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Cyberbullying Following Cyber-Victimization Among Chinese Children: The Role of Moral Disengagement and Normative Beliefs About Aggression

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Abstract
One unintended consequence of the widespread use of the Internet is the emergence of cyberbullying among children, which threatens their social and behavioral development. Recently, researchers have reported a positive relationship between cyber-victimization and cyberbullying in primary school children. While moral disengagement and normative beliefs about aggression predict cyberbullying, it is not clear whether they mediate the association between cyber-victimization and cyberbullying. To address this research gap, we performed a cross-sectional study with a sample of 1,252 children (56.8% boys; *mean age* = 9.38) from 16 primary schools in Hong Kong, China. Results of structural equation modeling analyses demonstrated that moral disengagement and normative beliefs about aggression served as mediators in the association between cyber-victimization and cyberbullying. Cyber-victimization increased engagement in cyberbullying through higher moral disengagement and stronger normative beliefs about aggression. Gender differences also played a significant role, with cyber-victimized boys more likely to engage in online bullying activities. Overall, the findings contribute to our understanding the development of cyberbullying in children in a non-Western setting. These findings also have implications for developing and implementing intervention programs aimed at protecting children from cyberbullying. Limitations of the study are discussed.

Keywords Cyberbullying · Cyber-victimization · Moral disengagement · Normative beliefs about aggression · Chinese children

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Introduction

In today's digital age, cyberbullying is recognized as a global social problem. It refers to a type of repetitive, intentional and aggressive behavior that occurs via information technology platforms and targets those who are in a subordinate position in a power relationship with the perpetrator (Kowalski et al., 2012; Patchin & Hinduja, 2012). In the virtual world, the victim experiences cyber-victimization while the perpetrator participates in cyberbullying acts. Cyber-victimization refers to individual's experience of being cyberbullied and cyberbullying perpetration means the experience of cyberbullying (Williford et al., 2013). Chen and Chen (2020) reported that in a sample of 2,582 adolescents, 20.4%, 7.7%, and 20.6% of juveniles in Hong Kong, mainland China, and Taiwan reported to having engaged in cyberbullying behaviors, respectively. Besides, 33.0%, 23.8%, and 31.7% of the respondents were also bullied in cyberspace at least one time during the semester, respectively.

Although young children are increasingly becoming active Internet users, the majority of studies on cyberbullying have focused on adolescents or young adults with the younger populations, with primary school students ignored (Chicote-Beato et al., 2024). In fact, meta-analyses (e.g., Kowalski et al., 2014; Marciano et al., 2020) showed that cyberbullying has resulted in negative outcomes for both perpetrators and victims, such as depression, stress, anxiety, self-harm, suicidal behaviors, aggression, and substance abuse. Empirical studies also showed that cyberbullying has long-term detrimental effects on young people's mental health including depression and anxiety (Fahy et al., 2016; Pabian & Vandebosch, 2016). Moreover, there is a tendency among victims of cyberbullying to turn into perpetrators later (Gibb & Devereux, 2014). Considering the deleterious impacts of cyber-victimization and cyberbullying perpetration on the development of young people, investigating the underlying mechanisms of the relationship between the two is vital for developing mitigation measures.

Cyber-Victimization and Cyberbullying

Experiences of cyber-victimization significantly predict an individual's cyberbullying behaviors (Salazar, 2021). Cross-sectionally, a strong overlap was observed between cyber-victims and perpetrators (Novo et al., 2015). Mishna et al. (2012) reported that the victim-perpetrator overlap was highly prevalent in cyberbullying contexts among young populations because of their increased exposure to technology (Hinduja & Patchin, 2010) and lack of social or contextual cues such as face-to-face interactions (Ang & Goh, 2010). In their study involving 2,186 middle and high school students in Canada, Mishna et al. (2012) revealed that over one-fourth of the participaents were exposed to cyberbullying as both victims and bullies. Chan and Wong (2020) also found that 14.9% of Hong Kong's adolescent participants reported being involved in both cyber-victimization and cyberbullying perpetration. Similar to bullies, victims tend to exhibit greater attentional focus toward aggressive stimuli and engage in more hostile attributional biases (van Reemst et al., 2014).

The social information processing (SIP) theory has been used to explain aggressive behavior, highlighting how individuals' real-time cognitive and emotional processes shape their understandings of social experiences, as well as their behavioral responses to social stimuli (Crick & Dodge, 1994). According to the SIP, victimization experiences may lead people to feel less in control of certain situations and feel futile about their positive efforts, and thus more inclined to choose responses that involve aggression (van Reemst et al., 2014). Against this background, individuals may develop preventive aggressive behavior due to previous victimization experiences stored in their memory. Existing research also supported the hypothesis that some people may be both victims and perpetrators (Solberg et al., 2007), and this conclusion could be extended to cyberbullying (Gibb & Devereux, 2014; König et al., 2010). Besides, from the perspective of Social Learning Theory, imitation also plays a role in cyberbullying (Lee et al., 2023). Cyberbullying can be acquired through direct or observational learning processes facilitated by incidental reinforcement (Lee et al., 2023). Accordingly, peer deviant behaviors in cyberspace contribute to individual potential involvement in cyberbullying. That is, associating with peers who participated in cyberbullying may make young people tend to rationalize or legitimize cyberbullying behavior, and subsequently participate in cyberbullying themselves (Hinduja & Patchin, 2013; Marcum et al., 2014).

