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The Nature Of Mobile Bullying & Victimisation In The Western Cape High Schools of South Africa

Michael Eddie Kyobe Prof.
University of Cape Town, Michael.Kyobe@uct.ac.za

Grant Wayne Oosterwyk
University of Cape Town, grant@oosterwyk.za.net

Oluyomi Kabiawu
University of Cape Town, oluyomi.kabiawu@uct.ac.za

KENNESAW STATE
U N I V E R S I T Y
COLES COLLEGE OF BUSINESS
Department of Information Systems

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Michael E. Kyobe
University of Cape Town
michael.kyobe@uct.ac.za

Grant W. Oosterwyk
University of Cape Town
grant@oosterwyk.za.net

Oluyomi O. Kabiawu
University of Cape Town
oluyomi.kabiawu@uct.ac.za

ABSTRACT

Cyberbullying is often operationalized as an aggression conducted by people on various electronic devices. However, these technologies differ in their characteristics and the distinctive aspects of their effects are not clearly known. The present study examined the nature and influence of cyberbullying committed using mobile phones in high schools in the Western Cape Province of South Africa.

We surveyed 3621 students and the findings suggest that the use of mobile phones could have greater cyber-bullying effect than the use of other electronic devices. School culture had the greatest influence on mobile bullying, followed by anonymity. Nevertheless, the influence of anonymity does not only depend on non-identification of the bully but on other factors like safety risk.

We also found that it is important to examine gender influence at various stages of the bullying activities. Gender appears to influence mobile bullying at its initiation stage than at the promotion and maintenance stages. The implications of these findings are discussed.

Keywords

Mobile bullying, Victimization, Influencing factors, Western Cape, South Africa, High schools

INTRODUCTION

While technology has improved communication amongst adolescents today, young people also use it to bully their peers. Studies often define d cyberbullying as an aggression conducted by various electronic means, for example, the Internet and Mobile technology (Pyżalski, 2011; Wolak, Mitchell and Finkelhor, 2007). hese technologies differ in their characteristics and the distinctive aspects of their

effects are not made clear (Pyżalski, 2011; Wolak, et al., 2007). The present study examines the nature and influence of cyberbullying committed using mobile phones.

The use of mobile phones amongst adolescents has dramatically increased, but limited research has been conducted in South Africa to examine mobile bullying, its effects on adolescents and their coping strategies (Badenhorst, 2011). The present study attempts to fill this gap in our understanding by investigating the nature and prevalence of mobile bullying in schools located in the Western Cape province of South Africa. It aims to identify those factors influencing involvement in mobile bullying and the impact of this involvement on victimization in schools.

The paper begins by reviewing the concept of bullying and the different forms of bullying. The researchers discuss the importance of examining the distinctive effects of specific technologies involved in cyberbullying, and the factors that influence cyberbullying (including mobile bullying). Based on this analysis, a conceptual model predicting the relationship between these factors, involvement in mobile bullying and victimization is developed. The methodology used to test this model is presented followed by the analysis of the findings, and finally conclusions are drawn and recommendations made.

LITERATURE REVIEW

Traditional bullying and Cyberbullying

The most universal definition of bullying articulates that "a person is being bullied when they are exposed, repeatedly and over time, to negative actions on the part of one or more other persons" (Olweus, 1991). Bullying can be done physically (referred to here as traditional or conventional bullying) or electronically, referred to as cyberbullying.

Traditional bullying is that form of bullying usually committed physically, and the aggressor is perceived to be physically, socially or psychologically more powerful than the target (Orpinas and Horne, 2006). Many definitions exist of cyberbullying, however, it commonly refers to that form of aggression committed using electronic means such as the Internet, mobile technology and computers (Brunstein, Sourander and Gould, 2010). Traditional and cyberbullying are similar in that both aim to harm others and are often repeated (Kowalski, Limber and Agatston, 2008). The main differences, according to Bauman (2010) are: "(a) the perception of anonymity on the part of perpetrators; (b) a potentially infinite audience; (c) an inability of the perpetrator to observe the target's immediate reaction; (d) an altered balance of power; and (e) the absence of time and space constraints on bullying". The similarities between traditional and cyberbullying have led some to argue that cyberbullying is an extension of conventional bullying, with the same individuals engaging in both behaviors (Ybarra, Mitchell and Espelage, 2009). This view is still debatable.

Danquah and Longe (2011) found that aggressive behavior results from the anonymity the offenders enjoyed online. It was also found that sexual violence against children was exported from the Internet to the physical world. In addition, cyberbullying may also differ by the technology used (Wolak, et al., 2007; Pyżalski, 2011). Such differences in views and impacts call for further research into the nature of different forms of cyberbullying, and how these forms relate to each other and to traditional bullying (Ybarra et al., 2009; Pyżalski, 2011). The present study examines the nature and implications of one form of cyberbullying, i.e. mobile bullying.

Mobile bullying

Mobile bullying is that form of cyberbullying committed through email, chatrooms, instant messaging and small text messages using mobile phones (Kowalski et al., 2008). Mobile bullying is increasingly a predominant form of bullying in recent years, often goes unnoticed and has serious implications (Badenhorst, 2011). The difficulties in defining cyberbullying have made it necessary to adopt an umbrella of definitions of cyberbullying. However, this has also led to limited examination of the nature of specific forms of cyberbullying, and assumptions of similar technological effects. Pyżalski (2011) argues that electronic aggression acts differ substantially when one considers the psychological and social mechanisms used and their consequences. Wolak et al. (2007) observed that sending abusive emails and text messages directly to a victim over the Internet might hurt differently from indirect aggression such as spreading rumors. Rice and Katz (2003) also observed earlier that while Internet and mobile phone users overlap they do not necessarily constitute equivalent populations. Recently Pearce and Rice (2013) also observed differences in Internet activities by the type of device used. Researchers therefore maintain that we still have limited understanding of how people use technologies differently (Donner, Gitau and Marsden, 2011). In particular, Nicol and Fleming (2010) state: "There is incomplete understanding of mobile phone aggression and the processes that contribute to it". Since mobile phone aggression has become a predominant method of cyberbullying, its nature and how it differs from other forms of bullying need to be understood fully (Badenhorst, 2011). In the following section we examine these differences, the factors likely to influence mobile bullying and the theoretical work that explain these factors.

Factors influencing mobile bullying

Many factors influencing cyberbullying have been identified in literature. It is assumed in this paper that since mobile bullying is a form of cyberbullying, some of the research works on bullying and cyberbullying may also explain mobile bullying aggression. These relate mainly to the nature of the technology and how it is used, the behavior and attitude of the persons, and the social and physical environment in which they are embedded (Schwanen and Kwan, 2008). In the following sections, the researchers discuss some of these factors.

Technology-related factors

The value creating attributes of mobile technologies have been identified as ubiquity, context-sensitivity, identifying function, and command and control functions (Pousttchi, Turowski and Weizmann, 2003). These attributes, however, can also enhance aggressive or anti-social behavior (Walsh, White and Young, 2010; Christopherson, 2007; Humphrey, 2005). In the following sections we discuss some of the negative aspects of mobile technology.

High rate of availability

The high rate of availability of mobile technology may result in abuse, distraction of self and others, and broken relationships. The more time young people spend online, the more exposed they are to cyberbullying (Slonje and Smith, 2008). Pictures, videos and text containing abusive materials can be transmitted easily and broadly via mobile media, which are always available. A number of studies report that respondents find pictures, photos and videos of violent scenes to have greater negative impact than text messages and website bullying (Menesini, Nocentini and Calussi, 2011). Wolak et al. (2007) noted

that some of these aggressive materials may not be easily terminated or removed from the media and as such remain available in the public domain. It can therefore be argued that electronic media that enables easy and regular dissemination of abusive materials contributes greatly to the escalation of bullying.

