The Effect of Perceived Anonymity on Cyberbullying

The Mediating Role of Online Disinhibition and the Moderating Role of Mindfulness

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Abstract. As a worldwide social problem, cyberbullying has received extensive attention from scholars. Cyberbullying has more diverse manifestations than traditional forms of bullying, including exclusion, cyberstalking, and doxxing, which negatively impact the mental health of the victim. This study explores the factors influencing cyberbullying from the perspective of perceived anonymity. A total of 317 valid subjects participated in this study, and completed the Perceived Anonymity Questionnaire, the Cyber De-Inhibition Questionnaire, the Cyberbullying Questionnaire, and the Mindfulness Questionnaire in turn. The results show that: First, perceived anonymity enhances individuals' cyberbullying; Second, perceived anonymity enhances online disinhibition and thus increases an individual's cyberbullying behavior, whereas Mindfulness reduces or inhibits the positive influence of perceived anonymity on cyberbullying.

Keywords: Cyberbullying, Perceived Anonymity, Online Disinhibition, Mindfulness.

1 Introduction

Scholars possess different definitions of the concept of cyberbullying. For example, the United Nations Children's Fund (UNICEF) defines cyberbullying as "the use of digital technology to engage in bullying" [24]. In academic terms, cyberbullying is "intentional aggressive behavior perpetrated repeatedly and over time by groups or individuals using forms of electronic contact against victims who are unable to defend themselves easily"[22]. Cyberbullying typically has a wider variety of manifestations than traditional bullying, with common types of cyberbullying including Exclusion, Cyberstalking, Doxxing, and Trolling[22]. With the popularity of the Internet in recent years, cyberbullying has become a common social problem around the world. For example, approximately 59.8% of people in the United States have experienced cyberbullying[23]. Other scholars have calculated that 18% of American adults have experienced severe online harassment and abuse, 10% have experienced physical threats online, 7% have experienced cyberstalking, and 6% have experienced online

sexual harassment[12]; In the UK, 33.5% of people have experienced cyberbullying [16]; while in Hong Kong, China, Mainland China and Taiwan cyberbullying implementation rates are 20.4%, 7.7% and 20.6% respectively[4].

Cyberbullying can hurt people's mental health. Previous research has shown that cyberbullying is significantly and positively associated with negative emotions (e.g., depression)[15]. For instance, adolescents who are cyberbullied can experience negative emotions such as "sadness, despair, or frustration," "fear of going to school," and skepticism of those around them [15]. Considering the prevalence and severity of cyberbullying, cyberbullying has become a hot topic of concern for scholars around the world[21-22]. This study will focus on the influences that lead to cyberbullying-- perceived anonymity. This is because online anonymity is an important factor in cyberbullying, and perceived anonymity is a specific manifestation of how an individual feels anonymity online. Perceived anonymity refers to the extent to which individuals perceive that their identity is not known to others or that they are unrecognizable as individuals[8]. Deindividuation refers to the state in which people behave differently from their usual behavior when they are part of a group [16].   According to deindividuation theory, when people are anonymous on the Internet, they'll lose their inner discipline and also reduce the cost of unethical behavior. Perceptions of self-awareness and responsibility for one's behavior also decline, resulting in the display of more cyberbullying behaviors[5][14]. However, although many previous studies have examined the relationship between online anonymity and cyberbullying, this study explains this effect from the perspective of online disinhibition[3].

