

**Comparing Cyberbullying Perpetration on Social Media Between Primary and
Secondary School Students**

Shirley S. Ho

Liang Chen

Angelica P.Y. Ng

Wee Kim Wee School of Communication and Information,
Nanyang Technological University, 31 Nanyang Link, Singapore 637718,
Singapore

Author Note

Correspondence concerning this article should be addressed to Shirley S. Ho, Wee Kim Wee School of Communications and Information, Nanyang Technological University, Singapore 637718. Email: tsyho@ntu.edu.sg.

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Abstract

This study aims to explore factors associated with cyberbullying perpetration on social media among children and adolescents in Singapore, based on the theory of reasoned action and the parental mediation theory. More specifically, the relationships between attitude, subjective norms, descriptive norms, injunctive norms, and active and restrictive parental mediation with cyberbullying perpetration on social media were investigated. Moreover, we examined the moderating effect of age on the relationship between parental mediation and cyberbullying perpetration. Multi-stage cluster sampling was used, in which 635 upper primary school children (i.e., Primary 4 to 6 students) and 789 secondary school adolescents participated in our survey. The results revealed that attitude, subjective norms, and the two parental mediations — active and restrictive mediation — were negatively associated with cyberbullying perpetration on social media. Age was a significant moderator of both parental mediation strategies and cyberbullying perpetration. Implications and limitations of this study were discussed.

Keywords: Computer-mediated communication; secondary education; elementary education; cyberbullying; social media

Comparing Cyberbullying Perpetration on Social Media Between Primary and Secondary School Students

In the past decades, exponential growth in the development of information and communication technologies (ICT) has been paralleled by an increase in social media use. People have harnessed social media in many different ways, such as to access a large amount of information and to improve social interactions. Although its benefits are practically limitless, social media is not without its risks. Social media has exposed children and adolescents to a large number of cyber risks, such as cyberbullying e a new form of bullying that transcends physical boundaries of space (Livingstone & Helsper, 2008).

Cyberbullying, defined as “an aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself,” occurs over electronic media such as social media (Smith et al., 2008, p. 1). Through such social media, cyberbullies are able to target their potential victims anonymously using pseudo usernames and profile pictures, leaving the victims helpless and unable to defend themselves (Slonje & Smith, 2008).

Recently, there has been a high prevalence of cyberbullying worldwide (Görzig & Frumkin, 2013). For instance, the National Crime Prevention Council and Harris Interactive found that over 40% of American adolescents were victims of cyberbullying (Bhat, 2008). Walrave and Heirman (2011) explored cyberbullying among 1318 Belgium students and found that at least one-third of the participants indicated past cyberbullying victimization experience, and approximately one-fifth of the participants reported engaging in past cyberbullying behavior. In Asia, Huang and Chou (2010) found that 34.9% and 20.4% of high school students reported having previously experienced cyberbullying victimization and to having cyberbullied others, respectively. However, it is worth noting that the definition and measurement of cyberbullying may have complicated comparisons among the different

prevalence studies (Grigg, 2010; Langos, 2012; Menesini et al., 2012). Such complications may also arise from cultural differences in the understanding of cyberbullying, as well as from the rapid developments in technology (Li, 2008; Menesini & Nocentini, 2009).

Cyberbullying can lead to various negative emotions. Patchin and Hinduja (2006) reported that those who suffered from cyberbullying usually experienced anger, frustration, and sadness. Kowalski, Limber, and Agatson (2008) indicated that cyberbullying victims generally experience isolation, loneliness, anxiety, depression, and lowered self-esteem. Beran and Li (2005) found that those who have been cyberbullied are more likely to engage in antisocial behaviors such as absenteeism. In fact, it has been found that cyberbullying may lead to more severe negative outcomes when compared to traditional bullying. For instance, Hay, Meldrum and Mann (2010) found that cyberbullying had “modestly higher effects” in terms of delinquency, self-harm and suicidal ideation (p. 8). Thus, it is important to examine the factors influencing cyberbullying perpetration.

Although there exists extensive research in the field of cyberbullying, most studies are lacking in theoretical foundations. Tokunaga (2010) as well as Heirman and Walrave (2012) indicated that it is important to examine cyberbullying based on a theoretical framework. Although two studies have employed the theory of planned behavior to explore cyberbullying perpetration (Doane, Pearson & Kelley, 2014; Heirman & Walrave, 2012), these studies mainly focused on American college students and European adolescents, without considering younger children and those from Asian countries. In addition, some studies have explored the role of parental mediation on cyberbullying victimization (e.g., Mesch, 2009). However, studies examining the association between parental mediation and cyberbullying perpetration, especially across different age groups, are limited.

Therefore, this present study explores cyberbullying perpetration from a theoretical angle, with a focus on the extended theory of reasoned action (TRA) (Ajzen & Fishbein,

1980) and the parental mediation theory (PMT). This study focuses on cyberbullying on social media because there are limited studies in this area even though cyberbullying has been found to be the most rampant on social media (Chen, Ho, & Lwin, 2016; Whittaker & Kowalski, 2015). Specifically, this study examines the effects of attitude, subjective norms, descriptive norms, injunctive norms, and active mediation and restrictive mediation on cyberbullying perpetration on social media among primary and secondary school students in Singapore. Furthermore, we also examine age as a potential moderator of parental mediation and cyberbullying perpetration on social media.

