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THE INFLUENCE OF CHINESE UNIVERSITY STUDENTS' REINFORCEMENT SENSITIVITY ON CYBER VIOLENCE

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ABSTRACT

With the popularity of the internet in China increasing, especially among young people and college students, it has become an indispensable part of life. However, Chinese college students either engage in violence via the internet or are targeted by online violence, causing major concern within Chinese society. Currently, the adverse consequences of online violence conducted by Chinese college students have attracted the attention of domestic college student affairs managers. This study, with the influence of reinforcement sensitivity on cyber violence as the starting point, analyzes punishment sensitivity and cyber violence and the relationship between the two by building a structural equation model. It was found that reward sensitivity is prominently related to cyber violence, and that punishment sensitivity have no obvious relevance to cyber violence. On this basis, it is proposed that university student administrators should pay attention to the high reward sensitivity of college students' satisfaction acquisition channels; college students with high reward sensitivity who participate in cyber violence for a sustained period need proper intervention. Improvements are needed in students' cognition and they should be taught how to deal with online violence.

Contribution/Originality: The paper's primary contribution is finding that reward sensitivity is prominently related to cyber violence, and punishment sensitivity have no obvious relevance to cyber violence. Suggestions are proposed on the prevention of cyber violence on the basis on the results.

1. BACKGROUND

With the soaring development of the information age, the number of internet users is on the increase. The China Internet Network Information Center (CNNIC) published the 47th "Statistical Report on China's Internet Development Status". By December 2020, the number of Chinese internet users has reached 989 million, and the internet popularization rate is 70.4%; the number of mobile internet users has reached 986 million, and the proportion of mobile internet users is 99.7%. The total number of students accounts for 21% of China's netizen group, of which 19.3% is made up of college students in higher education. The report result shows that the information era of rapid growth has dictated an increasingly greater influence of the internet on daily life and learning for college students in China.

For college students in China, while enjoying the convenience realized by the internet, they also experience the effects of negative behavior on the internet. Cyber violence represents one type of negative online behavior. The

scope of such behavior ranges from verbal abuse to manhunts and exposure and theft of personal information. According to existing information, the incidence of this behavior is between 10% and 53% (Guo, 2016), and the total incidence of cyber violence among college students is 59.47% (Jin, 2018), which is extremely high. This behavior will not only lead to psychological damage for the victims but may also extend to physical damage for the attacker. Cyber violence not only has a negative impact on the victims, but also has a negative influence on bystanders and society as a whole. A lack of effective control of cyber violence leads to the indifference of bystanders. This obstructs the formation of a civilized and harmonious internet culture. As such, it is necessary to research cyber violence in depth, which will, in turn, help college student managers to identify, prevent and control cyber violence.

Regarding the main discussion of the relationship between the reinforcement sensitivity of college students and their overt dangerous behaviors, the following two issues are specifically studied:

1. If reward sensitivity has a significant influence on overt, aggressive behavior and aggression in cyber violence.
2. If sensitivity to punishment has a significant impact on the overt attacking behavior and aggression in cyber violence.

2. LITERATURE REVIEW

2.1. Concept and Relationship

Cyber violence has evolved from the concept of traditional violence. Genyuan (2012) defines it as a type of malicious harassment utilizing information and communication technology to prevent people from effectively protecting themselves, causing great physical and mental harm to victims. Hou & Xinlin (2017) identifies it as a netizen criticizing immoral or unfair behavior, waving the flag of morality, and upholding justice. In this way, a person makes offensive, insulting, abusive, and defamatory comments about other people, cyberstalking them and publishing the true information about people and their relatives and friends to maintain social justice and ethical principles. Hence, there are three characteristics of online violence: (1) building up the momentum in public opinion; (2) significant damage; (3) obvious overall irrational tendencies of the perpetrators.

Generally speaking, the harm cyber violence causes is relatively severe. In terms of less violent cases it can defame a person, and in more severe situations it may result in right infringement and crime, which labels cyber violence as one of the most hurtful types of negative cyber behaviors.

Reinforcement sensitivity refers to an individual's responsiveness when presented with reinforcement stimulus, For example, individuals with high reward sensitivity are prone to impulsive behavior under the influence of external temptation information; Individuals with high penalty sensitivity can often show resistance or rejection to the information when they are tempted by the outside world. which changes the tendency and degree in mood, motivation and behavior. It is worth noting that Gray and McNaughton updated the version of reinforcement sensitivity in 2000 based on humans' individual differences. Smillie, Pickering, & Jackson (2006)-re integrated and modified the reinforcement sensitivity theory on this basis, and divided the theory into reinforcement sensitivity, including reward sensitivity and punishment sensitivity.

