

Cyberbullying Among Adolescents: The Role of Affective and Cognitive Empathy, and Gender

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Published online: 18 March 2010
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Abstract The purpose of the study was to examine the association between affective empathy, cognitive empathy, and gender on cyberbullying among adolescents. Participants were 396 adolescents from Singapore with age ranging from 12 to 18 years. Adolescents responded to a survey with scales measuring both affective and cognitive empathy, and cyberbullying behavior. A three-step hierarchical multiple regression analysis was used with cyberbullying scores as the dependent variable. Gender was dummy coded and both affective and cognitive empathy were centered using the sample mean prior to creating interaction terms and entering them into the regression equations. The testing, probing and interpretation of interaction effects followed established statistical procedures. Results from hierarchical multiple regression analysis indicated a significant three-way interaction. At low affective empathy, both boys and girls who also had low cognitive empathy had higher scores on cyberbullying than those who had high cognitive empathy. This pattern of results was similarly found for boys at high affective empathy. However, for girls, high or low levels of cognitive empathy resulted in similar levels of cyberbullying. Implications of these findings include the need for empathy training and the importance of positive caregiver-child relationships in reducing cyberbullying behavior among adolescents.

Keywords Cyberbullying · Affective empathy · Cognitive empathy · Gender

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Introduction

Cyberbullying refers to the willful use of the Internet as a technological medium through which harm or discomfort is intentionally and repeatedly inflicted, targeting a specific person or group of persons [1]. Because of the advancement of technology, the transmutation of bullying has surfaced from the physical to the virtual; the Internet has become a new arena for social interactions, permitting adolescents to say and do things with some anonymity and limited oversight by adult monitors. Kowalski and Limber [2] studied cyberbullying among 3,767 middle school students in United States. They found that 11% were victims of cyberbullying, 7% were cyberbullies/cybervitims, and 4% were cyberbullies at least once over the past couple of months. Approximately half of the victims reported not knowing the perpetrator's identity. Bullying in cyberspace has extensive and potentially severe consequences such as school refusal, depressive symptoms and suicide [3].

The majority of published research on cyberbullying reports data from Europe, Australia and North America. Comparatively, there is a dearth of published studies using samples from Asia in general, and Singapore in particular. It is critical to examine whether existing empirical evidence is generalizable by studying phenomena using different cross-cultural samples [4]. Given the rapid rise in the use of new media worldwide and the possible consequences of cyberbullying, research efforts toward a better understanding of cyberbullying and its correlates is not only warranted but critical because of the implications it has on mental health and the promotion of mental health. Additionally and more specifically, the role of two types of empathy—*affective* and *cognitive* empathy, and gender has not been examined together in the context of cyberbullying.

Empathy is generally viewed as a multidimensional construct and has been described in the literature as an *affective* trait (*affective* empathy), which is the ability to experience and share the emotions of others [5], a *cognitive* trait (*cognitive* empathy), which is the ability to understand the emotions of others [6], and both [7]. Regardless of definition, it is generally found that empathic responsiveness is positively related to prosocial behaviors and negatively related to bullying [8, 9]. Additionally, the construct of empathy is also related to callous-unemotional (CU) traits and aggression. Frick and colleagues [10] posited that CU traits are usually presented in the form of failure to show empathy for others and an absence of guilt when using others for one's own gain. While the relationship between low empathy and traditional offline bullying has received extensive support from systematic reviews and meta-analytic studies [8], the relationship between low empathy and cyberbullying has yet to be empirically examined. Hinduja and Patchin's [11] recent large scale online survey found that adolescents who reported bullying others in real life were more than 2.5 times as likely to report bullying others online. Raskauskas and Stoltz's study [3] also had similar findings. These findings suggest that the Internet platform may extenuate existing behaviors; traditional bullies can now tap on the ample opportunities afforded via cyberspace to torment victims.