Moral Disengagement in Cyberbullying

Moral disengagement (MD) describes a cognitive process whereby individuals use self-regulation to alleviate the tension stemming from a mismatch between immoral conduct (e.g., bullying others) and moral standards/norms (Wang et al., 2017). Ample evidence exists in support of the negative outcomes of individuals' morally disengaged predispositions, including juvenile deviant behaviors such as misconduct at work/school (Fida et al., 2022), aggressive behaviors among children and adolescents (Caravita et al., 2014), and bullying (Thornberg & Jungert, 2014). Bullying perpetrators and bystanders usually display higher levels of MD, by which they may manage to justify aggressive conduct without explicitly violating internal moral standards (Thornberg & Jungert, 2013, 2014). For example, some reviews support a positive relationship between moral disengagement and cyberbullying, suggesting that individuals who have a higher level of moral disengagement are more likely to engage in online bullying behaviors (Lo Cricchio et al., 2021; Zhao & Yu, 2021).

Studies showed that MD predicted the emergence and development of cyberbullying (e.g., Gao et al., 2020; Wang & Ngai, 2020). Characteristics of the cyber environment such as anonymity, reduced social censure, unchecked proliferation of harmful content, and limited relevant social restraints as seen in traditional bullying, have jointly weakened the effects of personal regulatory factors and thus intensified the effects of MD mechanisms (Luo & Bussey, 2022). Notably, both cyber perpetrators and cyber victims displayed higher levels of MD than did those who were never involved in cyberbullying events (Marín-López et al., 2020; Renati et al., 2012). Similarly, individuals who played the joint role of cyber perpetrators and cyber victims also displayed high MD (Marín-López et al., 2020). Such findings suggest that

MD mechanisms may be an important factor linking the roles of cyber victims and perpetrators (Luo & Bussey, 2022).

According to SIP theory, previous social experience (e.g., being rejected or bullied) could help shape social cognition of children, which may result in aggressive actions in the future (Crick & Dodge, 1994). Children who are bullied may develop irrational cognition of cyberbullying, such as moral disengagement mechanisms, which are also supported by current findings (e.g., Dou et al., 2020; Luo & Bussey, 2022; Merlici & Maftei, 2024). These studies have indicated that MD may play an important role in the link between cyber-victimization and cyberbullying. For instance, Dou et al. (2020) demonstrated that MD mediated the relationship between cyber-victimization and cyberbullying among a sample of college students. A recent longitudinal study by Dou et al. (2024) further revealed the mediating role of MD in the relationship between violent/stressful life events and cyber-aggression among Chinese young adults. Individuals with experiences of cyber-victimization tended to be morally disengaged since past online experiences have left the victims with an irrational belief that "if I am bullied, then I have the right to bully others" and thus being more vulnerable to perpetrating cyberbullying. Luo and Bussey (2022) also supported the mediating role of MD, explaining that MD mechanisms are invoked so that cyber victims and bystanders can commit cyberbullying without guilt. However, whether these findings can be replicated in children is still unclear since these studies were carried out among older adolescents and young adults. Thus, identifying the underlying role of MD in the relationship between cyber-victimization and cyberbullying would help guide future interventions to reduce the adverse effect of cyberbullying, as well as to prevent a change of role from victims to bullies among children.

Normative Beliefs about Aggression in Cyberbullying

Normative beliefs about aggression (NOBAG) refer to individuals' beliefs about the appropriateness or acceptance of aggressive behaviors (Huesmann & Guerra, 1997; Wright & Li, 2013). The SIP theory suggests that NOBAG, as a form of latent knowledge structure, can be weakened or strengthened by past experiences (Crick & Dodge, 1994). Children's processing of social cues is influenced by NOBAG, which may make them misinterpret casual encounters as hostile and consequently react aggressively (Zelli et al., 1999). The anonymity and deindividuation of cyberspace lead to behaviors guided by individuals' own normative beliefs (Suler, 2004). In short, an individual's moral cognition may be influenced by NOBAG, with negative changes in the individual's moral cognition, moral alienation, and eventually leading to cyberbullying behavior.

Previous findings have indicated that NOBAG exhibits robust associations with bullying and victimization in the online environment (e.g., Ang et al., 2017; Zhou et al., 2023). Specifically, empirical studies have shown that individuals showing high levels of NOBAG tended to engage in cyber perpetration or cyber aggression (e.g., Ang et al., 2017; Hilvert-Bruce & Neil, 2020). A meta-analysis has also identified strong associations of NOBAG with cyberbullying perpetration (Kowalski et al.,

2014). Additionally, experiences of victimization were significantly correlated with higher levels of NOBAG among both traditional bullying and cyberbullying victims (e.g., Burton et al., 2013; Su et al., 2018).

Existing evidence has demonstrated the mediating effect of NOBAG in the context of cyberbullying. For instance, Zhu et al. (2020) showed that NOBAG mediated the relationship between exposure to online gaming violence and cyberbullying among Chinese juveniles. Furthermore, Shi et al. (2020) also found that NOBAG could mediate the relationship between cyberbullying victimization and cyberbullying perpetration among middle school students. By adopting NOBAG, victims of cyberbullying may become more willing to take revenge or vent their anger via cyberbullying. Considering that the features of the online environment (e.g., anonymity and dearth of social and contextual cues) may undermine individuals' self-awareness and exacerbate NOBAG, it is worthwhile to investigate how NOBAG influences the transformation of cyber victims into cyberbullies, especially among children.