In the relationship between reinforcement sensitivity and cyber violence, with researchers' increasing focus on college students' cyber violence, there are various hypotheses regarding the relationship between reinforcement sensitivity and cyber violence. For example, the research of Wei, Liu, Li, & Fu (2016) found that reinforcement sensitivity personality characteristics are related to cyber violence. The results of a study by Zhang & Hou (2008) indicate that reinforcement sensitivity can predict some behaviors on the internet. Liu (2014), through research on cyber violence, found that reward sensitivity and punishment sensitivity can independently forecast individual impulsive behaviors on the internet. The research of Mitchell et al. (2007) reveals that after individuals have continuously received reward-related signals, individuals with high reward sensitivity and low punishment sensitivity are more likely to violate social norms. When an individual has continuously received punishment-related signals, those with low reward sensitivity and high punishment sensitivity are more prone to behave in a

way consistent with discipline and social norms. Park et al. (2013) also found that reward sensitivity and punishment sensitivity can be predictors of individual violations, violence, and other negative behaviors.

Existing research has suggested that reinforcement sensitivity can predict college students' tendency toward cyber violence, but the academic circle has not yet systematically studied the influence of reinforcement sensitivity on cyber violence behavior. This research systematically explores the relationship between college students' increased sensitivity and cyber violence.

2.2. Research Hypothesis

Based on the current research status of the reinforcement sensitivity of overt dangerous behaviors, the following hypotheses are proposed based on the research of domestic and foreign scholars and related theories, which are shown in Figure 1:

H1: Reward sensitivity has a significant influence on overt aggression, and the two are correlated.

H2: Reward sensitivity has a significant influence on relational aggression, and the two are correlated.

H3: Penalty sensitivity has a significant influence on overt aggression, and the two are correlated.

H4: Punishment sensitivity has a significant influence on relational aggression, and the two are correlated.

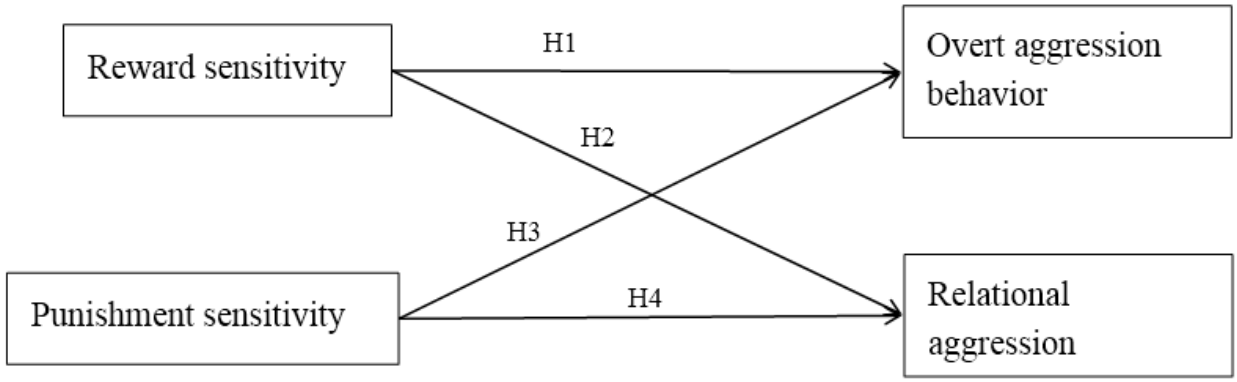

Figure 1. Hypothetical path diagram.

3. RESEARCH METHOD

This research is based on current full-time undergraduate college students in regular colleges and universities in China. Regarding sample size, some scholars, such as Zhang Weihao, who wrote "*Dancing with Structural Equations*" (2020), state that between 200 and 500 participants is a reasonable number. This study considered the stability of the sample and issued questionnaires to 295 full-time undergraduate college students. The questionnaire distribution methods are classified into field distribution, network distribution, and academic conference site distribution. The data obtained were analyzed by SPSS AMOS 22.0.

