




The relationship between the big five and cyberbullying among college students: the mediating effect of moral disengagement

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Abstract

The present study examined the prevalence of cyberbullying and the mediating effect of moral disengagement in the relationship between the Big Five personality traits and cyberbullying. We recruited 655 undergraduates to complete the NEO Five-Factor Inventory, Moral Disengagement Scale, and Cyberbullying Questionnaire. The results revealed: (1) significant gender differences in cyberbullying, with males reporting more cyberbullying than females in all three dimensions: perpetration, victimization, and bystander behavior; (2) agreeableness was negatively related to engaging in perpetration, victimization, and bystander behavior, whereas neuroticism was only positively related to bystander behavior; and (3) moral disengagement played a partially mediating role in the relationship between neuroticism and bystander behavior, as well as the relationship between agreeableness and bystander behavior. Moreover, moral disengagement played a totally mediating role in the relationship between agreeableness and engagement in perpetration, as well as the relationship between agreeableness and involvement in victimization.

Keywords College students · Big five personality · Cyberbullying · Moral disengagement

Introduction

With the rapid spread of the Internet and electronic communication, increasing numbers of people are using information and communication technologies (ICT) such as computers and mobile phones to communicate with others, share ideas, and gather information from the Internet (Nixon 2014). On the one hand, usage of such ICT is very convenient. However, it has also produced a negative consequence, namely, increasing the occurrence of cyberbullying. This is a new form of aggression, which has been defined as willful and repeated harm of an individual/group inflicted through the use of computers, cell phones, and other electronic devices (Hinduja and Patchin 2009; Patchin and Hinduja 2006).

Cyberbullying occurrences often involve three prominent parties, namely the bullies, victims, and bystanders (i.e.,

witnesses). People who commit a bullying incident online are often referred to as bullies; victims are those who have been bullied online, whereas bystanders are those who have witnessed a bullying/victimization incident online, regardless of them being passive (doing nothing when witnessing cyberbullying) or active (approving bullies' acts or defending victims; Balakrishnan 2018).

Cyberbullying has some potential negative effects. For example, researchers have found that being a cyberbully is associated with high levels of aggression, low empathy, depression, problematic alcohol use, hostility and psychoticism (Aricak 2009; Savage and Tokunaga 2017; Selkie et al. 2015; Zych et al. 2018). Being a victim is often associated with low self-esteem, depression, anxiety, suicidal ideations and attempts (Schenk and Fremouw 2012; Brack and Caltabiano 2014; Mitchell et al. 2016; Selkie et al. 2015), whereas passive bystanders often exhibit low levels of empathy (Van Cleemput et al. 2014).

Researchers worldwide have revealed significant inconsistencies in the reported prevalence of cyberbullying. A systematic review of empirical studies on cyberbullying in adults (Jenaro et al. 2018) summarized dozens of studies and pointed out that victim percentages range from 2.38 to 90.86%, perpetrator percentages range from 0.56 to 54.3%, and bystander percentages range from 36.2 to 68.8%. Given the popularity

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of cyberbullying and its devastating consequences, it is important to understand why people perform such acts, what factors influence them and what internal mechanisms may promote or hinder those behaviors. Studies examining such issues could help develop interventions to reduce the incidence of cyberbullying and its impact.

Gender and Cyberbullying

Gender is a crucial individual difference factor influencing human behavior, and the effect of gender on cyberbullying is controversial. Some studies have found that males are more likely to be perpetrators and victims of cyberbullying than females (Pelfrey and Weber 2013; Wong et al. 2014; Yang et al. 2013; Zhou et al. 2013). In contrast, other studies have shown that males are more likely to be perpetrators, whereas females are more likely to be victims (Festl and Quandt 2013; Heiman et al. 2015; Wachs et al. 2015). However, other findings have suggested that males are more likely to bully than females, but that there are no gender differences in victimization (Baroncelli and Ciucci 2014; Gámez-Guadix et al. 2014). Yet more studies have found no gender differences in perpetration, but also that more females were victims (Beckman et al. 2013; Cappadocia et al. 2013), whereas some studies found no gender differences in perpetration or victimization (Kowalski and Limber 2013; Navarro et al. 2015; Shin and Ahn 2015; Sticca et al. 2013).

It is noteworthy that participants in all the above studies were aged from 10 to 19, and a meta-analysis revealed that gender differences in cyberbullying were moderated by age: Females were more likely to report cyberbullying during early adolescence while males were more likely to be cyberbullies during later adolescence (Barlett and Coyne 2014). Whether such changes will extend into adulthood and what the gender differences will be in the three groups mentioned earlier (i.e., bullies, victims, and bystanders) are questions that remain to be answered. In addition, few studies have examined gender differences in bystanders of cyberbullying (e.g., Balakrishnan 2018; Campbell et al. 2017), especially for university students. Further studies are needed to address these issues.

