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Mobile Bullying Among Rural South African Students: Examining the Applicability of Existing Theories

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ABSTRACT

Mobile bullying, which is one form of cyberbullying, is escalating in schools in South Africa. Research can contribute to better understanding of the nature of this aggression, and provide guidance in determining appropriate interventions and administration of justice. However, studies into cyberbullying tend to focus mainly on the urban environment. Rural South Africa involves a large percentage of mobile phone users and experiences in relatively different cultural and social-economic conditions. Lack of research on rural mobile bullying calls into question the applicability of existing theories of crime and cyberbullying to the rural context and their effectiveness in guiding legal and policy interventions. The present study investigated mobile bullying among high school rural students, the influencing factors, the applicability of earlier theories, and legal and policy implications. A survey of 3500 students found that mobile bullies are intensive users of chat rooms, Facebook and Twitter. Certain forms of bullying increase with age, which is not consistent with earlier claims. Bullying by teasing increased up to 14 years, dropped at 15 but rose again from 16 to 18 years for a different group of students. Bullies mainly came from unstable residential areas and lack of self-control predicts mobile bullying the most. We found support for the applicability of the Life-course, Self-control, and Social disorganization theories. Legal and policy implications are discussed.

Keywords (Required)

INTRODUCTION

Mobile bullying, a form of cyberbullying, is escalating in many schools today. The proliferation of mobile technology has provided overwhelming avenues for committing this aggression. However, a few studies on cyberbullying and papers on legal responses to this aggression in South Africa have focused primarily on urban areas or incidences (Badenhorst, 2011; Burton and Mutongwizo, 2009). Little is also known about forms of cyberbullying, specifically mobile bullying, among the youth in rural areas. Recent study indicates that 84.2% of South African children access the Internet via mobile phones (Global Kids Online, 2016). Furthermore, in South Africa, more than 75% of the people in low-income groups, aged 15 years or older, own a mobile phone. Research also indicates that the Eastern Cape, Limpopo and Mpumalanga provinces have high levels of poverty, school dropout, youth unemployment and youth crime; additionally, (Czerniewicz and Brown, 2014) they also have the highest percentages of mobile phone usage in South Africa (MyBroadband, 2013). It is possible that with such high ownership of mobile phones, mobile bullying is predominant in rural schools and should be studied. Furthermore, rural communities tend to experience relatively different social-economic and cultural conditions compared to urban areas. The lack of research on mobile bullying in rural schools calls into question the applicability of existing theories of crime and cyberbullying to the rural context and their effectiveness in guiding policy development (Kaylen and Pridemore, 2012). Generalizable mobile bullying theories should account for both rural and urban circumstances. The present study investigated mobile bullying among high school rural students, the influencing factors, the applicability of earlier theories, and legal and policy implications.

LITERATURE REVIEW

Cyberbullying is defined in many ways; however, it commonly refers to that form of aggression committed using electronic means such as the Internet, mobile technology and computers (Sourander, Brunstein Klomek, Ikonen, Lindroos, Luntamo, Koskelainen, Ristkari and Helenius, 2010). It shares some of the characteristics of traditional bullying, such as aggressiveness, imbalance of power and repetitiveness. Mobile bullying is that form of cyberbullying committed through email, chat rooms, instant messaging and small text messages using mobile phones (Kowalski, Giumetti, Schroeder and Lattanner, 2014). This aggression can be committed directly as in the case of offensive or rude text and voice messages, and indirectly by social exclusion and gossiping (Bauman, 2010), pictures and chat rooms (Popovac and Leoschut, 2012). Recently, a number of research papers examining cyberbullying in African countries have been published. For example, Okoiye, Anayochi and Onah (2015) investigated the moderating effect of cyberbullying on the psychological well-being of adolescents from fifteen secondary schools in Benin Edo State, Nigeria.   Shapka, Onditi, Collie and Lapidot-Lefler (2017) examined cyberbullying and cyber victimization for adolescents aged 11–15 years in Dar es Salaam and Mwanza regions, Tanzania. Chiome, Thapa, Paula da Silveira Simões Pedro and Maria da Silva Gomes (2015) investigated various forms of cyberbullying in thirty-two high schools in Zimbabwe. However, mobile bullying research is still at early stages. Only a few research articles conducted in South Africa have been published. For example, Oosterwyk and Kyobe (2013) investigated the nature, influencing factors and implications of mobile bullying in South Africa. Lusinga and Kyobe (2017) developed and tested a mobile victimization typology in South African schools. Namane and Kyobe (2017) examined evolution of mobile bully-victims across different schools located in various safety risk areas in South Africa. The present study expands on the work done so far on mobile bullying research. While there are differences between the forms of bullying (Pyżalski, 2011), researchers acknowledge that some

characteristics of conventional, anti-social behaviors are indicators of cyberbullying (Beckman, 2013). Hence, some of the factors that influence conventional bullying may also influence cyberbullying. In the present study, we discuss those commonly identified in literature, i.e., social- ecological and technological factors (Leadbeater, Sukhawathanakul, Smith, Thompson, Gladstone, Sklar and Ramsey, 2013; Zhang, Land and Dick, 2010).