Researchers have examined the relationship between low *affective* empathy and low *cognitive* empathy on bullying. Jolliffe and Farrington [12] found frequent bullies, regardless of type of bullying and across gender, to have significantly less *affective* and total empathy than those involved with bullying only once or twice, and empathy scores of those who bullied only once or twice did not differ significantly from those who did not bully. According to Feshbach [13], *cognitive* empathy is important but *affective* empathy is as important or arguably more important to alleviate physical bullying. Shechtman [14] found that physically aggressive boys showed a lower level of *affective* empathy but did not differ from non-aggressive boys in *cognitive* empathy. Taken together, low *affective*

rather than cognitive empathy appears to be more related to physical bullying in some studies, and across different types of bullying in other studies.

Compared to physical and verbal bullying, indirect bullying such as social exclusion and gossiping, is characterized by the absence of direct confrontation, and due to its covered nature, it provides more anonymity to the perpetrator similar to the anonymity provided to cyberbullies by online platforms. Indirect bullying has been linked to cognitive empathy. For example, Crick [15] found that children who use indirect methods of bullying are not able to take the perspective of others, have low cognitive empathic responsiveness, and this contributes to increased levels of indirect bullying. Separately, Loudin et al. [16] found that individuals with poor perspective taking abilities were more likely to engage in relational aggressive behaviors compared to their peers. So far, studies have not examined components of empathy in relation to cyberbullying.

While boys are far more likely to be involved with traditional offline bullying compared to girls [12], research on cyberbullying suggests that gender differences do not consistently emerge. Some studies have found no gender differences between boys and girls either as an offender or victim [11], other studies have found girls more likely to be cybervictims while there are no significant gender differences on having cyberbullied others [17], and yet in other studies, boys were more likely to be cyberbullies than girls [18]. A main effect of gender does not always emerge because girls, who may be more submissive in face-to-face settings may feel less inhibited online as they are better empowered to manipulate others due to the anonymity and equalizing characteristics of the Internet [19].

When examining the relationship between empathy and gender, research has generally found that females have significantly greater levels of empathy than males [20]. Jolliffe and Farrington [21] found girls to score significantly higher than boys on affective, cognitive, and total empathy, but the magnitude of the difference between boys and girls was greater for the affective than the cognitive scale. Separately, Jolliffe and Farrington [12] found male and female frequent bullies to have significantly less affective and total empathy than those involved with infrequent bullying.

The nature of cyberspace may facilitate both low affective and low cognitive empathy in individuals, and the ease and effectiveness of bullying in cyberspace emboldens cyberbullies to effectuate their antagonistic agenda. Computer-mediated communication allows individuals to be anonymous, and when perceived to be unidentifiable, individuals are not motivated to manage their impression and are inclined to display disinhibited behaviors characteristic of reduced public awareness and self-regulation [22]. According to the Reduced Social Cues (RSC) model [23], lack of affective feedback in terms of reduced social and contextual cues could result in a deficiency in affective empathy and hence, deregulated behavior for both boys and girls. Therefore, it is plausible that boys and girls would behave similarly in conditions of low affective empathy. Given that magnitude of gender differences is greater for affective than cognitive empathy and that empathy has an inverse relationship with bullying [12, 21], it may be likely for gender differences to emerge at high affective empathy. Likewise, the RSC model also suggests that use of technology reduces the sensitivity an individual has towards others and his/her surroundings, and sensitivity requires perspective-taking, a cognitive aspect of empathy [23]. Perspective-taking is a central part of Kohlberg's [24] cognitive-developmental theory of moral judgment. Interestingly, Silfver and Helkama [25] found that for adolescent boys, cognitive perspective taking was a stronger predictor of guilt than for girls. This finding was in line with previous research showing that moral judgment of boys was more directly based on cognition compared to girls [26]. Therefore, for cyberbullying, it may be possible to differentiate boys at high and low levels of cognitive empathy but not girls.

We hypothesized a significant three-way interaction for the present study. At low affective empathy, those with low cognitive empathy would score higher on cyberbullying than those with high cognitive empathy, and we expected this relationship to hold across gender. However, at high affective empathy, gender differences were anticipated, based on Jolliffe and Farrington's [12, 21] prior work and the integrated body of theoretical and empirical research from empathy, perspective-taking and moral judgment [23, 25, 26]. At high affective empathy, it is likely that we continue to be able to differentiate boys low and high on cognitive empathy, with low cognitive empathy being associated with higher levels of cyberbullying, but high and low cognitive empathy would likely result in similar levels of cyberbullying for girls.

