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# **An Intervention Model for Cyberbullying Based on the General Theory of Crime and Routine Activity Theory**

**Full research paper**

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## **Abstract**

Cyberbullying is a major social issue that has the potential to impact on a large audience. The growth and proliferation of ubiquitous social media platforms, internet and digital technologies have increased the potential for cyberbullying in recent times. As such, cyberbullying too has become ubiquitous and does not seem to discriminate on age, sex, race or any other socio-technical factors. This research derives a conceptual model to intervene cyberbullying by following the cyberbully's journey from conception of the bullying idea, identification of the target to the bullying action. The model is inspired by two competing theories: The General Theory of Crime and Routine Activity Theory. The model incorporates socio-technical crime opportunity factors, which can influence the offender's motivation.

**Keywords** Cyberbullying, Adults, Socio-technical, Self-control, Opportunity

## 1. Introduction

Cyberbullying is a global phenomenon and it emerges as a new form of bullying, which occurs through the Internet, computer devices or handheld devices (Feinberg and Robey 2008). The growth and proliferation of social media platforms, ubiquitous mobile devices and connected devices have exacerbated the impact of cyberbullying (Kaluvarachchi et al. 2020), that does not seem to discriminate the boundaries of traditional bullying in relation to time and gender (Huang et al. 2018). A recent YouGov research released in the UK which interviewed 2,034 people shows that almost a quarter (23%) of British adults have experienced cyberbullying that had led to real-life negative consequences (Independent 2019). Similarly, recent literature shows that the percentage of cyber victims could be as high as 90.86%, while the percentage of cyber perpetrators could be up to 54% (Jenaro et al. 2018). Cyberbullying is demonstrated to have affected victims' health and social life in numerous ways, such as depression (Perren et al. 2010), anxiety (Kowalski et al. 2014), increased psychosomatic symptoms (Sourander et al., 2010) and intrusive thoughts of self-harming and suicide ideation (Kowalski et al. 2014).

Although cyberbullying perpetration is prevalent amongst all ages, much of the research to date has focused on adolescents or children (Jenaro et al. 2018; Orel et al. 2015). It has been highlighted that the impact of cyberbullying on the adult population has received less research attention (Kowalski et al. 2019; Kowalski et al. 2017). However, given the growth of internet use, social media platforms and connected devices (Palekar et al. 2015; Sedera et al. 2017; Sedera et al. 2016), the adult population is equally susceptible to cyberbullying. According to a recent research study, 44.2% of female college students in the United States had been involved with cyberbullying as a perpetrator, victim and/or witness while in college (Selkie et al. 2016). Another survey conducted with over 3600 adults in the United States found that over 20% of respondents had cyberbullying victimization in their adulthood and the perpetrator was their colleague or a core worker. The same study confirmed that 13.2% of respondents involved with cyberbullying perpetration in their adulthood (Kowalski et al. 2017; Kowalski et al. 2018). The proliferation of smartphones, the percentage of adults using social media, internet and workplace systems, the likelihood of cyberbullying in adults is purported to be high. Also the ubiquitous nature of email communication, and this has been using as a tool for cyber aggression creates unique challenges for organizations (Richard et al. 2020). The growing issue of cyberbullying amongst the adult population, deemed almost as severe as with younger populations (Jenaro et al. 2018), provides the context to this study. Therein, this paper attempts to provide a conceptual model to prevent, mitigate and reduce cyberbullying among the adult population.

## 2. Related Works

There has been a wealth of empirical and review studies that had examined the phenomenon of cyberbullying from various theoretical and practical viewpoints. Such research has observed the influence of; technology-related factors (Barlett et al. 2018; Barlett et al. 2019), individual factors such as gender and age (Guo 2016; Kowalski et al. 2019), personality factors (Chen et al. 2017a; Guo 2016), cyberbullying victimization, traditional bullying perpetration (Chen et al. 2017b; Ojanen et al. 2015) and contextual factors (Kowalski et al. 2019; Lee et al. 2018).

While the past literature on cyberbullying has provided a substantial contribution to our current knowledge, we observe some issues in the past literature: (i) studies tend to observe a simple correlation between cyberbullying (Guo 2016; Huang and Chou 2010; Kowalski et al. 2019; Lee et al. 2018) (ii) tend to focus on explaining the phenomenon of cyberbullying (Jenaro et al. 2018; Smith et al. 2012; Thomas et al. 2015) and (iii) lacks a theoretical position in relation to how interventions can be made in cyberbullying (Slonje et al. 2013; Välimäki et al. 2013). This theoretical underpinning possibly limits their application to the practice (Barlett 2017). Understanding what predicts cyberbullying perpetration is important to advise or help with interventions to reduce cyberbullying perpetration among adults (Barlett and Gentile 2012).

By considering these shortcomings, the research problem addressed in this study was to understand

R1) How can cyberbullying be effectively alleviated in various phases of the cyberbullying behaviour?