Gender Differences in Cyberbullying

Gender-linked SIP theory suggests that boys and girls may have differences in social information processing including environmental cues coding, interpretation of social cues, clarification of goals, response access, response decision, and behavioral enactment, which finally influence and maintain children's gender-specific aggressive behaviors (Galán et al., 2022). Likewise, gender plays an important role in cyberbullying involvement among young populations although the related empirical evidence is equivocal (Zhou et al., 2019). Most studies have revealed that adolescent boys are more likely to report cyber perpetration (e.g., Chan & Wong, 2020; Chen & Chen, 2020), whereas female youths show a higher tendency to be victimized in cyberspace than males (e.g., Alhajji et al., 2019; Zsila et al., 2019). Notably, Chan and Wong (2020) found a higher prevalence of overlap between cyberbullying and cyber-victimization among males than females. Eyuboglu et al. (2021) demonstrated a higher prevalence of victimization and victim–perpetrator overlap among boys in both cyber and traditional contexts. However, Tokunaga (2010) found gender to be a poor indicator of cyber-victimization, and Chen and Chen (2020) reported no gender differences in cyber-victimization among mainland Chinese adolescents. Overall, while the link between cyber-victimization and cyberbullying is well-established, the moderating effect of gender remains underexplored.

The Present Study

Despite the increasing number of young children gaining access to the internet who may face higher risks of cyber-victimization compared with their adolescent counterparts (CNNIC, 2016), little empirical findings of cyberbullying in children in primary schools have been reported (Kowalski et al., 2014; Walters, 2021). Previous studies have indicated that both MD and NOBAG played an important role in the relationship between cyber-victimization and cyberbullying (Merlici & Maftei,

2024; Shi et al., 2020). While MD primarily refers to an internal psychological mechanism, involving how to handle moral conflicts and focusing on how individuals rationalize their own behavior, NOBAG reflects an individual's views on external social rules and the acceptance of aggressive behavior, as well as how individuals perceive the actions of others and their social consequences. Thus, the influence of MD and NOBAG as two separate mechanisms on the relationship between cyber-victimization and cyberbullying requires further consideration. Additionally, the underlying mechanism between cyber-victimization and cyberbullying in Asia is still unclear. The study of this topic in the Asian culture is important considering the nature of Chinese culture that stresses collectivist and interpersonal harmony. If Chinese adolescents engage in behaviors that go against collectivist values, such as overt aggressive behavior, these actions will be prohibited or severely punished (Chen & French, 2008). Hence, it is possible that kids may exhibit aggression through the cyber world where one's identity can be concealed.

In this study, we aimed to investigate the effects of cyber-victimization on cyberbullying among children in Hong Kong. MD and NOBAG were examined as parallel mediators between the two constructs, and the influence of gender on these processes was also explored. Specifically, we examined the following four research hypotheses:

Hypothesis 1: Cyber-victimization would be positively associated with cyberbullying (Hypothesis 1a), and the association would be mediated by MD (Hypothesis 1b) and NOBAG (Hypothesis 1c).
Hypothesis 2: Boys who have been cyber-victimized would be more likely to become cyberbullies than girls.

Methods

Participants

To test these hypotheses, we recruited 1,252 Grade 4 students aged between 8 and 12 years (*mean age* = 9.38; *SD* = 0.57; 710 boys and 540 girls) from 16 local primary schools in Hong Kong. More than 60% of students reported owning a computer ($N = 932$, 74.7%) or a mobile phone ($N = 810$, 64.7%). Within this group, over 90% of the students said that their phones ($N = 831$, 93.1%) or mobile devices ($N = 731$, 93.0%) could connect to the internet. Additionally, 61.6% ($N = 759$) indicated that they had used online social platforms, such as Instagram. Specifically, 45.4% of the students reported their first internet use in or before the first grade of primary school, 58.2% frequently engaged in online gaming, and 59.7% mentioned that they often used the internet for entertainment purposes.

Sim et al. (2022) indicated that the sample size for the parallel mediation model ranged from 128 to 8,879 through reviewing the existing studies. They also provided the minimum required sample sizes for SEM models with partial mediation and indicated that this model requires 110–2,510 cases when the effect size of the indirect effect is large. Moreover, using an algorithm by Westland (Soper, 2024),

we have already conducted an a priori power analysis with a sample-size calculator for structural equation modeling. With a conservative effect size of 0.30 and a maximum of 13 latent variables with 38 observed variables, 248 participants are recommended as the ideal number for the study to detect the effects with a desired power of 0.90. Therefore, our sample size can be regarded as adequate and "large" with reference ot the views of researchers (e.g., Fritz & MacKinnon, 2007; Kline, 2015, 2016; Sim et al., 2022) and empirical studies (e.g., Grossi et al., 2011).

Procedures

Prior to undertaking the study, the researchers obtained ethical approval from the university's institutional review board. All participants and their parents provided written informed consent. The children were informed that their participation was voluntary and anonymous and that they could quit the study at any time. Under the supervision of trained research assistants and their class teachers, the participants completed a 20–30 min long questionnaire during class time.