Method

Participants

Three hundred and ninety-six adolescents (173 boys, 219 girls, 4 did not provide information on gender) from one middle and one high school in Singapore participated in this study. Age of the participants ranged from 12 to 18 years ($M = 14.88$, $SD = 1.79$). Of the 396 adolescents, 51% were from the middle school ($n = 202$), while 49% were from the high school ($n = 194$). Self-reported ethnic identification for the sample was as follows: 60.4% of the participants were Chinese, 8.1% were Indian, 19.7% were Malay, 11.6% endorsed Others (ethnic groups not listed), and 0.2% was missing data. Both schools are government schools situated within residential estates, and government schools are the most common type of schools in Singapore. In Singapore, the state is the principal provider of education at elementary, middle and high school levels, as well as tertiary levels. Government schools are public schools and these are registered and managed by the Ministry of Education, Singapore.

Measures

Basic Empathy Scale

The questionnaire is a 20-item measure [21] assessing cognitive and affective empathy using a 5-point Likert format. Exploratory factor analyses (EFA) was initially used, and confirmatory factor analysis (CFA) subsequently verified a 2-factor solution. The cognitive empathy subscale assesses the understanding of another person's emotions (e.g., "I can usually figure out when people are happy"). The affective empathy subscale assesses the sharing and feeling of another person's emotion (e.g., "Other people's feeling affect me easily"). Cronbach's alpha was .75 for the cognitive subscale and .76 for the affective subscale for the present sample.

Cyberbullying Questionnaire

A 9-item cyberbullying questionnaire was developed to measure cyberbullying behavior in this study. This included items on broadcasting (e.g., "I made fun of someone by sending/posting stories, jokes or pictures about him/her"), online actions targeted at the person (e.g., "I purposely left someone out from an online group"), and deception

(e.g., “I pretended to be someone else and sent/posted messages to get that person into trouble or make that person look bad”). Adolescents could indicate on a 5-point scale whether they engaged in these cyberbullying acts “once or twice this year”, “a few times this year”, “about once every week”, “about a few times every week” or if they have “never” bullied others. A total cyberbullying score can be calculated. All items measured the prevalence and frequency of cyberbullying in the current school year, with higher scores indicating greater prevalence and frequency of such acts. In addition, adolescents who did not report any cyberbullying acts were classified as “non-bullies”, those who reported engaging in cyberbullying acts a couple to a few times a year were classified as “infrequent bullies”, while those who reported weekly or more cyberbullying acts were classified as “frequent bullies”. The questionnaire was administered 11 months into the school year which was close to the end of the entire the school year. The Cronbach alpha reliability estimate obtained for the present sample was .83.

Both EFA and CFA were used in the development and initial validation of the 9-item cyberbullying questionnaire. The authors randomly divided the full sample ($n = 396$) into two, using EFA to assess the factor structure on Sample A ($n = 198$) and subsequently using CFA to confirm the factor structure obtained from EFA using Sample B ($n = 198$). Multigroup CFA was used to test for invariance across gender following procedures outlined by Byrne [27].

Principal components analysis with varimax rotation was performed on the scores of the 9-item cyberbullying questionnaire using Sample A. We based the decision about number of factors to retain on a combination of methods (e.g., parallel analysis, eigenvalue >1.0 , scree plots) as well as interpretability, theoretical salience of the factors, and simple structure. Items should load greater than .4 on the relevant factor and less than .4 on all other factors. Results supported a one-factor model. We used CFA on Sample B to test the 1-factor 9-item cyberbullying questionnaire structure obtained from EFA, using EQS Version 6.1 [28]. Correlated errors and other post hoc model respecification were not permitted. The Satorra-Bentler rescaled χ^2 ($SB\chi^2$) was used because of multivariate non-normality and robust maximum likelihood estimation was employed in CFA to correct for this [29]. The $SB\chi^2$ has been found to perform consistently well across small and large samples, and researchers have recommended its use for nonnormal multivariate data [30]. The $SB\chi^2$ provided a conventional measure of model fit in which a statistically non-significant chi-square value is expected of models considered to be well-fitting. Results indicated that the model fit was good, $SB\chi^2(27, N = 198) = 32.26$, $p = .22$.