### 3. Theory Building

To address the research gaps identified in the literature, we draw on the general theory of crime and routine activity theory to propose a research framework that guides our investigation into adult cyberbullying perpetration. Previous researches also argue the importance of combining theories in order to grasp the complexity of behaviour change in health promotion (Bartholomew et al. 2011). Also, Lowry et al. (2019, p. 1150) stated that “integrating competing theories is one way to provide a strong research contribution.” We use the General Theory of Crime (GTC) (Gottfredson and Hirschi 1990) and Routine Activity Theory (RAT) (Cohen and Felson 1979) to explain cyberbullying perpetration from a socio-technical perspective. GTC argues that individuals with low self-control are incapable of predicting long term consequences of their actions, so when presenting an opportunity, they involve delinquent behaviours. However general theory of crime has not measured the effectiveness of guardianships as a protective factor against delinquent behaviours or crime. Hence, we integrate the routine activity theory. RAT highlights three essential factors that lead to the occurrence of a crime or deviant behaviours: (1) a likely offender, (2) availability of a suitable target, and (3) absence of a capable guardianship. Despite their differences, GTC and RAT can be combined to establish a comprehensive understanding of deviant behaviours as they are “complementary” crime theories.

#### 3.1 General Theory of Crime (GTC)

Gottfredson and Hirschi (1990)'s General Theory of Crime argues that crime is a manifestation of low self-control; people who have low self-control, are more likely to engage in crime or deviant behaviour when presented with the opportunity to do so. They argued that the primary cause of crime is a low self-control and it developed by the age around 10 and remains stable across individuals over time. They also have shown that low self-control is a result of ineffective childrearing practices (Jaeyong and Kruis 2020). Gottfredson and Hirschi (1990) suggest that low self-control person exhibit traits such as impulsivity, preference for simple tasks and preference for physical activities, self-centred tendencies, risk-seeking behaviours, and short temperedness. These individuals with low self-control are incapable of predicting long term consequences of their actions and short-sightedness, so when present an opportunity they involve with delinquent behaviours than the people with high self-control believing that the amount of pressure of crime overweight its consequences (Jaeyong and Kruis 2020).

The General Theory of Crime is one of the most cited criminological theories in the empirical literature (Gottfredson and Hirschi 1990; Grasmick et al. 1993; Moon and Alarid 2015). Also, researchers have explicitly examined the relationship between low self-control interact with crime opportunity in explaining bullying and cyberbullying behaviour (Baek et al. 2016; Bossler and Holt 2010; Grasmick et al. 1993; Jaeyong and Kruis 2020; Lianos and McGrath 2018; Lowry et al. 2019; Moon and Alarid 2015; Ngo and Paternoster 2011; Vazsonyi et al. 2012). Recent research conducted with 1091 Korean adolescents supported the postures of the general theory of crime showing that low self-control and opportunity are significant predictors of cyberbullying in separate gender models (Jaeyong and Kruis 2020). Baek et al. (2016)'s study conducted with adolescents also shown that low self-control, opportunity, and gender have a significant influence on cyberbullying. Besides, Lianos and McGrath (2018) tested the ability of the general theory of crime and general strain theory to explain cyberbullying perpetration and found that low self-control and higher levels of strain related to cyberbullying perpetration. However various conceptualizations and definitions of the opportunity construct is found in the cyberbullying literature. The applicability of GTC as a theory is not only limited to criminal behaviours, GTC can also apply to explain a variety of deviant or imprudent behaviours (Starosta 2016). Hence GTC has been used in this study as a theory to explain cyberbullying perpetration.

#### 3.1 Routine Activity Theory (RAT)

Routine Activity Theory was published in 1979 by Cohen and Felson. This provides a framework to understand the changes in criminal activity. They suggest that crime behaviours likely to occur due to three factors such as the presence of a likely offender, a suitable target, and lack of a capable guardianship (Cohen and Felson 1979). The most essential component is a likely offender and if any of the components are missing the crime is less likely to occur (Navarro and Jasinski 2012).

The Routine Activity Theory is an extensively used criminological theory to analyze deviance and crime behaviours (Andresen 2006; Forde and Kennedy 1997; Holtfreter et al. 2008). Recently, many IS researchers have also begun to adopt RAT to examine cyber victimization and cyberbullying behaviours (Bossler and Holt 2009; Chan et al. 2019; Hutchings and Hayes 2009; Kalia and Aleem 2017; Leukfeldt and Yar 2016; Marcum et al. 2010; Navarro and Jasinski 2012; Ngo and Paternoster 2011; Reyns 2015;

Reyns 2017; Reyns et al. 2016; Wolfe et al. 2016). However, the operationalization of Routine Activity Theory's constructs of likely offender, a suitable target, and the absence of capable guardianship differs in the cyberbullying literature (Navarro and Jasinski 2012). Navarro and Jasinski (2012) shown that routine activities theory is a viable explanation for cyberbullying risk among teenagers. Holt and Bossler's (2009) also supported this claim. Chan et al. (2019) used RAT to examine the cyberbullying behaviours on social networking sites with the affordance perspective. Leukfeldt and Yar (2016)'s analysis shows some RAT elements are more significant than others when explaining cyberbullying behaviours. Reyns et al. (2016)'s study examined the absence of capable guardianship concept of routine activity theory to measure its efficacy in reducing the risk for cyberstalking victimization. They measured the effectiveness of offline guardianship as a protective factor against online victimization and their findings have shown that offline guardianship does not protect individuals from cyberstalking victimization (Reyns et al. 2016). Therefore, we have incorporated both online and offline mechanisms as capable guardianships for our research. RAT was chosen for this study as it addresses the presence of a likely offender such as a person with low self-control, a vulnerable victim, and a deviant behaviour such as cyberbullying, and the need for a capable guardian to intervene for the victim.

