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Cybercrime victimization among young people: a multi-nation study

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This study examines cybercrime victimization, what some of the common characteristics of such crimes are and some of the general predictors of cybercrime victimization among teenagers and young adults. A combined four-country sample (Finland, US, Germany and UK; $n = 3{,}506$) is constructed from participants aged between 15 and 30 years old. According to the findings, online crime victimization is relatively uncommon (aggregate 6.5% of participants were victims). Slander and threat of violence were the most common forms of victimization and sexual harassment the least common. Male gender, younger age, immigrant background, urban residence, not living with parents, unemployment and less active offline social life were significant predictors for cybercrime victimization.

Keywords: cybercrime; victimization; youth; young adults; routine activity theory

Introduction

Despite the commercialization of the Internet and other new information and communication technologies only a couple of decades ago, different forms of cybercrime have become a daily occurrence. The term cybercrime is a relatively vast concept, as targets for such crimes range from governments and multinational corporations to individuals, thus resulting in a wide range of research interest regarding the potential implications (e.g. Aaltonen & Salmi, 2013; Jewkes & Yar, 2013; Oksanen & Keipi, 2013). The common denominator for different forms of cybercrimes is their having been committed using computers and other online or electronic networks and platforms. In a broad sense, cybercrime may be categorized into two levels: institutional and individual. That is, larger scale cyber-attacks such as those targeting governments, institutions or multinational corporations are commonly initiated by *hackers* or *cyber terrorists* (terms by which the perpetrators are often referred) (e.g. Hansen, Lowry, Meservy, & McDonald, 2007). Cybercrime at an individual level, on the other hand, often reflects victimization through known assailants, or where the victim is a specific target. Keeping this in mind, the focus of our study will be on cybercrime at an individual level, as we examine young people and their perceived experiences with online crime victimization.

It is challenging to make the distinction between forms of online victimization, such as cyberbullying or online harassment, and those acts that actually constitute a crime (see e.g. McGuire & Dowling, 2013, p. 6). However, in this study our focus is solely on negative experiences online that the respondents have perceived as a crime. According to past research from the individual perspective, sexual solicitation or harassment, identity theft,

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defamation, fraud and phishing are among some of the common forms of cybercrime (e.g. Finkelhor, Mitchell, & Wolak, 2000; Oksanen & Keipi, 2013; Wolak, Mitchell, & Finkelhor, 2006; Yar, 2013).

The figures for cybercrime victimization tend to be low, but are higher among younger online users when compared to older age groups. According to Oksanen and Keipi (2013), 2.5% of respondents aged 15–74 years reported being victims of cybercrime in 2008. Among the ages of 15–24, the figure was 5.3%. In a Wolak et al. (2006) survey study, 4% of young American respondents reported having been a victim of aggressive sexual solicitation. Furthermore, US statistics from 2012 indicate that roughly 10% of Internet users reported being a victim of online scams or phishing (Norton, 2012). Our aim in this study is to provide new information concerning young Internet users and their perceived exposure to cybercrime victimization, as well as insight regarding the elements that influence such negative experiences. Young people tend be the most active Internet users, thus their experiences with victimization due to cybercrime provide important information concerning research on negative experiences in the online environment.

From a theoretical perspective, when looking at the elements that influence one's likelihood of becoming a victim of negative behaviour, the routine activity theory (RAT), developed by Cohen and Felson (1979) is plausible (see also Marcum, Higgins, & Ricketts, 2010; Pratt, Holtfreter, & Reisig, 2010). According to RAT, individuals' social behaviour influences the opportunities for victimization. In a broad sense, the odds for becoming a victim of an assault are much greater on a night out than they would be if one chose to spend the evening home alone. It appears that many aspects of online victimization support a similar theoretical approach. That is, active online users have been found to be more likely victims of negative online behaviour than less active users (e.g. Näsi et al., 2014; Oksanen & Keipi, 2013). In line with such findings, it has also been noted that young people tend to be more active users of new technologies, and as a result they are more likely to become victims online compared to older users (e.g. Ybarra, 2004). Staksrud, Ólafsson, and Livingstone (2013) also found that children who were active users of different types of social media faced more risks online than nonusers.