In addition, perceived risk will impact cyberbullying through network disinhibition. Network disinhibition is a phenomenon. In cyberspace, people do or say things they wouldn't say or do in "real life," because they feel less restricted and can express themselves more freely[20]. According to the network disinhibition theory, except for the separation of real and virtual identities, online anonymity likewise minimizes status and authority, it is another major factor contributing to the network disinhibition effect[20]. In real life, people tend to control their behavior to avoid making a bad impression on authorities (such as their bosses and parents);In virtual online environments, however, an individual's real-life social status can remain unknown to others due to online anonymity, it reduces the risk of loss of their social status or authority in the online world, which leads to individuals behaving more misconduct, being aggressive, and harassing others in their online lives[7]. In terms of addition, risk perception theory suggests that whether or not people engage in risk-taking behavior is largely determined by perceived risk. The higher the level of perceived risk, the lower the propensity to engage in risky behavior[13]. Cyberbullying is generally a high-risk behavior that engaging in cyberbullying may lead to sanctions by the online platform (deletion of their account or banning of their use of the platform), social exclusion (e.g., once their cyberbullying behavior comes to light, they may lose the support of friends, family, and social networks), It can even lead to civil lawsuits and criminal liability. When bullies perceive a high level of online anonymity, they may underestimate the perceived risk associated with cyberbullying and engage in more online disinhibition behaviors that can lead to cyberbullying. Accordingly, this study

proposes Hypothesis 1: Cyber disinhibition mediates the relationship between perceived anonymity and cyberbullying.

Cyberbullying is not inevitable despite the promotion of cyberbullying behavior through perceived anonymity and network de-inhibition, mindfulness is one of the important factors in reducing cyberbullying[17-18]. Mindfulness is an awareness that arises from an individual's conscious, nonjudgmental attention to experiencing the present moment[11]. The results of a meta-analysis showed that mindfulness can reduce anxiety, depression, and pain symptoms in individuals[6]. When an individual's mindfulness is higher, individuals may pay attention to their inner feelings and be less affected by negative behaviors in the online environment. That is, mindfulness can reduce the impact of an individual's perception of anonymity in the online environment on cyberbullying[19]. Conversely, when an individual's mindfulness is lower, individuals may pay more attention to the external environment, thus increasing their cyberbullying behavior. That is, it will enhance the effect of an individual's perception of anonymity in the online environment on cyberbullying. Accordingly, this study proposes Hypothesis 2: mindfulness moderates the relationship between perceived anonymity and cyberbullying, i.e., high mindfulness diminishes the effect of perceived anonymity on cyberbullying.

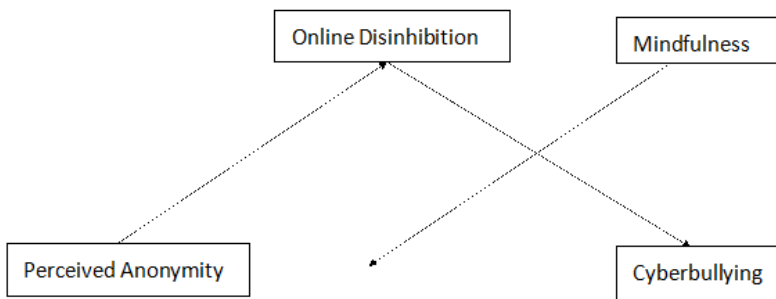In summary, as shown in Figure 1, this study tests the following overall model:

Fig. 1. Overall model of the study.

2   Research Methodology

2.1   Subjects

This study used a convenient sampling method to collect online questionnaires total of 332 data were obtained. Except for 15 invalid questionnaires that did not pass the attention test, the remaining valid data was 317. There were 115 males and 202 females, with a mean age of 28.67 years and a standard deviation of 7.98.

2.2   Measuring Tools

Perceived Anonymity: The Perceived Anonymity Scale developed by Jung et al. (2012), contains four entries. The scale is a 7-point scale, with higher scores indicat-

ing greater perceived anonymity. The internal consistency coefficient for this scale in this study was 0.85[9].

Online Disinhibition: Using the Network De-Inhibition Scale developed by Stuart and Scott [26], with 12 entries. It contains five dimensions: Internet usage, how they use the internet to think, feel and act online, and their perceptions of the online environment. The scale scored on a 5-point scale, with higher scores indicating higher network disinhibition. The internal consistency coefficient for this scale in this study was 0.92.

Mindfulness: The mindfulness Scale developed by Brown and Ryan (2003) and simplified by Van Dam et al. [2][25], contains five entries. The scale scored on a 7-point scale, with higher scores indicating lower mindfulness. The internal consistency coefficient for this scale in this study was 0.85.