Mobile phone enhances anonymous communication (anonymity)

The fact that mobile technology can provide information anonymously means people can be victimized without trace of the perpetrators. Anonymity is conceived as the inability of others to identify an individual or of others to identify one (Christopherson, 2007). Barlett (2013) found that anonymity predicts cyberbullying frequency, moderates the relation between positive attitude to cyberbullying and cyberbullying frequency, and mediates the relation between instant messaging frequency and cyberbullying behavior. Mobile email, chatrooms, instant messaging and Short Message Service (SMS) can all be used to abuse others anonymously on the mobile phone. Compared with other electronic devices, the identity of a mobile phone bully may be more difficult to establish than that of the PC Internet user. For instance, calls made by unregistered pay-as-you-go mobile-phone users or those with pre-registered SIM cards have proved difficult to trace (SA News, 2015). Those with technical knowledge can also tweak triangulation metrics or transmission layers to mask their identity.

Competency in using technology

Researchers have found that competency in technology usage contributes to cyberbullying. According to Ybarra and Mitchell (2004), people with expert Internet knowledge were found to be more aggressive than those with limited expertise. Also, attitude and addiction to technologies can contribute to engagement in aggressive activities. Excessive mobile phone use has led to theft among young people, disruption of social environment and accidents (Walsh et al., 2010). It is, however, not yet established whether usage differs by device Pearce and Rice (2013) found that frequency of usage did not significantly vary by device.

Advancement of the mobile device

Smartphones equip users with a range of advanced features for changing their social media status, sharing thoughts, feelings or photos in real time. These features allow them to be different people in a short space of time (Cuadrado-Gordillo and Fernández-Antelo, 2014). Thus it is reasonable to argue that with smartphones, bullies have more exposure to many features that enhance aggressiveness activities. With an advanced phone, a greater imbalance of power is created between the bully and the victim. Bullies can conveniently be anonymous and hurt others more than would be the case with those using basic phones or the Internet. Researchers like Raskauskas and Stoltz (2007), Slonje and Smith (2008) and Nocentini, Calmaestra, Schultze-Krumbholz, Scheithauer, Ortega and Menesini (2010) maintain that smartphone features such as image/video sharing, email and instant messaging are the most frequently used means of cyberbullying and can have serious effects on the victims.

Socio-ecological factors and attitudes

Bullying in general is a complex socio-ecological phenomenon. In his social-ecological theory, Bronfenbrenner (1979) postulated that human development could be understood by examining the entire ecological system (including the digital sub-system) in which growth occurs and the biological and genetic aspects of the person. Researchers show that bullying involves not only individuals but also their

interactions with families, peer groups, community, culture and the digital subsystem (Dilmac and Aydogan, 2010).

Attitude and gratification

According to the reasoned action model, an individual's attitude toward engaging in a certain behavior is dependent upon the subjective values or estimations of the results correlated with the behavior and the strength of these correlations (Ajzen, Albarracin and Hornik, 2007). White, Walsh, Hyde and Watson (2010) found that frequent users reported more advantages and fewer barriers that would prevent them from using hand-held mobile phones while driving. Researchers have also found that perception of positive outcome from aggressive behavior, retaliatory aggression and gratification lead to involvement in aggressive behavior (Nicol and Fleming, 2010; Patchin and Hinduja, 2010).

Culture and climate

Culture may also influence bullying. Culture in basic terms refers to conventions within a community that underlie their interactions and guide acceptable behavior within the society. The influence of culture is exhibited in many aspects of an individual's life, such as their quests, needs and decisions (McCracken, 1983). School culture is determined by the founders, the environment, as well as the kind of students the school aims to churn out (Robbins and Alvy, 2009). The salient attitudes, standards and beliefs, which dominate the communication among/within staff and students, form a school's climate (Welsh, 2000). Every school has certain rules that form the yardstick for acceptable behavior (Gruenert, 2008). Some researchers have found cyberbullying to be more prevalent in public than private schools (Topçu, Erdur-Baker and Capa-Aydin, 2008). Independently owned schools are said to have more resources and mechanisms to control bullying than state-owned schools. Therefore school environment, its culture and climate can influence bullying behaviour (Cappadocia, Craig and Pepler, 2013).

Lack of anti-mobile bullying policy and its awareness

Lack of awareness of the risks of mobile bullying and measures to prevent it in schools may also contribute to the escalation of this aggression in schools. This could be explained by the *Social contract theory.* According to this theory, a person's moral and/or political obligations are dependent upon a contract or agreement among several persons to form society (Friend, 2006). Friend argues further that in this contract, there should be a set of laws by which all agree to abide and a mechanism for enforcement in order to ensure governance, accountability and cooperation. However, the problem is that the users and service providers often violate these contracts or policies and their effectiveness has been questioned (Rancourt, 2009).

Gender

Gender is an area of great debate in the realm of cyberbullying and victimization, and research has proved to be inconclusive to this point. Females are said to endure considerably more cyberbullying on the basis of sexual attacks (Shariff, 2008), and in some other nature of attacks (Smith, Mahdavi, Carvalho, Fisher, Russell and Tippett, 2008). They have, however, also been found to be cyberbullies. Smith et al. (2008) found that girls were more likely to be both cyberbullies and cyber-victims than boys. Boys are, however, perceived to be more aggressive than girls (Thomas and Allen, 2006). One explanation of these contradictory findings is that boys and girls may both use different cyberbullying strategies, although girls are perceived to prefer more indirect approaches (such as gossiping or spreading rumors) while boys usually adopt direct forms of aggression (Raskauskas and Stoltz, 2007).

The present study – the context

South Africa in general has an undesirable reputation as one of the most violent countries worldwide (Burton and Mutongwizo 2009), and as revealed by the Centre for Justice and Crime Prevention, nearly one half of adolescents have been victims of mobile bullying in South Africa. The present study examines the nature of mobile bullying in the Western Cape province of South Africa due to the high levels of crime reported in the province. The Western Cape identified the highest number of bullying incidents (44%), followed by the North West (41%) and Gauteng (40%). The Western Cape also emerged as the province with the second highest rates of violent victimization in both 2008 and 2012 (Burton and Leoschut, 2013). It is reported that the experiences of online violence are highest among learners from metropolitan areas (Mason, 2008). The aggressors are said to be largely friends of the victims and commonly use pictures or video clips, instant messaging platforms such as Mxit, WhatsApp or simple text messages. The Western Cape government also confirms that young men in high-risk areas who are exposed to high levels of crime and violence from a very young age are more vulnerable to becoming involved in crime. Young women are more prone to become victims of gender-based violent crimes, such as assault and rape. The Western Cape government attributes this mainly to poverty and unemployment (Western Cape government, 2013).

While most of the studies on aggression in the South Africa have focused on traditional aggression and recently on cyberbullying, the focus on mobile bullying is still limited (Badenhost, 2011; Popovac and Leoschut, 2012). As indicated in the literature review, cyberbullying involves use of different online technologies, which may not necessarily capture the distinctive aspects of mobile aggression. Rice and Katz (2003) observed earlier that while Internet and mobile phone users overlap they do not necessarily constitute equivalent populations. In addition, a number of existing findings on cyberbullying and mobile bullying in South Africa and other parts of the world have been inconclusive. For instance, it is still not clear if cyberbullying is an extension of conventional bullying (Ybarra et al., 2009; Wolak et al., 2007; Danquah and Longe, 2011), whether gender influences cyberbullying (Smith et al., 2008), whether gender mediates mobile phone-based social relationships (Wei and Lo, 2006), whether heightened levels of mobile phone use decrease or increase prosocial behavior (Strenziok, Krueger, Pulaski, Openshaw, Zamboni, van der Meer, and Grafman, 2010), and which of the factors influencing mobile-bullying in South Africa are most significant. As mobile bullying becomes a predominant form of bullying in South Africa, understanding the nature and implications of this form of aggression is necessary (Badenhorst, 2011; Humphrey, 2005). Humphrey (2005) concludes that there is a need for better understanding of how this technology reflects social relations and processes as well as how it influences them.