Measurement

Cyber-Victimization and Cyberbullying

Cyberbullying behaviors were measured using a 9-item Cyberbullying Questionnaire developed by Ang and Goh (2010), which covered broadcasting, online actions targeted at a person, and deception. Cyber-victimization was measured by an adapted version of the Cyberbullying Questionnaire. Sample items included "I entered or used someone's email, website, or computer without his/her permission," and "Someone entered or used my email, website, or computer without my permission." Each item was answered using a five-point Likert scale ranging from 1 (*Never*) to 5 (*Several times per week*). Higher scores indicate higher frequencies of cyberbullying behaviors among the participants. The Chinese version of the scale demonstrated good reliability and validity among Chinese samples (Gao et al., 2020). In this study, the Cronbach's alpha values of the cyberbullying scale and the cyber-victimization scale were 0.91 and 0.90, respectively, which confirmed excellent internal consistency.

Moral Disengagement from Cyberbullying

The Cyberbullying Moral Disengagement Scale (Bussey et al., 2015) consisting of eight items was used to measure participants' agreement with statements on cyber-aggression and morality. Responses were captured on a 5-point scale, where 1 indicated "*strongly disagree*" and 5 indicated "*strongly agree*". Sample items included "It's okay to take revenge if someone cyberbullies one of your friends," and "If people give out their passwords to others, they deserve to be cyberbullied." Scoring higher on the measure suggested more deviation from decent conduct in cyberspace. The Chinese scale has been validated and applied in a Chinese context (Wang &

Ngai, 2020). Likewise, the Cronbach's alpha of the MD scale in this study was good (alpha = 0.85).

Normative Beliefs about Aggression

NOBAG was assessed using the adapted version of the Normative Beliefs About Aggression Scale (Huesmann & Guerra, 1997), which is used to measure participants' perceptions regarding the appropriateness of aggressive behaviors in cyberspace (Wright & Li, 2013), including cyber relational aggression (i.e., gossip and rumor spreading via text messages, social networking sites, or email) and cyber verbal aggression (i.e., ridiculing and insulting others online, sending abusive messages to others, or posting malicious comments about others). Participants responded to 12 items using a six-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Higher scores showed more negative beliefs about cyberbullying. The Chinese NOBAG showed good reliability and validity among Chinese adolescents (e.g., Zhu et al., 2020). In the current study, the Cronbach's alpha for NOBAG was 0.84.

Data Analysis Plan

First, we analyzed the descriptive statistics of the studied variables, Pearson correlations, and the common method bias test using SPSS 28.0. Next, the gender measurement invariances of the measures were examined including configural, metric, and scalar invariances. Model comparison results with a change in the Comparative Fit Index (ΔCFI) < 0.010, and Tucker–Lewis index (ΔTLI) < 0.010 supported the measurement invariance, with "mean differences" exist when ΔCFIs and ΔTLIs are between or equal to 0.01 and 0.02, and "definite differences" exist when ΔCFIs and ΔTLIs are > 0.02 (Cheung & Rensvold, 2002).

Moreover, we performed structural equation modeling (SEM) via Mplus 8.8 (Muthén & Muthén 1998–2019) with maximum likelihood estimation. As recommended by Anderson and Gerbing (1988), a two-step SEM approach was adopted: (1) a measurement model was built with confirmatory factor analysis (CFA), and (2) a final hypothesized structural model was analyzed to examine the mediation effects of MD and NOBAG. Several model fit indices were assessed to evaluate the goodness of fit of the model, including the CFI, the TLI, the root mean square error of approximation (RMSEA), and the standardized root mean squared error (SRMR). For a model with a sample size of 250 and more than 30 observed variables, the recommended acceptable fit is indicated by the following values: CFI > 0.90, TLI > 0.90, RMSEA < 0.08, and SRMR < 0.08 (Kline, 2015). Moreover, a parallel multiple mediator model was tested using a regular bootstrapping sample approach (N = 1,000) with 95% confidence intervals (95%*CI*). Significant mediation is represented by 95%*CI* excluding the value of "0". Finally, to investigate gender-based differences in the mediation hypotheses, we used the WALD chi-square test of parameter equalities.

Results

Descriptive Statistics, Correlations, and Common Method Bias Test

Table 1 presents the descriptive statistics of mean scores, standardized deviations, skewness, kurtosis values, reliability, and Pearson correlations for all the variables studied. Although the cyber-victimization and cyberbullying data do not follow a normal distribution, a large sample size can relatively make up the problem of abnormal distribution (Marsh et al., 1989; West et al., 1995). Moreover, the maximum likelihood estimator with bootstrapping was performed in this study to reduce the issue caused by the non-normal distribution, as suggested by researchers (e.g., Efron, 1979; Zhu et al., 2025). Therefore, the current statistical methods and results can be regarded reliable.

Moreover, the discriminant validity of the measures was also tested using the Average Variance Extracted (AVE)-SV strategy, which examined whether the AVE is greater than the shared variance (SV; i.e., squared correlation), as suggested by Fornell and Larcker (1981). The results reported in Table 1 showed that all measures in the current study have good discriminant validities, as the square root of the AVE value of each construct is greater than its correlation with other constructs (Zait & Bertea, 2011).

Moreover, the common method bias test using Harman's single-factor test analysis was tested and showed that the total variance extracted by one factor was 29.062%, which was less than the recommended cutoff threshold of 40%, suggesting that this study did not have significant common method bias.