Cyberbullying: A total of five entries measured two dimensions, which encompassed perceptions of the internet, and bullying behavior, among others. This scale is a 7-point scale, with higher scores indicating higher levels of cyberbullying. In this study, the internal consistency coefficient of the scale was 0.86.

2.3   Procedures

The method of online measurement is adopted, sending the questionnaire through the questionnaire star link. Subjects were first asked to read the informed consent form that after they gave their consent, they completed the Perceived Anonymity Scale, the Internet Desuppression Scale, the Mindfulness Scale, the Cyberbullying Scale, and demographic variables.

3   Research Results

SPSS 26.0 and Hayes' SPSS macro program PROCESS 4.0 were used in this study to organize and count the data and perform descriptive statistics, mediation, and moderation tests. Harman single-factor test was used to test the common method bias[1]. After exploratory factor analysis of all items of perceived anonymity, network disinhibition, mindfulness and cyberbullying, it was found that the variation explained by the first factor was 33.44 %, which was less than the critical value of 40 %, indicating that there was no serious common method bias.

3.1   The Mean Score and Correlation Matrix between the Variables Involved in the Study

The mean, standard deviation and correlation matrix of the variables studied are shown in Table 1.

Table 1. The mean value, standard deviation and correlation analysis results of each variable. (N=317)

	M	SD	1	2	3	4	5	6	7
1. Age	28.67	7.98	1						
2. Gender	-	-	-0.13*	1					
3.Education level	3.93	0.62	-0.17**	0.08	1				
4.Monthly income	3.04	1.44	0.50**	-0.19**	0.06	1			
5.Perceived anonymity	4.55	1.34	-0.06	-0.08	-0.06	<0.01	1		
6.Network disinhibition	4.81	1.11	0.02	-0.15**	-0.02	0.19**	0.28***	1	
7.Mindfulness	3.49	1.32	-.23***	-0.06	0.07	-0.08	0.22***	0.29***	1
8. Cyberbullying	3.36	1.43	-0.04	-0.21***	0.04	0.13*	0.25***	0.39***	0.49***

Note: * denotes p<0.05, ** denotes p<0.01, *** denotes p<0.001, same below.

3.2 The Mediating Effect Test of Network Disinhibition

Using stepwise multiple regression to analyze the mediating role of network disinhibition in the relationship between perceived anonymity and cyberbullying. As in Table 2: In the first step, perceived anonymity was a significant positive predictor of cyberbullying (B = 0.27, p < 0.001), validating Hypothesis 1; In the second step, perceived anonymity was a significant positive predictor of network disinhibition (B = 0.23, p < 0.001]); In the third step, the perceived anonymity and network disinhibition are included in the independent variables, a perceived anonymity (B = 0.17, p < 0.01) and network disinhibition (B = 0.44, p < 0.001) also have significant positive predictive effects on cyberbullying. This study also uses Model 4 of SPSS 26.0 macro program PROCESS 4.0 to verify. The results showed that the indirect effect of social comparison tendency on psychological symptoms was significant (effect size = 0.18, SE = 0.02, 95 % CI = [0.14, 0.22]). Thus, network disinhibition acts as a partial mediator between perceived anonymity and cyberbullying, validating Hypothesis 1.

Table 2. The mediating role of network disinhibition between perceived anonymity and cyberbullying

| Steps	Result variable	Predictive variables	R^2	F	B(SE)	t
The first step	Cyberbullying	Perceived anonymity	0.06	21.66***	0.27***(0.06)	4.65***
The second step	network de-inhibition	Perceived anonymity	0.08	27.06***	0.23***(0.05)	5.20***
The third step	Cyberbullying	Perceived anonymity	0.17	32.68***	0.17**(0.06)	2.94**
		network de-inhibition			0.44***(0.07)	6.40***

3.3 The Moderating Effect Test of Mindfulness

The moderating effect of mindfulness on network disinhibition between perceived anonymity and cyberbullying used the Model 5 of SPSS 26.0 macro program PROCESS 4.0 to verification. In order to explain more clearly the interaction between

perceived anonymity and mindfulness, Add and subtract a standard deviation of mindfulness according to the average score, simple slope effect tests were performed by dividing the subjects into high and low positivity groups. The results are shown in Both Figure 1 and Figure 2. In the high mindfulness group, the effect of perceived anonymity on cyberbullying (B = -0.01, t = -0.10, p > 0.05) was smaller than that in the low mindfulness group (B = 0.22, t = 3.01, p < 0.01).That is, mindfulness can alleviate the cyberbullying caused by perceived anonymity, which verifies hypothesis 2.