SOCIAL-ECOLOGICAL FACTORS

Bullying is a complex socio-ecological phenomenon commonly resulting from the interrelations of various personal and environmental factors. The social disorganization (SD) theory has been extensively used by criminologists to account for rates of crime in urban communities (Osgood and Chambers, 2000), and examine the effects of social and structural interactions on criminal behavior in rural areas (Thomas, Connor and Scott, 2015). Social disorganization is defined as an inability of community members to achieve shared values or to solve jointly experienced problems (Bursik, 1988). It hinders development of friendship networks needed to identify wrong doers (Sampson and Groves, 1989). Researchers have found that rural communities are more socially organized due to their homogeneous populations and social cohesion than urban communities (Barnett and Mencken, 2002). The Urban communities on the other hand are characterized by anonymity, privacy, and greater heterogeneity of values, which may contribute to high levels of social disorganization (Websdale, 1998).

 However, while the SD theory can explain influencing factors, its ability to explain bullying is still debatable. A study found a weak association between socioeconomic status and being a bully (Tippett and Wolke, 2014). Bullies were not likely to come from middle or lower-social economic background while victims are more likely to live in poor families. While this study conclude that socioeconomic status may not be the most accurate indicator for identifying those involved in school bullying, the study however confirms it can be used to identify victims (Tippett and Wolke, 2014).

In South Africa, a study has confirmed observation about social economic status and victimization (Zuze, Reddy, Juan, Hannan and Visser, 2016). This study found that one-fifth of pupils of low socioeconomic status who attend independent schools are bullied (victimized) weekly (Zuze et al., 2016). They maintain that irrespective of whether the study environment is resource-rich or resource-poor, the most socioeconomically vulnerable learners will still be victimized the most. Another study conducted in South Africa does not appear to agree with the social economic status and victimization claim (Tippett and Wolke, 2014) that socioeconomic status is not the most accurate measure of school bullying. It is argued that poverty, especially in rural areas, has become a source of behavioral problems among learners leading to disruptions in learning (Wadesango, Chabaya, Rembe and Muhuro, 2011).

There is lack of consensus on the ability of the SD theory to explain anti-social behavior in rural community in the developed and developing nations. While rural communities are characterized by extreme poverty, which is associated with high crime rates (Tickamyer, 1990), some researchers in the developed world did not find significant impact of poverty on violent crime rates (Petee and Kowalski, 1993). Higher levels of poverty in rural areas have instead been associated with higher levels of community stability (Osgood and Chambers, 2000). Another study also reports a strong negative association between poverty and assault, robbery, and rape (Bouffard and Muftić, 2006). Few studies have examined the impact of these factors on mobile bullying in rural areas. These are examined in the present study.

LOCATION (RESIDENTIAL INSTABILITY)

The incidence of crime has been associated with the level of violence within a school and its surroundings (Burton and Leoschut, 2013). Residential instability and concentrated disadvantage have also been associated with anti-social behaviors in the rural areas. However, research indicates that relocating or living in lower-poverty areas reduces cases of violent and property related crimes among young females (Kling, Ludwig and Katz, 2005). Another research found that in a disorganized neighborhood, collective efficacy may increase female delinquency, rather than decrease it as predicted by theory (Fagan and Wright, 2012). It was also reported that concentrated disadvantage was related to a decrease in violent delinquency amongst females. Studies conducted in the United States confirm that economic and social decay within neighborhoods increased the likelihood of traditional and cyberbullying and victimization (Holt, Turner and Lyn Exum, 2014). Given the reported high rate of aggression committed against females in rural South Africa (Ncontsa, 2013), we predict that:

Proposition 1. Residential instability (e.g., location safety risk) will have a greater influence on female mobile bullies than males.

AGE

The age-crime relationship has been studied for years and attributed to biological, social, psychological and physical development factors, among others (Steffensmeier and Allan, 1988). Neuropsychology theory predicts that as the brain develops, psychosocial capacities that improve decision-making and reduce risk taking such as impulse control, emotion regulation, delay of gratification and resistance to peer influence also mature in young people (Farrington, Ohlin and Wilson, 1986). Physical development theory can also explain the link between age and criminal involvement. The development of physical abilities such as strength, speed, prowess and aggression leads to successful commission of many crimes, while physical strength declining with age makes crime too dangerous or unsuccessful (Ulmer and Steffensmeier, 2014).