Cyber-victimization was significantly related to cyberbullying ($r = 0.634$, $p < 0.001$). Hypothesis 1a was well supported. Moreover, MD showed significantly positive relationships with cyber-victimization and cyberbullying. NOBAG has significantly positive relationships with cyber-victimization and cyberbullying.

Measurement Model

A parceling approach via factorial algorithm (Rogers & Schmitt, 2004) was used to maximize scale commonality and avoid inflated measurement errors (Matsunaga, 2008). We aggregated cyberbullying items into three parcels, cyber-victimization items into three parcels, MD items into three parcels, and NOBAG items into four parcels. The results of the measurement model revealed a good model fit: x^2 ($df = 59$, $N = 1{,}249$) $= 374.69$, $p < 0.001$, with a CFI of 0.973, TLI of 0.964, RMSEA of 0.065 (95% $CI = [0.059, 0.072]$), and SRMR of 0.041. The findings provided strong support for the dimensionality of these three measures. Additionally, measurement invariances across genders were tested. Results showed that the configural, metric, and scalar invariance of all measures was established (i.e., ΔCFIs < 0.010, ΔTLIs < 0.010), thus suggesting that the variables of interest had gender measurement invariance.

Table 1 Means, Standard Deviations, and Cronbach's alpha of all Study Variables

Variables	*M*	*SD*	Skewness	Kurtosis	α	1	2	3	4	AVE	the square root of AVE
1. Cyber-victimization	1.28	.58	3.84	17.41	.90	-				0.542	0.736
2. Cyberbullying	1.19	.49	3.11	11.35	.91	.634***	-			0.515	0.718
3. MD	1.82	.82	1.06	.91	.85	.401***	.401***	-		0.420	0.648
4. NOBAG	2.17	1.00	.16	−1.29	.84	.303***	.206***	.245***	-	0.345	0.587

M Mean, *SD,* Standard Deviations, *MD* Moral disengagement, *NOBAG* Normative beliefs about aggression, *AVE* Average Variance Extracted

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

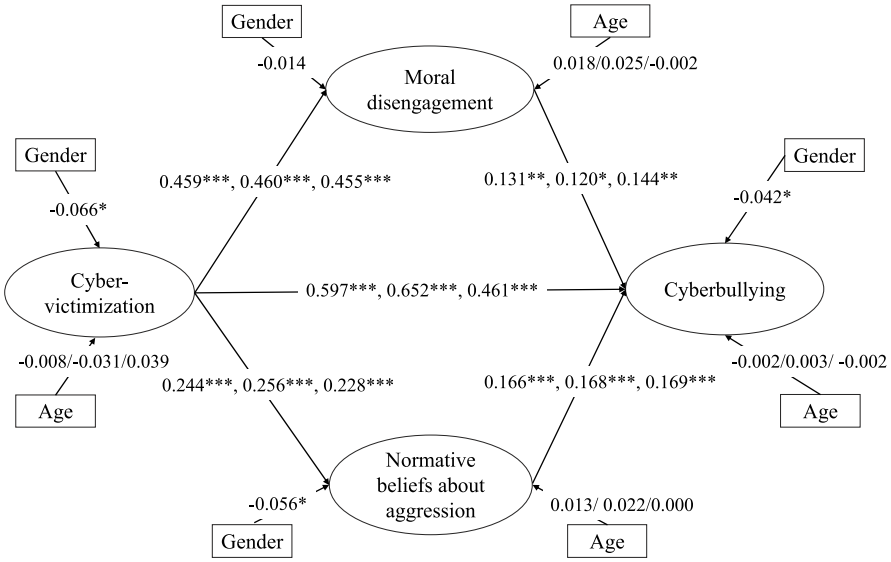

Fig. 1 Structural equation model. The parallel multiple mediator model. Latent constructs are shown in ellipses. The standardized coefficients of all paths from left to right represent the entire, male, and female samples, respectively, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 2 Model fit index

Model	$x^2(df)$	CFI	TLI	RMSEA	SRMR	AIC	BIC
Total	452.576(78)	0.968	0.957	0.062[0.057 0.068]	0.057	26,815.93	27,082.57
Male	302.744(69)	0.966	0.955	0.069[0.061 0.077]	0.063	16,088.15	16,307.15
Female	218.556(69)	0.968	0.958	0.064[0.054, 0.073]	0.058	10,428.04	10,633.76

CFI Comparative Fit Index, *TLI* Tucker–Lewis Index, *RMSEA* Root Mean Square Error of Approximation, *SRMR* Standardized root mean square residual, *AIC* Akaike information criterion, *BIC* Bayesian information criterions