4. RESEARCH RESULT

The reinforcement sensitivity questionnaire (SPSRQ) compiled by Torrubia, Avila, Moltó, & Caseras (2001) was adopted in this study. It was revised by Guo, Song, Zhao, & Ma (2011) to be suitable as the reinforcement sensitivity questionnaire for Chinese college students. The questionnaire has the two dimensions of reward sensitivity and punishment sensitivity, with a total of 16 items. In this study, JLMGX refers to reward sensitivity, and CFMGX refers to punishment sensitivity.

The College Students' Cyber Violence Scale adopts Little, Henrich, Jones, & Hawley (2003) theoretical model based on the classification scale of aggressive behaviors. Zhao & Gao (2012) prepared the cyber violence questionnaire for Chinese college students on the basis of the existing CBI scales in foreign countries, which is

divided into two dimensions—overt aggression and relational aggression—with a total of 13 items. In this study, WXGJ refers to overt aggression and GXGJ refers to relational aggression.

4.1. Reliability Test

In testing the reliability of the scale adopted in this research, the current universal testing standard is taken, which is when the Cronbach value is higher than 0.8, the reliability of the scale is high; if the value is between 0.7 and 0.8, the reliability of the scale is good; if the value is between 0.6 and 0.7, the reliability of the scale is acceptable; and if the value is less than 0.6, the reliability of the scale is not good. The average Cronbach values of the adopted scale are all higher than 0.8, which means that the overall reliability of the questionnaire is good and the next step of the validity test can be carried out.

This study set a related coefficient value of 0.3 as the threshold value. CITC values smaller than 0.3 will be deleted; however, as they are all greater than 0.3 in this study, there is no need to delete any values. The four dimensions in the questionnaire are measured through SPSS AMOS 22.0 software, and the results are shown in Table 1.

Table 1. Reliability test.

Item	Total correction correlation (CITC)	The α coefficient deleted by the item	First-order Cronbach's α coefficient	Second-order Cronbach's α coefficient	Overall Cronbach's α coefficient
JLMGX1	0.446	0.811	0.819	0.869	0.878
JLMGX2	0.592	0.792			
JLMGX3	0.592	0.791			
JLMGX4	0.589	0.791			
JLMGX5	0.591	0.791			
JLMGX6	0.592	0.791			
JLMGX7	0.436	0.813			
JLMGX8	0.482	0.807			
CFMGX1	0.540	0.873	0.879		
CFMGX2	0.605	0.867			
CFMGX3	0.637	0.864			
CFMGX4	0.742	0.853			
CFMGX5	0.609	0.867			
CFMGX6	0.715	0.855			
CFMGX7	0.578	0.870			
CFMGX8	0.700	0.857			
WXGJ1	0.554	0.893	0.880	0.926	
WXGJ2	0.802	0.839			
WXGJ3	0.797	0.840			
WXGJ4	0.705	0.862			
WXGJ5	0.738	0.852			
WXGJ6	0.648	0.869			
GXGJ1	0.797	0.873	0.896		
GXGJ2	0.738	0.878			
GXGJ3	0.829	0.868			
GXGJ4	0.574	0.904			
GXGJ5	0.802	0.873			
GXGJ6	0.618	0.897			
GXGJ7	0.762	0.873			

4.2. Validity Test

A Kaiser–Meyer–Olkin (KMO) test is used to confirm the validity, and the factor loading coefficient is used to measure the corresponding relationship between the factor (dimension) and the item, so this study conducts a comprehensive analysis of the questionnaire through the indicators, such as KMO value, variance interpretation

rate, and factor loading coefficient value, among others. If the KMO value is higher than 0.8, the validity is high; if the KMO value is between 0.7 and 0.8, the validity is good; if the KMO value is between 0.6 and 0.7, the validity is acceptable, and if the KMO value is less than 0.6, it suggests poor validity. In this study, the overall KMO value of the questionnaire is 0.891, and the KMO value of each variable is greater than 0.5. The questionnaire as a whole has a high degree of explanation and excellent validity; the overall Bartlett sphere test significance (sig.) of the questionnaire is less than 0.01 (very significant), the significance level of each variable is less than 0.01, and the assumption that each variable is independent of the others is rejected. The scale has relatively good validity (see Table 2 for specific results) and is suitable for factor analysis.

Table 2. Validity test.