#### 4. Deriving the Conceptual Model

We draw on the General Theory of Crime and Routine Activity Theory to investigate cyberbullying perpetration on adults. A likely offender with low self-control and degradative attitudes towards the victim increases the likelihood of cyberbullying. According to the prior research, it is very important to consider all human, social and technology use related factors to understand this complex societal challenge and these factors are known as socio-technical factors (Lowry et al. 2019). Therefore, four subconstructs (socio-technical factors) derived from the literature, also have incorporated as criminogenic opportunities into the a-priori model. The "Capable guardianships" also introduced as a moderator to test whether the capable guardianships such as offline authorities or online mechanisms moderate the relationships. Figure 1 depicts the proposed framework for adult cyberbullying perpetration showing the socio-technical factors derived from the literature in relation to the key constructs in the General Theory of Crime and Routine Activity Theory.

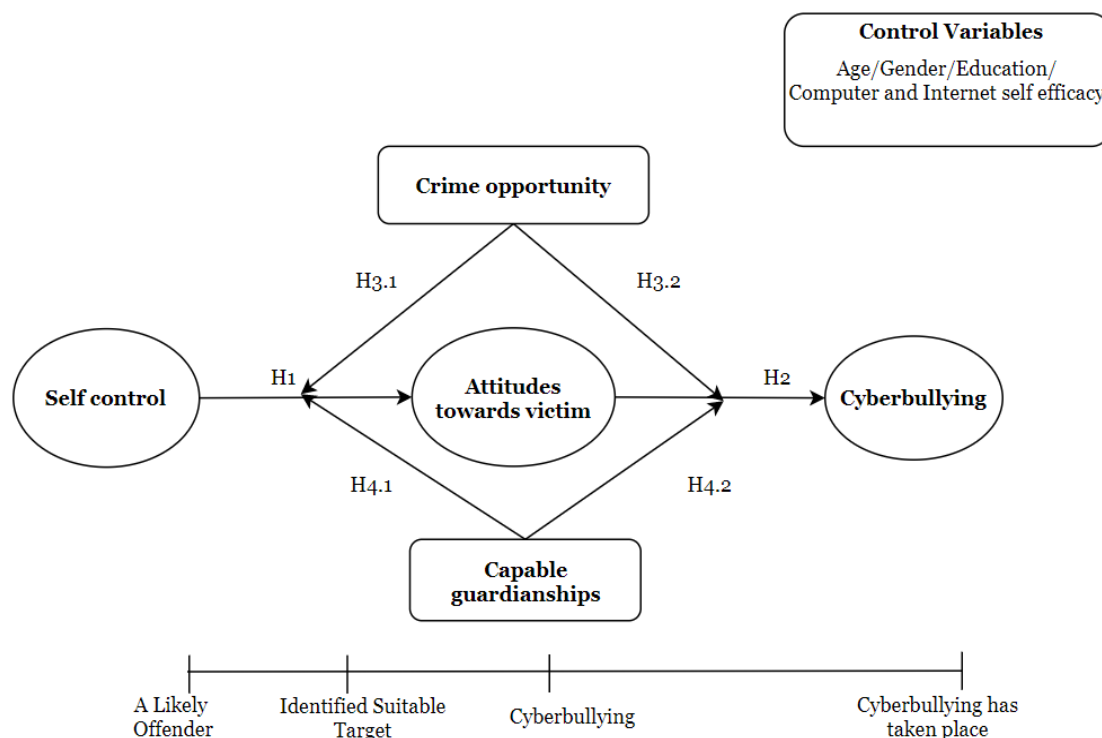


Figure 1: A framework for adult cyberbullying perpetration

This model also identifies the timeline of cyberbullying and places of clear interventions where we can introduce prevention strategies to prevent, mitigate and reduce cyberbullying. Several intervention

points have been identified to reduce cyberbullying such as decreasing crime opportunities (e.g. peer reinforcement) or harden prospective targets or increase the capability and/or the number of guardians such as new laws/online mechanisms to prevent cyberbullying.

## 4.1 Independent Variables

In the next part of the paper, each independent construct and relationships are discussed.

### 4.1.1 Self-control

Gottfredson and Hirsch (1990) propose that crime is a manifestation of low self-control and individuals with low self-control engage in criminal acts when an opportunity presents. Self-control, also known as self-regulation is a person's power or ability to control over their emotions, behaviour or actions (Wong et al. 2018). The breakdown of self-control process is one of the main causes of the violent or deviant behaviour (Baumeister and Boden 1998). 'Low self-control' was conceptualized as having six distinct and interrelated factors such as impulsivity, preference for simple tasks, preference for physical activities, self-centred tendencies, risk-seeking behaviours, and short temperedness (Gottfredson and Hirschi 1990). Individuals with low self-control are more likely to engage in criminal and antisocial behaviour because they pursue their self-interest and desire to maximize pleasure and cannot govern their behaviour in pursuit of this pleasure (Gottfredson and Hirschi 1990). Ample of cyberbullying studies have unintentionally investigated the components of low self-control, such as antisocial personality factors (Chen et al. 2017a; Guo 2016; Kowalski et al. 2019), aggressive cognition (Guo 2016; Lianos and McGrath 2018), lacking empathy and being impulsive (Kowalski, Limber et al., 2019, Guo, 2016) and found strong relationships with cyberbullying. On the other hand, Routine Activity Theory presumes that crimes would not happen without an offender, therefore the presence of a likely offender is a prerequisite for any crime or deviance behaviour. A likely offender refers to an individual who might commit a crime or engage in deviant behaviour for any reason (Cohen and Felson 1979). We were noted that likely offender and low self-control occur in combination, hence we formally conceptualize that "a likely offender is a person who has low self-control". Thus, we hypothesize that:

*Hypothesis 1: An offender with low self-control increases the degradative attitudes towards his/her victim.*

### 4.1.2 Attitudes Towards Victim

RAT theory suggested that crime behaviours likely to occur when a suitable target is presented. Suitable target indicates the degree of vulnerability posed by the potential victim or property (Cohen and Felson 1979, Navarro and Jasinski 2012). In this study, we conceptualize "suitable target" as an individual towards the bully/offender has got negative attitudes. The offender can have negative attitudes towards victims due to variety of different factors such as thrill seeking behaviours, sexual orientation, disability, hatred based on dysfunctional relationships, work related conflicts or hatred based on ongoing conflict between neighbours (Walters et al. 2016). Many cyberbullying researchers suggested that people may bully a victim because they do not like that person (Hinduja and Patchin 2007) or they are jealous or hate about that person or they need to get revenge from the victim (Varjas et al. 2010) due to variety of factors. Thus, we hypothesize that:

*Hypothesis 2: High levels of degradative attitudes towards the victim increases the likelihood of cyberbullying.*

## 4.2 Moderator Variables

In the next part of the paper moderator variables and relationships are discussed.

### 4.2.1 Crime Opportunity

The opportunity has an important role to play in every class of offence, including violence (Clarke 2012). Gottfredson and Hirschi (2003) stated that opportunities to commit crimes are unlimited, but each specific crime needed a unique set of opportunities for the crime to be committed. Although there is an endless supply of opportunities, keeping with arguments for a social-technical perspective in studying cyberbullying, we conceptualize the opportunity as having, four socio-technical environmental conditions as potential factors that, if present, may influence offender motivation to involve with cyberbullying as shown in table 1.

<b>Construct (Author names)</b>	<b>Definition</b>
<b>Time spent online including social media</b> (Barlett and Chamberlin 2017; Barlett et al. 2019; Chen et al. 2017; Guo 2016; Kowalski et al. 2019; Lee 2017; Lianos and McGrath 2018; Lowry et al. 2016).	Frequency and time an individual spent on the Internet and social media.
<b>Perceived anonymity</b> (Barlett et al. 2017; Barlett 2017; Barlett and Kowalewski 2019; Barlett et al. 2019; Kowalski et al. 2019; Lee and Wu 2018; Lianos and McGrath 2018).	Anonymity refers to the extent to which technology enables users to conceal their identity when they are interacting with others online. Willard (2007) argued that when people used ICTs, they perceived themselves as anonymous.
<b>Relationships with a vulnerable to deviant or violent peers.</b> (Guo 2016; Kowalski et al. 2019; Lee et al. 2018; Lee and Wu 2018; Lianos and McGrath 2018).	Adults' relationships with delinquent or violent friends or peers, and their link to cyberbullying perpetration.
<b>Cyber or traditional bullying perpetration and victimization.</b> (Chen et al. 2017; Guo 2016; Hemphill and Heerde 2014; Kowalski et al. 2019; Lee et al. 2018; Lianos and McGrath 2018).	Involvement with traditional bullying or cyberbullying as a bully or victim increased the chances of being involved with cyberbullying as well.

Table 1. Socio-technical factors influencing cyberbullying

Research has mostly acknowledged that technology has an important role in both creating and blocking opportunities for deviant or criminal activities (Lowry et al. 2019). We have introduced two technology use related factors "time spent online including social media" and "perceive anonymity" which would influence offender motivation to involve with cyberbullying. The popularity of social media, risky ICT usage such as the massive amount of personal information shared online and increased time spent on online create new opportunities for cyberbullying (Barlett et al. 2017; Barlett and Chamberlin 2017; Guo 2016; Kowalski et al. 2019). Thus, a technology-enabled anonymous environment provides plenty of opportunities for crime (Lowry et al. 2019). Perceive anonymity may be more pronounced because the bully does not need to have a relationship with the victim or not as identifiable as traditional bullying and the bully's perceived anonymity also increase offender motivation for cyberbullying (Barlett et al., 2016).

Researchers found that individuals with low self-control were more likely to engage in anti-social behaviour when their peer involved in anti-social behaviours (Kuhn and Laird, 2013). Similarly, Kowalski et al. (2019) shown that if peers engage in cyberbullying behaviours it is more likely to participate with cyberbullying perpetration and this has been studied from elementary school to college students. Guo (2016) also confirmed that having poor peer relationships with a vulnerable to deviant or violent peers will increase the chances of being a cyberbully.

Crime opportunity theory has shown that one crime produces opportunities for another crime (Felson and Clarke 1998). Bandura (1978) revealed that people can observe other's behaviours and reproduce the same behaviour. Hence past behaviours such as cyber or traditional bullying perpetration and victimization also increase offender motivation for cyberbullying perpetration via the learning and reproducing other's behaviours (Guo, 2016; Smith et al., 2008). Hence, we hypothesized that.