Structural Model

A parallel multiple mediator model was used to test the hypotheses, with gender and age as covariates (See Fig. 1). The model fit was good: x^2 ($df=78$) = 452.58, $p<0.001$, CFI = 0.968, TLI = 0.957, RMSEA = 0.062 (95% CI = [0.057, 0.068]), and SRMR = 0.057 (See Table 2). Our results supported that cyber-victimization was strongly predicted by cyberbullying ($\beta=0.60$, $p<0.001$). Cyber-victimization was also strongly related to MD ($\beta=0.46$, $p<0.001$). Moreover, MD was significantly linked to cyberbullying ($\beta=0.13$, $p<0.01$). A significant indirect effect of MD was found in the association between cyber-victimization and cyberbullying ($\beta=0.06$, $p<0.001$, $95\%CI_{bootstrap}=[0.02, 0.09]$). Hypothesis 1b was supported. Cyber-victimization was strongly related to NOBAG ($\beta=0.24$, $p<0.001$), and NOBAG was significantly linked to cyberbullying ($\beta=0.17$, $p<0.001$). We also found a significant

indirect effect of NOBAG in the association between cyber-victimization and cyberbullying ($\beta = 0.04$, $p < 0.001$, $95\%CI_{bootstrap} = [0.02, 0.06]$). The direct effect of cyber-victimization on cyberbullying ($\beta = 0.60$, $p < 0.001$, $95\%CI_{bootstrap} = [0.51, 0.69]$) was statistically significant, which indicated that NOBAG partially mediated the relationships between cyber-victimization and cyberbullying (See Table 3). Therefore, Hypothesis 1c was supported. Considering the significant impacts of

Table 3 Mediation effect test

Paths	β	*SE*	$95\%CI_{bootstrap}$
Total (control gender and age)			
CV → MD	0.459***	0.045	[0.365, 0.544]
MD → CB	0.131**	0.039	[0.047, 0.199]
CV → NOB	0.244***	0.032	[0.183, 0.302]
NOB → CB	0.166***	0.029	[0.111, 0.222]
CV → CB	0.597***	0.048	[0.508, 0.692]
CV → MD → CB	0.060***	0.017	[0.023, 0.091]
CV → NOB → CB	0.041***	0.008	[0.024, 0.057]
Total effect	0.697***	0.040	[0.612, 0.773]
Total indirect effect	0.101***	0.018	[0.062, 0.134]
Direct effect	0.597***	0.048	[0.508, 0.692]
Male (control age)			
CV → MD	0.460***	0.059	[0.349, 0.571]
MD → CB	0.120*	0.052	[0.016, 0.221]
CV → NOB	0.256***	0.043	[0.168, 0.337]
NOB → CB	0.168***	0.039	[0.095, 0.244]
CV → CB	0.652***	0.065	[0.527, 0.781]
CV → MD → CB	0.055*	0.023	[0.008, 0.096]
CV → NOB → CB	0.043***	0.011	[0.021, 0.064]
Total effect	0.750***	0.053	[0.635, 0.844]
Total indirect effect	0.098***	0.024	[0.047, 0.143]
Direct effect	0.652***	0.065	[0.527, 0.781]
Female (control age)			
CV → MD	0.455***	0.060	[0.331, 0.564]
MD → CB	0.144**	0.056	[0.036, 0.254]
CV → NOB	0.228***	0.044	[0.136, 0.310]
NOB → CB	0.169***	0.033	[0.107, 0.231]
CV → CB	0.461***	0.068	[0.318, 0.596]
CV → MD → CB	0.065*	0.026	[0.018, 0.120]
CV → NOB → CB	0.038***	0.009	[0.021, 0.057]
Total effect	0.565***	0.061	[0.435, 0.675]
Total indirect effect	0.104***	0.029	[0.049, 0.163]
Direct effect	0.461***	0.068	[0.318, 0.596]

CV Cyber-victimization, *MD* Moral Disengagement, *NOB* Normative beliefs about cyber aggression, *CB* Cyberbullying

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

gender on the studied variables, we further tested the model in male and female populations, respectively. Results showed that the findings were similar between male and female participants (Table 2 and Table 3).

Gender Differences in the Paths

In order to detect gender differences in the paths, we conducted the Wald chi-square test of parameter equalities with age as a covariate. Results showed that the structural path from cyber-victimization to cyberbullying was significantly different between boys and girls (Wald test value = 21.74, $p < 0.001$; $\beta_{male} = 0.65$, $p < 0.001$; $\beta_{female} = 0.46$, $p < 0.001$), with a stronger relationship amongst boys than girls. Thus, Hypothesis 2 was supported. Table 4 shows the results of gender differences in each path.

Discussion

This study is pioneering in exploring the effects of both MD and NOBAG on cyber perpetration after experiencing cyber-victimization in a large sample of primary school children from Hong Kong. As predicted, cyber-victimization was found positively associated with cyberbullying, MD, and NOBAG, and the association between cyber-victimization and cyberbullying was mediated by MD and NOBAG. These findings clarify the developmental trajectories from cyber-victimization to cyberbullying (i.e., theoretical advance), offering valuable inputs for designing prevention

Table 4 Gender differences in each path with age as a covariate

Paths	β	*SE*	95%*CI*	Wald χ^2/df
CV → CB	0.652***/0.461***	0.065/0.068	[0.527, 0.781]/[0.318, 0.596]	21.739***
CV → MD	0.460***/0.455***	0.059/0.060	[0.349, 0.571]/[0.331, 0.564]	1.323
MD → CB	0.120*/0.144**	0.052/0.056	[0.016, 0.221]/[0.036, 0.254]	0.007
CV → NOB	0.256***/0.228***	0.043/0.044	[0.168, 0.337]/[0.136, 0.310]	0.332
NOB → CB	0.168***/0.169***	0.039/0.033	[0.095, 0.244]/[0.107, 0.231]	0.860
Mediation effects				
CV → MD → CB	0.055*/0.065*	0.023/0.026	[0.008, 0.096]/[0.018, 0.120]	0.071
CV → NOB → CB	0.043***/0.038***	0.011/0.009	[0.021, 0.064]/[0.021, 0.057]	0.105

CV Cyber-victimization, *MD* Moral Disengagement, *NOB* Normative beliefs about cyber aggression, *CB* Cyberbullying

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

and intervention measures targeting at reducing the prevalence of cyberbullying among children (i.e., practical advance).