To test for invariance across gender, we obtained the best-fitting models of each group independently [27]. The model for boys was good, $SB\chi^2(27, N = 173) = 27.42$, $p = .44$. Likewise, the model for girls was good, $SB\chi^2(27, N = 219) = 26.55$, $p = .49$. A test of equal form with no equality constraints imposed on the parameters was first established. Subsequently, in a sequential manner, factor loadings and factor variance were constrained to be equal across boys and girls. Because the difference between two robust scaled chi-square statistics is not itself distributed as chi-square, chi-square differences were adjusted appropriately with Satorra and Bentler’s [31] correction. The degree of invariance is typically assessed by the $\Delta\chi^2$ value (or $\Delta SB\chi^2$ value) between two nested models. A statistically nonsignificant difference between the two models would be evidence of invariance across groups. Results suggested invariance of form, factor loadings, and factor variance of the 1-factor cyberbullying questionnaire across gender (see Table 1). This cyberbullying questionnaire was subsequently used in the present research.

Table 1 Testing for gender invariance: results of multigroup confirmatory factor analyses

Model	SB χ^2	df
Gender invariance		
Model 1: Model with no equality constraints imposed	54.01	54
Model 2: Model 1 with factor loadings constrained	58.66	62
Model 3: Model 2 with factor loadings and factor variance constrained	77.36	63
Model 2–Model 1 ($\Delta\text{SB}\chi^2(8) = 4.84, p = .77$)	4.84	8
Model 3–Model 1 ($\Delta\text{SB}\chi^2(9) = 16.32, p = .06$)	16.32	9

SB χ^2 = Satorra-Bentler rescaled χ^2

Consent and Procedure

The Research Ethics Board at the Division of Psychology, Nanyang Technological University, Singapore, approved the study. Approval was also obtained from the Ministry of Education in Singapore and the schools prior to conducting the research. Parental consent was obtained via letters and forms sent home and subsequently returned to the schools. Adolescent assent was obtained in person. The participation rate was 93.6%. The questionnaire was administered in English as English is the main language of instruction for schools in Singapore.

Data Analytic Plan

A hierarchical multiple regression analysis was performed with cyberbullying scores as the dependent variable. In Step 1, the main effects of affective empathy, cognitive empathy, and gender were entered. Two-way and three-way interactions were entered in Steps 2 and 3, respectively. Gender was dummy coded as 0 for girls and 1 for boys, and both affective and cognitive empathy were centered using the sample mean prior to creating and entering the interaction terms into the equations. The testing, probing and interpretation of interaction effects followed methods outlined by Aiken and West [32].

Results

Table 2 contains means, standard deviations, and correlations for all the study variables. The percentages of boys and girls involved in cyberbullying were 23.6 and 15.1%, respectively. For males, 19.9% were classified as infrequent bullies and 3.7% were classified as frequent bullies. For females, 14.2% were classified as infrequent bullies and 0.9% were classified as frequent bullies.

Table 3 presents the results from the hierarchical multiple regression analysis. In Step 1, results indicated that low affective empathy was associated with higher cyberbullying. Results in Step 2 showed no significant two-way interactions. Results of Step 3 indicated that a significant three-way interaction, $\Delta R^2 = .03$, $\Delta F(1, 384) = 10.78$, $p < .01$, $\beta = -.26$. We plotted the 3-way interaction and tested the statistical significance of slope differences among all 6 pairs of slopes (see Fig. 1) using procedures suggested by Aiken and West [32]. Of the 6 pairs of slopes, the slope difference between (1) and (3)

Table 2 Means, standard deviations, and correlations of study variables

Variable	Males		Females		1	2	3
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1. Affective empathy	35.29	6.33	40.37	5.84	–	.37**	–.10
2. Cognitive empathy	31.42	5.10	33.77	4.47	.33**	–	–.10
3. Cyberbullying	11.96	4.72	10.94	2.75	–.11	–.11	–

** $p < .01$

Correlations for males are printed above the diagonal and correlations for females are printed below the diagonal. The effect sizes associated with the correlations, computed using Cohen's d , ranged from $d = .20$ to $d = .80$