The present study aims to create a better understanding of some of these problems in the Western Cape province of South Africa. In particular, we examine the influence of technological, social, cultural and environmental factors as these have been identified in many studies on cyberbullying. It is also in these areas that some of the inconsistencies in findings have been reported in South Africa and other studies. A conceptual model of the influences of involvement in mobile bullying and the relation between mobile bullying and victimization is presented in Figure 1 below.

The Conceptual Model

In this conceptual model, we argue that independent factors like gender, anonymity, perception and attitude, technology usage, gratification of mobile bullying and possession of anti-mobile bullying policy will influence the involvement in mobile bullying. Furthermore, we also predict that the effect of anonymity on involvement in mobile bullying will be moderated by contextual factors and that involvement in mobile bullying would not only have negative effects (victimization), but these effects may be moderated by anonymity.
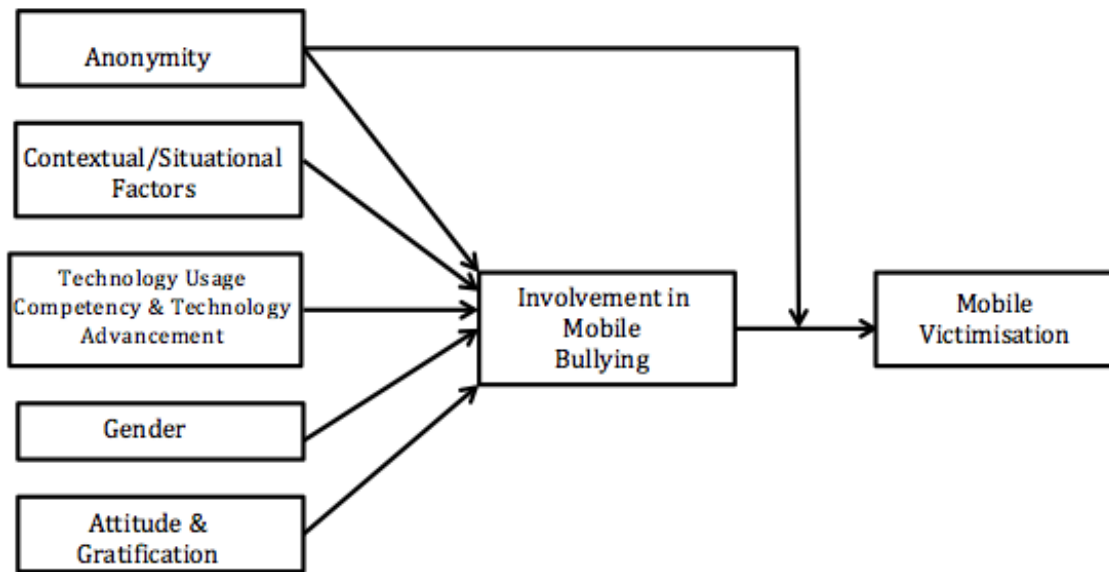

Figure 1: Conceptual Model

Propositions

The first construct of the model is Anonymity. Researchers agree that the power of the online bully lies in their anonymity as it minimizes the bully's identification and accountability (Kruger, 2011; Badenhorst, 2011; Burton and Mutongwizo, 2009). However, empirical evidence on the effects of anonymity is still inconclusive. Some researchers argue that anonymity does not independently contribute to anti-social behavior; other contextual or situational factors may influence this impact (Atkinson, 2002). Therefore, we predict that:

Proposition 1: anonymity will have a positive effect on the student involvement in mobile bullying; however, this effect will also depend on other contextual or situational factors.

It is claimed that the higher the magnitude of expertise in using online communication tools, the higher the likelihood of cyberbullying taking place (Zhang, Land and Dick, 2010). It has also been reported that individuals who spend more time online tend to be more aggressive (Ybarra and Mitchell, 2004). While some studies have not found significant evidence to support the claim that an individual's experience with technology usage affect their cyberbullying behavior (Zhang et al. (2010), there is evidence to confirm that excessive use of mobile phones may result in anti-social behavior (Walsh et al., 2010). In addition, research also suggests that the advancement of a mobile phone or use of advanced

phone features contribute to addictive behavior and enhance the level of mobile bullying (Cuadrado-Gordillo and Fernández-Antelo, 2014). Therefore, we propose that:

Proposition 2a: an individual's mobile phone usage competence will positively influence their involvement in mobile-bullying activities.

Proposition 2b: mobile bullying will differ by mobile phone advancement.

The Western Cape government reveals that young men are more likely to get involved in crime, while young women are more prone to become victims of violence. Male students have been found to be more enthusiastic about and more accepting of the use of computers in school (Thomas and Allen, 2006). However, other studies suggest these differences are trivial (Card, Stucky, Sawalani and Little, 2008). Also, the forms that bullying might take and the processes by which it unfolds whether committed by males or females in South Africa are yet to be understood. It is important to understand gender differences and the processes involved. Therefore, we predict that:

Proposition 3: there are gender differences in the way students get involved in mobile bullying activities.

Studies also show that one's social-ecological and cultural environment may influence one's involvement in aggressive activities. For instance, attitude or attachment to mobile phones or problematic mobile phone use can result in addiction-like behavior, which could lead to involvement in anti-social behavior (Takao, Takahashi and Kitamura, 2009). However, this assertion is debatable, as researchers have also found mobile phone attachment and use resulting in more positive than negative outcomes (Cassidy, 2006). Further research in this area is therefore necessary (Walsh et al., 2010). Researchers have also found that perception of positive outcome from aggressive behavior, retaliatory aggression and gratification leads to involvement in aggressive behavior (Nicol and Fleming, 2010; Patchin and Hinduja, 2010). In addition, as discussed in the literature review, school culture and climate may influence the extent of bullying across the different types of schools (Barnes, Brynard and De Wet, 2012; Cappadocia et al., 2013). Independently owned schools are said to have more resources and mechanisms to control bullying than state-owned schools. Therefore, we predict that:

Proposition 4a: individuals' perception and attitude towards their mobile phones will influence their involvement in mobile-bullying activities.

Proposition 4b: individuals' beliefs about the appropriateness of retaliatory aggression and acceptability of bullying behaviour will influence their involvement in mobile-bullying activities.

Proposition 4c: the level of mobile bullying in school will differ by school culture and climate.

There is a lack of awareness regarding the risks and implications around mobile bullying in South Africa. This tends to influence the way in which mobile bullying is perceived and understood (Badenhost, 2011; Popovac and Leoschut, 2012). Furthermore, the existence of the law regulating mobile bullying and the knowledge of this law and the liabilities for non-compliance with it, have been found to influence the extent to which mobile crime or aggression occurs (Kyobe, 2009). Therefore, we predict that:

Proposition 5: the existence of an anti-mobile-bullying policy in schools will deter students from involvement in mobile-bullying activities**.**

Many studies confirm that involvement in cyberbullying is associated with increase in the likelihood of victimization and non-rejection of cyberbullying among young people (Kim, Leventhal, Koh and Boyce, 2009). It is also claimed that anonymity can moderate the relation between positive attitude toward cyberbullying and cyberbullying frequency (Barlett, 2013). Therefore, we that:

Proposition 6: student involvement in mobile bullying will influence mobile victimization, however, this influence will be moderated by the victims' lack of knowledge of the (anonymity).