1. Theory of reasoned action

The theory of reasoned action (TRA) can be used to forecast people's behavioral intention and hence predict their likelihood of engaging in that behavior (Ajzen & Fishbein, 1980). TRA includes two types of beliefs: behavioral and normative beliefs. First, behavioral beliefs are dependent on individuals' attitude towards the behavior. In other words, individuals possessing a more positive attitude towards a certain behavior are more likely to perform the behavior. Indeed, attitude towards cyberbullying was found to be positively associated with cyberbullying perpetration (Perren & Gutzwiller-Helfenfinger, 2012).

Second, normative beliefs focus on how subjective norms influence behavioral intention (Madden, Ellen & Ajzen, 1992). The formation of a subjective norm is dependent on expected social expectation from important others upon engaging in the behavior. This includes expectations of individuals' friends and family, which is positively associated with behaviors (Cialdini & Trost, 1998). Several studies have established the significance on the subjective norms induced by important others onto one's behavior. For instance, Heinemann, Pellander, Vogelbusch and Wojtek (1981) found a strong positive correlation between subjective norms and subsequent treatment of physically handicapped individuals and homosexuals. Furthermore, since subjective norms are formed via the perceptions of one's

important others, these norms may be observed via individuals' behavior toward in-groups and out-groups. For example, group bias is commonly observed among children especially those with higher levels of group identification (Abrams, Rutland, Ferrell, & Pelletier, 2008).

When individuals have strong beliefs that the behavior will elicit social understanding, they will be more likely to perform the behavior (Espada, Griffin, Gonzalez & Orgiles, 2015). Ojala and Nesdale (2004) found that the frequency of bullying behaviors increases when aggressiveness and bullying attains “legitimacy or validity” by being considered as a norm in the in-group. Furthermore, Doane et al. (2014) explored cyberbullying perpetration among American college students and found strong positive correlations between attitude, subjective norms, and cyberbullying perpetration. Based on the abovementioned considerations, we advance the following hypotheses:

H1. Individuals with less favorable attitude are less likely to engage in cyberbullying perpetration on social media.

H2. Individuals who perceive that significant referent groups would disapprove of them to cyberbully others (subjective norms) are less likely to engage in cyberbullying perpetration on social media.

1.1. Descriptive norms

In general, social norms are “rules and standards that are understood by members of a group, and that guide and/or constrain social behavior without the force of laws” (Cialdini & Trost, 1998, p. 152). Besides subjective norms, the social norms theory postulates the existence of two other norms — descriptive and injunctive norms — that are also associated with behavior. These three norms could lead individuals into constructing an inaccurate standard of behavior upon misinterpreting the attitude and/or behaviors of family members and peers (Berkowitz, 2002; Pedersen, Grønhoj, & Thøgersen, 2015).

Descriptive norms are formed by observing the actions of others. Credibility of

particular behaviors is boosted when many people engage in them, thus making the behaviors more acceptable and correct. The “perceived social support” then helps individuals formulate social heuristics, which is a general guideline that leads to correct behavior most of the time (Cialdini & Trost, 1998, p. 155). In the case of traditional bullying in a classroom environment, descriptive norms can come from estimates of the frequency of a behavior within a group, where when more students are engaging in bullying behavior, the behavior will be more likely to be deemed as the common and correct behavior, hence increasing the students’ behavioral intentions (Mercer, McMillen, & DeRosier, 2009; Sentse, Veenstra, Kiuru, & Salmivalli, 2015). While there is much evidence that descriptive norms are positively associated with traditional bullying, studies examining the relationship between descriptive norms and cyberbullying are scarce. Moreover, traditional bullying and cyberbullying take place in different environments. Therefore, we cannot simply assume the same relationship between descriptive norms and cyberbullying. Hence, we propose the following research question:

RQ1: How does perceived prevalence of significant referent groups in cyberbullying (descriptive norms) relate to individuals' likelihood to engage in cyberbullying perpetration on social media?

1.2. Injunctive norms

Injunctive norms indicate the extent of general consensus for socially acceptable behaviors. Injunctive norms differ from subjective norms in the notion that it considers the perception held by society in general, while subjective norms focus on perceptions held by one's important others.

In forming a perceived injunctive norm, individuals will consider expected levels of approval and/or punishment from the general public. Approval can come in the form of popularity, while punishment can come in the form of social isolation (Cialdini & Trost,

1998). Previous research has found that injunctive norms affected both “normative beliefs of aggression” and “had direct effects on aggressive behavior over time” (Salmivalli & Voeten, 2004, pp. 247–248). This implies a relationship between injunctive norms and traditional bullying. However, extant cyberbullying research understudied the association of injunctive norms with cyberbullying perpetration. Thus, we develop the following research question:

RQ2: How does the perception that societal approval of cyberbullying (injunctive norms) relate to individuals' likelihood to engage in cyberbullying perpetration on social media?

1.3. Parental mediation

According to the parental mediation theory (PMT), various “interpersonal communication strategies” are employed by parents to reduce the harmful consequences of their children's media usage (Clark, 2011, p. 325). The PMT usually encompasses two types of mediation e active mediation and restrictive mediation.