*Hypothesis 3.1: Socio-technical and environmental conditions, as measured by suitable crime opportunity, influences the relationship between an offender's self-control and attitudes towards the victim.*

*Hypothesis 3.2: Socio-technical and environmental conditions, as measured by suitable crime opportunity, influences the relationship between attitudes towards victim and cyberbullying.*

#### 4.2.2 Capable Guardianships

Researchers have shown that in the absence of capable guardianships, there is a likelihood that crime and deviance behaviours can occur (Baumeister and Boden 1998). Lowry et al. (2019) also shown that crime occurs in situations where crime or deviant behaviour is mentally and physically easy to perform and lack of monitoring simplify online crime behaviours. According to the Routine Activity Theory, guardianships are not limited to government authorities alone, can also include anybody whose presence or proximity that discourage crime or deviant behaviours (Baumeister and Boden 1998). Leukfeldt and Yar (2016) shown that guardianship can come in other forms such as technical personal

(e.g. network administrators, forum moderators, users, and peers) as well as a range of automated protections (e.g. firewalls, virtual private networks, anti-virus, anti-intrusion software, ID authentication and access management systems).

In this research, we have included ‘Law and regulatory framework’ from offline authorities and online mechanisms such as “Facebook/Twitter” help centres, privacy settings, protective software, filters, and access management systems as capable guardianships. Bullying research has highlighted that anti-bullying programs and laws are designed to protect people from bullying (Berg 2015; Hinduja and Patchin 2019). Furthermore, its existence provides a tool by which parents, schools, and ultimately law enforcement, can convince bullies from ceasing their conduct (Berg and Breheny 2014) and absence of capable guardianships would encourage such conducts. Therefore, we hypothesized that:

*Hypothesis 4.1: The absence of capable guardianships influences the relationship between an offender’s self-control and attitudes towards the victim.*

*Hypothesis 4.2: The absence of capable guardianships influences the relationship between attitudes towards victim and cyberbullying.*

### 4.3 Control Variables

We used four sociodemographic and socio-technical factors as control variables: age, gender, education, computer, and Internet self-efficacy. The table 2 below describes the control variables that used for this study.

Control variable	Why variable must be controlled	How variable will be controlled
Age	Previous studies have tested the relationship between Age and cyberbullying and findings show that the cyberbullying rates differ based on age.	Participants age will be restricted to 18 years old or older because we are going to develop a conceptual model to prevent, mitigate and reduce cyberbullying among the adult population.
Gender	Gender should be treated as a moderator because motives of bullies may also differ across gender.	A large sample would be used with equal representation of gender.
Education	Level of education would also change an individual’s behaviours.	The data will be collected from a more diverse sample including all levels of income, education, and occupation.
Computer and Internet self-efficacy	An individual’s confidence/ knowledge about computers and internet usage would also change their behaviours in the cyberspace.	The data will be collected from a more diverse sample including all levels of computer and Internet self-efficacy.

Table 2. Control Variables

## 5. Conclusion, Contribution and Future Research

The phenomenon of cyberbullying has become a major problem among adults, and it creates persistent psychological problems. Generally, the cyberbullying literature was found to be a lack of an overarching framework to guide interventions that combat cyberbullying and assist adults to stay safe online. This paper proposes an intervention model that follows the process of cyberbully from conception of the bullying idea, identification of the target to the bullying action, considering salient moderations. The model is inspired by two competing theories that had not been combined in this way before. It identified several places of clear interventions such as decreasing crime opportunities (e.g. peer reinforcement) or reduce the exposure of victims or introduce new laws/online mechanisms to hinder or curtail cyberbullying.

### 5.1 Theoretical Implications

Theoretically, this research contributes to the information systems (IS) literature by exploring cyberbullying perpetration among adults. This study explains the theoretical view of cyberbullying process. It also adds to the existing research on cyberbullying by integrating knowledge from multiple disciplines. This study combines two competing crime theories for the purpose of creating



interventions. This intervention model empirically identifies the journey that a cyberbully would take from the conception of the bullying idea, identification of the target to the bullying action and demonstrates that socio-technological factors play a substantial role in influencing cyberbullying among adults.

## 5.2 Practical Implications

Much the research focused on cyberbullying perpetration has been largely atheoretical or lack solid theoretical foundation (Barlett 2017; Kowalski et al. 2014) This theoretical underpinning possibly limit their application to the practice (Kowalski et al. 2014). We identify the several intervention points to hinder or curtail cyberbullying in our model and this will provide an actionable plan for governments, policymakers, internet providers and other practitioners to tailor their curriculum to specifically target this new social phenomenon. Overall, this research is expected to stimulate the development of evidence-based policy positions and interventions that combat cyberbullying and assist adults to stay safe online.

The research presented in this paper has been limited by the small number of studies conducted relating to adult cyberbullying and interventions. The future research direction is to focus on what can be done to protect against cyberbullying and what protection steps can be implemented to protect adults.