RESEARCH METHODOLOGY

Secondary school learners between the ages 14 and 18 were involved once permission was obtained from the students, parents and school principals to conduct the study. Presentations were made to the schools before data was captured in order to explain more clearly the meaning of bullying and mobile bullying. Data was captured using a questionnaire developed from previous studies and the key issues identified in the literature review. The questionnaire consisted of a brief definition of mobile bullying to ensure that all respondents understood the term.

Variable/Section	Description	References
Descriptive data	This section included general information about the learners, for example, age, grade, gender, and location of the school.	
Mobile phone usage and the advancement of the applications	Determined the time learners spent online per day (TC1) and the mobile applications they used (TC2), e.g. SMS, MMS, Email, chatrooms, and Social Networks.	Cheung and Huang, (2005); Cuadrado-Gordillo et al., (2014).
Context/ Situational factors		
	Attitude to mobile phone: Measured learners' feelings, attitudes and perceptions towards their mobile phone.	Walsh et al. (2010).
	School culture and climate: Measured the influence of school ownership, school safety risk, and possession of anti-bullying policy.	Friend (2006), Barnes et al. (2012); Cappadocia et al. (2013).
Technology competency	Measuring a learner's technology competency in using mobile phone applications.	Slonje and Smith (2008); Walsh et al. (2010); Zhang et al. (2010)
Involvement in conventional and mobile bullying and gratification of bullying	This measured how learners are involved in mobile bullying and the influence of socio-ecological, social cognition and cultural factors. It also measured the extent to which they like (or are gratified) to see others threatened.	Rigby and Slee (1993); Danquah and Longe (2011)
Mobile victimization	This measured the extent to which learners were victims of mobile bullying. These variables were measured using a Likert scale (1= Never; 2= Rarely; 3= Sometimes; 4= Often; 5= Always).	Hamburger, Basile and Vivolo, (2011)
Traditional bullying	Measured learners' involvement in physical bullying. These variables were measured using a Likert scale (1= Never; 2= Rarely; 3= Sometimes; 4= Often; 5= Always).	Rigby and Slee, (1993).
Mobile bullying and victimization Incidents	Further information on victims of mobile bullying was gathered, for example, applications used in mobile bullying, and the location of perpetrator.	Hamburger et al., (2011); Friend (2006).

Table 1: Variables employed in the survey

It was used to capture demographic information, anonymity, technology competency (frequency of mobile phone use), attitude or attachment to mobile phone, involvement in mobile, existence and awareness of school bullying policy, conventional bullying and mobile victimization. Table 1 represents the variables, their description and the sources where the variables were obtained. Except for the descriptive data, most items were measured on a 5-point Likert scale (1= Lowest; 5= Highest).

RESEARCH FINDINGS AND ANALYSIS

Descriptive data

A total of 3 621 responses were obtained of which 49% were from males students and 51% females students. The questionnaire was completed by seven secondary schools in Cape Town. The age of participants ranged from 14 to 18, with the majority (67%) falling between age 14 and 16. They consisted of students from varying income families, different school fees structures and located in different safety risk zones in the city. All participants indicated that they possessed or used mobile phones. Table 2 represents data about respondents in each school category.

School	Safety Risk	Fees structure	Ownership	% of participants	Female %	Male (%)
School A	High	Low	State	12.86	56	44
School B	High	Low	State	37.64	56	44
School C	Moderate	High	Independent	8.75	54	46
School D	Moderate	Medium	Independent	1.82	45	55
School E	Moderate	Medium	Independent	7.67	46	54
School F	Low	Low	State	18.53	58	42
School G	Low	Medium	State	12.7	21	79

Table 2: Respondents in each school category

Reliability Testing

The overall reliability of the variables was good (i.e. Cronbach alpha = 0.81). Most constructs had alpha values above the threshold of 0.70 (Hair, Black, Babin, Anderson and Tatham, 2006) except for Mobile phone victimization and Possession of anti-mobile bullying policy, which scored (0.67 and 0.661) respectively. These low values were attributed to the few items used to measure the constructs. However, Moss, Prosser, Costello, Simpson, Patel, Rowe and Hatton, (1998) argue that a Cronbach alpha value above 0.6 is still generally acceptable.

We also conducted Pearson correlation analysis to determine the association of items that measured each construct. For most of the constructs the correlations between items was significant and positive, ranging from 0.14 to 0.55 at $p < 0.05$. It was therefore possible to use the average scores of the items that measured each construct.

Analysis of influencing factors

Anonymity and Gender

The researchers determined whether victims of mobile bullying knew the perpetrators. Table 3 presents the mean responses of all the students. Anonymity was rated 2.91, which indicates that the perpetrator

was 'not known'. Further analysis was also conducted to examine the responses of victims who did not know their offenders. These totaled 102, aged 16 years on average and consisting of 63 females and 29 males. Some of these victims suspected the bullying to be done mainly out of school.

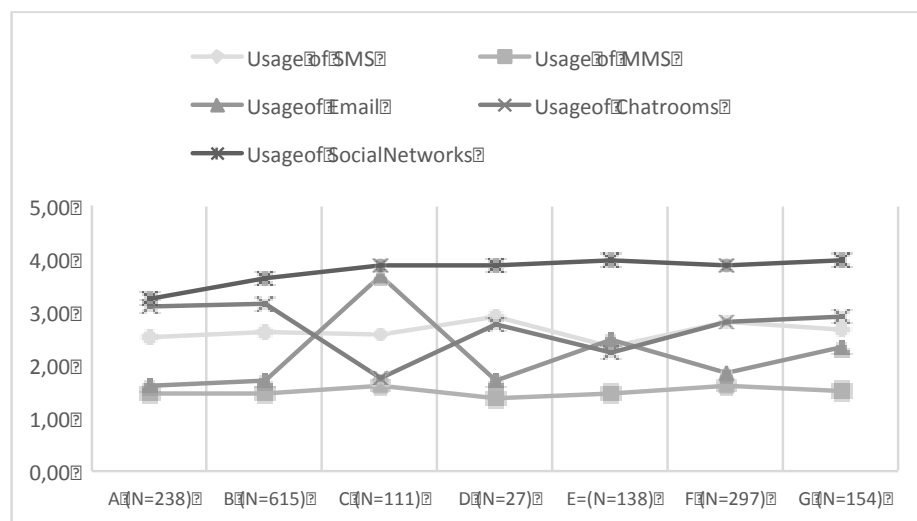		All students						Victims only			Female Victims			Male Victims		
	N	M	Min	Max	SD		N	Mean	SD	N	Mean	SD	N	Mean	SD
Anonymity**	3621	2.91	1	3	0.71		102	2.89	0.29	63	2.77	0.25	39	2.66	0.34
Retaliation*	2922	2.24	1	5	1.17		97	2.66	1.08	59	2.63	1.13	38	2.82	1.01
Involvement in Trad-bullying	3590	1.35	1	5	0.79		102	1.84	1.33	63	1.54	1.15	39	2.18	1.45
Victim of tradition bullying	3585	1.70	1	5	1.00		101	2.32	1.19	63	2.11	1.06	38	2.63	1.28
Involvement in Mobile-bullying	3620	1.29	1	5	0.51		102	1.89	0.92	63	1.61	0.78	39	2.31	1.04
School has anti-bullying Policy	3424	2.39	1	3	0.85		101	2.56	0.75	63	2.65	0.68	38	2.45	0.83
Gender of the bully Known	3424	2.75	1	3	1.14		102	2.89	0.70	63	2.89	0.76	39	2.77	0.49
Location of the bully Known	3621	2.63	1	3	0.71		102	2.33	0.48	63	1.95	0.48	39	1.97	0.31

Table 3: Descriptive statistics – Anonymity and Gender
(*1-5 Scale: 1=Never; 2=Rarely; 3=Sometimes; 4=Often; 5=Always) (**1-3 Scale:1=Yes; 2=No; 3=Not sure)

Further analysis by school revealed that schools B and F had the most victims (52 and 27 victims respectively). Both schools are state-owned and have low fees structures. School B is, however, in a high safety risk zone while School F is found in a low safety risk area. Other schools had less than seven victims.