Active mediation addresses the fact that children are active users of cyberspace and actively engage in activities such as seeking others with the aim of communication (Clark, 2011). For instance, parents may discuss issues and provide information about the Internet to their children and guide them how to use the Internet safely (Livingstone & Helsper, 2008), and track their child's Internet usage regularly (Lwin, Stanaland, & Miyazaki, 2008). Such parental communication has been found to be effective in equipping children with the skills and knowledge on responding to dangerous situations while on the Internet (Liu, Ang & Lwin, 2013). On the other hand, restrictive mediation serves as a subtler way of influencing the child's Internet usage, such as by setting rules, limiting time spent online, and putting restrictions on the types of accessible websites (Nathanson, 2001a). Studies have found a strong negative correlation between restrictive mediation and duration of the child's Internet usage or the amount of dangers that the child experiences online (Lee, 2012).

In general, numerous studies have found that parental mediation as a whole is

considered to be one of the most effective methods in addressing the risks that children face on the Internet (Benrazavi, Teimouri, & Griffiths, 2015; Livingstone & Helsper, 2008). For instance, restrictive parental mediation strategies such as limiting the time children spent online and restricting the sites children were allowed to access are associated with lowered risk of cyberbullying victimization (Livingstone, Haddon, Gořzig, & Olafsson, 2011; Mesch, 2009; Navarro, Serna, Martínez, & Ruiz-Oliva, 2013; Rosen, Cheever, & Carrier, 2008). In addition, the presence of positive “parent-adolescent communication quality,” a key factor in successful active mediation strategies, has been found to have a buffering effect against risks such as cyberbullying that arise from high Internet usage (Appel, Holtz, Stiglbauer, & Batinic, 2012, p. 17). However, there are still relatively scant studies in the case of parental mediation and cyberbullying perpetration. Hence, we aim to bridge this existing research gap by examining the association between active and restrictive mediation and children's cyberbullying perpetration. As such, we advanced the following hypotheses:

H3. Individuals under active parental mediation are less likely to engage in cyberbullying perpetration on social media.

H4. Individuals under restrictive parental mediation are less likely to engage in cyberbullying perpetration on social media.

1.4. Age as a moderator

Maccoby (2007) indicated that the significance of the parents' influence in socializing their children generally decreases as the child's age increases. In general, parents exert more influence onto the growth of children when the children are at a younger age. However, in the case of adolescents, the proportion of time spent with other agents such as peers and teachers increases, while the time spent with family members decreases (Bukowski, Brendgen & Vitaro, 2007). This indicates that as compared to younger children, the norms, values and beliefs possessed by adolescents are likely to be more influenced by these “external”

characters.

Additionally, it has been found that children of different ages generally have differing reactions to parental mediation strategies. For instance, younger children tend to be more responsive and accepting of parental mediation as compared to adolescents. Besides, results from some studies revealed that parental mediation may be ineffective in protecting adolescents from media-related risks (Chen et al., 2016; Lwin et al., 2008). Hence, we expect that different parental mediation strategies may have different effects on cyberbullying perpetration among children and adolescents. In light of the abovementioned age differences, we posit the following research questions:

RQ3: How do active parental mediation strategies differ in preventing cyberbullying perpetration on social media between children and adolescents?

RQ4: How do restrictive parental mediation strategies differ in preventing cyberbullying perpetration on social media between children and adolescents?

2. Method

2.1. Sample and procedure

We conducted a self-administered paper-and-pencil survey in four primary schools and four secondary schools in Singapore. Upper primary school students and secondary school students were recruited to participate in this study. We applied and received ethical approval from the University Institutional Review Board (IRB) and the Ministry of Education in Singapore. Prior to conducting the survey with the students, we had obtained written permission from the children and their parents. Specifically, we had asked the teachers in each school to distribute the parental consent forms to the parents one week before the scheduled survey date. Parents were required to return the parental consent form to the school before the scheduled survey date. On the scheduled survey date, students were required to complete the children's minor consent form before filling out the questionnaire. Multi-stage

cluster sampling was used to ensure that schools from the four Singapore regions (North, South, East, and West) were equally represented in this survey. The survey was conducted from June to December in 2015. Out of the initial fifteen primary schools and twelve secondary schools invited to participate in the survey, four primary schools and four secondary schools eventually participated. The response rates were 26.7% for primary schools and 33.3% for secondary schools.

A total of 1424 students participated in the survey. Specifically, 635 were upper primary school children (primary four to six; nine to twelve years old) and 789 were secondary school adolescents (secondary one to secondary five; 13–17 years old). The total average response rates were 69.6% for student participation (60.7% for primary schools, 78.4% for secondary schools). The margin of error was approximately +/- 3% at the 95% confidence level.

3. Measures

3.1. Demographic variables

Demographic variables of students specified in this study included education level ($Mdn = 4$, indicating secondary one, $SD = 1.88$), age (1 = child, 2 = adolescent, 44.6% children), and gender (1 = male, 2 = female, 52.4% male).