## 6. References

- Andresen, M. A. 2006. "A Spatial Analysis of Crime in Vancouver, British Columbia: A Synthesis of Social Disorganization and Routine Activity Theory," *The Canadian Geographer / Le Géographe canadien* (50:4), pp. 487-502.
- Baek, H., Losavio, M., and Higgins, G. 2016. "The Impact of Low Self-Control on Online Harassment: Interaction with Opportunity," *Journal of Digital Forensics, Security and Law*.
- Barlett, C. P. 2017. "From Theory to Practice: Cyberbullying Theory and Its Application to Intervention," *Computers in Human Behavior* (72), pp. 269-275.
- Barlett, C., Chamberlin, K., and Witkower, Z. 2017. "Predicting Cyberbullying Perpetration in Emerging Adults: A Theoretical Test of the Barlett Gentile Cyberbullying Model," *Aggressive Behavior* (43:2), pp. 147-154.
- Barlett, C. P., and Chamberlin, K. 2017. "Examining Cyberbullying across the Lifespan," *Computers in Human Behavior* (71), pp. 444-449.
- Barlett, C. P., and Gentile, D. A. 2012. "Attacking Others Online: The Formation of Cyberbullying in Late Adolescence," *Psychology of Popular Media Culture* (1:2), pp. 123-135.
- Barlett, C. P., Gentile, D. A., Chng, G., Li, D., and Chamberlin, K. 2018. "Social Media Use and Cyberbullying Perpetration: A Longitudinal Analysis," *Violence and gender* (5:3), pp. 191-197.
- Barlett, C. P., and Kowalewski, D. A. 2019. "Learning to Cyberbully: An Extension of the Barlett Gentile Cyberbullying Model," *Psychology of Popular Media Culture* (8:4), pp. 437-443.
- Barlett, C. P., Madison, C. S., Heath, J. B., and DeWitt, C. C. 2019. "Please Browse Responsibly: A Correlational Examination of Technology Access and Time Spent Online in the Barlett Gentile Cyberbullying Model," *Computers in Human Behavior* (92), pp. 250-255.
- Bartholomew, L. K., Parcel, G. S., Kok, G., Gottlieb, N., and Fernandez, M. 2011. "Diffusion of Innovations Theory," *Planning Health Promotion Programs: An Intervention Mapping Approach*, pp. 108-111.
- Baumeister, R. F., and Boden, J. M. 1998. "Aggression and the Self: High Self-Esteem, Low Self-Control, and Ego Threat," in *Human Aggression: Theories, Research, and Implications for Social Policy*. San Diego, CA, US: Academic Press, pp. 111-137.
- Berg, C. 2015. "Submission to the Senate Standing Committee on Environment and Communications Inquiry into Enhancing Online Safety for Children Bill 2014 and the Enhancing Online Safety for Children (Consequential Amendments) Bill 2014.," I.o.P. Affairs (ed.). Melbourne, Australia.
- Berg, C., & Breheny, S. (2014). A social problem, not a technological problem, Bullying, cyberbullying and public policy. Melbourne: Institute of Public Affairs Retrieved from [https://ipa.org.au/wp-content/uploads/archive/submission\\_V6.pdf](https://ipa.org.au/wp-content/uploads/archive/submission_V6.pdf).

- Bossler, A. M., and Holt, T. J. 2009. "On-Line Activities, Guardianship, and Malware Infection: An Examination of Routine Activities Theory," *International Journal of Cyber Criminology* (3:1).
- Bossler, A. M., and Holt, T. J. 2010. "The Effect of Self-Control on Victimization in the Cyberworld," *Journal of Criminal Justice* (38:3), pp. 227-236.
- Chan, T. K. H., Cheung, C. M. K., and Wong, R. Y. M. 2019. "Cyberbullying on Social Networking Sites: The Crime Opportunity and Affordance Perspectives," *Journal of Management Information Systems* (36:2), pp. 574-609.
- Chen, L., Ho, S. S., and Lwin, M. O. 2017. "A Meta-Analysis of Factors Predicting Cyberbullying Perpetration and Victimization: From the Social Cognitive and Media Effects Approach," *New Media & Society* (19:8), pp. 1194-1213.
- Clarke, R. V. 2012. "Opportunity Makes the Thief. Really? And So What?," *Crime Science* (1:1), p. 3.
- Cohen, L. E., and Felson, M. 1979. "Social Change and Crime Rate Trends: A Routine Activity Approach," *American sociological review*, pp. 588-608.
- Feinberg, T., and Robey, N. 2008. "Cyberbullying," *Principal Leadership* ( 9(1)), pp. 10-14.
- Felson, M., and Clarke, R. 1998. "Opportunity Makes the Thief: Practical Theory for Crime Prevention," *The Policing and Reducing Crime Unit* (ed.). London.
- Forde, D. R., and Kennedy, L. W. 1997. "Risky Lifestyles, Routine Activities, and the General Theory of Crime," *Justice Quarterly* (14:2), pp. 265-294.
- Gottfredson, M. R., and Hirschi, T. 1990. *A General Theory of Crime*. Stanford University Press.
- Grasmick, H. G., Tittle, C. R., Bursik, R. J., and Arnekley, B. J. 1993. "Testing the Core Empirical Implications of Gottfredson and Hirschi's General Theory of Crime," *Journal of Research in Crime and Delinquency* (30:1), pp. 5-29.
- Guo, S. 2016. "A Meta-Analysis of the Predictors of Cyberbullying Perpetration and Victimization.," *Psychology in the Schools* (53:4), pp. 432-453.
- Hemphill, S. A., and Heerde, J. A. 2014. "Adolescent Predictors of Young Adult Cyberbullying Perpetration and Victimization among Australian Youth," *Journal of Adolescent Health* (55:4), pp. 580-587.
- Hinduja, S., and Patchin, J. 2007. "Offline Consequences of Online Victimization: School Violence and Delinquency," *Journal of School Violence* (9).
- Hinduja, S., & Patchin, J. W. (2019). Cyberbullying Identification, Prevention, and Response. In: Cyberbullying Research Center (cyberbullying.org).
- Holtfreter, K., Reiss, M. D., and Pratt, T. C. 2008. "Low Self-Control, Routine Activities, and Fraud Victimization," *Criminology* (46:1), pp. 189-220.
- Huang, Q., Inkpen, D., Zhang, J., and Van Bruwaene, D. 2018. "Cyberbullying Intervention Based on Convolutional Neural Networks," *Proceedings of the First Workshop on Trolling, Aggression and Cyberbullying (TRAC-2018)*, pp. 42-51.
- Huang, Y.-y., and Chou, C. 2010. "An Analysis of Multiple Factors of Cyberbullying among Junior High School Students in Taiwan," *Computers in Human Behavior* (26:6), pp. 1581-1590.
- Hutchings, A., and Hayes, H. 2009. "Routine Activity Theory and Phishing Victimization: Who Gets Caught in the 'Net?'," *Current Issues in Criminal Justice* (20:3), pp. 433-452.
- Independent. 2019. "Quarter of British Adults Have Experienced Cyberbullying, Figures Show." Retrieved 02/07, 2020, from <https://www.independent.co.uk/life-style/cyberbullying-adults-online-abuse-facebook-instagram-a8891701.html>
- Jaeyong, C., and Krus, N. E. 2020. "Gender, Self-Control, and Opportunity: Applying the General Theory of Crime to Online Harassment," *International Journal of Cyber Criminology* (14:1), pp. 267-282.
- Jenaro, C., Flores, N., and Frías, C. P. 2018. "Systematic Review of Empirical Studies on Cyberbullying in Adults: What We Know and What We Should Investigate," *Aggression and Violent Behavior* (38), pp. 113-122.
- Kalia, D., and Aleem, S. 2017. "Cyber Victimization among Adolescents: Examining the Role of Routine Activity Theory," *Journal of Psychosocial Research* (12:1).