Research findings on age and involvement in cyberbullying however, have been inconsistent across existing studies. For example, some researchers found that cyberbullying increases with age (Patchin and Hinduja, 2010; Ybarra and Mitchell, 2004), whereas others found no age influence on cyberbullying in one of their surveys (Smith, Mahdavi, Carvalho, Fisher, Russell and Tippett, 2008). Other studies on bullying also suggest that bullying gradually declines as children grow older (Flisher, Mathews, Mukoma and Lombard, 2006). Studies conducted in rural areas appear to suggest that age has an influence on cyberbullying (Aoyama, Saxon and Fearon, 2011). Many South African studies confirm that young people aged 12-22 years are most victimized (Pelser, 2008). Similar age groups have also been associated with cyberbullying in South Africa due to increasing usage of mobile phones and the Internet (Burton and Mutongwizo, 2009; Popovac and Leoschut, 2012). We, therefore, predict that:

Proposition 2. Mobile bullying behaviors in the rural schools will differ by age.

Gender

Sociological studies suggest gender differences in the way people react to their social environment. The Life-course theory recognizes the impact of historical changes and diversity in life journeys (Hutchison, 2011). It is claimed that crime patterns vary across the course of an individual's life. Women are however believed to be affected more than men in their life journeys due to stigmatization and are

socialized and controlled differently by institutions such as family and schools (Aoyama et al., 2011; Sampson, 2005).

It appears that cyberbullying is more prevalent among girls than boys. This is so because the Internet provides girls with covert ways of expressing their emotions (Edmonson and Zeman, 2009). Since males have been noted to engage mainly in physical bullying while females prefer electronic bullying (Kupczynski, Mundy and Green, 2013), and since intensive mobile phone use has been associated with the female sex (Lepp, Li, Barkley and Salehi-Esfahani, 2015), we predict that:

Proposition 3. Females in rural schools will engage in mobile bullying more than males.

Self-control

Low self-control is claimed to stem from ineffective parenting, poor monitoring of children's behavior, and the inability to recognize and address children's deviant behavior (Rebellon, Straus and Medeiros, 2008). Individuals possessing low self-control have been found to be selfish, lack sympathy and often participate in risky activities (DeLisi, 2011). High self-control, on the other hand, limits the possibility of criminal behavior, and people who are self-controlled are less likely to participate in criminal acts. A study found that self-blaming attributions (a form of low self-control) predicted emotional distress after a cyberbullying incident in a sample of 221 rural intermediate school students (Bauman, 2010).

Studies conducted in South Africa on alcohol misuse among adolescents suggest lack of self-control influences anti-social behavior. Ziervogel, Ahmed, Flisher and Robertson (1997) found that adolescents misuse alcohol because it is believed to increase self-confidence and adult status. Misusers of alcohol were associated with negative characteristics such as lacking self-control and self-respect. They were also conservative and immature which are characteristics of people with low self-control (DeLisi, 2011). Researchers also found that the alleviation of boredom, experimentation, peer pressure and parental influence facilitated misuse of alcohol (Ziervogel et al., 1997).

Almost similar findings are reported in cyberbullying research. It is suggested that as a person's self-control drops, their likelihood to engage in cyberbullying increases (Marcum, Higgins and Freiburger, 2012). On the contrary, highly self-controlled individuals are perceived as being good decision-makers, successful and willing to make sacrifices for long-term goals (DeLisi Berg, 2006). Therefore, we predict that:

Proposition 4a. Individuals with low self-control will engage in mobile bullying activities more than those with high self-control.

However, in a study that used measures of self-control and crime to examine gender and age variations, it was found that while self-control measures can interpret the main demographic facts about crime or deviance, it does not predict misbehavior equally well among various subcategories of age groups (Tittle, Ward and Grasmick, 2004). We, therefore, predict that:

Proposition 4b. The influence of self-control on mobile bullying will not differ by age.

Use of mobile technology

Psychological theories explain that emotional attachment to parents and things can lead to delinquency. Children are often attached to their parents however when this bond is broken, this could result in sadness and depression (Bowlby, 1980). People with strong emotional attachment to objects (e.g. Hoarders) have been found to share many characteristics with addicts (Shapiro and Henderson, 2016).

In the electronic world, people with expert Internet knowledge or competency in use of technology have been found to be more aggressive than those with limited expertise (Ybarra and Mitchell, 2004). Excessive mobile phone use has led to theft among young people, disruption of the social environment and accidents (Walsh, White and McD Young, 2010). Phone addiction or attachment has been attributed to shyness and loneliness (Casey, 2012). These behaviors have also been associated with rural schools (Sanches-Martinez and Otero, 2009). Intensive mobile phone use has been associated with the female sex, rural school location, smoking tobacco, excessive alcohol consumption, depression, mobile phone dependence and school failure (Lepp et al., 2015). Therefore, we predict that:

Proposition 5. Frequent or routine mobile phone users in rural schools will be involved in mobile bullying victimization more than infrequent users.