The Big Five and Cyberbullying

Personality researchers have investigated potential individual difference variables as contributors to cyberbullying. For example, research have stated that cyberbullying is related to impulsivity, ‘callousness-uncaring’ traits, and personality traits in the Big Five and ‘dark triad’ (Machiavellianism, narcissism, psychopathy; Ciucci and Baroncelli 2014; Festl and Quandt 2013; Gibb and Devereux 2014; Goodboy and Martin 2015; van Geel et al. 2017; Workman 2012). In the present study, we focused on how the Big Five personality

traits are associated with cyberbullying perpetration, victimization, and bystanding behaviors.

The Big Five personality traits include extraversion (sociable, gregarious, assertive, talkative, active), agreeableness (courteous, trusting, good-natured, cooperative, tolerant), conscientiousness (careful, responsible, organized), neuroticism (anxious, depressed, angry, embarrassed, worried, and insecure), and openness to experience (imaginative, cultured, curious, original, intelligent; Barrick and Mount 2010). Previous studies have found that perpetration of cyberbullying is related to low agreeableness, low conscientiousness, and high neuroticism (Celik et al. 2012; Festl and Quandt 2013; Karl et al. 2010; Kokkinos et al. 2013; Smith 2016; van Geel et al. 2017). Also, victimization in cyberbullying has been associated with low extraversion, low conscientiousness, and high neuroticism (Celik et al. 2012; Kokkinos et al. 2013; Smith 2016). However, while existing research on cyberbystanders focuses on psychological or individual factors, such as moral disengagement, anti-social conformity, impulsivity, and empathy (Erreygers et al. 2016; Song and Oh 2018; Van Cleemput et al. 2014), research on cyber-bystanders and the Big Five is scarce. Few studies have investigated the Big Five personality traits and all three cyberbullying roles (bullies, victims, bystanders) simultaneously. Given the limitation of available research, the relationship between cyberbullying and Big Five personality traits should be further examined.

Moral Disengagement and Cyberbullying

Why might persons with different personality traits enact cyberbullying behaviors to varying degrees? The general aggression model (Anderson and Bushman 2002) could help us understand this question in terms of three levels: personal and situational factors, internal states, and decision-making processes (Kokkinos et al. 2016b). According to the model, personal factors (e.g., personality traits) interact with situational factors (e.g., conflict, online social network) to influence internal states of individuals (e.g., heightening aggressive cognition, affecting socio-cognitive processes), affecting decision-making processes regarding whether or not a person will engage in cyberbullying. Specifically, the general aggression model claims that the Big Five personality traits may influence a person’s propensity to aggression and cyberbullying via distortion of socio-cognitive processes (i.e., the mechanism of justifying aggressive behaviors).

An important contribution to analyzing the socio-cognitive correlates of aggressive behaviors is the social cognitive theory of the moral self (Bandura 1991; Kokkinos et al. 2016b). According to this theory, aggression is related to moral biases such as moral disengagement. Moral disengagement is a cognitive mechanism moralizing actions that would be considered immoral through self-regulation processes (Bandura et al. 1996; Gini et al. 2015). According to the moral

disengagement theory (Bandura 1990), most people have established personal moral behavior standards, and these standards play a self-regulatory role that guides good behaviors and inhibits immoral behaviors. Behaviors violating these standards would result in guilt and remorse, which hinders immoral behaviors. Moral disengagement helps people reduce tension created when performed behaviors do not match personal standards and moral norms (Wang et al. 2016), which may make individuals exhibit more aggressive behaviors in online social networks.

Some empirical studies have supported moral disengagement theory with respect to cyberbullying. For example, studies have found that moral disengagement can positively predict cyberbullying in adolescents (Lazuras et al. 2013), and this association still remained even when controlling for knowledge of cyberbullying moral standards (Bussey et al. 2015a). Moral disengagement has also been found to be positively correlated with the cyberbullying behaviors of junior high school students (Pomari and Wood 2010). The overall level of moral disengagement, as well as its separate dimensions like diffusion of responsibility and attribution of blame, can all positively predict cyberbullying behaviors of youths between the ages of 12 and 15 (Robson and Witenberg 2013). Compared to traditional bullies, cyberbullies are more lacking in morality and exhibit higher moral disengagement (Wachs 2012), and compared to non-bullies, cyberbullies report higher scores in moral disengagement (Perren and Sticca 2011). A meta-analysis has also suggested that one of the strongest associations with cyberbullying perpetration is moral disengagement (Kowalski et al. 2014), and cyberbullies and cyber-victims have been found to exhibit higher levels of moral disengagement among high school students (Renati et al. 2012). However, the majority of such studies have focused on teenagers, and few studies have examined the relationship between cyberbullying bystanders and moral disengagement. Further studies are needed to investigate these issues.