Table 3. Moderating role of positive thoughts between perceived anonymity and cyberbullying

predictor variable	cyberbullying	
	B(SE)	B(SE)
age	-0.03*(0.01)	-0.01(0.01)
Gender	-0.59***(0.17)	-0.37**(0.14)
educational attainment	0.05(0.13)	0.05(0.11)
monthly salary	0.16*(0.06)	0.12*(0.06)
Perceived anonymity		0.11*(0.05)
Mindfulness		0.42***(0.06)
Perceived anonymity * Mind-fulness		0.14*(0.06)
network de-inhibition		0.26***(0.07)
R^2	0.07	0.36
F	5.81***	21.44***
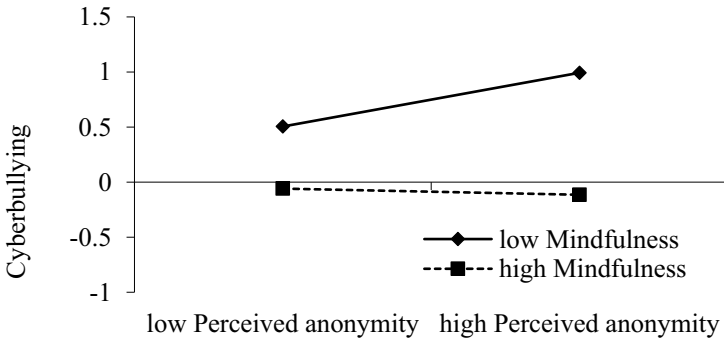
Fig. 2. Moderating effect of mindfulness on perceived anonymity and cyberbullying

4   Discussions

Based on previous research, we can find that the greater the perceived anonymity, the more likely participants are to trigger the cyber de-suppression effect and engage in cyberbullying. And mindfulness reduces the positive effects of perceived anonymity

on cyberbullying, making cyberbullying less likely to occur. This phenomenon may be because people lose their sense of self and their sense of responsibility when they are anonymous on the Internet. At the same time, the Internet has the characteristics of minimizing authority and activities that are difficult to trace. This allows the bully to separate the real identity from the virtual identity of the bully on the Internet and insulate real life from being a cyberbully. On the other hand, mindfulness will focus people's consciousness on their internal feelings rather than the external network environment, thus avoiding the impact of perceived anonymity and reducing cyberbullying.

Because mindfulness has a strong negative correlation with perceived anonymity and cyberbullying behavior, mindfulness has strong theoretical and practical implications when trying to reduce cyberbullying. Firstly, according to research conducted by Estíbaliz Royuela-Colomer, mindfulness reduces the likelihood of perpetrating and experiencing cyberbullying. This is because mindfulness can help teens have a positive mindset of reducing their depression and anxiety and avoid the rumination of emotions such as anger and hostility that may inspire cyberbullying[25]. In addition to this, mindfulness allows teens to live with healthier habits, reducing adolescents' conflicts with their peers and the amount of time they spend on the Internet. These changes can further reduce the risk of cyberbullying[18].