The sections above identify some of the factors that influence different forms of bullying and victimization. It also reveals many inconsistencies in the findings, rendering some of the theoretical predictions questionable and findings inconclusive. A conceptual model to guide the examination of these factors is presented in Figure 1.
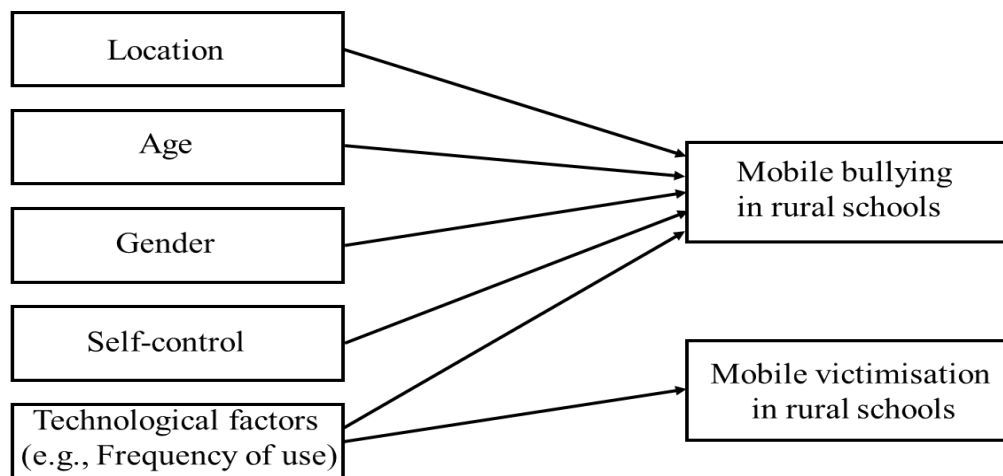
Figure 1. The Conceptual Model

Context of the study

The present study was conducted in the provinces of the Eastern Cape, Limpopo, Mpumalanga and North West, in South Africa. These provinces have been selected because of their predominantly rural environment and low economic development (Makiwane and Chimere-Dan, 2010). In the Eastern Cape, for example, unemployment, poverty, poor education and fractured families are the norm (Westaway, 2012). Further, the Eastern Cape has higher permanent net out-migration than any other province in the country (Hamann and Tuinder, 2012). The situation in Limpopo province is almost similar. There is an enormous urban migration of skilled people, who normally leave their children behind in the care of

relatives (Mlisa, Ward, Flisher, Lombard, Ward, Flisher and Lombard, 2008). The SAHRC study indicates that learners from Limpopo and the North West provinces were significantly more likely to report being afraid when traveling on foot to and from school (SAHRC, n.d.). In the Eastern Cape, learners revealed that new initiates (amakrwala) are a problem in many schools because they force themselves on girls (Ncontsa, 2013). These provinces also have high usage levels of mobile technology, and mobile phones have been reported to be the primary means of communication for most people living in remote rural areas (Makoe, 2010). The challenges outlined above make these provinces appropriate study areas for mobile bullying.

RESEARCH METHODOLOGY

The researchers adopted positivism as their philosophical paradigm and quantitative methods to conduct this study. Quantitative methods have been found to be appropriate for studies involving testing of hypotheses and propositions and informing policy (Bryman, Becker and Sempik, 2008; Chen and Hirschheim, 2004). The directory of South African high schools (saschools, 2018) was initially consulted to identify schools falling within safe and risk zones (Crime Stats SA, 2015). According to the South Africa crime status report for 2014-2015 (SAPS, n.d.), the average contribution to common crime by province was: Gauteng (27%); KwaZulu-Natal (21%); Western Cape (15%); Eastern Cape (11%); North West (7%); Limpopo (6%); Mpumalanga (5%) and Northern Cape (3%). This means the provinces studied (i.e., Eastern Cape, North West, Limpopo and Mpumalanga) contribute approximately 30 percent to national crime. It is estimated that there are 1715 rural schools in the Eastern Cape, 2348 in Limpopo, 1835 in the North West and 2252 in Mpumalanga (Gardiner, 2008; School4SA, n.d.). Using the provincial percentage contribution to national crime, we determined that 570 schools had to be selected (i.e., 1715 x 11%; 2348 x 6%; 1835 x 7% and 2252 x 5%). However, due to resource and financial constraints, we could not study all these schools. Only 5% of the 570 schools had to be studied, i.e., 10 in the Eastern Cape, 7 in Limpopo, 7 in the North West and 6 in Mpumalanga. Schools were then selected based on our knowledge and anecdotal evidence obtained from communities about the school safety. Both schools with high and low safety risks were included in our selection. School heads were then contacted to solicit their involvement, and only 12 responded positively. After obtaining the permission to conduct the study, 3500 secondary school learners between the ages of 14 and 18 were involved in the study. Data was captured from learners using a questionnaire.

