16	1.77***	.55	.17	1.73***	.52	.17	1.68**	.51	.17	1.67**
<b>Psychological</b>												
Sensation seeking				.82	.22	2.26***	.71	.22	2.04***	.72	.22	2.05***
Psychological difficulties				.99	.46	2.70*	.78	.47	2.18	.77	.47	2.16
Intensity of harm				.43	.20	1.54*	.30	.20	1.34	.30	.20	1.35
<b>Cyberbullying experiences</b>												
Bullied via SNS							.39	.14	1.48**	.39	.14	1.48**
Bullied via IM							.65	.14	1.91***	.65	.14	1.91***
Types of online bullying							.72	.37	2.05	.72	.37	2.05
<b>Country level</b>												
% online on-the-go										1.14	.85	3.16
-2 Log likelihood ratio												1.75(1)

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

## Discussion

The threat of cyberbullying appears to be increasing due to technological features of mobile devices (GfK, 2012; ONS, 2011; Rideout et al., 2010). However, there should not be systemic panic at a new wave of potential threats towards today's youth. Put in context, across Europe there are estimates of about 6% through 18 % of children who use the Internet experiencing online bullying (Hasebrink et al., 2009; Livingstone et al., 2011a). There are large ranges from well below that to one in four children being a suspected cyberbullying victim (National Children's Home, 2002).

We argued that cyberbullying via mobile devices (i.e., on-the-go) in addition to other platforms would be associated with a) factors related to mobile Internet usage, b) psychological factors that could lead to or follow from cyberbullying experiences (or both) and c) cyberbullying experiences in terms of technological platforms and the range of types of online bullying. Most of our hypotheses were confirmed.

Children who are older, girls and those who use the Internet on-the-go were more likely to be cyberbullied on-the-go. Older children tend to have more access to technological and mobile devices in particular (Ortega et al., 2009). Girls tend to use more features associated with social relationships online which in turn lend themselves to cyberbullying (Cross et al., 2009; Kowalski & Limber, 2007; Mesch, 2009). And generally those who use the Internet on a mobile device are more likely to be bullied through this device.

In terms of psychological variables we found that sensation seeking, psychological difficulties and the intensity of harm were associated with being cyberbullied on-the-go. Sensation seekers are more likely to take risks and seek out new experiences (Stephenson et al., 2003; Zuckerman, 1979); hence we argued that they would be more likely to be in situations that lend themselves to cyberbullying on-the-go. However, sensation seeking did also show a negative association with intensity of harm from cyberbullying. It is possible that sensation seeking both leads to higher risk experiences and provides a resilience factor enabling adolescents to cope with the risks encountered (cf. Coleman & Hagell, 2007; Farmer et al., 2001; Schoon, 2006; Smith et al., 1992).

Being cyberbullied on-the-go was also associated with negative mental health consequences such as higher psychological difficulties and intensity of harm. This suggests that cyberbullying on-the-go has particular features that might exacerbate the negative mental health consequences of cyberbullying (Gradinger et al., 2009; Juvonen & Gross, 2008; Perren et al., 2010; Spears et al., 2009). However, this finding has to be regarded with care as with every cross-sectional study no statement about causality can be made. It is possible that those exhibiting higher psychological difficulties are more likely to experience cyberbullying on-the-go to begin with and subsequently present with higher intensities of harm. This is possibly a cyclical process which might apply in a similar way to cyberbullying in general whereby those with features of negative mental health are more susceptible to be cyberbullied as well as more likely to experience negative mental health symptoms when being cyberbullied (Gradinger et al., 2009; Juvonen & Gross, 2008; Spears et al., 2009).

Adolescents who were cyberbullied on-the-go were significantly more likely to have been bullied via SNS or IM. In line with media user statistics from the UK (GSMA Mobile Media Metrics, 2010; Ofcom, 2011), this finding suggests that European adolescents access SNS and IM more frequently through their mobile devices than other platforms. In addition, the variables indicating negative psychological consequences of cyberbullying on-the-go (i.e., psychological difficulties, intensity of harm) became insignificant when bullying via SNS and IM were controlled for. This finding suggests that SNS and IM are mechanisms that lead to greater psychological distress through cyberbullying on-the-go. That is, the higher psychological distress through cyberbullying on-the-go as opposed to stationary devices might be due to cyberbullying experiences via IM and SNS. Why this is the case remains unclear, however a range of plausible reasons are considered by previous studies. Possibly, the wide range and ongoing presence of bullying messages on SNS sites (Cross et al., 2009) or the personal relationships often held on SNS or through IM leading to more relational aggression on these platforms (Mesch, 2009) as well as the high prevalence and frequency of bullying through IM (Kowalski & Limber, 2007; Smith et al., 2008) are responsible.

