

Research Article

10.33897/fuip.v9i2.860

## Impact of Machiavellianism and Problematic Internet Use in Cyberbullying Perpetration: Role of Demographic Variables

Maryam Javed<sup>1</sup>, Dr Aisha Zubair<sup>1</sup>, Nurmeen Bakhtawar Niazi<sup>1</sup>, Marwa Khan Tahirkheli<sup>1</sup>

1. National Institute of psychology, Quaid-i-Azam University, Islamabad

For correspondence: Maryam Javed. Email: maryamjavedgk786@gmail.com

### Abstract

**Objectives.** The present study aimed to assess the impacts of Machiavellianism and problematic Internet use on cyberbullying among university students. Study also examined moderating influences of the family system and the demographic variables such as gender and parental education.

**Method.** By using random sampling, 433 university students aged 18–25 years ( $M = 21.17$ ,  $SD = 1.89$ ) were selected. The Machiavellianism Subscale of the Short Dark Triad (Jones & Paulhus, 2014), the Problematic Internet Use Questionnaire (Thatcher & Goolman, 2005), and the Cyberbullying Perpetration Scale (Lee et al., 2017) were used to assess study variables.

**Results.** Results showed that Machiavellianism and problematic internet usage significantly predicted the perpetration of cyberbullying. The family system also significantly moderated the effect of Machiavellianism on cyberbullying. Furthermore, demographic factors including gender and parental education also found to influence study variables. Males had a higher mean level of Machiavellianism, problematic internet use and cyberbullying perpetration. Low parental education was also associated with higher cyberbullying perpetration.

**Conclusion & Implications.** This study facilitates understanding the complex relationship between personality traits, internet use, and cyberbullying perpetration. It states that those higher in Machiavellianism and higher in problematic internet use are more likely to perpetrate cyberbullying. Also, it states that family system and other socio-demographic variables have a strong impact on online behaviors. Thus, these findings suggest the need to create interventions that address both personality-related factors and contextual elements strongly to reduce cyberbullying effectively.

**Keywords.** Machiavellianism, cyberbullying perpetration, problematic internet use, gender differences, university students, family system, parental education.



## Introduction

Cyberbullying is a serious social problem that affects millions of people globally (Giumetti & Kowalski, 2022). Whereas the traditional bullying occurs in physical spaces, cyberbullying happens in cyberspace — through electronic devices that make attacks a constant possibility with repeated acts of online aggression, including insults, threats, rumour spreading, or social exclusion. These actions are facilitated by the anonymity and access provided by the digital world, which makes cyberbullying an ongoing and hard-to-regulate issue.

Some other factors linked to cyberbullying are personality traits, online activities, and family relationships. A couple of variables that have been newly associated with cyberbullying are Machiavellianism and problem Internet use (Sánchez-Fernández et al., 2023). Machiavellianism refers to behavioral tendencies such as manipulation, a lack of concern, morality, and a need for control and dominance (Ramsay et al., 2023). High Machiavellians are Masters-and might persuade, con, and charm their way through anything that serves their goals. They tend to manipulate interpersonal relationships for their own benefit, and cyberbullying can be a means to manipulate others while avoiding social sanctions (Jablonska & Zajdel, 2020).

This personality trait has also been associated with other forms of deviant online behavior, such as cyberstalking (Blais et al., 2024) and trolling (Leite et al., 2023). In the current study, we further explored the moderating role of PIU on the relationship between Machiavellianism and cyberbullying perpetration. PIU refers to excessive and compulsive involvement with Internet activities to the point of impairment in daily functioning (Yudes et al., 2022). It is not only the duration of time spent online that matters, but rather the inability to regulate Internet use, which frequently results in neglected responsibilities, withdrawal symptoms when offline, and increased likelihood of engaging in online aggression (Sakakihara et al., 2019).

Problematic internet use has been linked to impaired cognitive functioning, interpersonal difficulties, mental health problems, and risk taking (Arrivillaga et al., 2020; Teng et al., 2020). In addition, PIU has been associated with academic burnout, family conflict, sleep problems, depression, suicidal thoughts, and substance use (Arrivillaga et al., 2020; TóthKirály et al., 2021). Internet overusers tend to

show more aggression and hostility (Dhaka & Naris, 2019) and are more likely to engage in aggressive behavior overall (Agbaria, 2021). In addition, PIU increases exposure to cyberbullying, but also reduces empathy and awareness of the consequences of cyberbullying (Cebollero-Salinas et al., 2022; Auriemma et al., 2020).

However, the relationship between Machiavellianism, PIU, and perpetration of cyberbullying takes on a second dimension with respect to the external variable of family structure, which are key variables in this context. Prior studies have highlighted manipulation and lack of empathy as crucial personality traits of those treating others in cyberbullying actions; the question of why these mechanisms behave in such a manner remains relatively unexplored. Studies indicate that family dynamics play an important role in determining online behavior. For example, Tajmirriyahi et al. (2020) found a good linear relationship between nuclear family arrangements and high levels of PIU, adding further complexity to the picture. One possibility is that in nuclear families there are fewer resources for supervision or regulation of internet use, heightening susceptibility to problematic behaviors (Islam et al., 2020). On the other hand, joint families tend to have a household system that, while allowing greater observability of technology use, has also its disadvantages (McMurphy, 2020). The absence of such regulatory mechanisms in nuclear families might be aiding in the development of PIU and cyberbullying, especially in terms of neglectful parenting (Shafiq & Batool, 2023).