Furthermore, we are also keen to establish whether other background variables that have been known to influence crime victimization in the offline context have similar effects in terms of cybercrime. For instance, it has been found that residents of bigger cities are more likely to become victims than those living in rural areas (Glaeser & Sacerdote, 1999), whereas in more recent studies it was noted that native residents were more shielded from crime compared to immigrants (Lehti et al., 2014; Wheeler, Zhao, Kelleher, Stallones, & Xiang, 2010). We are thus interested in examining whether there are similar associations with cybercrime. This study therefore aims to establish how common cybercrime victimization actually is, what some of its common characteristics are, and the general predictors of cybercrime victimization among teenagers and young adults.

Data, measures and analysis

Our data are constructed from participants aged between 15 and 30 years old from four countries, namely the USA ($n = 1{,}033$), Finland ($n = 554$), Germany ($n = 973$) and the UK ($n = 999$). The American and Finnish data were collected in the spring of 2013 while the German and UK data were collected in the spring of 2014. Data collection was administrated by Survey Sample International, and the participants from the four countries participated voluntarily on different panel surveys. As such, the potential participants for

this type of survey were recruited using several different methods, including random digit dialing, banner ads and other permission-based techniques. Besides this, email invitations were also sent to a sample of panel members in all four countries in order to stratify the participant pool, mirroring the population in terms of basic socio-demographic measures of age, gender, education level and income (see Lorch, Cavallaro, & van Ossenbruggen, 2012). The sample quota was calculated to be nationally relatively well representative on age and gender for all four countries (see also Näsi et al., 2014).

We thus need to acknowledge the possibility of volunteer bias due to the method of data collection. However, the above discussed actions were applied in order to minimize the potential effects of such bias. It should also be noted that demographically balanced online panels are becoming increasingly common due to the benefits they afford. Such a method can in fact protect against research participant bias as such screening makes it easier to target respondents and panelists who have already agreed to participate in online surveys (Evans & Mathur, 2005; Wansink, 2001). Further, it has been found that recruitment and selection processes, including the use of pre-panel interviews and different participation incentives, increase the competence and therefore the validity of those who ultimately become part of such a panel (see e.g. Wansink, 2001; see also Näsi et al., 2014).

Our first aim was to examine how many if the respondents had been victims of cybercrime. This was measured by asking the respondent the following: 'In the past three years, has someone committed a crime against you online?' with the option for either a yes or no response. The question therefore required self-evaluation of whether one actually perceived having been a victim of a crime online. As we were interested in a more detailed description of the characteristics of these crimes, the questionnaire had the following list of online crimes in order to provide more specific details about the crimes of which respondents had actually been victims. The options were 'Slander or defamation of your character', 'Coercion or a threat of violence', 'Identity theft', 'Fraud', 'Sexual harassment' and 'other, which?'

Our second aim was to examine how different background variables influence the likelihood of becoming a victim of online crime. We included several independent variables including country of residence (the USA, Finland, Germany or UK), gender and age (four age groups, 15–18, 19–22, 23–26 and 27–30), whether either of the respondents' parents had been born abroad (Yes/No), respondents' area of residence (categorized as 'Large city' or 'Not large city'), respondents' economic activity (categorized as Student, Working or Not working) and whether respondent was living with parents (Yes/No). Finally, we controlled for respondents' social activity ('How often do you meet face-to-face with friends, relatives or work colleagues for social reasons?' with a scale of 7 options, ranging from 1 = Never to 7 = Every day).

Variables selected were determined as relevant and topical for the purpose of establishing some of the predictors of cybercrime victimization. Both gender and age are commonly used control variables. However, respondents' area of residence was included because general crime victimization has been found to be more common in larger cities than in smaller cities or towns (e.g. Glaeser & Sacerdote, 1999). The variable 'parent(s) born abroad' was included because crime victimization has been found more common among those with an immigrant background (e.g. Lehti et al., 2014; Wheeler et al., 2010). Economic activity was included on the basis that a link between unemployment and crime has been established in several past studies (e.g. Cohen & Felson, 1979; Sampson, 1985). Past research has also established a strong link between the role of family and victimization (e.g. Apel & Kaukinen, 2008); thus, we were keen to examine whether living

at home would also serve as a protective factor for online victimization. Finally, social activity was included as a control variable, as popularity and friendships have been found to serve as protective factors against victimization (e.g. Schreck, Fisher, & Miller, 2004). In essence, we were interested in examining how factors that have been found to be influential in the context of offline victimization might affect users in the online context.