Against predictions the range of types of online bullying experiences was not significantly related to cyberbullying on-the-go. Hence, our assumptions that cyberbullying on-the-go might also be associated with more differential bullying experiences could not be confirmed. It is possible that those who are additionally cyberbullied via mobile devices are bullied more intensely, as bullying on-the-go is more invasive, but in the same ways as those bullied via other online technologies.

In addition to the individual level predictors of cyberbullying on-the-go there was significant cross-country variation in the incidence of those cyberbullied on-the-go among those cyberbullied. However, the hypotheses that this country variation is related to the amount of adolescents going online on-the-go within each country could not be confirmed. Even though the country variation in cyberbullying on-the-go reached statistical significance, of the variation explained by all of variables considered in the model **country** as a variable did only explain 3.6%. Hence finding significant indicators to account for these 3.6% can be a daunting task. One of the reasons for the low explanatory power of countries was certainly the small sample sizes within each country leading to confidence intervals ranging from +/-8% for Denmark up to +/-29% for Italy. This finding explains why only a few countries significantly differed from the cyberbullying on-the-go overall average. Overall we can conclude that being cyberbullied on-the-go can mainly be explained by individual level but not by country level factors.

## Limitations

The data collection in the EU Kids Online project was not specifically targeted towards assessing cyberbullying on mobile devices. Hence, some of the variables in our model could only be considered proxies for theoretically assumed mechanisms or concepts. Most importantly, the dependent variable did not directly assess whether adolescents were actually cyberbullied on their mobile devices **via the Internet**. However, we made the assumption that those who stated to have been bullied via the Internet and the mobile phone would be likely to have been bullied while using the Internet on their mobile devices. This assumption was supported by the fact that this group did indeed use their mobile devices to go online significantly more than others.

The data set did not enable us to test some of the assumptions regarding the underlying mechanisms. We hypothesised that cyberbullying on-the-go would lead to more harm due to its 24/7 presence (e.g., Willard, 2007). However, respondents in the current study were not asked the reasons for being upset or whether they are constantly logged on with their mobile device. Further, we concluded that adolescents would use SNS and IM increasingly on mobile devices and hence, these popular platforms for cyberbullying now being on mobile devices, would cause those being cyberbullied on-the-go more distress. Again we had to make an assumption as there was no direct data available whether when adolescents were cyberbullied through SNS and IM this happened on their mobile devices. Further research is needed targeting these concepts directly to clarify whether our assumptions hold.

## Implications

Do our findings suggest that older children and girls should be kept from using the Internet to the extent that they do? Should adolescents in general be restrained from going online via their mobile devices? Certainly, the consequences of using the Internet on mobile devices are not only cyberbullying. Older children use the Internet longer and on more platforms, they do have more skills to use the Internet than younger children, use it in a greater variety and more creative ways over all contributing to positive experiences (cf. Hasebrink et al., 2011; Pruulmann-Vengerfeldt & Runnel, 2012). Similarly girls' social and networking activities online do also not exclusively consist of being cyberbullied.

In sum, even though older children, girls and generally those using the Internet on mobile devices are more likely to experience cyberbullying on-the-go we would not think it advisable to restrict mobile Internet use for these groups. However, these groups might be particular targets for cyberbullying prevention programs and campaigns.

Our findings indicate that cyberbullying on-the-go causes more distress than cyberbullying does already.

It appears that this is due to bullying experiences on SNS and IM. However, it cannot be a solution to ban adolescents from the use and some of the opportunities that they can gain through such applications such as increased life satisfaction, perceived social support and positive self-views (e.g., Gentile, Twenge, Freeman, & Campbell, 2012; Manago, Taylor, & Greenfield, 2012).

Further research is needed on how bullying is taking place on social applications and by whom. It might be possible to prevent cyberbullying on SNS and IM by empowering adolescents through more skills regarding their privacy settings (cf. Patchin & Hinduja, 2010). In addition, as it has been shown that cyberbullying is not a one-way phenomenon but those who are cyberbullies have often been cyberbullied themselves (Erdur-Baker, 2010; Görzig, 2011; Li, 2007). Raising adolescents' awareness of the consequences for themselves and others might provide a means for breaking the cycle of reciprocal cyberbullying. As cross-country variation appears minimal, implications of our findings should hold across countries studied.

## Notes

1. Valid answers were all answers excluding the response options "don't know", "prefer not to say", if available, and data errors. These were coded as missing values. Logistic regression analyses with missing values as the dependent variables (response missing vs. not missing) and all other variables entered as predictors showed no significant relation between those whose responses were coded as missing and those who showed valid responses for any of the variables (all  $p$ 's < .05). Hence, missing at random was assumed and no further procedures to deal with missing values were deemed necessary.

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