Variable	KMO test	Bartlett test
	KMO value	Significance level
Overall validity	0.891	0.000
JLMGX	0.842	0.000
CFMGX	0.895	0.000
WXGJ	0.813	0.000
GXGJ	0.897	0.000

This study employs the principal component analysis method to perform exploratory factor analysis on the sample data, which gives the factor loading matrix that also includes the factor composition type, eigenvalues and the variance contribution rate of the measurement items. The factors with eigenvalues greater than 1 are then extracted. To enable the meaning of each factor to be relatively clear, the maximum variance method can be used to rotate the measurement items with multiple common factors. Only when the factor loading of each measurement item is greater than 0.5 and less than 0.95 (Wu, 2009), the scale can be considered to have good validity.

From Table 3, we can see that a total of four factors are extracted, and the cumulative variance contribution rate is 60.016%, which proves a good level of explanation.

Table 3. Explanation table of total variance.

Composition	Initial eigenvalues			Extracted load square sum			Rotating load square sum		
	Total	Variance	Cumulative %	Total	Variance	Cumulative %	Total	Variance	Cumulative %
1	7.986	27.538	27.538	7.986	27.538	27.538	6.435	22.190	22.190
2	5.462	18.835	46.373	5.462	18.835	46.373	4.710	16.243	38.433
3	2.693	9.286	55.659	2.693	9.286	55.659	3.604	12.429	50.862
4	1.473	5.081	60.740	1.473	5.081	60.740	2.655	9.154	60.016
5	0.097	3.784	64.524						

Table 4 shows the component matrix after the factor loads below 0.5 have been removed. The deleted factors are: JLMGX1 "Will a good money-earning opportunity strongly drive me to do something"; WXGJ4 "I steal someone else's online identity (such as QQ account) with Trojan horses and other hacking techniques"; WXGJ6 "Someone is threatened and intimidated by me on their personal space or blog"; GXGJ4 "I talk negatively with friends about someone online". The remaining four dimensions are now presented, which are: reward sensitivity (JLMG), punishment sensitivity (CFMGX), overt aggression behavior (WXGJ), and relational aggression (GXGJ).

Composition reliability represents a measurement indicator measuring the consistency of items in the dimension. Normally, it is recommended that values greater than 0.5 are ideal, and values from 0.36 to 0.5 are within the acceptable range. Convergence validity is adopted to consider whether an item can be a reflection of the dimension or aspect. Here, a total of four factors are targeted to conduct a confirmatory factor analysis (CFA). It

can be learned from Table 5 that the values of CR and AVE in correspondence with the four factors are between 0.36 and 0.5, which means that the data aggregation (convergence) validity of this analysis is good.

Table 4. Factor loading component table.

Item	JLMGX	CFMGX	WXGJ	GXGJ
JLMGX2	0.672			
JLMGX3	0.772			
JLMGX4	0.669			
JLMGX5	0.739			
JLMGX6	0.753			
JLMGX8	0.587			
CFMGX1		0.608		
CFMGX2		0.663		
CFMGX3		0.733		
CFMGX4		0.814		
CFMGX5		0.705		
CFMGX6		0.773		
CFMGX7		0.705		
CFMGX8		0.781		
WXGJ1			0.763	
WXGJ2			0.802	
WXGJ3			0.748	
WXGJ5			0.587	
GXGJ1				0.920
GXGJ2				0.791
GXGJ3				0.900
GXGJ5				0.880
GXGJ7				0.769

The calculation of discrimination validity takes the root-opening method. Select SORT under AVE, and then calculate the AVE which needs to be opened-rooted. The root value of each AVE is greater than the correlation of other related aspects. In this research, for GXGJ, its AVE square root value is 0.865, for WXGJ, its AVE square root value is 0.801, for CFMGX, its AVE square root value is 0.691, and for JLMGX, its AVE square root value is 0.650. All of them are greater than the maximum value of the correlation coefficient absolute value between factors, which means that it has good discrimination validity. (The details are shown in Table 6）.

To sum up, the questionnaire adopted by this study has good internal consistency and credibility. As a result, the next step of the analysis can be implemented.

4.3. Research Hypothesis Verification

Based the initial model of constructing the reward and punishment sensitivity variables in correspondence with the variables of cyber violence, the model variables include reward sensitivity, punishment sensitivity, overt aggression behavior and relational aggression. The relationship between variables Figure 2 is constructed on the basis of the research hypothesis Figure 2, and verification is done about the relationship between the variables based on this.

Table 5. Model AVE and CR indicator results.