3.2. Attitude

Attitude was measured on four dimensions adopted from Heirman and Walrave (2012). Participants rated their attitude toward cyberbullying perpetration via the following dimensions: (a) disadvantageous/advantageous, (b) unpleasant/pleasant, (c) bad/good, and (d) harmful/beneficial, on a seven-point Likert scale. The items were averaged to form a composite index. It was then reverse coded, in which a higher score indicates less favorable attitude toward cyberbullying perpetration ($M = 5.17$; $SD = 1.20$, Cronbach's alpha = 0.82).

3.3. Subjective norms

Subjective norms were measured using six items adopted from Ajzen (1988), where students rated on a scale of 1 (strongly disagree) to 7 (strongly agree) for the following statements: (a) “Most of my friends would not expect me to make rude or mean comments to someone on social media;” (b) “Most of my friends would not expect me to spread rumours about someone on social media, whether they are true or not;” (c) “Most of my friends would not expect me to make aggressive or threatening comments to someone on social media;” (d) “My family members would not expect me to make rude or mean comments to someone on social media;” (e) “My family members would not expect me to spread rumours about someone on social media, whether they are true or not;” and (f) “My family members would not expect me to make aggressive or threatening comments to someone on social media.” The items were averaged to create a composite index, in which a higher score indicates a lower level of perceived approval for cyberbullying from individuals' referent groups ($M = 5.43$; $SD = 1.69$, Cronbach's alpha = 0.93).

3.4. Descriptive norms

Descriptive norms were measured by using six items adopted from Ajzen and Fishbein (2005), where students had to rate on a scale of 1 (strongly disagree) to 7 (strongly agree) for the following statements: (a) “Most of my friends do not make rude or mean comments to someone on social media;” (b) “Most of my friends do not spread rumours about someone on social media, whether they are true or not;” (c) “Most of my friends do not make aggressive or threatening comments to someone on social media;” (d) “My family members do not make rude or mean comments to someone on social media;” (e) “My family members do not spread rumours about someone on social media, whether they are true or not;” and (f) “My family members do not make aggressive or threatening comments to someone on social media.” The items were averaged to create a composite index, in which a higher

score indicates a lower level of perceived prevalence of cyberbullying among referent groups ($M = 5.44$; $SD = 1.59$, Cronbach's alpha = 0.93).

3.5. Injunctive norms

Injunctive norms were measured using six items adopted from Ajzen and Fishbein (2005), where students rated on a scale of 1 (strongly disagree) to 7 (strongly agree) for the following statements: (a) "Most of my friends would not approve of me making rude or mean comments to someone on social media;" (b) "Most of my friends would not approve of me spreading rumours about someone on social media, whether they are true or not;" (c) "Most of my friends would not approve of me making aggressive or threatening comments to someone on social media;" (d) "My family members would not approve of me making rude or mean comments to someone on social media;" (e) "My family members would not approve of me spreading rumours about someone on social media, whether they are true or not;" and (f) "My family members would not approve of me making aggressive or threatening comments to someone on social media." The items were averaged to create a composite index, in which a higher score indicates a lower level of perceived societal approval for cyberbullying ($M = 5.61$; $SD = 1.71$, Cronbach's alpha = 0.93).

3.6. Active mediation

Active mediation was measured using four items adopted from Lwin et al. (2008), where parents rated on a scale of 1 (not at all) to 7 (very frequently) for the following statements: (a) "Tell your child about the information they can disclose on social media;" (b) "Remind your child not to give out any personal information on social media;" (c) "Tell your child to stop any experience on social media if they feel uncomfortable or scared;" and (d) "Explain to your child about the dangers of social media." The items were averaged to create a composite index, in which a higher score indicates a higher level of active mediation ($M = 4.40$; $SD = 1.73$, Cronbach's alpha = 0.85).

3.7. Restrictive mediation

Restrictive mediation was measured using five items adopted from Lwin et al. (2008), where parents rated on a scale of 1 (not at all) to 7 (very frequently) for the following statements: (a) “Restrict the amount of time your child can use social media;” (b) “Set rules regarding your child's access to social media, such as Facebook, Twitter, YouTube, Instagram, WhatsApp, etc.;" (c) “Limit the kinds of activities your child can do on social media;” (d) “Restrict the type of social media platforms your child can visit;” and (e) “Limit your child to using social media only for school work.” The items were averaged to create a composite index, in which a higher score indicates a higher level of active mediation ($M = 3.63$; $SD = 1.76$, Cronbach's alpha = 0.87).

3.8. Cyberbullying perpetration

Cyberbullying perpetration was measured using a 3-item scale adapted from Ybarra, Diener-West, and Leaf (2007). Students were asked to rate their frequency of cyberbullying perpetration behavior in the last 12 months from 1 (not at all) to 7 (very frequently) for the following statements: (a) “Made rude or mean comments to someone on social media;” (b) “Spread rumours about someone on social media, whether they are true or not;” and (c) “Made aggressive or threatening comments to someone on social media.” The items were averaged to create a composite index, in which a higher score indicates a higher frequency of cyberbullying perpetration ($M = 1.85$; $SD = 1.24$, Cronbach's alpha = 0.73).