The questionnaire (in English) was developed from previous studies and the key issues identified in the literature review. It consisted of a brief definition of mobile bullying to ensure all understood the term. Ethical considerations were also addressed by informing the respondents that their responses would be kept confidential, their participation was voluntary and they could exit the research at any time. The questionnaire was approved by the ethics committee of the university.

The questionnaire captured various items of information. Section A collected general demographic information, e.g., gender, grade (8 to 12), age and where the student lived. Section B measured mobile phone Internet accessibility and usage of mobile phone applications. The former was measured by asking learners to choose from these options: (0 hours, 1-2 hours, 3-5 hours, 6-8 hours and more than 8 hours). The latter was measured using the scale 1=never; 2= rarely; 3=sometimes; 4=often and 5=always. Questions were based on the work of Cheung and Huang (2005). Section C measured engagement in mobile bullying (1=never; 2=rarely; 3=sometimes; 4=often; 5=always). Questions were based on the work of Rigby and Slee (1993).

Section D measured lack of self-control (1=never; 2=rarely; 3=sometimes; 4=often; 5=always). Questions were based on the work of DeLisi (2011); Bauman (2010) and Grasmick, Tittle, Bursik and Arneklev (1993). Section E measured mobile phone victimisation (1=never; 2=rarely; 3=sometimes; 4=often; 5=always). Questions were based on the work of Hamburger, Basile and Vivolo (2011).

Before the questionnaire was administered, permission was obtained from the relevant departments of education, the schools, parents and learners. The researchers also made presentations to the schools to explain the purpose of the study, the meaning of bullying and mobile bullying and the ethical considerations (as mentioned above). Immediately after the briefing, the questionnaire was distributed and completed in the presence of the researchers.

Validity and reliability tests

Reliability was tested using the Cronbach Alpha. All the constructs were above the threshold Cronbach Alpha value (α) of 0.60 acceptable in exploratory studies (Hair et al., 2006).

RESEARCH FINDINGS AND ANALYSIS

Descriptive data

Table 1 represents the descriptive data. It reveals that most frequently used mobile applications are chat rooms and social networks. Many thought about their mobile phone to some extent and were unable to control its use. The majority did not agree that they were engaged in bullying activities and appeared to possess high levels of self-control. However, it appeared that those who were victimized preferred not to talk about it. Further analysis shows that most respondents were male and 16 years old.

Descriptive Statistics					
	No	Mean	Min	Max	SD
Self-control					
I get into a fight with someone I can easily beat	3416	1,455	1	5	0,977
I get picked on by others	3385	1,587	1	5	1,016
Arguments easily arise with others over my phone	3359	2,075	1	5	1,201
Usage of Mobile Application					
Use SMS	3243	2,787	1	5	1,123
Use Email	2960	1,751	1	5	2,136
Use Chatrooms	3173	3,667	1	5	1,591
Use Social Networks	3265	3,606	1	5	1,454
Victimisation					
Receive insulting Messages	3447	1,613	1	5	1,046
Receive threatening Calls	3443	1,552	1	5	0,993
Receive threatening Messages	3424	1,245	1	5	0,845
Mobile bullying					
Tease others in online groups	3442	1,56	1	5	1,075
Exclude others from chat-groups	3210	1,508	1	5	1,001
Spread rumours	3412	1,658	1	5	1,018
Influence others to dislike a person	3408	1,59	1	5	1,018
Location (Safety risk)*	3167	1,827	1	3	0,702

*Self-control: (1=never; 2=rarely; 3=sometimes; 4=often; 5=always).
Use of mobile application: (1=never; 2=rarely; 3=sometimes; 4=often and 5=always).
Victimization: (1=never, 2=rarely, 3=sometimes, 4=often and 5=always).
Mobile bullying: (1=never, 2=rarely, 3=sometimes, 4=often and 5=always).
Location safety risk levels: (1=very high safety risk; 2=moderate safety risk, 3=low safety risk).

Table 1. Descriptive Data

In Proposition 1, we predicted that the influence of residential instability on mobile bullying would be higher if the bullies are females than males. We used the average of all items that measured mobile bullying to conduct a Tukey Honest Significant Difference (HSD) test. These items were all correlated with the construct (location safety risk or residential instability), and as such could be averaged. Table 2 shows significant differences in the means between females and males living in high safety risk areas (p=0.039), and between males in moderate and females in high safety risk areas (0.004). However, males in high (and moderate) safety risk areas engage in mobile bullying more than females (Means: 3.579 and 3.482 for males compared with 2.485 for females). Proposition 1 is therefore not supported as the influence of residential instability appears to be higher on male than female bullies.