- Kaluvarachchi, C., Warren, M., and Jiang, F. 2020. "Responsible Use of Technology to Combat Cyberbullying among Young People," *Australasian Journal of Information Systems* (24).
- Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., and Lattanner, M. R. 2014. "Bullying in the Digital Age: A Critical Review and Meta-Analysis of Cyberbullying Research among Youth," *Psychological Bulletin* (140:4), pp. 1073-1137.
- Kowalski, R. M., Limber, S. P., and McCord, A. 2019. "A Developmental Approach to Cyberbullying: Prevalence and Protective Factors," *Aggression and Violent Behavior* (45), pp. 20-32.
- Kowalski, R. M., Toth, A., and Morgan, M. 2017. "Bullying and Cyberbullying in Adulthood and the Workplace," *The Journal of Social Psychology* (158:1), pp. 64-81.
- Kuhn, E. S. & Laird, R. D. 2013. "Parent and Peer Restrictions of Opportunities Attenuate the Link between Low Self-control and Antisocial Behavior," *Social Development* (22), pp. 813-830.
- Lee, E. B. 2017. "Cyberbullying: Prevalence and Predictors among African American Young Adults," *Journal of Black Studies* (48:1), pp. 57-73.
- Lee, J. M., Hong, J. S., Yoon, J., Peguero, A. A., and Seok, H. J. 2018. "Correlates of Adolescent Cyberbullying in South Korea in Multiple Contexts: A Review of the Literature and Implications for Research and School Practice," *Deviant Behavior* (39:3), pp. 293-308.
- Lee, Y., and Wu, W.-L. 2018. "Factors in Cyber Bullying: The Attitude-Social Influence-Efficacy Model," *Anales de Psicologia* (34), pp. 324-331.
- Leukfeldt, E. R., and Yar, M. 2016. "Applying Routine Activity Theory to Cybercrime: A Theoretical and Empirical Analysis," *Deviant Behavior* (37:3), pp. 263-280.
- Lianos, H., and McGrath, A. 2018. "Can the General Theory of Crime and General Strain Theory Explain Cyberbullying Perpetration?," *Crime & Delinquency* (64:5), pp. 674-700.
- Lowry, P. B., Zhang, J., Moody, G. D., Chatterjee, S., Wang, C., and Wu, T. 2019. "An Integrative Theory Addressing Cyberharassment in the Light of Technology-Based Opportunism," *Journal of Management Information Systems* (36:4), pp. 1142-1178.
- Lowry, P. B., Zhang, J., Wang, C., and Siponen, M. 2016. "Why Do Adults Engage in Cyberbullying on Social Media? An Integration of Online Disinhibition and Deindividuation Effects with the Social Structure and Social Learning Model," *Information Systems Research* (27:4), pp. 962-986.
- Marcum, C. D., Higgins, G. E., and Ricketts, M. L. 2010. "Potential Factors of Online Victimization of Youth: An Examination of Adolescent Online Behaviors Utilizing Routine Activity Theory," *Deviant Behavior* (31:5), pp. 381-410.
- Moon, B., and Alarid, L. F. 2015. "School Bullying, Low Self-Control, and Opportunity," *Journal of Interpersonal Violence* (30:5), pp. 839-856.
- Navarro, J., and Jasinski, J. 2012. "Going Cyber: Using Routine Activities Theory to Predict Cyberbullying Experiences," *Sociological Spectrum* (32:1), pp. 81-94.
- Ngo, F. T., and Paternoster, R. 2011. "Cybercrime Victimization: An Examination of Individual and Situational Level Factors," *International Journal of Cyber Criminology* (5:1).
- Ojanen, T. T., Boonmongkon, P., Samakkeekarom, R., Samoh, N., Cholratana, M., and Guadamuz, T. E. 2015. "Connections between Online Harassment and Offline Violence among Youth in Central Thailand," *Child Abuse & Neglect* (44), pp. 159-169.
- Orel, A., Campbell, M., Wozencroft, K., Leong, E., and Kimpton, M. 2015. "Exploring University Students' Coping Strategy Intentions for Cyberbullying," *Journal of Interpersonal Violence* (32:3), pp. 446-462.
- Palekar, S., Atapattu, M., Sedera, D., and Lokuge, S. 2015. "Exploring Spiral of Silence in Digital Social Networking Spaces," *The International Conference on Information Systems (ICIS 2015)*, Fort Worth, Texas: AIS.
- Perren, S., Dooley, J., Shaw, T., and Cross, D. 2010. "Bullying in School and Cyberspace: Associations with Depressive Symptoms in Swiss and Australian Adolescents," *Child and Adolescent Psychiatry and Mental Health* (4:1), p. 28.
- Reyns, B. W. 2015. "A Routine Activity Perspective on Online Victimization," *Journal of Financial Crime*.