4. Results

An ordinary least squares (OLS) hierarchical regression analysis was conducted to test our hypotheses and research questions. The independent variables were entered into the regression model according to their assumed causal order. The first block included control variables, such as demographic variables (gender and education level). TRA-related variables (attitude, subjective norms, descriptive norms, and injunctive norms) were entered in the

second block. Next, parental mediation variables (active and restrictive mediation) were included in the third block. The last block included the two interaction terms. The main effect variables were centered and standardized before the creation of interaction terms to prevent multicollinearity problems between the interaction term and its components. In addition, the assumptions of regression were tested. First, all study variables were normally distributed. Second, according to the scatter plots, the relationship between the independent and dependent variables was linear. Moreover, the data was homoscedastic. Lastly, there was no multicollinearity in the data, since Variance Inflation Factors (VIF) for all dependent variables were smaller than 2.5.

The overall regression model explained a total of 27.30% of the variance in cyberbullying perpetration. First, the demographic variables in the first block explained 4.70% of the variance in cyberbullying perpetration. Specifically, education level ($\beta = 0.25, p < 0.001$) was negatively related to cyberbullying perpetration, while age ($\beta = 0.30, p < 0.001$) was positively associated with cyberbullying perpetration (see Table 1).

With regard to TRA, the results demonstrated that attitude ($\beta = -0.34, p < 0.001$) was negatively associated with cyberbullying perpetration, which supported H1. Similarly, subjective norms ($\beta = -0.18, p < 0.001$) had a negative association with cyberbullying perpetration, hence supporting H2. To answer RQ1 and RQ2, the results revealed that descriptive norms and injunctive norms were not significantly associated with cyberbullying perpetration. The TRA block explained 17.50% of the variance in cyberbullying perpetration ($p < 0.001$).

Next, in terms of parental mediation, the results showed that both active ($\beta = -0.18, p < 0.001$) and restrictive mediation ($\beta = -0.06, p < 0.05$) were negatively associated with cyberbullying perpetration, which supported H3 and H4. These two parental mediation variables explained 4.00% of the variance in the dependent variable ($p < 0.001$).

Finally, to answer RQ3 and RQ4, we examined whether age would moderate the negative relationships between parental mediation (active and restrictive mediations) and cyberbullying perpetration. Table 1 revealed that the relationship between active mediation and cyberbullying perpetration was significantly moderated by age ($\beta = 0.10, p < 0.01$). Specifically, the results showed that the negative relationship was greater for children than for adolescents (see Fig. 1). Notably, age was a significant moderator of restrictive mediation and cyberbullying perpetration ($\beta = 0.14, p < 0.001$). Fig. 2 revealed that children who were exposed to high restrictive mediation were less likely to perform cyberbullying perpetration, while adolescents who were exposed to high restrictive mediation were more likely to engage in cyberbullying perpetration. The interaction block explained 1.10% of the variance in cyberbullying perpetration ($p < 0.001$).

5. Discussion

The aim of this study was to explore the factors associated with cyberbullying perpetration based on TRA and PMT. Moreover, the moderating effects of age on the relationship between parental mediation and cyberbullying perpetration were also examined. First, this study showed that individuals with less favorable attitude had a lower likelihood to engage in cyberbullying behavior. This is consistent with extant research, where a positive correlation was found between positive attitude and cyberbullying perpetration (Perren & Gutzwiller-Helfenfinger, 2012). In fact, Heirman and Walrave (2012) found attitude to be the most crucial predictor of perpetration.

In terms of social norms, our findings revealed that subjective norms had a significant negative association with cyberbullying perpetration. Some previous studies have also showed similar findings, where individuals who perceive an expectation from significant others to not behave offensively are less likely to engage in aggressive behaviors (Doane et al., 2014; Espada et al., 2015; Heinemann et al., 1981; Ojala & Nesdale, 2004). One reason

for this finding may be due to the strong pressure exerted from one's peers, who are considered to be one's "most influential reference group" (Pabian & Vandebosch, 2013, p. 474). In the presence of peers who cyberbully, the social pressure which manifests itself as subjective norms imposes a significant influence onto the intention to engage in cyberbullying in order to elicit higher levels of social approval and respect from peers (Varjas, Talley, Meyers, Parris, & Cutts, 2010).

In contrast, descriptive norms and injunctive norms were not significantly associated with cyberbullying perpetration. In other words, individuals who perceive that their significant others cyberbully others or an approval from significant others to cyberbully may not be more likely to engage in cyberbullying perpetration. First, it is possible that children and adolescents may not be aware of others' cyberbullying behaviors. According to the third-person effect theory (Davison, 1983), they may hence perceive that others are more likely to be involved in cyberbullying on social media than themselves. This may result in an overestimation of the number of actual people engaging in cyberbullying perpetration, along with an underestimation of their personal likelihood to cyberbully others. Such personal biases might explain the non-significant association between the social norms and cyberbullying perpetration.

Besides, in terms of injunctive norms, one possible explanation for the null finding as proposed by Cialdini (2003) is that since salience is a crucial pre-existing factor for normative influence on behavior, young children may not be aware of injunctive norms, which are formed based on social approval of others (Rinker & Neighbors, 2013). As compared to descriptive and subjective norms, injunctive norms are considerably less salient and more ambiguous, and may exert a lesser influence on one's eventual behavior (Grønhøj & Thøgersen, 2012). Hence, injunctive norms generally require more cognitive analyses for individuals to make indirect inferences on the behavior, as well as to understand and decipher

the ambiguous levels of social acceptability of the behavior (Cialdini, 2003). Furthermore, the low salience of injunctive norms in cyberbullying may be further increased due to the anonymity of online behaviors, hence lowering the influence of any possible approval and/or punishment from the general public.