Technology competency of mobile bullies

Technology competency was measured by the 'Frequency of use' of various mobile phone applications. Table 4 below shows that social networks, SMS and chatrooms were most commonly used.

Table 4: Frequency of technology usage by students in Schools A, B, C, D, E, F and G
(1=Never; 2=Rarely; 3=Sometimes; 4=Often; 5 = Always)

Perception and attitude about mobile phones

While most students did not have strong attachment to their mobile phones, students in school A (located in a high safety risk zone) were strongly attached to their phones. Students in schools C and D (located in a moderate safety risk zone) appear to use their phones passively although those in school D

were distracted by their phones the most. Further analysis of the 102 victimized students shows that both females and males have strong feelings about their mobile phones.

We conducted a correlation analysis to examine the association between attitude to mobile phone and engagement in bullying activities. Table 5 below shows significant correlation coefficients particularly between most measures of attitude to mobile phone and mobile bullying behavior such as belonging to online social network group that teases others, spreads rumors, gets others to dislike a person and to some extent uses mobile applications to threaten others.

	Means	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Think about my phone	3,142	1,330												
2. Use phone For No Reason	2,938	1,340	**0,274**											
3. In Conflict because of my phone	2,784	1,349	**0,250**	**0,207**										
4. Distracted because of my phone	3,136	1,335	**0,262**	**0,139**	**0,340**									
5. Unable To Control Phone Usage	3,225	1,379	**0,308**	**0,299**	**0,273**	**0,307**								
6. Feel distressed without my phone	2,893	1,444	**0,375**	**0,173**	**0,271**	**0,297**	**0,331**							
7. Unable to control phone usage	2,758	1,401	**0,239**	**0,165**	**0,205**	**0,219**	**0,283**	**0,310**						
8. Involved in Traditional Bullying	1,654	1,077	**0,070**	**0,091**	0,061	0,063	0,061	0,031	**0,077**					
9. Belong to a SN group that threaten others	1,685	1,163	0,064	0,003	**0,111**	**0,110**	0,067	**0,117**	0,078	**0,154**				
10. Belong to chat-group that excludes others	2,794	1,312	0,038	0,037	0,009	0,025	0,050	-0,009	0,007	0,027	-0,056			
11. Spread Rumours using Mobile phone	1,756	1,106	**0,083**	0,045	**0,147**	**0,120**	**0,105**	0,031	**0,186**	**0,168**	**-0,071**			
12. Usephone to get others to dislike people	1,499	0,921	**0,090**	0,031	**0,133**	**0,114**	**0,123**	**0,133**	0,068	**0,283**	**0,242**	-0,025	**0,493**	
13. Like threatening others using Mobile Appl.	1,677	1,182	0,050	-0,023	0,056	0,033	0,056	**0,120**	**0,118**	**0,246**	**0,289**	-0,056	**0,290**	**0,368**

Table 5: Correlation analysis of independent variables (significant values are in bold)

Retaliation

Overall most respondents would not retaliate in the event of being victimized (see Table 3, mean = 2.24). Further analysis of the responses of 102 victims who did not know their bullies indicates most of these were uncertain whether they could retaliate (2.66), although males seemed to be more uncertain about this (2.82) than females (2.63).

Existence of anti-mobile bullying policy

Students were also asked if their schools had anti-mobile bullying policy. Table 3 above shows a score of 2.36, which suggests they did not. Further analysis of the responses by victimized students also indicates similar results for both females (2.40) and males (2.41). Similar results were also obtained for those who were both bullies and victims.

Analysis of dependent variables

Mobile Bullying

Table 6 below presents the descriptive data about mobile bullying in schools: 144 students were involved in mobile bullying; about 80 males and 54 females and the majority aged 16 years. The common method of bullying was by excluding others from joining chat groups and threatening others in social network groups. Males sometimes like threatening others using their mobile applications (3.11), suggesting they draw satisfaction from their actions (gratification).

Further analysis by school reveals also that school B had the highest number of bullies, followed by school A.

Mobile Bullies	(All bullies)						Females			Males		
	N	Mean	MIN	MAX	SD		N	Mean	SD	N	Mean	SD
Gender	136	2.00	1	2	0.00		54	1.00	0.00	82	2.00	0.00
Age	135	16.00	14	18	0.00		49	15.00	0.00	80	16.00	0.00
Involved in Traditional Bullying	144	2.35	1	5	1.43		54	2.35	1.40	82	2.30	1.39
Belong to SN group that threaten others	142	3.11	1	5	1.41		53	3.42	1.43	81	2.88	1.38
Belong to chat-group that exclude others	144	3.44	1	5	1.36		54	3.59	1.22	82	3.00	1.43
Spread Rumours using mobile phone	141	2.98	1	5	1.30		53	3.00	1.30	80	2.25	1.26
Use Phone to get others to dislike people	143	2.52	1	5	1.40		54	2.39	1.34	81	3.00	1.44
Like threatening others using Mobile Appl	142	2.99	1	5	1.56		54	2.63	1.55	80	3.11	1.56
Retaliation	128	2.98	1	5	1.21		47	2.96	1.27	74	3.00	1.19

Table 6: Descriptive data – Involvement in Mobile bullying
(1=Never; 2=Rarely; 3=Sometimes; 4=Often; 5 = Always)

We also determined if bullying differs by school. Only those students engaged in mobile bullying were considered. The ANOVA results in Table 7 below suggest bullying differs by school only when it is committed using social network groups and mobile applications.

Variable	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
Belong to SN group that Threaten others	**22.507**	**6**	**3.751**	**710.552**	**593**	**1.198**	**3.130**	**0.004986**
Belong to chat-group that exclude others	3.559	6	0.593	372.787	595	0.626	0.947	0.460734
SpreadRumours	13.761	6	2.293	650.439	590	1.102	2.080	0.053729
Use phone to get others to dislike people	9.125	6	1.520	445.960	591	0.754	2.015	0.061719
Like threatening others using mobile applications	**21.105**	**6**	**3.517**	**716.586**	**590**	**1.214**	**2.896**	**0.008629**

Table 7: ANOVA results – Difference in Mobile bullying by school (significant values are in bold)

Mobile victimization

Table 8 below shows that about 247 students were victims of mobile bullying (including 18 bully-victims). Further analysis of those students who were only victimized reveals that majority were 16 year old and females (i.e. 139 females and 90 males). These students were mainly victimized using insulting and frightening messages. Analysis of these victims by school revealed that school F had the most number of victimized students followed by school A. Threatening calls were the most common means of victimization in school B and F. Unlike other schools, school G had males as the most victimized students.

Victimised	N	Mean	Min	Max	SD	Female			Male		
						N	Mean	SD	N	Mean	SD
Receive Insulting Messages	247	3.62	1	5	1.01	139	3.63	0.94	90	3.54	1.10
Receive Threatening Calls	246	2.96	1	5	1.20	138	2.98	1.17	90	2.88	1.24
Receive Frightening Messages	243	3.15	1	5	1.13	137	3.31	1.10	88	2.92	1.10

Table 8: Descriptive data – Mobile victimization by gender
(1=Never; 2=Rarely; 3=Sometimes; 4=Often; 5 = Always)

The influence of school culture and climate on mobile bullying

School culture and climate was measured by the nature of school ownership, school safety risk and possession of an anti-bullying policy. Table 9 shows that while most respondents in state and independent schools did not engage in mobile bullying, some forms of mobile bullying (such as spreading rumours, using mobile phone to get others to dislike a person, and using mobile applications to threaten others) differ by school in state and independent schools.