Table 3 Moderated multiple regression analysis predicting cyberbullying

Predictor measure and step	β	R^2	ΔR^2	ΔF
Step 1				
Affective empathy	–.12*			
Cognitive empathy	–.07			
Gender	.07	.04	.04	5.19**
Step 2				
Affective empathy	–.14			
Cognitive empathy	–.05			
Gender	.07			
Affective empathy \times cognitive empathy	.01			
Affective empathy \times gender	.03			
Cognitive empathy \times gender	–.02	.04	.00	0.09
Step 3				
Affective empathy	–.19*			
Cognitive empathy	–.10			
Gender	.11*			
Affective empathy \times cognitive empathy	.19*			
Affective empathy \times gender	.05			
Cognitive empathy \times gender	–.03			
Affective empathy \times cognitive empathy \times gender	–.26**	.07	.03	10.78**

* $p < .05$; ** $p < .01$

Gender was coded 0 for girls and 1 for boys; both affective and cognitive empathy were centered using the sample mean prior to creating interaction terms and entering them into the regression equations

($t = -2.04$, $p < .01$), and between (2) and (4) ($t = 3.15$, $p < .01$) were statistically significant, after Bonferroni correction.

Analyses of slope differences suggest that at low affective empathy, both boys and girls who also had low cognitive empathy had higher scores on cyberbullying than those who had high cognitive empathy. At high affective empathy, for boys, a similar pattern was found; those with low cognitive empathy had higher cyberbullying scores than those who had high cognitive empathy. However, for girls with high affective empathy, high or low levels of cognitive empathy resulted in indistinguishable levels of cyberbullying.

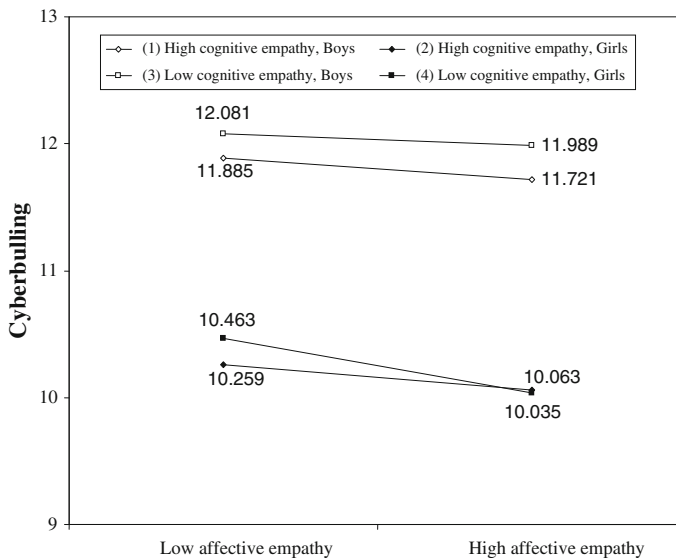


Fig. 1 Three-way interaction of affective empathy, cognitive empathy, and gender in predicting cyberbullying scores

Discussion

This study sought to investigate the conjoint influence of affective empathy, cognitive empathy and gender on cyberbullying behaviour among adolescents. Rates of cyberbullying found were comparable to those found in the US, Canada and UK [3, 17, 18]. Results from the present study contribute to a growing body of research that suggests that cyberbullying is a universal issue affecting adolescents internationally. Consistent with previous research, girls had higher mean scores on both affective and cognitive empathy compared to boys, but the magnitude of the difference was greater for affective empathy [21].

In a separate but related body of empathy research, researchers found that moral judgment of boys was more directly based on perspective-taking, a cognitive aspect of empathy, compared to moral judgment of girls [25]. Even though it could be argued that low affective empathy is the key variable contributing to offline bullying behavior [12], cyberbullying has similarities with indirect bullying which has links with cognitive empathy. Interactions in cyberspace allow individuals to remain anonymous and reduce the sensitivity an individual has towards others and his/her surroundings. These processes coupled with reduced social and contextual cues may facilitate a dip in both affective and cognitive empathy resulting in deregulated behavior for adolescents [33].