Next, results showed that active mediation strategies (e.g., directly teaching children about the dangers of the Internet) and restrictive mediation strategies (e.g., limiting child's time spent online) were negatively associated with cyberbullying perpetration. In other words, parents who engage in strategies of active mediation and restrictive mediation could be effective in preventing children's cyberbullying perpetration. With an increase in knowledge about the risks of social media upon active mediation strategies, children may be more cautious about their behaviors on social media, and be more aware of any negative consequences that may arise from deviant behavior on social media. In addition, the restriction in terms of time and access to certain social media platforms successfully leads to lower opportunities to cyberbully others. Such findings are consistent with extant studies, where parental mediation was found to be effective in reducing children's engagement in online risks (Livingstone & Helsper, 2008; Lwin et al., 2008).

Finally, age was found to be a significant moderator of parental mediation e both active and restrictive mediation e and cyberbullying perpetration. Consistent with extant findings, the effectiveness of active mediation was greater in reducing cyberbullying perpetration for children than adolescents. Indeed, non-significant effects of active mediation on older children have been found in several other studies as well (Austin, Pinkleton & Fuijioka, 2000; Nathanson, 2002). One plausible explanation for such findings is that adolescents are more mature than younger children (Eisenberg, Spinrad & Morris, 2014). Hence, even without enough guidance from their parents (i.e., low active mediation), adolescents may still possess an understanding of the negative consequences and

psychological harm induced by cyberbullying and thus, display lower levels of cyberbullying. On the other hand, younger children may not have attained such levels of emotional maturity, and therefore, their cyberbullying behaviors are largely affected by active guidance from their parents.

Additionally, age is a significant moderator of restrictive mediation on cyberbullying as well. Our findings revealed that younger children were likely to respond more positively toward restrictive mediation strategies (e.g., site restrictions and time limitations). However, in line with existing research, overly restrictive control was found to increase cyberbullying perpetration in adolescents. In fact, adolescents exhibited less cyberbullying behaviors when they are exposed to less restrictive strategies. For example, Nathanson (2002) found that adolescents under high restrictive mediation displayed more negative attitudes toward their parents, as well as more rebellious acts such as viewing forbidden online content with peers. Nathanson (2002) also indicated that adolescents under restrictive mediation might perceive lower levels of trust from their parents and hence invest less time and effort into developing positive relationships with their parents. Such attitudes may eventually lead to adolescents behaving in the opposite ways that their parents wished them to, hence increasing the likelihood of cyberbullying perpetration (Nathanson, 2002). Such opposite behaviors may also be explained by the boomerang effect where older children may be less susceptible to intimidation by representations of authority, and that restrictive strategies may lead to older children becoming more tempted to access the forbidden material and engage in anti-social behaviors (Lwin et al., 2008). Another possible reason pertains to adolescents becoming more independent. They generally spend more time away from home and are more influenced by their peers (Nathanson, 2001b). Hence, parental restrictions, which are usually limited to the home setting, may not be effective in addressing cyberbullying perpetration among older children.

6. Limitations and contributions

There are several limitations in this study that should be addressed in future studies. First, cross-sectional data was used in this study. While it is useful for correlation purposes, causal relations cannot be concluded from such data. Second, instead of investigating cyberbullying risk factors on individual media platforms (e.g., specific social networking sites and mobile apps), factors associated with cyberbullying perpetration were examined as a whole instead. It is possible that different associations may be present for different social media platforms. Third, this study did not investigate the influence of social media consumption as well as the impact of psychological factors on cyberbullying, which might be also crucial factors of cyberbullying (Chen et al., 2016). Fifth, while this study explored the influences of active and restrictive mediation on cyberbullying perpetration on social media, parents might use many different strategies to manage children's social media use. Future research could explore parental mediation strategies of social media use and their effectiveness on cyberbullying.

Moreover, this study did not examine how other potential factors such as the perceived estimated risks of being caught by relevant authorities might affect an unethical behavior like cyberbullying perpetration. In the case of music piracy, for example, studies have found that individuals who underestimated the risk of being caught while illegally downloading music, still held a positive attitude towards music piracy (e.g., Nandedkar & Midha, 2012). On the other hand, participants who perceived a high risk of prosecution were more likely to classify the act of illegally downloading software as unethical, and were subsequently less likely to perform the behavior (Tan, 2002). Extending this notion to cyberbullying, future studies could investigate the association between perceived estimated risk of being caught and cyberbullying perpetration, as well as the strength of the perceived estimated risk of being caught as a potential moderator on the relationship between attitude

towards cyberbullying and cyberbullying perpetration.

On a similar note, studies have found that the strength of agreement regarding the social acceptability of illegally downloading software and the fear of social repercussions upon being caught significantly influenced participants' decisions to pirate software (e.g., Tan, 2002). Such information may be derived from the existing descriptive and injunctive norms within the individual's social circle. As such, although our study did not demonstrate that descriptive and injunctive norms were significantly related to cyberbullying perpetration, it might be worthwhile for future studies to investigate the influence of descriptive and injunctive norms in the formation of perceived estimated risks of being caught for engaging in cyberbullying perpetration.