There are several shortcomings in this study. Future research may be able to remedy this through other methods. First, the study only analyzed cross-sectional data on the dependent and independent variables, which allowed the study to predict correlations between mindfulness, perceived anonymity, and cyberbullying without proving causality. Secondly, the data for this study were collected mainly online and partially from the questionnaire community, which may introduce bias into the results of the study, because participants may forgo authenticity for the sake of efficiency in completing the questionnaire. In addition to this, although this study analyzes a very large number of factors that influence cyberbullying, such as mindfulness, perceived anonymity, and the network disinhibition effect, there are still a considerable number of factors that can influence cyberbullying that were not considered in this study. Taking danger perception as an example, it is likely that bullies engage in cyberbullying when they do not perceive cyberbullying as a high-risk behavior, whereas if the bully had a stronger risk perception, they might give up bullying. Risk perception theory holds that the bully's misjudgment of risk can be explained in terms of many kinds of danger perception theories, such as social action theory (People take risks because of peer pressure or a general community perception that an activity is less risky), Theory of habitual action(Repeatedly engaging in a high-risk behavior without negative outcomes usually reduces the perceived risk associated with that behavior.)and risk compensation theory(When people feel more secure, they tend to take more risks).Empathy and sympathy can affect cyberbullying as well. There is a very large body of research that suggests that people are more likely to engage in antisocial behaviors similar to cyberbullying when they are in a state of low empathy and sympathy[10]. Future research could analyze the relationship between these factors and cyberbullying.

5   Conclusion

Perceived anonymity enhances online disinhibition, which in turn increases an individual's cyberbullying behavior, whereas mindfulness reduces or inhibits the positive effects of perceived anonymity on cyberbullying. The results have significant theoretical implications for online anonymity, online disinhibition, mindfulness, and cyberbullying, as well as practical implications for reducing cyberbullying behavior. The results are shown in Table 3. The moderating effect of mindfulness between online disinhibition and cyberbullying was significant (B = 0.14, t = 2.27, p < 0.05).

References

1. Zhou Hao, Long Lirong. (2004). Statistical test and control method of common method bias. Advances in psychological science, (6): 942-950.
2. Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. Journal of Per- sonality and Social Psychology, 84, 822–848. http://dx.doi.org/10.1037/ 0022-3514.84.4.822.
3. Borders, A., Earleywine, M., & Jajodia, A. (2010). Could mindfulness decrease anger, hostility, and aggression by decreasing rumination? Aggressive Behavior, 36(1), 28–44. https://doi.org/10.1002/ab.20327.
4. Chen, J.-K., & Chen, L.-M. (2020). Cyberbullying among adolescents in Taiwan, Hong Kong, and mainland China: A cross-national study in Chinese societies. Asia Pacific Journal of Social Work and Development, 30(3), 227–241. https: //doi. org/ 10. 1080/ 021 85385.2020.1788978.
5. Eastwick, P. W., & Gardner, W. L. (2008). Is it a game? Evidence for social influence in the virtual world. Social Influence, 4(1), 18–32. https: //doi. org/ 10. 1080/ 15534 510 802254087.
6. Goyal, M., Singh, S., Sibinga, E., Gould, N., Rowland-Seymour, A., Sharma, R., Berger, Z., Sleicher, D., Maron, D., Shihab, H., Ranasinghe, P., Linn, S., Saha, S., Bass, E., Haythornthwaite, J., & Cramer, H. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. Deutsche Zeitschrift Für Akupunktur, 57(3), 26–27. https://doi.org/10.1016/j.dza.2014.07.007.
7. Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. Perspectives on Psychological Science, 6(6), 537–559. https://doi.org/10.1177/1745691611419671.
8. Hite, D. M., Voelker, T., & Robertson, A. (2014). Measuring perceived anonymity: The development of a context independent instrument. Journal of Methods and Measurement in the Social Sciences, 6(1). https://doi.org/10.2458/azu_jmmss.v5i1.18305.
9. Jung, Y., Song, H., & Vorderer, P. (2012). Why do people post and read personal messages in public? The motivation of using personal blogs and its effects on users' loneliness, belonging, and well-being. Computers in Human Behavior, 28(5), 1626-1633.
10. Jolliffe, D., & Farrington, D. P. (2006). Examining the relationship between low empathy and bullying. Aggressive Behavior, 32(6), 540–550. https://doi.org/10.1002/ab.20154
11. Kabat-Zinn, J. (2003). Mindfulness-Based Interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144–156. https: //doi. org/ 10. 1093/ clipsy/bpg016.