Dimension	Item	Parameter: Significance Estimation				Factor Loads	Composition Reliability	Convergence Validity
		Unstd.	S.E.	t-value	P	Std.	CR	AVE
JLMGX	JLMGX8	1.000				0.493	0.812	0.422
	JLMGX6	1.361	0.182	7.462	***	0.697		
	JLMGX5	1.339	0.180	7.440	***	0.693		
	JLMGX4	1.221	0.176	6.942	***	0.602		
	JLMGX3	1.385	0.181	7.641	***	0.738		
	JLMGX2	1.176	0.163	7.195	***	0.645		
CFMGX	CFMGX8	1.000				0.763	0.878	0.477
	CFMGX7	0.858	0.080	10.790	***	0.639		
	CFMGX6	1.083	0.081	13.433	***	0.782		
	CFMGX5	0.884	0.078	11.278	***	0.666		
	CFMGX4	1.033	0.076	13.644	***	0.793		
	CFMGX3	0.879	0.077	11.407	***	0.673		
	CFMGX2	0.825	0.079	10.502	***	0.625		
	CFMGX1	0.662	0.073	9.019	***	0.543		
WXGJ	WXGJ1	1.000				0.643	0.875	0.641
	WXGJ2	1.270	0.101	12.542	***	0.926		
	WXGJ3	1.125	0.093	12.131	***	0.858		
	WXGJ5	0.881	0.081	10.916	***	0.745		
GXGJ	GXGJ1	1.000				0.903	0.936	0.748
	GXGJ2	0.959	0.048	19.817	***	0.822		
	GXGJ3	1.158	0.041	28.411	***	0.955		
	GXGJ5	0.993	0.041	23.967	***	0.894		
	GXGJ7	0.991	0.062	15.987	***	0.733		

Table 6. Model discrimination validity index results.

Dimensions	AVE	GXGJ	WXGJ	CFMGX	JLMGX
GXGJ	0.748	0.865			
WXGJ	0.641	0.643	0.801		
CFMGX	0.477	-0.043	0.094	0.691	
JLMGX	0.422	0.150	0.235	0.262	0.650

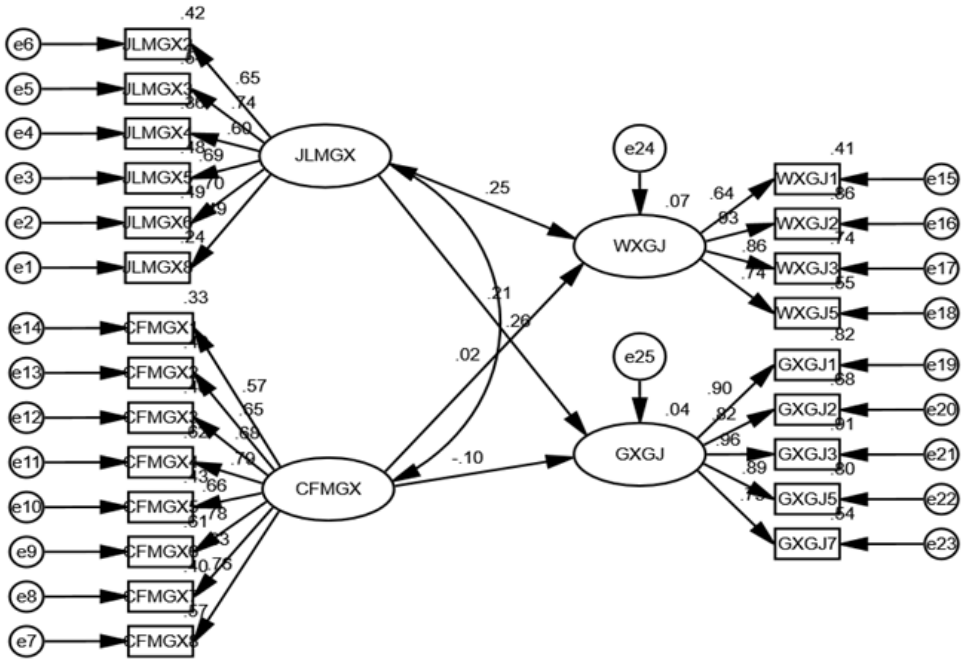

Figure 2. Model diagram of the sensitivity to rewards and punishments to variables of cyber violence.

In building a model diagram of the sensitivity of rewards and punishments to the variables of cyber violence, the chi-square value is 610.398, the freedom degree is 225, and the model fit CMIN/df = 2.713, which meet the discriminant index of CMIN/df < 3, showing that the fit index of the model reaches an acceptable range and degree; the root mean square of the approximate error RMSEA = 0.076, which meets the standard of the upper limit RMSEA < 0.08, suggesting that the model fits well; GFI = 0.856, NFI = 0.848, IFI = 0.899, CFI = 0.898, TLI = 0.885, they all meet the index of greater than 0.80, which further confirms the model's goodness of fit.