Besides this, the current study measured cyberbullying perpetration via specific types of cyberbullying behavior (i.e., making rude and mean comments, spreading rumours, and threatening others online). While such constructs have been widely used, other widely established aspects of cyberbullying should be included into future studies to improve on the representativeness and coverage of cyberbullying. For instance, constructs measuring key aspects of cyberbullying such as power imbalance, repetition, anonymity and intentionality (Langos, 2012; Menesini et al., 2012; Vandebosch & Van Cleemput, 2008) should be included in future studies to provide for a more in-depth measure of cyberbullying. Additionally, future studies should also distinguish between cyberbullying from “fighting” with someone online. While the former includes the intent to hurt others, the latter involves retaliatory self-protective behaviors against cyberbullying from others instead. Lastly, slight differences in the classification of the types of behaviors that may be considered as cyberbullying exist among individuals from different cultural backgrounds (Nocentini et al., 2010). Since this study focused on a Singaporean sample, the results obtained may not be entirely representative of that in other cultures. Hence, in order to fully understand the

relationships between the constructs measured and cyberbullying perpetration, future studies should replicate this study in other cultural contexts.

Our study has several theoretical and practical implications. As mentioned in the introduction, the majority of extant studies investigated cyberbullying from an empirical angle, while studies using a theoretical angle are largely limited. Hence, the findings from attitude and subjective norms on cyberbullying perpetration highlight TRA to be a promising theoretical framework to examine cyberbullying. Also, limited studies explored the association between parental mediation and cyberbullying, with the majority of existing studies focusing on cyberbullying victimization rather than perpetration. This study hence contributes to the relatively scant research in this field. Findings that parental mediation may have differing effectiveness based on the children's age brings about several practical implications that may benefit educators and parents when addressing their children's online risk. For example, active mediation strategies such as direct teachings and guidance would be more appropriate for younger children. Similarly, for restrictive strategies, educators and parents must direct more attention and care when applying such strategies to older children. Restrictive strategies, such as website and time restrictions, should be set in such a way that the older child does not perceive an infringement on their freedom and autonomy. Overly restrictive mediation strategies may backfire and lead to an increase in cyberbullying perpetration; thereby defeating the purpose of the mediation. Mediation and intervention strategies should instead be tailored to children of different age groups and specific perceptions.

For instance, mediation and intervention strategies targeted toward children should include elements of both active mediation (e.g., direct and explicit instructions) and restrictive mediation (e.g., fixed rules and regulations). On the other hand, due to the possibility of restrictive mediation unintentionally increasing cyberbullying perpetration,

mediation and intervention strategies for adolescents should include lesser focus on both active and restriction mediation in order to protect them from cyberbullying.

Complementing the above, parents and teachers should also undergo educational awareness activities to raise their awareness on the matter of cyberbullying (e.g., Tanrikulu, Kınay, & Arıcak, 2015). Such activities may be implemented in the form of instructional videos (Akbulut, 2014), or lectures on cyberbullying (Akbulut & Cuhadar, 2011). In addition to increasing awareness on cyberbullying risks and outcomes, such activities have been shown to enhance participants' efficacy in dealing with cyberbullying cases (Akbulut & Cuhadar, 2011). Due to their close proximity and relationship to the children and adolescents experiencing and committing cyberbullying, it is imperative that parents and teachers be knowledgeable and competent in the techniques that identify and address cyberbullying.

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Table(s) and Figure(s)

Table 1. OLS hierarchical regression analysis predicting cyberbullying perpetration

	<i>Zero-order correlations</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
<i>Block 1: Demographic variables</i>				
Gender (1 = male, 2 = female)	-0.03	-0.02	-0.02	-0.02
Education level	-0.44***	-0.38***	-0.22***	-0.25***
Age (1 = child, 2 = adolescent)	0.21***	0.38***	0.32***	0.30***
Incremental R^2 (%)		4.70***		
<i>Block 2: Theory of Reasoned Action</i>				
Attitudes	-0.39***		-0.35***	-0.34***
Subjective norms	-0.27***		-0.19***	-0.18***
Injunctive norms	-0.20***		0.04	0.07
Descriptive norms	-0.20***		-0.03	-0.02
Incremental R^2 (%)			17.50***	
<i>Block 3: Parental Mediation Theory</i>				
Active mediation	-0.28***			-0.18***
Restrictive mediation	-0.18***			-0.05*
Incremental R^2 (%)				4.00
<i>Block 4: Age moderating effects</i>				
Age x Active mediation	—			0.10**
Age x Restrictive mediation	—			0.14***
Incremental R^2 (%)				1.10***
Total Incremental R^2 (%)				27.3***

Note. $N=1,424$. Cell entries for all models are final standardized regression coefficients for Blocks 1, 2, and 3, and before-entry standardized regression coefficient for Block 4. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