In addition, given the mechanism of moral disengagement that can serve as a way to justify aggressive behaviors (Wang et al. 2016), the Big Five personality traits, as personal factors, may influence cyberbullying via the mechanism of moral disengagement. Previous studies have documented the mediating effect of moral disengagement in the relationships between personal factors, including trait anger, empathy, callous-unemotional traits, cyberbullying, and aggression (Kokkinos et al. 2016b; Wang et al. 2017a, b). Yet, whether moral disengagement can mediate the association between the Big Five and cyberbullying has not been tested and needs further study.

Moral Disengagement and the Big Five

Few studies have examined the relationships between moral disengagement and the Big Five personality traits, and results

on this topic have been mixed. One study found that agreeableness and conscientiousness could negatively predict moral disengagement, whereas openness, extraversion, and neuroticism could positively predict moral disengagement (Sagone and Caroli 2013). Also, Egan et al. (2015) found that low agreeableness and conscientiousness were correlated with high moral disengagement, but found no associations between moral disengagement and extraversion as well as emotional stability. In contrast, a recent study found that only emotional instability and agreeableness were related to moral disengagement (Caprara et al. 2017).

The relationships of personality traits to moral disengagement seem stable over a period of time. For example, a longitudinal study found agreeableness could negatively predict moral disengagement four years later (Caprara et al. 2013). Despite inconsistent findings, previous studies have suggested that persons with different Big Five personality traits may show different levels of moral disengagement, which may further influence people's engagement in cyberbullying to different degrees.

The Big Five, Moral Disengagement, and Cyberbullying

To date, no research has investigated the mediating effect of moral disengagement on the relationship between Big Five personality traits and cyberbullying. According to the general aggression model, the online environment interacts with personality factors to create an individual's internal social cognition process, having an influence on the decision-making process regarding whether an individual will engage in cyberbullying or not. Also, according to Bandura's moral disengagement theory, an individual will overcome guilt and shame through the moral disengagement mechanism before conducting cyberbullying behaviors. Based on these theories and the previously mentioned studies, it seems logical to suggest that moral disengagement plays a mediating role in the relationship between Big Five personality traits and cyberbullying.

The Current Study

To address the previously mentioned issues, we focused in the present study on three objectives. First, we examined gender differences in perpetrators, victims, and bystanders of cyberbullying among college students. Second, we investigated relationships of cyberbullying to the Big Five among college students. Third, we identified whether moral disengagement plays a mediating role in the relationship between the Big Five personality traits and cyberbullying. Based on the previously mentioned theoretical models and research findings, we hypothesized that perpetration of cyberbullying would be negatively correlated with agreeableness (H1a)

and conscientiousness (H1b), but positively correlated with neuroticism (H1c). Conversely, we also hypothesized that victimization of cyberbullying would be negatively correlated with extraversion (H2a) and conscientiousness (H2b), but positively correlated with neuroticism (H2c). Finally, we hypothesized that moral disengagement would have a mediating effect on the relationship between Big Five personality traits and cyberbullying (H3).

Methods

Participants

Based on accessibility, the present study used convenient cluster sampling technology to recruit 855 college students from five universities in mainland China. Correspondingly, 855 questionnaires were sent in print form, and 655 valid questionnaires were returned: a response rate of 76.6%. Participants ranged from 17 to 26 years old ($M = 19.22$, $SD = 1.55$), consisting of 305 males (46.56%), 347 females (52.98%), and three persons (0.46%) who did not report their gender.

Measures

NEO Five-Factor Inventory (NEO-FFI)

The NEO Five-Factor Inventory (NEO-FFI) developed by Costa and McCrae (1992) was used to measure the Big Five personality traits. The NEO-FFI is a shortened version of the NEO Personality Inventory (NEO-PI), comprising 60 items (12 items for each trait) rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The questionnaire has been demonstrated to be reliable and valid in a sample of Chinese university students with the Cronbach's α of all five dimensions being beyond 0.6 (Yao and Liang 2010). In the present study, the internal consistency coefficients of neuroticism, extraversion, openness, agreeableness, and conscientiousness were 0.80, 0.70, 0.18, 0.48 and 0.65, respectively. A CFA showed that the index of model fit was not very adequate: ($\chi^2 = 5334.567$, $df = 1700$, $p < 0.001$; CFI = 0.545, TLI = 0.527, RMSEA = 0.057, SRMR = 0.075).