It is only through the examination of both types of empathy together with gender that we are able to better understand the complexity of the patterns of relationships involved. The significant three-way interaction between affective empathy, cognitive empathy, and gender found in this study suggests that unlike the case of offline bullying, the contribution of cognitive empathy to cyberbullying cannot be ignored and it plays a different role for boys and girls. At low affective empathy, both boys and girls reported similar behavioral responses—those who were also low on cognitive empathy reported more cyberbullying

behaviors than those who were high on cognitive empathy. However, at high affective empathy, boys continued to report a similar pattern of behavior—those who were also low on cognitive empathy reported more cyberbullying behaviors than those who were high on cognitive empathy, but for girls, regardless of their levels of cognitive empathy (high or low), they reported similar and indistinguishable levels of cyberbullying behavior. It appears that high affective empathy buffers the impact of low cognitive empathy on cyberbullying for girls but not for boys. Based on Silfver and Helkama's [25] work, cognitive empathy may play a larger role in moral decision making for boys compared to girls.

Two main implications arise from the present findings. First, empathy training and education should be included in cyberbullying intervention programs, with additional emphasis on cognitive components of empathy for boys and affective components of empathy for girls. Such training has been successful in reducing offline aggressive, bullying behaviour [34]. The effect sizes vary across studies but on average, the magnitude is of a small to medium range [35, 36]. For example, adolescents could be taught to view issues and grievances from the victim's perspective, and to learn to vicariously experience the emotions of the victim as opposed to engaging in typical responses of victim blaming [37]. Generalizing these cognitive and affective empathy skills from an offline to an online context with reduced social-contextual cues is a big challenge. Therefore it is important in the context of providing empathy training and education, to personalize the serious and real consequences of cyberbullying (e.g., suicide), sending the message that if these consequences can happen to a fellow peer, it could happen to anyone including themselves.

Second, Ybarra and Mitchell [19] have highlighted that positive caregiver-child relationships may be important in helping to decrease the likelihood of online aggression. Supportive adult caregivers such as parents or teachers could serve as mentors to model appropriate empathic responses [38]. Research studies on the importance of positive parent-child and teacher-student relationships provide some initial empirical support for Ybarra and Mitchell's [19] assertion. For example, studies using both Asian and Western adolescent samples have shown that positive parent-child and teacher-student relationships have been associated with reductions in offline aggressive behavior [19, 39–41]. Further research is necessary to examine the importance of positive caregiver-child relationships in reducing cyberbullying.

As far as we are aware, this is the first study investigating both types of empathy together with gender on cyberbullying behavior. Previous research studies have either focused primarily on traditional offline bullying behavior or have not distinguished between types of empathy. Examining these relevant variables together in a single study allows for a more comprehensive understanding of the complex pattern of relationships among them. At present, generalizability of these findings to the population remains limited and current results await further replication especially when the size of the effect is small. Our data were based on adolescents' self reports, and significant associations obtained may reflect problems associated with shared method variance. Based on our current study, only a small percentage of adolescents was classified as frequent cyberbullies. Even though adolescents completed the questionnaires anonymously and this could be argued as a feature to guard against social desirability, nonetheless, the potential influence of social desirability cannot be totally discounted. Future studies could consider utilizing a multiple informant and multiple method strategy. Given the correlational and cross-sectional nature of the study we were not able to establish directionality. Future longitudinal research is needed to establish causal directions of the relations found.

Summary

Results from hierarchical multiple regression analysis indicated a significant three-way interaction. At low affective empathy, both boys and girls who also had low cognitive empathy had higher scores on cyberbullying than those who had high cognitive empathy. This pattern of results was similarly found for boys at high affective empathy. However, for girls, high or low levels of cognitive empathy resulted in similar levels of cyberbullying. Implications of these findings include the need for empathy training and the importance of positive caregiver-child relationships in reducing cyberbullying behavior among adolescents.

Given the prevalence of cyberbullying worldwide and its possible consequences, it would be important to first replicate these results, and then develop and empirically evaluate educational intervention programs that empower youth to safely use online services such as blogs and social networking. Such interventions should include empathy training as previously mentioned, Internet etiquette, and healthy Internet behavior. The goal is to increase prosocial online behavior and to reduce online aggression.

Acknowledgments The authors would like to thank Vania Yip for her assistance with this project. This research was supported by an Academic Research Fund Tier 1 grant [RG96/07] awarded to the first author.

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