Variable	Analysis of Variance Marked effects are significant at p < .05000							
	SS	df	MS	SS	df	MS	F	p
Mobile bullying	**1.832**	**1**	**1.833**	**105.220**	**312**	**0.337**	**5,432**	**0.020**
Unequal N HSD test; Variable: AVGMOB - Marked differences are significant at p < .05000								
Gender/Location type Column 1 = Gender Column 2= Location	{1} M=2.485; Std =0.614; N=136	{2} M=3.391; Std = 1.072; N=178	{3} M=3.667; Std = 1.143; N= 27	{4} M=3.579; Std=1.201; N=163	{5} M=3.482; Std= 1.136; N= 174	{6} M=3.408; Std=1.16; N=49		
1 1 {1}		**0.018**	0.052	**0.039**	**0.004**	0.228		
1 2 {2}	**0.018**		0.844	0.089	0.970	1.000		
1 3 {3}	0.052	0.844		0.128	0.971	0.933		
2 1 {4}	**0.039**	0.089	0.128		**0.014**	0.482		
2 2 {5}	**0.004**	0.970	0.971	**0.014**		0.999		
2 3 {6}	0.228	1.000	0.933	0.482	0.999			

*Gender 1 = Female; Gender 2 = Male
Location type: 1=High safety risk location; Type 2=Moderate safety risk; Type 3=Low safety risk   Mobile bullying: 1=Never; 2=rarely; 3=Sometimes; 4=Often and 5=Always.

Table 2. The Influence of Residential Instability (Location Safety Risk) on Male and Female Involvement in Mobile Bullying

We also predicted in Proposition 2 that mobile bullying behavior in rural schools would differ by age. We examined only those that indicated involvement in mobile bullying. This proposition is partially supported as shown in Table 3. Age influences mobile bullying only where the aggression is committed by teasing others in online groups. The results also reveal a pattern in the nature of bullying. Students from the ages of 14 to 18 years agreed to having been engaged in this form of bullying. However, it appears this form of bullying declines at the age of 15 years and then rises steadily from 16 to 18 years. This finding is not consistent with the claims by the neuropsychological theory and physical development theory of anti-social behavior (Farrington et al., 1986; Ulmer and Steffensmeier, 2014). Our study suggests that as students mature, their participation in teasing others online increases.

Proposition 3 was tested by conducting a t-test to determine if gender influences one's involvement in the four types of bullying behaviors studied. Table 4 shows no significant differences were observed in teasing others or in influencing others to dislike a person. Males were found to exclude others from chat-groups than females, while females spread rumors more than males. Therefore, we conclude that Proposition 3 is partially supported as females in rural schools were only found to be more aggressive in spreading rumors. Further analysis of the profile of these female aggressors shows that they mainly come from schools located in high safety risk areas.

Variable	Analysis of Variance Marked effects are significant at p < .05000							
	SS	df	MS	SS	df	MS	F	p
Tease others online	16.543	7	2.363	418.308	608	0.688	3.435	0.001
Influence others to dislike a person	8.822	7	1.260	1200.255	598	2.007	0.628	0.733
Exclude others from chat groups	9.812	6	1.635	871.290	528	1.650	0.991	0.430
Spread rumours	10.340	7	1.477	800.745	590	1.357	1.088	0.369

Breakdown Table of Descriptive															
Age	Tease others online				Influence others to dislike a person				Exclude others from chat-groups				Spread rumors		
	M	No	Std		M	No	Std		M	No	Std		M	No	Std
10	3.000	2	0.000		4.000	1			4.000	1			3.000	1	
11	3.000	1			3.000	1			3.731	26	0.874		3.000	1	
14	3.733	60	0.880		3.818	33	0.917		3.685	54	0.820		3.306	72	0.685
15	3.387	75	0.695		3.805	41	0.843		3.500	98	0.815		3.261	69	0.610
16	3.479	119	0.746		3.549	82	0.804		3.566	122	0.833		3.229	144	0.564
17	3.661	124	0.864		3.661	112	0.876		3.577	208	0.795		3.300	190	0.617
18	3.786	234	0.877		3.683	202	0.875		3.578	201	0.766		3.326	340	0.644
All groups	3.646	615	0.841		3.672	472	0.861		3.578	710	0.813		3.296	817	0.624

Table 3. Analysis of Variance – Influence of Age on Mobile Bullying

Variable	T-tests; Grouping: Gender Group 1: Female (F) Group 2: Male (M)										
	Mean (F)	Mean (M)	t-value	df	p	N (F)	N (M)	Std F	Std. M	F-ratio Variances	p Variances
Tease others	3.621	3.671	-0.732	615	0.463	291	326	0.835	0.848	1.030	0.791
Influence others to dislike a person	3.623	3.707	1.052	469	0.293	215	256	0.860	0.860	1.000	0.997
Exclude others from chat-groups	3.505	3.661	-2.164	508	0.031	239	271	0.783	0.839	1.147	0.274
Spread Rumors	3.353	3.250	2.353	816	0.019	359	459	0.591	0.660	1.246	0.027