Cyberbullying Questionnaire

The cyberbullying questionnaire was adapted from Huang and Chou's (2010) survey. This comprises 10 items covering many kinds of electronic communication tools (e.g., e-mails, QQ, WeChat, chat rooms, web forums, weblogs, and cellphone text messages) and different forms of cyberbullying (e.g., threats, harassment, insults, making jokes, spreading rumors) to investigate cyberbullying phenomena in terms of

experiences as perpetrators, victims, and bystanders. Each item includes three questions participants answer from three perspectives (bullies, victims, and bystanders), such as "Hurting, threatening and harassing someone in cyberspace: Have you ever witnessed such incidents? / Have you ever suffered such incidents? / Have you ever done such incidents?" Thus, cyberbullying in this questionnaire included three dimensions, which are bystanders, victims and bullies, respectively. Each question is rated on a 5-point Likert scale (0 = never, 1 = once or twice, 2 = twice or three times in a month, 3 = once a week, 4 = several times a week). The higher the total score for each role (perpetrator, victim, bystander), the more frequently the respondent recalls participating in behaviors consistent with the role. Thus, participants each have three total scores, indicating their frequency of participation in cyberbullying as a perpetrator, victim, and bystander. The internal consistency when validated originally was optimal: $\alpha_{\text{cyber-bystanders}} = 0.92$, $\alpha_{\text{cyber-perpetration}} = 0.95$, $\alpha_{\text{cyber-victimization}} = 0.95$. A CFA showed that the validity index of the questionnaire presented a high goodness of fit ($\chi^2 = 1880.426$, $df = 402$, $p < 0.001$; CFI = 0.914, TLI = 0.907, RMSEA = 0.075, SRMR = 0.05).

Moral Disengagement Questionnaire

The moral disengagement questionnaire created by Detert et al. (2008) was used. The questionnaire comprises 32 items covering eight moral disengagement mechanisms: moral justification, euphemistic labeling, advantageous comparison, displacement of responsibility, diffusion of responsibility, distortion of consequences, attribution of blame, and dehumanization. Items are rated on a 5-point Likert scale. The higher the score, the higher the moral disengagement level. The internal consistency when validated originally was optimal: $\alpha = 0.94$. CFA showed that the validity index of the questionnaire presented a goodness of fit ($\chi^2 = 1888.421$, $df = 436$, $p < 0.001$; CFI = 0.856, TLI = 0.836, RMSEA = 0.072, SRMR = 0.057).

Data Processing

SPSS 19.0 was used for data preprocessing, descriptive statistics, reliability analysis, correlation analysis of variables as well as the analysis of mediating effects. Mplus 7.0 was used for confirmatory factor analysis.

Results of the Common Method Bias Test

We used the Harman single-factor test to statistically verify the common method bias in order to rule out its effect on the self-reported data. The results showed that 27 factors had eigenvalues greater than 1, and the first one explained 17.99% of total variance, which was less than the judgment standard

(40%) proposed by Podsakoff et al. (2003). This method showed that common method bias did not exist.

Gender Differences in Cyberbullying

The results of the cyberbullying questionnaires showed that the cyberbullying prevalence was 37.6% in terms of engaging in perpetration (65.4% for male students, 21% for female students). In terms of involvement in victimization, the cyberbullying prevalence was 57.3% (71.8% for male students, 44.4% for female students). However, in terms of engaging as bystanders, the cyberbullying prevalence was 92.4% (93.1% for male students, 91.6% for female students). Table 1 lists the *t* test results of gender differences in cyberbullying for the three dimensions: bullies, victims, and bystanders. Results revealed that more male than female students were involved in cyberbullying in all three dimensions. In other words, male students were more likely to be cyberbullies, victims, or bystanders.

Relationships among Big Five Personality Traits, Moral Disengagement, and Cyberbullying: correlation Analysis

Table 2 lists the Pearson correlation coefficients for the relationships among Big Five personality traits, moral disengagement, and cyberbullying. Neuroticism was significantly positively correlated with moral disengagement level ($r = 0.10$). In particular, it was significantly positively correlated with advantageous comparison, displacement of responsibility, distortion of consequences, and dehumanization (r between 0.08 and 0.13). It was not correlated with moral justification, euphemistic labeling, diffusion of responsibility, or attribution of blame. Extraversion was significantly negatively correlated with moral disengagement ($r = -0.12$). It was significantly negatively correlated with moral justification, euphemistic labeling, displacement of responsibility, distortion of consequences, attribution of blame, and dehumanization (r between -0.08 and -0.13), and it had no correlation with advantageous comparison or diffusion of responsibility. Openness to experience had no correlation with moral disengagement or its eight mechanisms. Agreeableness was significantly negatively correlated with moral disengagement and its eight mechanisms (r between -0.17 and -0.34). Conscientiousness

was significantly negatively correlated with moral disengagement and its seven mechanisms except euphemistic labeling (r between -0.08 and -0.13).

Neuroticism was only significantly positively correlated with engagement in bystanding behaviors. It had no correlation with engagement in perpetration or victimization. In other words, the higher the neuroticism of an individual, the more often he or she has witnessed cyberbullying behaviors as a bystander. Agreeableness was significantly negatively correlated with all three dimensions (r between -0.16 and -0.23). In other words, the higher the agreeableness of an individual, the less likely he or she is to engage in perpetration, victimization, or bystander behavior. Extraversion, openness to experience, and conscientiousness had no correlations with cyberbullying.