For the purposes of the analysis we have combined the data from the four countries ($n = 3{,}506$). We report descriptive statistics and logistic regression analysis models including odds ratios (OR) and their confidence intervals. Model fit and the total variance accounted for are reported using the log-likelihood and Pseudo coefficient of determination (Cragg and Uhler's R^2, i.e. Nagelkerke R^2).

Results

In Table 1 we present the descriptive statistics of cybercrime victimization according to all independent variables. As we can see, the number of respondents by country regarding certain variables was not very high; thus, we decided to combine the data for the rest of the analysis. In the aggregated data ($n = 3{,}506$), only 6.5% of the respondents reported having been victims of cybercrime during the past three years. The percentages of victimization were almost identical in each of the four countries, and the differences between countries were not statistically significant. We also examined the characteristics of the crime in the combined data (not shown in the table). According to the results of those respondents who had been victims of cybercrime, slander or defamation of one's character was the most common form of crime (40% of the victims reported this as the category of the crime),

Table 1. Descriptive statistics of cybercrime victimization.

	Finland	USA	Germany	UK
	Yes % (*n*)	Yes % (*n*)	Yes % (*n*)	Yes % (*n*)
Victim of cybercrime	6.2 (33)	6.3 (63)	6.0 (58)	7.4 (74)
Gender				
Female	6.4 (17)	6.0 (30)	3.1 (15)	5.9 (29)
Male	6.0 (16)	6.6 (33)	8.9 (43)	8.8 (45
Age				
15–18	6.5 (7)	3.9 (5)	9.2 (13)	6.9 (10)
19–22	4.6 (7)	6.7 (22)	5.4 (15)	5.7 (18)
23–26	6.0 (9)	7.6 (21)	5.6 (18)	7.3 (19)
27–30	8.1 (10)	5.6 (15)	5.1 (12)	9.6 (27)
Parent(s) born abroad				
No	5.3 (25)	4.7 (33)	5.6 (37)	7.1 (51)
Yes	12.7 (8)	10.0 (30)	6.9 (21)	8.3 (23)
Residence				
Not large city	4.3 (11)	4.5 (20)	4.8 (25)	4.6 (21)
Large city	7.7 (21)	7.8 (43)	7.2 (33)	9.9 (53)
Living with parents				
No	6.5 (24)	7.6 (44)	6.3 (38)	9.8 (54)
Yes	5.4 (9)	4.5 (19)	5.4 (20)	4.4 (20)
Economic activity				
Student	5.7 (14)	4.3 (16)	5.6 (24)	5.5 (18)
Working	5.6 (9)	6.8 (29)	6.5 (25)	9.1 (45)
Not working	7.9 (10)	8.8 (18)	5.7 (9)	6.3 (11)
Social activity (mean and SD)	4.9 (1.6)	4.5 (1.7)	5.1 (1.5)	4.7 (1.7)

followed by coercion or a threat of violence (34%). Furthermore, 28% had been victims of fraud and 23% had been victim of identity theft. Sexual harassment was the least common form of online crime (17%).

In Table 2 we provide the explanatory logistic regression analysis for online victimization by independent variables. Coefficients shown in the table are based on the adjusted model. The results show that males (OR 1.70, $p = 0.000$) were more likely to be victims than females. The youngest age groups were more likely to be victims than the older age groups (age group 19–22, OR 0.55, $p = 0.017$, age group 23–26, OR 0.49, $p = 0.010$ and age group 27–30, OR 0.47, $p = 0.012$). Respondents whose parent, or both parents had been born abroad (OR 1.47, $p = 0.010$) were more likely to be victims than those respondents who parent had not born abroad. Respondents living in big cities were more likely to be victims than those living in small cities (OR 1.75, $p = 0.000$). Respondents who were no longer living at home were more likely to be victims than those still living with their parent(s) (OR 0.53, $p = 0.001$). Furthermore, those not working (OR 1.67, $p = 0.020$) were more likely to be victims compared to those studying. Finally, in terms of social activity, those meeting with their friends, relatives or colleagues face to face for social occasions were less likely to be victims than those socially less active (OR 0.91, $p = 0.024$).

Table 2. Explanatory logistic regression analysis of the independent variables.