*Group 1=Female (F), Group 2=males (M)

Table 4. Influence of Gender on Mobile Bullying

Variable	T-tests; Grouping: self contact Group 1: LSC Group 2:HSC										
	Mean LSC	Mean HSC	t-value	df	p	N LSC	N HSC	Std . LSC	Std. HSC	F-ratio Variances	p Variances
Tease others in on-line groups	3.747	3.565	2.676	616	0.007	277	341	0.881	0.800	1.212	0.092
Influence others to dislike a person	3.729	3.601	1.597	471	0.110	262	211	0.874	0.841	1.082	0.552
Exclude others from chat-groups	3.647	3.495	2.108	509	0.035	275	236	0.843	0.769	1.201	0.146
Spread rumors	3.401	3.215	4.257	817	0.000	364	455	0.683	0.564	1.462	0.000

*Group1 = lack self-control (LSC), group 2 = have self-control (HSC))

Table 5. Influence of Self-Control on Mobile Bullying

Variable	Analysis of Variance Marked effects are significant at p < .05000							
	SS	df	MS	SS	df	MS	F	p
Mobile bullying	49.994	28	1.785	878.338	828	1.061	1.683	0.015

AGE/Self-control Column 1 = AGE Column 2= Self-control	{1} M=3.428; Std =0.741; N=28	{2} M=3.61; Std = 0.673; N=47	{3} M=3.401; Std = 0.733; N= 49	{4} M=3.528; Std=0 .756; N=70	{5} M=3.882; Std= 0.895; N= 50	{6} M=3.513; Std=0.814; N=74	{7} M=3.900; Std=0.91 9; N=120	{8} M=3.666; Std=0.83 7; N=114
15 1 {1}		1.000	1.000	0.999	0.274	1.000	0.110	0.867
15 2 {2}	1.000		1.000	0.961	**0.039**	0.975	**0.003**	0.384
16 1 {3}	1.000	1.000		0.994	0.080	0.997	**0.009**	0.587
16 2 {4}	0.999	0.961	0.994		0.284	1.000	0.052	0.955
17 1 {5}	0.274	**0.039**	0.080	0.284		0.220	1.000	0.788
17 2 {6}	1.000	0.975	0.997	1.000	0.220		**0.031**	0.916
18 1 {7}	0.110	**0.003**	**0.009**	0.052	1.000	**0.031**		0.365
18 2 {8}	0.867	0.384	0.587	0.955	0.788	0.916	0.365	

Unequal N HSD test; Variable: AVGMOB - Marked differences are significant at p < .05000

*Self-control 1 = Low self-control (LSC); Self-control 2 = High self-control (HSC)

Age groups tested: 15 to 18 years

Mobile bullying scale: 1=Never; 2=Rarely; 3=Sometimes; 4=Often and 5=Always.

Table 6. The Influence of Self-Control on Mobile Bullying Across Age Groups

In Proposition 4a we determined whether individuals with low self-control were more associated with mobile bullying activities than those with high self-control. Table 5 below indicates that in all the cases (except for influencing others to dislike a person), those lacking self-control are more involved in bullying than those with high self-control, and the differences are significant. This suggests therefore that Proposition 4a is supported to a great extent.

In Proposition 4b, we determined if the influence of self-control differs by age. We conducted a Tukey HSD test for pairwise comparisons of scores. In this test we used the average of all the items that measured mobile bullying (excluding 'influence others to dislike a person' since Table 5 did not reveal a significant association with self-control). Table 6 shows significant differences in the mean scores between those aged 15 years, with high self- control (HSC) and those aged 17 years, with low self-control (LSC); those aged 15 years with high self-control and those aged 18 years with low self-control; those aged 16 years with low self-control and those aged 18 years with low self-control; and finally those aged 17 years with high self-control and those aged 18 years with low self-control. There appears to be more bullying by older low self-controlled students than young low and high self-controlled students. Proposition 4b is therefore supported to some extent.

We tested Proposition 5 by comparing the involvement in mobile bullying and victimization by frequent and non-frequent users of the most commonly used mobile applications, i.e. social networks (Facebook and Twitter) and chat rooms. Table 7 shows that frequent users of these applications were engaged in the following aggressions more than infrequent users: tease others in online groups ($3.86 > 3.51$); influence others to dislike a person ($3.79 > 3.58$); and spread rumors ($3.40 > 3.23$). However, we did not find significant differences between these two groups in the way they exclude others from chat-groups.