Moral disengagement was significantly positively correlated with all three groups (r between 0.20 and 0.51). In other words, the higher the moral disengagement level of an individual, the more likely he or she is to engage in perpetration, victimization, or bystander behavior. The eight mechanisms of moral disengagement were significantly positively correlated with all three dimensions (r between 0.13 and 0.51).

Mediating Effect of Moral Disengagement

The present study followed MacKinnon's four-step procedure to test the mediating effect of moral disengagement on the relationship between the Big Five and cyberbullying (MacKinnon 2008; Wang et al. 2017b). This procedure requires: (a) a significant relationship between the Big Five and cyberbullying; (b) a significant relationship between the Big Five and moral disengagement; (c) a significant relationship between moral disengagement and cyberbullying while controlling for the Big Five; and (d) a significant coefficient for the indirect path between the Big Five and cyberbullying via moral disengagement. Whether the last condition is satisfied is judged by the bias-corrected percentile bootstrap. As shown in the above Pearson correlation analysis, we found that neuroticism, moral disengagement, and bystander behavior were associated with each other, as were agreeableness, moral disengagement and perpetration/victimization/bystander behavior. Thus, we investigated only the mediating effect of moral disengagement on the relationship between neuroticism and bystanders, as well as on the relationship between agreeableness and bystander behavior/perpetration/victimization. Gender and Age were included in all our analyses as covariates.

As shown in Tables 3, 4, 5, 6 and Fig. 1, multiple regression analysis indicated that, in the first step, neuroticism was significantly positively associated with bystanders ($b = 0.12$, $p < 0.01$); agreeableness was significantly negatively associated with bystanders ($b = -0.13$, $p < 0.01$), victimization ($b = -0.16$, $p < 0.001$) and perpetration ($b = -0.06$, $p < 0.001$; see model 1 of Tables 3, 4, 5, 6). In the second step, neuroticism

Table 1 A comparison of cyberbullying between genders

	Male (<i>N</i> = 305) <i>M</i> ± <i>SD</i>	Female (<i>N</i> = 347) <i>M</i> ± <i>SD</i>	<i>t</i>
Cyberbullies	15.51 ± 7.99	10.68 ± 2.50	10.14***
Cyberbullying victims	16.83 ± 8.02	11.52 ± 3.76	10.59***
Bystanders	21.54 ± 8.39	18.68 ± 7.76	4.51***

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 2 Correlation analysis of Big Five personality, moral disengagement, and cyberbullying

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
2	-.43**																	
3	-.06	-.05																
4	-.33**	.30**	-.06															
5	-.40**	.40**	.10*	.23**														
6	.05	-.12**	-.02	-.32**	-.09*													
7	.05	-.09*	-.03	-.31**	-.11**	.76**												
8	.13**	-.07	-.06	-.17**	-.08*	.46**	.51**											
9	.08*	-.13**	.03	-.29**	-.12*	.76**	.72**	.47**										
10	.07	-.05	-.01	-.29**	-.07	.72**	.76**	.52**	.68**									
11	.13**	-.13**	-.00	-.31**	-.13**	.72**	.72**	.51**	.71**	.71**								
12	.06	-.08*	.01	-.30**	-.10**	.79**	.75**	.50**	.73**	.71**	.75**							
13	.12**	-.11**	-.02	-.32**	-.11**	.74**	.70**	.52**	.73**	.71**	.71**	.74**						
14	.10*	-.12**	-.02	-.34**	-.12**	.88**	.88**	.66**	.86**	.86**	.86**	.89**	.86**					
15	.02	-.03	.04	-.23**	-.00	.51**	.45**	.23**	.44**	.42**	.45**	.47**	.44**	.51**				
16	.01	.01	.00	-.22**	.01	.46**	.41**	.19**	.42**	.39**	.42**	.42**	.40**	.46**	.86**			
17	.10*	-.02	.03	-.16**	-.01	.19**	.17**	.13**	.17**	.18**	.16**	.16**	.18**	.20**	.42**	.48**		
18	.06	-.02	.03	-.23**	-.00	.44**	.39**	.21**	.39**	.38**	.39**	.40**	.39**	.44**	.87**	.90**	.79**	
<i>M</i>	34.70	39.60	36.12	41.59	40.14	7.86	8.34	10.53	8.87	8.46	8.31	8.03	8.28	68.68	20.01	13.99	12.93	46.93
<i>SD</i>	6.94	5.62	3.79	4.42	5.05	3.24	3.20	2.80	2.79	3.12	3.00	3.16	2.93	20.55	8.17	6.67	6.23	17.77