Variable	Mean 1	Mean 2	t-value	df	p	Valid N1	Valid N2	Std. Dev.1	Std. Dev.2	F-ratio Variances	p Variances
Belong to SN group that Threaten others	1.205	1.174	1.264	3605	0.206199	2491	1116	0.687	0.620	1.230	0.000064
Belong to chat-group that exclude others	1.540	1.548	-0.214	3556	0.830513	2463	1095	1.022	1.024	1.003	0.946667
Spread Rumours	**1.263**	**1.205**	**2.415**	**3572**	**0.015783**	**2469**	**1105**	**0.693**	**0.602**	**1.324**	**0.000000**
Use phone to get others to dislike people	**1.219**	**1.167**	**2.419**	**3577**	**0.015610**	**2473**	**1106**	**0.632**	**0.510**	**1.535**	**0.000000**
Like threatening others using mobile applications	**1.226**	**1.165**	**2.377**	**3572**	**0.017488**	**2470**	**1104**	**0.730**	**0.622**	**1.380**	**0.000000**

Table 9: t-test to determine the influence of school ownership on bullying (significant values are in bold)
(Mean 1 = State owned, Mean 2 = independently owned school)

We also determined whether mobile bullying differs by the school level of 'safety risk'. Three categories of safety risk were identified in Table 2 above, i.e. (1), Moderate safety risk (2) and Low safety risk (3). The ANOVA results confirm that there are significant differences.

Variable	Analysis of Variance (Marked effects are significant at p < .05000)							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
Belong to SN group that Threaten others	7.093	2	3.546	1600.759	3605	0.444	7.987	0.000346
Belong to chat-group that exclude others	30.324	2	15.162	3691.061	3556	1.038	14.607	0.000000
Spread Rumours	3.711	2	1.855	1584.657	3572	0.443	4.183	0.015325
Use phone to get others to dislike people	3.710	2	1.855	1276.250	3577	0.356	5.199	0.005564
Like threatening others using mobile applications	6.082	2	3.041	1741.328	3572	0.487	6.238	0.001973

Table 10: ANOVA results – Influence of school safety on mobile bullying (significant values are in bold)

We further determined whether mobile bullying differed by possession of an anti-mobile bullying policy in school. Only those respondents that either possessed or did not possess a policy were considered. The t-test results show significant differences in most forms of bullying measured (except for Exclusion of others from chatrooms).

Variable	T-tests; Grouping: Policy (Group 1: 1 Group 2: 2)										
	Mean 1	Mean 2	t-value	df	p	Valid N1	Valid N2	Std. Dev1.	Std. Dev2.	F-ratio Variances	p Variances
Belong to SN group that Threaten others	**1.142**	**1.274**	**-3.413**	**1266**	**0.000663**	**820**	**448**	**0.555**	**0.812**	**2.144**	**0.000000**
Belong to chat-group that exclude others	1.569	1.639	-1.083	1263	0.278753	818	447	1.068	1.157	1.172	0.052940
Spread Rumours	**1.203**	**1.343**	**-3.474**	**1268**	**0.000530**	**822**	**448**	**0.585**	**0.847**	**2.098**	**0.000000**
Use phone to get others to dislike people	**1.174**	**1.252**	**-2.303**	**1268**	**0.021436**	**822**	**448**	**0.536**	**0.649**	**1.466**	**0.000003**
Like threatening others using mobile applications	**1.181**	**1.330**	**-3.333**	**1263**	**0.000883**	**820**	**445**	**0.650**	**0.923**	**2.018**	**0.000000**

Table 11: T-test – Influence of possession of anti-bullying policy on mobile bullying (significant values are in bold)

The above results therefore indicate that mobile bullying will to some extent differ by school culture and climate.

The influence of mobile phone advancement on involvement in mobile bullying

We also determined the level of involvement in mobile bullying differs by the advancement of the device used by the student. Advancement of the device was measured by the type of features used by the student on their phone. Smartphones are for instance equipped with the capabilities to display photos, play games, play videos, navigation, built-in camera, access email, etc. Students who used such advanced features (i.e. chatrooms, social networks, email and MMS) were considered to possess advanced phones, and those who did not were considered to use basic or feature phones. Hurlen (2013) shows that the impact of advanced features can be determined via possession and usage of advanced applications. Lane and Manner (2011) also measured smartphone utilization by asking the respondents to indicate the importance attached to functions like phone calls, texting, Internet, email, music, and games. Student involvement in the five forms of mobile bullying measured was categorized into 4 levels:

1 = Very limited involvement (involved in not more than one form of mobile bullying,

2= Limited involvement (involved in two 2 forms of mobile bullying,

3 = involved in three forms, and

4 = involved in more than three forms of mobile bullying.

The results in Table 12 and 13 indicate that involvement in mobile bullying can differ by phone advancement where the bullying is conducted through chatrooms, social networks and MMS. No significant differences were observed when the bullying is conducted via email.

Variable	Analysis of Variance, Marked effects are significant at p < .05000							
	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
Usage of Chatrooms	**278.194**	**3**	**92.731**	**8602.699**	**3617**	**2.378**	**38.989**	**0.000000**
Usage of Social Networks	**30.489**	**3**	**10.163**	**7775.781**	**3617**	**2.149**	**4.727**	**0.002699**
Usage of Email	4.939	3	1.646	5365.766	3617	1.483	1.109	0.343705
Usage of MMS	**10.167**	**3**	**3.389**	**2358.635**	**3617**	**0.652**	**5.197**	**0.001395**

Table 12: ANOVA - Mobile phone advancement influence on involvement in Mobile bullying
(significant values are in bold)

Breakdown Table of Descriptive Statistics N=3621												
Mobile Bullying category	Usage of Chatrooms	Usage of Chatrooms N	Usage of Chatrooms Std.Dev.	Usage of Social Networks	Usage of Social Networks N	Usage of SocialNetworks Std.Dev.	Usage of Email	Usage of Email N	Usage of Email Std.Dev.	Usage of MMS	Usage of MMS N	Usage of MMS Std.Dev.
1	2.342	2041	1.515	3.534	2041	1.458	1.917	2041	1.195	1.400	2041	0.762
2	2.803	1171	1.567	3.732	1171	1.447	1.994	1171	1.232	1.509	1171	0.856
3	3.029	270	1.592	3.663	270	1.545	1.896	270	1.254	1.492	270	0.834
4	3.179	139	1.616	3.561	139	1.570	1.942	139	1.344	1.510	139	0.958
All Grps	2.575	3621	1.566	3.609	3621	1.468	1.941	3621	1.218	1.446	3621	0.809

Table 13: Descriptive Data – Mobile Phone advancement and Involvement in Mobile bullying

Regression analysis

We conducted a multiple regression analysis to determine the influence of all independent variables on mobile bullying and that of mobile bullying on mobile victimization. The items that measured each variable were averaged. Standardized data was used for the regression analysis since variables were measured on different scales. The results are presented below.