12. Maeve Duggan. (2017, July 11). Online harassment 2017. Pew Research Center: Internet, Science & Tech; Pew Research Center: Internet, Science & Tech. https: //www. pewresearch.org/internet/2017/07/11/online-harassment-2017/.

13. Megías-Robles, A., Cándido, A., Maldonado, A., Baltruschat, S., & Catena, A. (2022). Differences between risk perception and risk-taking are related to impulsivity levels. International Journal of Clinical and Health Psychology, 22(3), 100318. https:// doi. org/ 10.1016/j.ijchp.2022.100318.

14. N. P. Hoang and D. Pishva, "Anonymous communication and its importance in social networking," 16th International Conference on Advanced Communication Technology, Pyeongchang, Korea (South), 2014, pp. 34-39, doi: 10.1109/ICACT.2014.6778917. keywords: {Facebook; IP networks; Internet; Virtual private networks; Servers; Software; Security; Privacy; Network Tracing Tools; Anonymous Communication Tools; Social Networking; Facebook},

15. Nixon, C. (2014). Current perspectives: The impact of cyberbullying on adolescent health. Adolescent Health, Medicine and Therapeutics, 5(5), 143–158. https: //doi. org/ 10. 2147/ ahmt.s36456.

16. Przybylski, A. K. (2019). Exploring adolescent cyber victimization in mobile games: Preliminary evidence from a british cohort. Cyberpsychology, Behavior, and Social Networking, 22(3), 227–231. https://doi.org/10.1089/cyber.2018.0318.

17. Rösner, L., & Krämer, N. C. (2016). Verbal venting in the social web: Effects of anonymity and group norms on aggressive language use in online comments. Social Media + Society, 2(3), 205630511666422. https://doi.org/10.1177/2056305116664220.

18. Royuela-Colomer, E., Calvete, E., Gámez-Guadix, M., & Orue, I. (2018). The protective role of dispositional mindfulness against the perpetuation of cyberbullying victimization and perpetration among adolescents. Cyberpsychology, Behavior, and Social Networking, 21(11), 703–710. https://doi.org/10.1089/cyber.2017.0685.

19. Smith, P. K., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. Journal of Child Psychology and Psychiatry, and Allied Disciplines, 49(4), 376–385. https: //doi. org/ 10. 1111/ j.1469-7610.2007.01846.x.

20. Suler, J. (2004). The online disinhibition effect. International Journal of Applied Psychoanalytic Studies, 2(2), 184–188.

21. Slonje, R., Smith, P. K., & Frisén, A. (2013). The nature of cyberbullying, and strategies for prevention. Computers in Human Behavior, 29(1), 26–32. https: //doi. org/ 10. 1016/ j.chb.2012.05.024.

22. SLONJE, R., & SMITH, P. K. (2008). Cyberbullying: Another main type of bullying? Scandinavian Journal of Psychology, 49(2), 147–154. https: //doi. org/ 10. 1111/j. 1467-9450. 2007.00611.x.

23. Turan, N., Polat, O., Karapirli, M., Uysal, C., & Turan, S. G. (2011). The new violence type of the era: Cyber bullying among university students. Neurology, Psychiatry and Brain Research, 17(1), 21–26. https://doi.org/10.1016/j.npbr.2011.02.005.

24. UNICEF. (2023, February). Cyberbullying: What Is It and How to Stop It. UNICEF; Unicef. https://www.unicef.org/end-violence/how-to-stop-cyberbullying.

25. Van Dam, N. T., Earleywine, M., & Borders, A. (2010). Measuring mindfulness? An item response theory analysis of the Mindful Attention Awareness Scale. Personality and Individual Differences, 49, 805–810. http://dx.doi.org/10.1016/j.paid.2010.07.020.

26. Stuart, J., & Scott, R. (2021). The Measure of Online Disinhibition (MOD): Assessing Perceptions of Reductions in Restraint in the Online Environment. Computers in Human Behavior, 114, 106534. https://doi.org/10.1016/j.chb.2020.106534.