1 = neuroticism; 2 = extraversion; 3 = openness to experience; 4 = agreeableness; 5 = conscientiousness; 6 = moral justification; 7 = euphemistic labeling; 8 = advantageous comparison; 9 = displacement of responsibility; 10 = diffusion of responsibility; 11 = distortion of consequences; 12 = attribution of blame; 13 = dehumanization; 14 = moral disengagement; 15 = perpetration; 16 = victimization; 17 = bystanders; 18 = cyberbullying

was significantly positively associated with moral disengagement ($b = 0.16, p < 0.001$), while agreeableness was significantly negatively associated with moral disengagement ($b = 0.28, p < 0.001$; see model 2 of Tables 3, 4, 5, 6). In the third step, when controlling for neuroticism, moral disengagement was significantly positively associated with bystander behavior ($b = 0.15, p < 0.01$); when controlling for agreeableness, moral disengagement was significantly positively associated with bystander behavior ($b = 0.13, p < 0.01$), victimization ($b = 0.35, p < 0.001$) and perpetration ($b = 0.41, p < 0.001$). Meanwhile, when controlling for moral disengagement,

neuroticism was significantly positively associated with bystander behavior ($b = 0.10, p < 0.05$), agreeableness was significantly negatively associated with bystander behavior ($b = -0.09, p < 0.05$), but not significant associated with victimization ($b = -0.05, p > 0.05$) and perpetration ($b = -0.04, p > 0.05$; see model 3 of Tables 3, 4, 5, 6). Finally, the bias-corrected percentile bootstrap method indicated that the indirect effect of neuroticism on bystanders via moral disengagement was significant, $ab = 0.03, SE = 0.01, 95\% CI = [0.01, 0.05]$. The indirect effects of agreeableness on bystanders ($ab = -0.07, SE = 0.02, 95\% CI = [-0.12, -0.02]$),

Table 3 The mediating effect of neuroticism on cyberbullying bystanders

Predictors	Model 1		Model 2		Model 3	
	(cyber-bystanders)		(moral disengagement)		(cyber-bystanders)	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Gender	-0.19	-4.90***	-0.42	-11.56***	-0.12	-3.07**
Age	0.02	0.44	-0.003	-0.08	0.02	0.46
Neuroticism	0.12	3.13**	0.16	4.39***	0.10	2.53*
Moral disengagement					0.15	3.44**
<i>R</i> ²	0.04		0.18		0.06	
<i>F</i>	10.03***		47.82***		10.60***	

b = standardized regression coefficient, *R*² = adjusted *R* square

Table 4 The mediating effect of agreeableness on cyberbullying bystanders

Predictors	Model 1		Model 2		Model 3	
	(cyber-bystanders)		(moral disengagement)		(cyber-bystanders)	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Gender	−0.15	−3.82***	−0.35	−9.75***	−0.11	−2.50*
Age	0.02	0.61	0.08	0.21	0.02	0.59
Agreeableness	−0.13	−3.30**	−0.28	−8.02***	−0.09	−2.24*
Moral disengagement					0.13	3.06**
<i>R</i> ²	0.04		0.23		0.05	
<i>F</i>	10.40***		65.65***		10.24***	

victimization ($ab = -0.15$, $SE = 0.03$, 95% $CI = [-0.21, -0.10]$) and perpetration ($ab = -0.16$, $SE = 0.03$, 95% $CI = [-0.24, -0.12]$) via moral disengagement were also significant. Overall, the four criteria for establishing mediation effects were fully satisfied. Moral disengagement played a partial mediating role in the relationships between neuroticism or agreeableness and bystander behavior; moral disengagement played a totally mediating role in the relationships between agreeableness and victimization and perpetration.

Discussion

The objectives of our research were to investigate gender differences in perpetration, victimization, and bystanders of cyberbullying, to examine the associations between cyberbullying and the Big Five, and to explore the mediating effect of moral disengagement on the relationships between the Big Five and cyberbullying. Our results supported only two of our hypotheses (H1a and H3), but we found that agreeableness was not only negatively associated with perpetration, but also negatively associated with victimization and bystander behavior. In addition, we also found that neuroticism was positively related to bystander behavior. There were significant gender differences in the prevalence of cyberbullying in

terms of perpetration, victimization, and bystander behavior, respectively. Moral disengagement played a mediating role in the relationships between the Big Five and cyberbullying.

Gender Differences in Cyberbullying among College Students

Our study found that cyberbullying was very common among college students and showed significant gender differences. More male college students (65.4%) were found to engage in perpetration incidents than female college students (21%), consistent with previous studies (Akbulut and Eristi 2011; Ozden and Icelliglu 2014). This result may be explained by the gender socialization theory, which suggests that females are more likely than males to obey rules (Ward and Beck 1990). Committing perpetration behaviors could violate the moral norms of individuals and society; thus, females are less likely than males to do such acts. In addition, females generally show a higher level of empathy than males (Fields et al. 2011), which may lead males to exhibit more perpetration behaviors. With regard to cyberbullying victimization, more male college students (71.8%) reported being bullied than female students (44.4%), consistent with previous studies (Akbulut and Eristi 2011; Akbulut et al. 2010). This is also consistent with studies on traditional bullying (Eslea and