Regression Summary for Dependent Variable: Involvement in Mobile Bullying R= .66776413 R²= .44590893 Adjusted R²= .44438995 F(9,3283)=293.56 (All schools included)						
N=3293	**b***	**Std.Err. - of b***	**b**	**Std.Err. - of b**	**t(3291)**	**p-value**
Intercept			**0.171**	**0.080**	**2.142**	**0.032222**
Anonymity	**0.135**	**0.013**	**0.149**	**0.014**	**10.179**	**0.000000**
Contextual/situational factors						
School ownership	**0.592**	**0.013**	**0.574**	**0.012**	**44.532**	**0.000000**
School safety	**0.042**	**0.013**	**0.040**	**0.012**	**3.209**	**0.001341**
Possession of anti-mobile bullying Policy	-0.002	0.013	-0.001	0.012	-0.150	0.880159
Attitude to Mobile Phone	**0.133**	**0.019**	**0.133**	**0.019**	**6.951**	**0.00000**
Mobile Phone advancement	**0.040**	**0.018**	**0.040**	**0.019**	**2.149**	**0.03164**
Technology Usage Competency	**0.088**	**0.021**	**0.110**	**0.026**	**4.213**	**0.000026**
Gender	**0.099**	**0.015**	**0.094**	**0.014**	**6.546**	**0.000000**
Gratification (Like to threatening others)	0.021	0.013	0.033	0.020	1.614	0.106605

Table 14: Regression analysis – Involvement in Mobile bullying vs. independent variables (all schools) (significant values are in bold)

All the independent variables (except for Gratification and Possession of anti-mobile bullying policy) had positive and significant influence on involvement in mobile bullying. When schools in high safety risk zones (i.e. schools A and B) were excluded from this analysis, the influence of anonymity on involvement in mobile bullying was (significant at b = 0.142), but much lower than b = 0.149 as shown in Table 14.

Moderation effect of Anonymity and Perception of help availability

The second regression analysis tested the influence of involvement in mobile bullying on mobile victimization. Table 15 below confirms the existence of a fairly high positive and significance influence (b = 0.343). When Anonymity is added to this model, the results in Table 16 confirm that anonymity moderates the influence of involvement in mobile bullying on victimization. The regression coefficient drops from b = 0.343 to b = 0.306 (see Tables 15 and 16).

Regression Summary for Dependent Variable: Victimisation R= .41311847 R²= .1706687 Adjusted R²= .17043765 F(1,3618)=744.54						
N=3620	**b***	**Std.Err. of b***	**b**	**Std.Err. of b**	**t(3618)**	**p-value**
Intercept			**0.894**	**0.022**	**40.056**	**0.00000**
Mobile bullying	**0.413**	**0.015**	**0.343**	**0.012**	**27.286**	**0.00000**

Table 15 – Regression analysis: Mobile bullying vs mobile victimization (significant values are in bold)

Regression Summary for Dependent Variable: Victimisation R= .44608852 R²= .19899497 Adjusted R²= .19855206 F(2,3617)=449.29						
N=3620	b*	Std.Err. of b*	b	Std.Err. of b	t(3617)	p-value
Intercept			**0.696**	**0.028**	**24.744**	**0.00000**
Mobile Bullying	**0.367**	**0.015**	**0.306**	**0.012**	**23.873**	**0.00000**
Anonymity	**0.174**	**0.015**	**0.160**	**0.014**	**11.310**	**0.00000**

Table 16 – Regression analysis (Mobile bullying vs. mobile victimization with anonymity as Moderating variable) (significant values are in bold)

DISCUSSION OF THE FINDINGS

Anonymity

Anonymity has been linked to involvement in cyberbullying and mobile bullying (Badenhorst, 2011; Hindija and Patchi, 2008). The regression analysis suggests that anonymity has the second greatest and most positive influence on involvement in mobile bullying (see Table 14, b = 0.149). A number of researchers have found anonymity to be one major predictor of cyberbullying (Barlett, 2013). Compared with other technologies used for bullying, mobile technologies greatly enhance anonymous communication. It is not surprising therefore that Fenaughty and Harre (2013) found mobile bullying to be more damaging and distressing than Internet bullying. Furthermore, both female and male victims were not sure who the aggressors were (see Table 3, mean = approx. 3.00), but suspected that these could be peers not from their schools. This is consistent with findings on traditional bullying reported in the Western Cape safety report (Mason, 2008) and other cyberbullying studies. We found, however, that social networks and chatrooms are more widely used by mobile bullies than spreading rumours. Analysis of the likelihood to retaliate by victim shows that most of those who did not know their bullies would not consider retaliation, thereby confirming the effect of the power of anonymity.

However, the regression analysis results indicate that the influence of anonymity on involvement in mobile bullying is stronger when the bullies are from high safety risk schools (for example schools A and B) than low safety risk schools. This suggests the effect of anonymity does not depend only on non-identification of the bully but also on some contextual and situational factors as observed earlier by Pinsonneault and Heppel (1997). Proposition 1 is therefore supported. Anonymity of mobile bullies has a positive effect on the student involvement in mobile bullying, but this effect depends on factors other than the power of non-identification.

Technology usage competency

Technology competency also influences involvement in mobile bullying (Table 14, b = 0.110). Proposition 2 is therefore supported. Technology competency, however, came fourth. The findings show that females are more likely to use mobile technology than males. This is consistent with the observations by Walsh et al. (2011). Further analysis of those that use mobile phones persistently shows an association between over-usages with increased involvement in anti-social behavior. However, earlier studies indicate that the influence of frequency of usage on bullying does not necessarily vary by device, but by duration of usage (Pearce and Rice, 2013). This claim was not tested in the present study since we only measured duration on the Internet. Nevertheless, we determined the influence of age on frequency of use of technology and engagement in mobile bullying. We found that as students get older their involvement in mobile bullying decreases (only 36 older students out of 3621 students in total were involved in mobile bullying). This could be attributed to students maturing and becoming more aware of bullying implications.

Mobile phone advancement

The ANOVA results (see Table 12) show that mobile bullying differs by phone advancement, therefore Proposition 2b is supported. This is also confirmed by the regression analysis results (see Table 14, b = 0.040), although this influence is not as great compared to that of anonymity (b = 0.149) and school ownership (b = 0.574). The findings show that use of chatrooms, MMS and social networks applications contributes significantly to student involvement in mobile bullying. These features can be addictive and relatively increase the time that users will spend on their phones (Cuadrado-Gordillo and Fernández-Antelo, 2014). Ultimately, addictive smartphone users may lose a sense of feeling towards others and engage in anti-social behaviors. The fact that email was not found to have a significant influence on bullying confirms Burton and Mutongwizo's (2009) observation that students more commonly use features other than email to commit anti-social behaviors. These researchers found that text and voice messages were more commonly used compared to Internet bullying via email. With the many features and services available to mobile technology users today, and the fact that these devices are always switched on, there is little doubt that mobile phones will continue to make people more susceptible to bullying than other forms of technology (Juvonen and Gross, 2008; Fenaughty and Harre, 2013).

Gender

Although gender was also found to influence involvement in mobile bullying, (thereby supporting Proposition 3), it is a weaker predictor (0.094) than the other factors discussed above. School B had the highest number of bullies followed by school A. Both schools are located in high safety risk zones, which may have impacted on student behaviors (Mason, 2008). Females were found to be victimized more than males in most schools, and this aggression was mainly committed using chatrooms and social networks. Studies examining the impact of different technologies on bullying also confirm that male aggression over female partners was increasingly perpetuated using mobile applications than computers today (Duran and Martinez-Pecino, 2015). Fenaughty and Harre (2013) also observed that female phone harassment exceeded male phone harassment. However, while there is little doubt that the females are most often the victims, and it is imperative that interventions are tailored to address this specific aggression, Fenaughty and Harre's (2013) finding and those of the present study indicate that females can also be aggressors. There were 54 female bullies compared to 82 male bullies in the present study.