- Reyns, B. W. 2017. "Routine Activity Theory and Cybercrime: A Theoretical Appraisal and Literature Review," in *Technocrime and Criminological Theory*. Routledge, pp. 35-54.
- Reyns, B. W., Henson, B., and Fisher, B. S. 2016. "Guardians of the Cyber Galaxy: An Empirical and Theoretical Analysis of the Guardianship Concept from Routine Activity Theory as It Applies to Online Forms of Victimization," *Journal of Contemporary Criminal Justice* (32:2), pp. 148-168.
- Richard, E., Young, S., Walsh, J., and Giumetti, G. 2020. "Cyberaggression in Work-Related Email: Nomological Network and Links to Victims' Counterproductive Work Behavior," *Occupational Health Science*.
- Sedera, D., Lokuge, S., Atapattu, M., and Gretzel, U. 2017. "Likes—the Key to My Happiness: The Moderating Effect of Social Influence on Travel Experience," *Information & Management* (54:6), pp. 825-836.
- Sedera, D., Lokuge, S., Salleh, N., Moghavvemi, S., and Palekar, S. 2016. "Spoilt for Choice: When User-System Relationship Becomes One-to-Many," *The International Conference on Information Systems (ICIS2016)*, Dublin, Ireland: AIS.
- Selkie, E. M., Kota, R., and Moreno, M. 2016. "Cyberbullying Behaviors among Female College Students: Witnessing, Perpetration, and Victimization," *Coll Stud J* (50:2), pp. 278-287.
- Slonje, R., Smith, P. K., and Frisé, A. 2013. "The Nature of Cyberbullying, and Strategies for Prevention," *Computers in Human Behavior* (29:1), pp. 26-32.
- Smith, P., Barrio, C., and Tokunaga, R. 2012. "Smith, P.K.; Del Barrio, C. Y Tokunaga, R. (2012) Definitions of Bullying and Cyberbullying: How Useful Are the Terms? In S. Bauman, J. Walker Y D. Cross (Eds) Principles of Cyberbullying Research. Definitions, Measures and Methodology (Pp.26-40). Nyork/Londres: Routledge." pp. 26-40.
- Starosta, L. 2016. "The General Theory of Crime Applied to Bullying Perpetration : Does School Climate Moderate the Relationship between Self-Control and Bullying?." University of British Columbia.
- Thomas, H., Connor, J., and Scott, J. 2015. "Integrating Traditional Bullying and Cyberbullying: Challenges of Definition and Measurement in Adolescents - a Review," *Educational Psychology Review* (27:1), pp. 135-152.
- Välimäki, M., Almeida, A., Cross, D., Fandrem, H., O'Moore, M., Berne, S., Deboutte, G., Heiman, T., Olenik-Shemesh, D., Fulop, M., Stald, G., Kurk, M., and Sygkollitou, E. 2013. "Guidelines for Preventing Cyber-Bullying in the School Environment: A Review and Recommendations In: Cost Iso801.," in *Cyberbullying through the New Media: Findings from an International Network*.
- Varjas, K., Talley, J., Meyers, J., Parris, L., and Cutts, H. 2010. "High School Students' Perceptions of Motivations for Cyberbullying: An Exploratory Study," *The western journal of emergency medicine* (11), pp. 269-273.
- Vazsonyi, A., Machackova, H., Sevcikova, A., Smahel, D., and Cerna, A. 2012. "Cyberbullying in Context: Direct and Indirect Effects by Low Self-Control across 25 European Countries," *European Journal of Developmental Psychology* (9:2), pp. 210-227.
- Walters, M., Brown, R., and Wiedlitzka, S. 2016. "Causes and Motivations of Hate Crime," *Equality and Human Rights Commission research report* (102).
- Wolfe, S. E., Marcum, C. D., Higgins, G. E., Ricketts, M. L. J. C., and Delinquency. 2016. "Routine Cell Phone Activity and Exposure to Sext Messages: Extending the Generality of Routine Activity Theory and Exploring the Etiology of a Risky Teenage Behavior," (62:5), pp. 614-644.
- Wong, R. Y. M., Cheung, C. M. K., and Xiao, B. 2018. "Does Gender Matter in Cyberbullying Perpetration? An Empirical Investigation," *Computers in Human Behavior* (79), pp. 247-257.

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