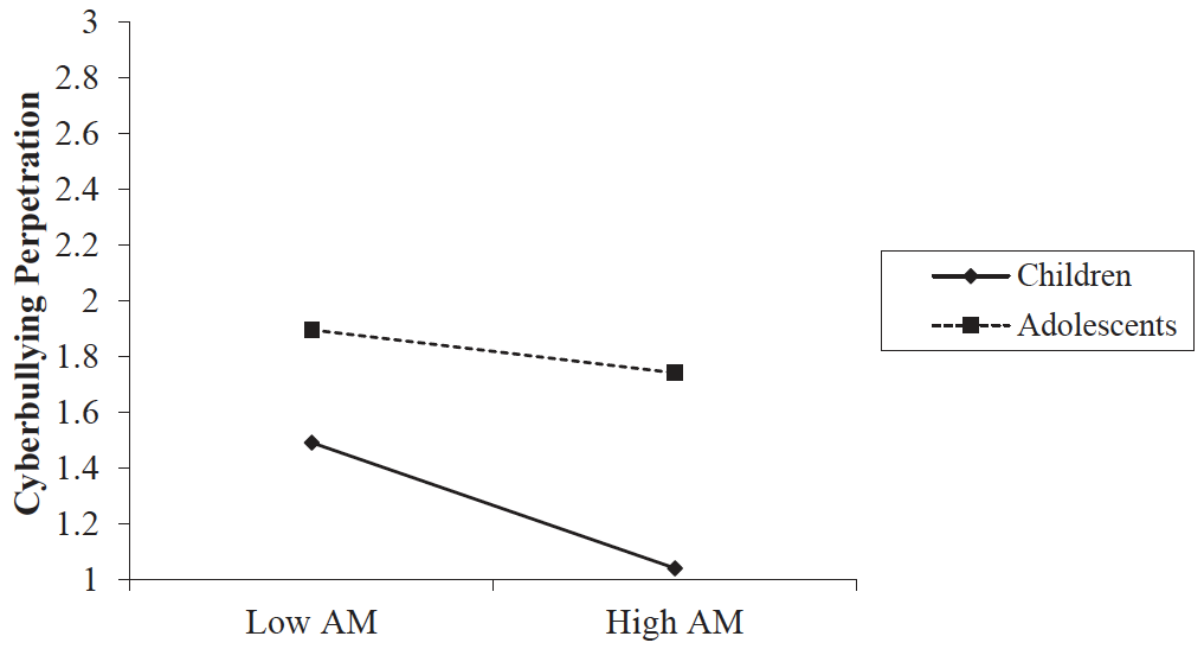


Fig. 1. Active mediation (AM), age, and cyberbullying perpetration. Note: Scales ranges in the y-axis are partially displayed.

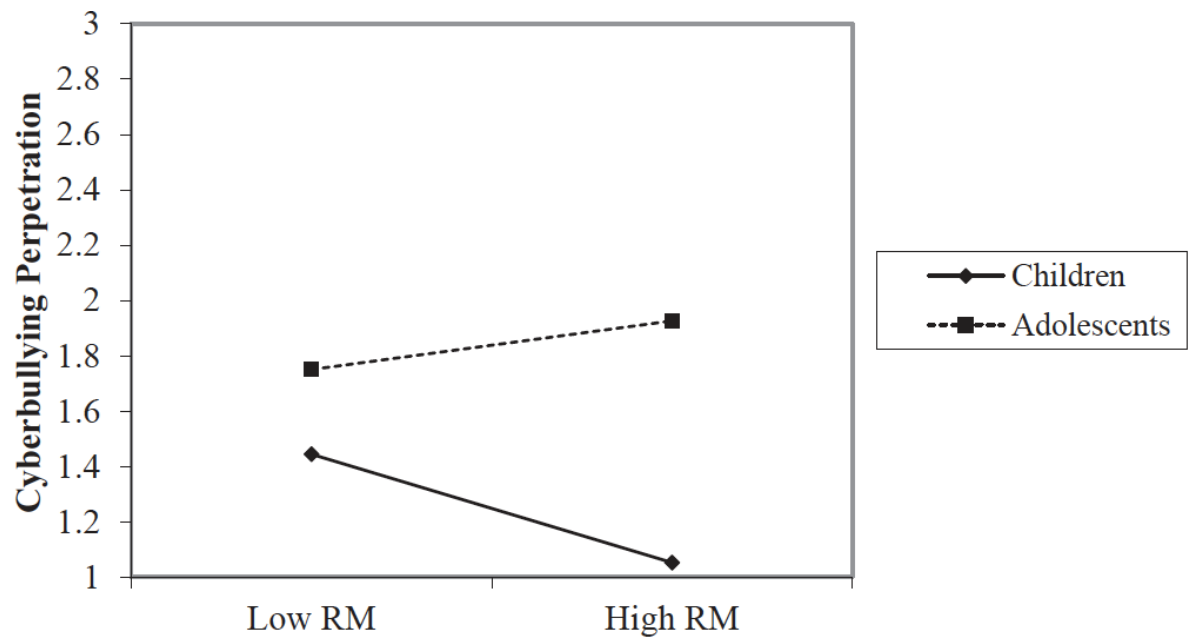


Fig. 2. Restrictive mediation (RM), age, and cyberbullying perpetration. Note: Scales ranges in the y-axis are partially displayed.