Our findings also suggest three categories of behaviors in the way bullies initiate, promote and maintain their activities. Females initiate bullying by deliberately using their mobile phones to start rumors − (see Table 6, Mean = 3.00) − while males do so by getting others to dislike people (Mean = 3.00). There were, however, similarities and differences in the mobile bullying techniques students use to promote their activities. Females do so mainly by excluding others (3.59), while males promote activities by sending threatening messages online (3.11). Further analysis of the mobile facilities students use to maintain their behavior also revealed some differences as females mainly used chatrooms while males used social networks. However, when we ran t-tests, not all these differences were supported. The differences in the way males and females initiate their activities were confirmed (Females: t = -3.7254, p= 0.000198; Males: t = -4.60678, p = 0.00004). Those relating to the way students promote bullying activities were partially supported. Differences in gender relating to exclusion of others were not significant (t = -1.54388 p = 0.12407), while those relating to sending threatening messages were significant (-1.43673 p = 0.150884). The differences in the way females and males maintain their behaviors were also found not to be significant (use of chatroom; t = 1.32017 p = 0.18902; Use of social network: t = 1.8554 p=0.06572).

These findings therefore suggest inconclusive results as far as the influence of gender on mobile bullying is concerned. Gender appears to have influence at the mobile bullying initiation stage than at the promotion and maintenance stages. Some earlier claims are supported, others not (Smith et al., 2008; Raskauskas and Stoltz, 2007).

Attitude to mobile phone and acceptability of bullying behavior

Attitude to mobile phone was the third strongest predictor of involvement in mobile bullying (see Table 14, b= 0.133). Students have feelings about their phones and in particular those in schools A, C and D. School A was categorized as being in a high safety risk area with a low fees structure. The safety reports by the Western Cape government indicate that young people in high-risk areas are often exposed to crime and violence and are vulnerable to becoming involved in crime.

Takao et al. (2009) show that addiction to mobile phone reduces student loneliness and that addictive people tend to feel depressed, lost and isolated without a mobile phone, which could result in aggressive behaviours. While the behaviour of bullies was not examined in detail in the present study, there is evidence of positive and significant correlation between attitude to phone and involvement in mobile bullying. For instance, as shown in Table 5, respondents who thought about the phone when not using it also admitted to involvement in spreading rumors and using mobile phone to get others to dislike a person. Those in conflict because of their phones also belonged to social network groups that threaten others. Proposition 4a is therefore supported. Furthermore, students who indicated involvement in bullying activities also indicated likelihood of retaliation in event of being bullied. In addition, the influence of gratification (such as to threaten others using one's phone) on involvement in mobile bullying was found to be positive and significant (see Table 6). Proposition 4b was also supported.

The influence of contextual and situational factors

This was measured by examining the influence of school culture and climate (the ownership of the school, school safety) and possession of an anti-bullying policy. Table 9 shows that some forms of mobile bullying, such as spreading rumours, using mobile phone to get others to dislike a person and using mobile applications to threaten others, are influenced by the ownership of the school. The regression analysis results confirm that school ownership has the greatest influence on mobile bullying

(see Table 14, b = 0.574). School safety was also found to influence mobile bullying (Table 14, b = 0.040) and this finding is consistent with the ANOVA results in Table 10 which reveal significant differences in mobile bullying due to the nature of the school safety environment.

Socio-ecological factors have always played a huge role and been identified in bullying studies. These factors are a mix of interactions between individuals and the sense of value from learnt and observed ways of life in the school, home and community. Although independently owned schools may have more dedicated staff to address bullying, there is still a significant level of occurrence within them. State-owned schools may be bound by state laws which mandate a framework to be put in place for handling such matters, but in practice may have fewer specialist resources to handle such cases.

Our prediction that the existence of an anti-mobile bullying policy in schools would deter involvement in mobile bullying activities appears not to be supported by the outcomes of the regression analysis (Table 14, b =0.001 not significant). However, t-test results in Table 11 suggest that possession of an anti-bullying policy would influence some forms of mobile bullying in school. Policies in general are expected to play a role in thwarting mobile bullying or aggression (Kyobe, 2009), therefore further studies need to be conducted to examine this relationship. As methods of bullying change with advances in technology, as is particularly the case with cyberbullying, prevention policies and procedures need to continually evolve. We therefore conclude that Proposition 5 and Proposition 4c were partially supported.

Mobile involvement and victimization

The findings confirm that mobile bullying influences victimization and that the effect of involvement in mobile bullying on the outcomes of mobile victimization is moderated by other factors like anonymity. This confirms findings from traditional bullying studies that anonymity does not independently contribute to anti-social behavior (Atkinson, 2002). Proposition 6 is therefore supported.

CONCLUSION AND RECOMMENDATIONS

This study set out to examine the nature and implications of mobile bullying in the Western Cape province of South Africa and the distinctive influences of this technology. The findings indicate that one measure of school culture (i.e. ownership of the school – public or independent) has the greatest influence on mobile bullying. Mobile bullying was found to be more prevalent in public schools located in high safety risk areas and without anti-bullying policies. Therefore it is imperative that these schools and communities around them should be assisted in developing the appropriate culture that will ensure the safety of the learners.

The second major predictor of mobile bullying is anonymity. The effect of anonymity does not, however, only depend on non-identification of the bully but also on some contextual factors. We found that the level of safety risk in the school location can moderate the influence of anonymity. This emphasizes that communities still have a major role to play in addressing mobile bullying challenges. The study also confirms that extreme attachment to mobile phones may lead to engagement in   mobile   bullying. It also confirms that mobile bullying differs by phone advancement, therefore earlier assumptions of similar technological effect on mobile bullying may not hold in some situations. This suggests, therefore, that the advancement in mobile technology will continue to enhance the likelihood of mobile bullying.

The influence of gender on involvement in mobile bullying is still inconclusive. This study, however, reveals that by examining gender effects at different levels, for example at the level mobile bullying activities are initiated, promoted and maintained, different results are observed. The present study provides evidence of gender differences at the initiation rather than later stages. Future studies therefore need to examine gender influence at various stages of mobile bullying activities and intervention strategies should take this into consideration.

While the influence of policy on involvement in mobile bullying was not supported, probably because these never existed in the schools studied, earlier studies emphasize the role policy plays in thwarting online aggression (Kyobe, 2009). It is therefore imperative that these policies are developed. The study also confirms that the influence of involvement in mobile bullying on mobile victimization is indeed moderated by anonymity. This moderating effect appears to exist in all forms of bullying (i.e. traditional, cyber and mobile bullying).

The research builds on the understanding of various theoretical works that explain bullying. It shows that some influences will be similar regardless of the form of bullying (i.e. traditional, cyber or mobile). However, there are also clear differences between cyberbullying and mobile bullying studies, which emphasizes the need to examine the distinct influences of the technologies, used in cyberbullying. The study also sheds more light on the inconsistencies in earlier studies. It confirms, for instance, that differences in gender are not trivial as earlier thought. Males and females differ in some of the ways they initiate, promote and maintain mobile bullying. More comprehensive studies should be conduct to understand these differences better.

This research offers school principals, education departments, communities, service providers and regulators enhanced knowledge with which to deal with mobile bullying issues. The conceptual model developed can be a useful guide in developing solutions to the problem. There is a need to create awareness of the risks of mobile bullying in schools and develop policy on how to deal with it. Communities, schools and law enforcement, especially in high safety risk areas, have a major role to play as it appears that contextual factors has both a direct and an indirect influence on involvement in mobile bullying. Service providers should work together with schools in finding technical ways of preventing misuse of the devices and applications they provide.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This research has, however, some limitations. It was not possible to interview the students due to limited contact time that was made available by schools. Future studies can collect more qualitative data to complement the quantitative findings. Further, interviews should also include school principals, educators, students support groups (counsellors), parents, law enforcement officers and mobile manufacturers.

This study did not ask students how many friends they had and as such could not test the effect of number of friends on this relationship. Research shows that availability of buffers (perception of help available) may or may not moderate the influence of mobile bullying on victimization (Masten, Telzer, Fuligni, Lieberman and Eisenberger, 2012). This can be examined in future studies. The present study was cross-sectional. Mobile bullying is, however, dynamic, as it may change over time. Therefore longitudinal studies may provide more interesting results.

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