	T-tests; Grouping: Frequent-user Group 1: (FU), Group 2: (NFU).										
Variable	Mean	Mean	t-value	df	p	N	N (NFU)	Std (FU)	Std.(NFU)	F-ratio	p
	(FU)	(NFU)				(FU)				Variances	Variances
Tease others in on-line groups	3.862	3.510	5.170	616	0.000	240	378	0.888	0.781	1.289	0.027
Influence others to dislike a person	3.792	3.589	2.539	471	0.011	193	280	0.888	0.833	1.137	0.325
Spread rumors	3.404	3.233	3.820	817	0.000	309	510	0.712	0.559	1.623	0.000
Exclude others from chat-groups	3.642	3.536	1.440	509	0.150	196	315	0.850	0.786	1.168	0.222

[*]Frequent (FU) and infrequent mobile phone users (NFU)

Table 7. Involvement in Mobile Bullying – Frequent and Infrequent Users of Mobile Phones

Victimization

In the case of victimization, Frequent Users (FU) of chat-rooms and social networks are victimized more (than Non-Frequent Users – NFU) where the aggression is committed using insulting messages, threatening calls and frightening messages (see Table 8).

Proposition 5 is therefore supported to a great extent, i.e., frequent or routine mobile phone users in rural schools are more involved in mobile bullying and are victimized more than infrequent mobile phone users.

Variable	T-tests; Grouping: Frequent-user Group 1: (FU) Group 2: (NFU)										
	Mean 1 (FU)	Mean (NFU)	t-value	df	p	N (FU)	N (NFU)	Std.Dev. (FU)	Std.Dev. (NFU)	F-ratio Variances	p Variances
Receive insulting messages	3.549	3.384	2.744	718	0.006	242	478	0.824	0.725	1.291	0.020
Receive threatening calls	3.511	3.384	2.099	634	0.036	225	411	0.785	0.693	1.282	0.031
Receive frightening messages	3.558	3.420	2.215	643	0.027	222	423	0.814	0.713	1.302	0.022

Table 8. Victimization of Frequent/Infrequent Mobile Phone Users

DISCUSSION AND CONCLUSION

Rural schools need assistance in developing cognitive behavioral strategies that will change students' aggressive use of mobile phones. High residential instability was found to influence the tendency to engage in arguments over phones. The influence of the level of safety risk of the location (i.e., residential instability) on mobile bullying was found to be higher among rural males than females living in high and moderate safety risk areas. The findings of the present study indicate that males in high and moderate safety risk areas engage in mobile bullying more than females (Table 2, Means: 3.579 and 3.482 for males compared with 2.485 for females). Therefore, while Proposition 1 was not supported, there is some evidence to support the applicability of the Social Disorganization Theory to the rural environment. This finding also emphasizes the importance of taking into consideration the hostility of the bully's environment when administering justice.

Age was found to influence bullying only when the aggression is committed by teasing others in online groups. This form of bullying rises from the age of 14 years, declines at age 15 and then increases from 16 to 18 years. It appears that in some schools, different groups of students engage in this form of bullying from 16 years. One possible explanation could be that interventions are focused on the early age groups than older students above 15 years. A new group of bullies (16 years and above) emerge replacing the young ones. There is a need to monitor and manage the behaviors of both young and old students. This finding may also provide guidance on determining incapacitation, deterrent and rehabilitation policies. For instance, should the incapacitation period be set at the peaks (i.e., 14 years or 18 years)? It is also not clear why the older bullies in the schools with interventions start this aggression at 16 years. Studies into their perceptions and how these impact the interventions would be useful. The findings of the present study indicate that bullying does not decrease as age increases. Therefore, the

present study did not confirm the neuropsychology and physical development theories, which claim that bullying would decline with growth (Farrington et al., 1986; Ulmer and Steffensmeier, 2014).

We also found that gender influences mobile bullying only when the aggression is committed by excluding others from chat-groups and by spreading rumors. Males exclude others from chat groups more than females, while females spread rumors more than males. This corroborates earlier observations (Smith et al., 2008). Most of the females engaging in this aggression came from schools located in high safety risk areas. Literature suggests that women in these areas in South Africa are subject to increasing violence in their life-time (Burton and Leoschut, 2013). This may have impacted negatively on the pupil's behavior online. There is therefore support for the applicability of the Life-course Theory to the rural environment. This theory recognizes the impact of historical changes and diversity in life journeys (Hutchison, 2011).

Our study revealed that lack of self-control has much influence on mobile bullying. It shows that those who lack self-control would tease others in online groups, exclude others from chat-groups and spread rumors more than those with high self-control. This confirms that lack of self-control predicts anti-social behavior- (Bauman, 2010; Marcum et al., 2012). High levels of low self-control calls for restorative justice on part of the bullies. A study published in 2012 paints a picture of hell in South African children prisons (Muntingh and Ballard, 2012). The costs of incarceration are also prohibitive. More interventions for developing self-control among the youth have to be considered by the criminal justice system.

While the present study provides more insight into mobile bullying and aggression in the rural environment, more research is needed to enhance our understanding of this problem and its implication for educators, policy makers and the justice systems in South Africa.

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