	OR, *p*-value, 95% CI	
Country		
Finland	1	
USA	1.02	0.65–1.60
Germany	1.04	0.71–1.51
UK	1.24	0.87–1.76
Gender		
Female	1	
Male	1.70***	1.27–2.26
Age		
15–18	1	
19–22	0.55*	0.34–0.90
23–26	0.49*	0.29–0.85
27–30	0.47*	0.27–0.84
Parent(s) born abroad		
No	1	
Yes	1.47**	1.10–1.96
Residence		
Not large city	1	
Large city	1.75***	1.31–2.34
Living with parents		
No	1	
Yes	0.53***	0.37–0.77
Economic activity		
Student	1	
Working	1.47	1.00–2.16
Not working	1.67*	1.08–2.56
Social activity	0.91*	0.83–0.99
Log likelihood	−808.361	
Cragg & Uhler's R^2	0.05	

Notes: OR, odds ratio; CI, confidence interval. Significance levels: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Discussion

This article examined the prevalence, characteristics and general predictors of cybercrime victimization among teenagers and young adults. As the results indicated, cybercrime victimization was not very common and there were no significant differences between the countries, thus indicating that the cross-national differences in terms of general crime victimization are perhaps more notable in the offline context (see e.g. Heiskanen, 2010). In terms of how common cybercrime victimization is, our findings appear somewhat in line with the prior research (Norton, 2012; Oksanen & Keipi, 2013; Wolak et al., 2006).

In terms of the characteristics of the crimes, defamation and threat of violence were the most common forms of crimes, whereas sexual harassment was the least common. This may in fact relate to the particular nature of online interaction. It is relatively easy to spread false or offensive information about individuals online; thus, such behaviour might become highlighted in the online context, whereas sexual harassment is perhaps more physical in nature. In fact, according to US statistics sexual harassment is by far more often reported in offline contexts than in online contexts (e.g. Duggan, 2014; Ilies, Hauserman, Schwochau, & Stibal, 2003).

In terms of the other independent variables, males were more likely to be victims than females. This perhaps mirrors the results concerning the types of crimes that were more common. As noted, women are more likely to be victims of sexual harassment, whereas defamation and threats of violence tend to be more common among males (e.g. Borden, 1997). Our results concerning age were in line with past findings concerning general online victimization, which have found younger respondents to be both more active Internet users and more likely to be victims online (Oksanen & Keipi, 2013; Ybarra, 2004). Furthermore, respondents whose parent or both parents had been born abroad were significantly more likely to be victims of crime online than respondents with native parents. These findings are supported by recent studies which have found that immigrants are commonly more likely to be victims of a crime compared to natives (Lehti et al., 2014; Wheeler et al., 2010), indicating that a non-native background heightens the likelihood of crime victimization offline as well as online.

Furthermore, living in large cities increased the likelihood for online crime victimization. This is in line with findings concerning offline victimization, and the results were similar concerning economic activity, as unemployment has also been found to heighten risk for offline victimization (e.g. Glaeser & Sacerdote, 1999; Sampson, 1985). However, it appears that living with one's parents as well as having a more active offline social life protects against the potential for online victimization.

From the RAT perspective, we could argue that both suitability for becoming a target and the role of guardianship play a notable role both in the online and offline environments. As noted above, large cities provide opportunities and suitable targets for criminals. Living in a larger city may also be associated with lifestyle choices that increase the likelihood of victimization. Lack of guardianship, in particular, is a central characteristic of those living in big cities. The same may apply to some extent to those who are less integrated socially. The protective role of guardianship was manifested in our results in terms of those living with parents and those characterized as more socially active offline being less likely to be victims of cybercrime. In addition, those who were still studying were also less likely to be online victims.

Our findings therefore suggest that many aspects of cybercrime victimization appear similar to the elements that are influential in offline victimization. However, it may be that cultural influences may be less evident online when comparing to the offline context.

Finally, it needs to be noted that new studies and theories focusing on different forms of online behaviour from the perspective of criminology are very much needed in order to construct a more comprehensive understanding of the risks of online victimization.

Our study naturally has its limitations. First, our data are not based on random sampling, thus we must be cautious when interpreting the results in terms of how applicable they are in the general context. Second, because most young people and young adults today use the Internet on a daily basis, it would be important to measure the intensity of their online activities using various measures (hours of daily usage and importance assigned to the online activities and communities). Finally, future studies' use of cross-national comparison would provide valuable information in terms of the role of cybercrime in different countries.

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