Table 5 The mediating effect of agreeableness on cyberbullying victimization

Predictors	Model 1		Model 2		Model 3	
	(cyber-victimization)		(moral disengagement)		(cyber-victimization)	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Gender	−0.37	−10.03***	−0.35	−9.75***	−0.25	−6.67***
Age	−0.002	−0.06	0.08	0.21	−0.005	−0.14
Agreeableness	−0.16	−4.03***	−0.28	−8.02***	−0.05	−1.33
Moral disengagement					0.35	9.15***
<i>R</i> ²	0.17		0.23		0.27	
<i>F</i>	46.29***		65.65***		60.07***	

Table 6 The mediating effect of agreeableness on cyberbullying perpetration

Predictors	Model 1 (cyber-perpetration)		Model 2 (moral disengagement)		Model 3 (cyber-perpetration)	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
	Gender	-0.35	-9.42***	-0.35	-9.75***	-0.20
Age	-0.07	-2.04*	0.08	0.21	-0.08	-2.31*
Agreeableness	-0.16	-4.36***	-0.28	-8.02***	-0.04	-1.12
Moral disengagement					0.41	10.98***
<i>R</i> ²	0.17		0.23		0.30	
<i>F</i>	46.60***		65.65***		93.11***	

Mukhtar 2000; Kumpulainen et al. 1999). Compared to females, males may be more likely to be attacked by fellow males when they exhibit behaviors different from their gender roles (Li 2006), and this pattern may also be applicable to the Internet environment. Concerning cyberbullying bystanders, males (93.1%) were more likely than females (91.6%) to report being a bystander, which may be caused by the gender difference in usage of ICT. Research has found that males have higher knowledge and skills in ICT applications than females (Mustafa 2014). The more exposure individuals have to ICT, the more they may witness cyberbully incidents.

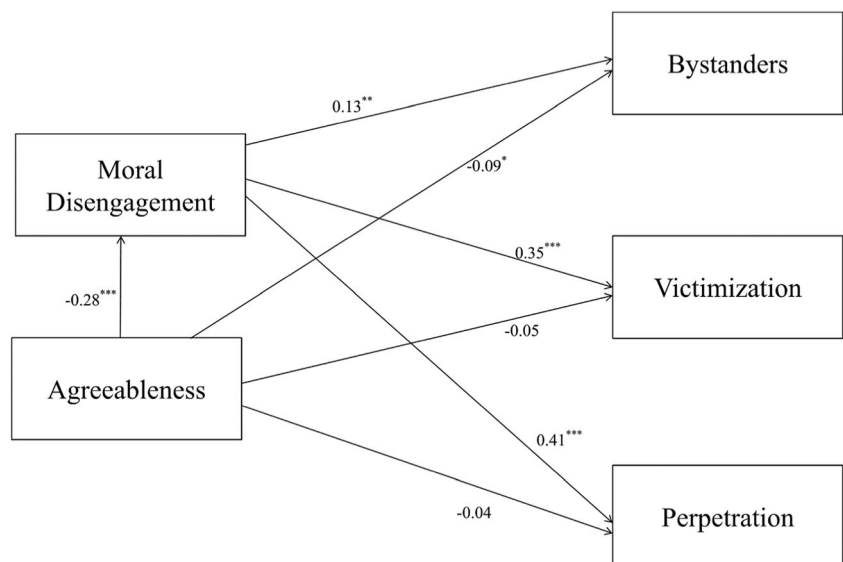
The Big Five and Cyberbullying

The present study found that agreeableness was significantly negatively associated with involvement in perpetration, victimization and bystander behavior, which only supported one of our hypotheses (H1a). This is in line with a study by van Geel et al. (2017), and a meta-analysis on traditional bullying by Mitsopoulou and Giovazolias (2015) where agreeableness was also a negative predictor of traditional bullying.

Individuals with high agreeableness tend to be altruistic and tenderminded, which inhibits them from engaging in harmful behaviors such as cyberbullying (van Geel et al. 2017). Individuals with low agreeableness are not able to effectively manage hostility and disagreement in interpersonal interactions because of low empathy (McCullough et al. 2001). They are likely to be rude, contentious, vindictive, inconsiderate, and uncooperative, and to exhibit deviant interpersonal behaviors (Kokkinos et al., 2016a). They are more likely to exhibit harmful or antisocial behaviors such as laughing at others or making harmful comments on Facebook (Karl et al. 2010), or even taking revenge on others through the Internet (Baldasare et al. 2012).