Our results showed that cyber-victimization was strongly associated with cyberbullying, which is in line with previous findings that children who experience cyber-victimization are more likely to engage in cyberbullying (e.g., Durak & Saritepeci, 2020; Gajda et al., 2022). In other words, experiencing bullying by a peer in cyberspace can increase an individual's likelihood of engaging in cyberbullying (Durak & Saritepeci, 2020; Lianos & McGrath, 2018). The anonymity offered by an online environment lowers the risk of in-person retaliation for cyber offenders, thus increasing their propensity to escalate aggressive actions (Wang et al., 2020). Overall, these findings shed light on the significance of addressing cyber-victimization as a risk factor for cyberbullying and the need to develop effective strategies to prevent and address this issue.

In this study, cyber-victimization was significantly positively associated with MD, which is consistent with prior findings (Luo & Bussey, 2022; Marín-López et al., 2020). Cyber-victimization also significantly predicted NOBAG, which suggests that children who experience cyber-victimization are more likely to normalize and justify aggressive online behaviors. In addition, the positive relationship between MD and cyberbullying identified in this study also supports the previous findings (e.g., Marín-López et al., 2020; Renati et al., 2012). Meanwhile, consistent with previous studies (e.g., Ang et al., 2017; Hilvert-Bruce & Neil, 2020), NOBAG was positively and significantly related to cyberbullying. Viewed through the lens of the SIP theory, the current findings imply that children's negative emotions and revenge motivation may be activated by victimization. Thus, those who have been victimized are more likely to develop unethical moral evaluations (Luo & Bussey, 2022), display strong acceptance of aggression (Sukhodolsky & Ruchkin, 2006), and in turn tend to conduct bullying behaviors.

Our findings revealed the mediating effects of MD and NOBAG on the relationships between cyber-victimization and cyberbullying among Chinese primary students, which enhance our understanding of the association of cyber-victimization with cyberbullying especially in the context of Chinese culture. Specifically, cyber-victimization may promote the occurrence of cyberbullying behavior by increasing MD and NOBAG. MD allowed individuals to rationalize aggressive behaviors and thereby reduce the internal moral burden by disconnecting moral judgment from behaviors, while NOBAG may lead individuals to perceive aggression as a socially acceptable response. Thus, our findings suggest that understanding the occurrence of cyberbullying behavior requires considering both individual moral cognition and social beliefs simultaneously.

MD has been identified as a mediator in earlier studies on cyberbullying (Dou et al., 2020, 2024; Luo & Bussey, 2022). Different from traditional in-person bullying behaviors, the anonymity afforded by the cyber context removes immediate social constraints, thereby strengthening the impact of personal regulatory factors and increasing the potential influence of MD mechanisms (Luo & Bussey, 2022). Furthermore, continual exposure to bullying through victimization leads to the desensitization and rationalization of bullying behaviors (Luo & Bussey, 2022; Pabian et al., 2016). In a study involving adolescents in Australian schools, Luo

and Bussey (2022) identified MD as a factor that may facilitate the transition from bystanders and victims of cyberbullying to perpetrators of cyberbullying. In the context of China, Dou et al. (2024) also found that violent stressors predicted further cyber aggression through MD among college students. Based on SIP, stressful experiences not only shape an individual's internal moral framework but also profoundly influence their reactions to experiences. Moreover, when confronted with immense stress, cyber-victimized individuals tend to adopt distorted moral standards, wherein they believe that they can alleviate negative emotions by bullying others online, mimicking how they were bullied themselves.

Our results also give support to the mediating effect of NOBAG on the relationship between cyber-victimization and cyberbullying. Participants who experienced cyber-victimization showed increased NOBAG, which in turn contributed to a higher level of cyberbullying. This finding is in line with that reported by Shi et al. (2020), who analyzed a sample of middle school students from mainland China. Burton et al. (2013) showed that youths with higher levels of NOBAG showed a higher likelihood of being involved in cyber-victimization and cyberbullying. Moreover, NOBAG influenced how young adults reacted to cyberbullying (Pabian & Vandebosch, 2014). According to the SIP theory, the experience of cyber-victimization may result in NOBAG interfering with moral cognition and prompting cyberbullying behaviors. Given this finding, offering cybersecurity education to children is vital to help them realize the devastating outcomes of cyberbullying.