Table 7. Regression coefficients of the influence of the variables of the sensitivity to reward and punishment on the variables of cyber violence.

			Estimate	S.E.	C.R.	P	Label
WXGJ	<---	JLMGX	0.316	0.096	3.307	***	par_21
GXGJ	<---	JLMGX	0.194	0.067	2.878	0.004	par_22
WXGJ	<---	CFMGX	0.020	0.056	0.369	0.712	par_23
GXGJ	<---	CFMGX	-0.061	0.041	-1.470	0.142	par_24

With the analysis of the path regression coefficient (see Table 7), the P-value of the influence of reward sensitivity (JLMGX) on overt aggression (WXGJ) is less than the 0.05 significance level, so this study considers reward sensitivity (JLMGX) as influential on overt aggression (WXGJ); the P-value of the influence of reward sensitivity (JLMGX) on relational aggression (GXGJ) is less than the 0.05 significance level, so we conclude that reward sensitivity (JLMGX) has an influence on relational aggression (GXGJ); the P-value of the influence of punishment sensitivity (CFMGX) on overt aggression (WXGJ) is greater than the significance level of 0.05, so we can confirm that punishment sensitivity (CFMGX) does not have influence on overt aggression (WXGJ); and finally, the P-value of the influence of punishment sensitivity (CFMGX) on relational aggression (GXGJ) is greater

than the significance level of 0.05, so we can conclude that punishment sensitivity (CFMGX) does not have influence on relational aggression (GXGJ).

Based on the above results, this research finds that reward sensitivity (JLMGX) is significantly correlated with online violence, and there is a positive correlation. This is in line with the research results of Zhang & Hou (2008). Punishment sensitivity (CFMGX) has no relation to cyber violence, which is contrary to the research results of Liu (2014).

5. DISCUSSION AND SUGGESTIONS

It can be seen from the above research results that students with higher reward sensitivity are more inclined to exhibit behaviors related to cyber violence, which means that these students are more prone to feelings of satisfaction and increased self-confidence by attacking others in an online environment and ignoring the risks that their behavior could bring. Meanwhile, college students with high reward sensitivity will also trigger the curiosity of other students who are also highly reward-sensitive and will become bystanders who eventually imitate the behaviors. This subsequently leads to the expansion of cyber violence, resulting in adverse consequences that are unpredictable for the perpetrator. The following suggestions are proposed based on this research:

1. The research shows that students with higher reward sensitivity are more likely to be involved in online violence, so college student managers should place greater emphasis on how students with high reward sensitivity achieve feelings of satisfaction. Diversified channels of psychological satisfaction for college students in real life can be established to lower the possibility of them resorting to online violence. For instance, college students can be encouraged to participate in many different types of leisure activities to gain feelings of satisfaction and a sense of achievement. This, in turn, will help them to reduce their time spent online and thus reduce the possibility of engaging in cyber violence.

2. College student managers could also focus their attention on students with high reward sensitivity and measure the sensitivity of students by spotting high reward sensitivity students in advance. Guiding or adjusting college students' motives for cyber violence, especially for students with high reward sensitivity, and using appropriate intervention methods should be practiced regarding their engagement in long-term online activities. Improving the awareness of this type of student about cyber violence and helping them to avoid the adverse consequences of cyber violence will be highly beneficial.

3. This research found no correlation between punishment sensitivity and cyber violence. This is an indication that the measures, such as colleges and universities having strict online management of students, limiting and blocking sensitive words through online platforms, and formulating punishment systems for anyone who engages in cyber violence, do not reduce the possibility of students becoming involved in cyber violence. Hence, student managers must focus on publicizing the dangers of cyber violence and guide the students, leading them to voluntarily reject cyber violence.

In conclusion, to effectively prevent the occurrence of cyber violence, college student affairs managers should not only implement rules and regulations with associated penalties but should also take into account the high reward sensitivity of college students and how they can achieve satisfaction through productive and positive means, thereby reducing the time that these students spend on the internet. Educating students and providing guidance and support, and using methods of punishment where cyber violence has been identified will further improve students' consciousness of the harmfulness of cyber violence, enabling them to understand the dangers of cyber violence and thus reduce the incidence of such behavior.

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