In addition, our research also found that neuroticism was significantly positively associated with being a bystander. One reason could be that individuals with high neuroticism are generally anxious, fragile, and uncomfortable, and they rarely have social lives as successful as those of people with stable emotions (Hojat 1982). They feel lonely more easily, and thus tend to use the Internet and social media excessively, which may lead them to observe more cyberbullying behaviors

Fig. 1 The mediating effect of moral disengagement in the relationship between agreeableness and three cyberbullying roles



(Celik et al., 2012). Prior research has found that engaging in social behaviors online can reduce individuals' loneliness (Shaw and Gant 2002), and individuals with social anxiety are more likely use the Internet to overcome loneliness (Sheldon 2008). They feel more comfortable with using the Internet to maintain their social relationships than with face-to-face interactions (Ebeling-Witte et al. 2007). In addition, individuals with high neuroticism are more likely to use the Internet to search for information, read news, browse merchandise, and use email, blogs, forums, social networking sites, and cloud services (Kim and Jeong 2015). The results of a meta-analysis also showed that individuals with high neuroticism are more likely to be addicted to the Internet (Kayaş et al. 2016).

Our research did not find any significant associations between extroversion, conscientiousness or neuroticism (except in relation to bystanders) and cyberbullying, which did not support any of our hypotheses except H1a, also inconsistent with previous studies (Celik et al., 2012; Festl and Quandt 2013; Smith 2016). Given the scarcity of research on the Big Five and cyberbullying as well as its contradictory results, further study and eventually a meta-analysis are needed to further clarify associations between the Big Five traits and cyberbullying, and moderators that may explain differences between studies.

The Mediating Role of Moral Disengagement

Our research found that moral disengagement played a partial mediating role in the relationship between neuroticism and cyberbullying bystanders, as well as between agreeableness and cyberbullying bystanders. We also found that the moral disengagement played a totally mediating role in the relationship between agreeableness and cyberbullying perpetration and victimization. These findings supported our hypothesis H3. Previous studies also showed that moral disengagement can mediate the relationships between personal factors (e.g., callous-unemotional traits, empathy, trait anger) and cyberbullying and aggression (Kokkinos et al. 2016b; Wang et al. 2017b). However, the present study is the first to document the mediating effect of moral disengagement in the link between the Big Five and cyberbullying. This finding is in line with the general aggression model (Anderson and Bushman 2002), according to which, personality traits of neuroticism and agreeableness can predict cyberbullying via the mechanism of moral disengagement.

In addition, our research found that moral disengagement was positively associated with cyberbullying, which is in line with previous studies (Bussey et al. 2015a; Meter and Bauman 2016; Orue and Calvete 2016; Wang et al., 2017a, b), and also congruent with Bandura's moral disengagement theory (Bandura et al. 1996). That is, individuals with high-level moral disengagement are more likely to justify cyberbullying

behaviors; thus, they also are more likely to enact such immoral behaviors. Moreover, after controlling for moral disengagement, neuroticism and agreeableness were also significantly correlated with cyberbullying, which suggested that not only is the moral disengagement a crucial mediation mechanism to explain cyberbullying, but also the Big Five personality traits are important in understanding cyberbullying.

Limitations and Practical Implications

The present study has several limitations. First, the data were collected through self-reported measures, which may lead to social desirability bias, a tendency of participants to respond in a way that will be favored by others and society, which may affect the veracity and validity of results. Second, all participants in our sample were Chinese young adults, and did not include clinical samples, which could influence the external validity of the study. Thus, our findings should not be generalized to other ethnic samples because of cultural differences in cyberbullying (Li 2008), and special samples. Third, our research was cross-sectional in design. Readers should be cautious about causal inferences. Last, a major limitation was that the internal consistency reliabilities for the NEO openness and agreeableness factors were low in our study, which may be caused by cultural differences. Previous studies demonstrated that there was no openness factor in the five-factor model in Asian samples when using Norman's (1963) method and stimulus materials (Bond, 1983; Bond and Others, 1975). Chinese native studies also found that the personality structure of Chinese people did not include openness and agreeableness independently, but instead distributed these characteristics through other personality dimensions (Cui and Wang, 2005; Wang and Cui, 2006). Further studies should attempt to use more culturally compatible tools in research.

Despite these limitations, our research also has important practical implications. According to the results, our study may help in the design of some effective interventions to cope with college students' cyberbullying. Given the important role of socio-cognitive mechanisms (i.e., the moral disengagement mechanism) in the relationship between the Big Five and cyberbullying, greater awareness of the underlying mechanism could disrupt the relationship between high neuroticism and low agreeableness, and cyberbullying. Specifically, universities could first pay more attention to the moral education of college students in both offline and online communication, and advocate access to the internet in a positive and healthy way. Second, it is important and necessary that college students learn to take personal responsibility for their cyberbullying conduct: universities should foster in students the idea that there is no excuse for cyberbullying, and government and universities should consider policies that directly constrain deviant behavior among college students. Last,

universities could consider empathy training as a means to reduce moral disengagement, as a higher level of empathy has been found to be related to a lower level of moral disengagement (Bussey et al., 2015b). Doing so may further alleviate some of the possible detrimental effects between high neuroticism, low agreeableness, and cyberbullying.

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Compliance with Ethical Standards

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