Gender differences in the effects of cyber-victimization on cyberbullying in our study corroborate the results of prior studies (e.g., Wong et al., 2017; Zsila et al., 2019). Zsila et al. (2019) explained that children's gender facilitates an understanding of the dynamics and consequences of cyber-victimization and cyberbullying. Specifically, boys may exhibit an elevated risk of bullying others in order to seek revenge or vent negative emotions after experiencing victimization. However, the strong effects of past cyber-victimization were not seen among the girls. This could be because males tend to utilize intensified confrontation as a response to strain events (Turton & Campbell, 2005). Moreover, existing evidence has shown that boys tended to employ cyber perpetration such as spreading rumors by e-mail and/or phone and recording humiliating images of a peer, which can be seen as an extension of the traditionally male-dominated form of bullying (e.g., Calvete et al., 2010). Thus, developing effective interventions to address male cyberbullying will be crucial to mitigating the problem of cyberbullying in school. However, it is important to add that the extant knowledge on gender differences and the link between cyber-victimization and cyberbullying is inconclusive (e.g., Chan & Wong, 2020; Chen & Chen, 2020; Eyuboglu et al., 2021), possibly owing to different conceptualizations of cyberbullying and cyber-victimization, diverse population-based characteristics, and the different measurements of responses. Thus, additional studies are needed to confirm the effects of gender in the context of cyberbullying. In fact, there are two factors contributing to the relatively weaker effect in girls. First, girls may not resort to aggression because of higher affective and cognitive levels with which girls exhibit fewer negative emotions and bullying behaviors (Topcu & Erdur-Baker, 2012). Second, girls tend to seek external support when experiencing cyber-victimization, and thus better cope with stress (Alhajji et al., 2019).

Conclusion

Implications

This study has key theoretical contributions and practical implications for addressing cyberbullying among school-aged children. Theoretically, this is the first work to identify the mediating roles of MD and NOBAG on the relationship between cyber-victimization and cyberbullying, highlighting the cognitive factors that lead to cyber victims' propensity to perpetrate cyberbullying. This study also expands the SIP model into the realm of cyberbullying research underscoring the importance of understanding cognitive mechanisms in a digital context, and highlighting that helping young children with cyber-victimization experience in primary schools is more important than in secondary schools when cyberbullying peaks (Wright & Li, 2013). Obviously, this is a theoretical innovation.

By uncovering the mechanisms behind the overlap between cyber-victimization and cyberbullying, our results equip schools, families, and society with constructive guidance toward minimizing the adverse consequences of cyberbullying and arresting the transition from cyber-victimization to cyber perpetration. Specifically, prevention programs, including moral and normative beliefs education, and courses to help children with emotional regulation, perspective-taking, and moral reasoning skills, should be conducted and encouraged in primary schools to reduce MD and promote healthy normative beliefs. Parents should be equipped with resources and training on how to recognize signs of cyber-victimization. It is beneficial to encourage parents to openly discuss with their children about online behavior and the significance of reporting cyberbullying incidents. Additionally, communities should conduct awareness campaigns, and establish counseling services and peer support groups, to help cyber-victims receive necessary support and guidance. With reference to the positive youth development (PYD) approach, we argue that such programs, such as Tin Ka Ping P.A.T.H.S. program in China, can help to promote moral and normative beliefs and emotional regulation in young people (Shek, 2024; Shek & Dou, 2024).

Our results also support the need to examine gender-based differences in the developmental trajectory from cyber-victimization to cyberbullying. Prevention and intervention efforts would benefit from adopting targeted, specialized methods that address the formation and development of cyberbullying in boys and girls by reducing MD and NOBAG. The findings also suggest gender-sensitive cyberbullying intervention programs that encourage boys to voice their victimization experiences and support them with appropriate coping strategies in avoidance of any aggressive reactions.

Limitations and Future Directions

Although the present study and its findings are innovative, four limitations of this study should be acknowledged. First, the sample of this study only consisted of primary

school children only from Hong Kong. Thus, it is unclear how the robust relationship between cyber-victimization and cyberbullying could be generalized to various populations. Second, the self-reported measures adopted in this study may have been biased by the children's desire to fit the image of good students (i.e., social desirability effect). To overcome this drawback, future studies could employ a focus group method or multiple methods of data collection, including multiple-informant surveys (e.g., caregiver- or teacher-report) and interviews. Third, although some researchers (Marsh et al., 1989; West et al., 1995) argued that a large sample size may help reduce the impact of non-normal distribution, the high kurtosis values for cyberbullying and cyber-victimization in this study could still increase the risk of potential biases in parameter estimation. Besides, the AVE value for NOBAG (i.e., 0.345) is slightly lower than the acceptable range (i.e., 0.36–0.50; Purnomo, 2017; Yin, 2018), which may indicate potential challenges in measurement validity. Thus, future research could focus on enhancing the measurement instruments and employing more robust and advanced statistical approaches. Finally, the underlying mechanisms of cyber-victimization and cyberbullying could be further investigated using longitudinal data to reveal the casual relationship.

Conclusion

This study offers a unique insight into the risk factors that contribute to the transition of cyber victims into cyberbullies. The findings demonstrate that cyber-victimization may result in cyberbullying through the mediators of MD and NOBAG among children from Hong Kong. Hence, particular attention should thus be paid to children who have engaged in cyberbullying activities, especially those who have been cyber-victimized. Prevention and intervention targeting MD and NOBAG among cyber victims can help decrease the prevalence of cyberbullying among school-aged children. Additionally, in view of the gender differences in the relationship between cyber-victimization and cyberbullying, targeted intervention approaches should be designed to understand the transition of victims into bullies. In conclusion, this study enriches and deepens our understanding of the dynamic patterns of cyber-victimization and cyberbullying and offers valuable implications for theory and practice.

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Declarations

Conflict of Interest To avoid conflict of interest, Editor in Chief who is included in the authorship of this article, has excluded himself from manuscript handling. The peer review process including decision making has been executed by one of the Associate Editors of the journal.

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