The individual freedoms that university students enjoy amplify the effects these risks could have. With almost total absence of parental supervision on moral aspects and the consequences of internet use, students could have an increased susceptibility to these negative online behaviors. Parental education is another major factor concerning PIU and cyberbullying behaviors (López-Castro & Priegue, 2019). Following are the three terms: socioeconomic status, cultural capital, and cognitive abilities, all of which are implied by parental education (Seum et al., 2022; O'Reilly & Mohan, 2023). According to Chandrima et al. (2020), High parental education would have provided higher levels of guidance and support on appropriate online behavior and monitoring and regulation of internet use. These factors would protect against excessive internet use and online aggression.

These insights have been discussed widely in the respective literature but in isolation by divorce from considering the interaction of personality traits and environmental factors in determining behaviors related to cyberbullying. In opposing directions, Machiavellian traits have been related to manipulative online behaviors, PIU and cyberbullying with cyberbullying forward in recent studies (Yudes et al., 2022), therefore a theoretical framework as a combination of both individual attributes and environmental influences is thus needed. An intelligible way of comprehending this issue would greatly arise from an established integration of the mentioned.

The Problem Behavior Theory tries to explain how such relationships come into being. It has been defined by Jessor in 1987. As per this theory, the behavioral problems come into existence in a person's life due to the interaction of personal traits and the environment. It also focuses on the personal traits, social influences, and contextual factors which may be the determinants of a person's behavioral outcome. One important strength of the PBT concept is how it combines personality with e-environmental and internet-related factors to improve the understanding of impersonation in cyberbullying perpetration. This theory's application to cyberbullying research expands its prevention efforts with implications, for it indicates the need for prevention interventions that are targeted at both personality traits and contextual variables.

This study is significant for three reasons: First, although earlier studies focused on Machiavellianism, PIU, and cyberbullying as isolated concepts, their interaction has received scant research attention to date. Thus, this study aims to fill this gap by specifically looking at how these contribute to perpetrating cyberbullying. Second, as family environments are determinant for adolescent behavior, research into the moderating effects of family on these relationships is few and not intensive in Pakistan. This research therefore attempts to give an understanding of the several family structures and parental education levels from which insights worth noting could be gleaned to socioenvironmental causes under which cyberbullying becomes more obvious or obscure. Findings are expected to assist in developing family-centered prevention measures and in equipping parents and other caregivers with tools necessary for creating supportive and regulated environments dissuading cyberbullying behaviors.

Finally, cyberbullying is not uniform across all individuals; different setups of gender norms and

expectations dictate how men and women participate in and are affected by cyberbullying. Thus, this study pursues a gender-sensitive analysis to assess how these factors come into play with cyberbullying behaviors and help formulate gender-responsive prevention and intervention programs. In summary, this study seeks to explore Machiavellianism and PIU in relation to cyberbullying perpetration, examining the moderating effects of family structures. By combining personality psychological understandings with environmental influences, targeted intervention programs can be created that deal with individual and contextual factors that cause cyberbullying. This information will be helpful for educators, policymakers, and mental health professionals in creating more effective programs to curb cyberbullying and promote healthier online behavior.

### **Hypotheses**

1. Machiavellianism and problematic internet use positively predict cyberbullying perpetration.
2. Family System moderates the relationship between Machiavellianism, problematic internet use and cyberbullying perpetration.
3. Boys are more likely to express Machiavellianism, problematic internet use, and cyberbullying perpetration as compared to girls.
4. Respondents with lower maternal education are more likely to exhibit higher inclinations toward Machiavellianism, problematic internet use, and cyberbullying perpetration.
5. Respondents with lower paternal education are more likely to exhibit higher inclinations toward Machiavellianism, problematic internet use, and cyberbullying perpetration.

### **Sample**

The data for present study was collected through random sampling, involving a total of 433 university students from different public and private universities in Rawalpindi and Islamabad. The present study's sample inclusion criteria involved university students who have regular internet access and utilize screen devices for a minimum of 2 hours (Nagata et al., 2022). Additionally, participants were required to possess accounts on at least two social networking sites. The sample comprised of 51.3% boys (n = 222) and 48.7% girls (n = 211). The age distribution of the participants revealed that 58.7% (n = 254) fell within the 18-21 years category, while 40.2% (n = 174) were in the 21-25 years range. Family structures varied, with 60.0% (n = 260) belonging to nuclear families and 40.0% (n = 173) residing in joint family setups.

## Instruments

**Machiavellianism Subscale from Short Dark Triad.** The Machiavellianism subscale from the Short Dark Triad Scale (Jones & Paulhus, 2014) was used in the present study to assess participants' Machiavellian tendencies. It has 9 items, with each item on a four-point Likert scale. To compute the total score for the Machiavellianism subscale, responses across all items were summed, yielding a potential range of scores from 9 to 36. However, in the present study, the observed range of scores fell between 12 and 34. A high score on the scale reflects that respondents have a higher inclination toward Machiavellianism, and a low score indicates that they have a lower level of Machiavellianism. In the previous studies, the Machiavellianism subscale represented adequate reliability, with a Cronbach's alpha coefficient of .74 (Rogoza & Cieciuch, 2019). Likewise, in the current study reliability of this scale was found to be .76.

**Problematic Internet Use Questionnaire.** In the present study, the Problematic Internet Use Questionnaire (PIUQ) (Thatcher & Goolam, 2005) was used to assess the level of problematic internet use that participants experienced in their daily lives. The PIUQ questionnaire consists of a total of 20 items, which measure an individual's online preoccupation, negative effects, and social interaction. The total score can range from 20 to 80, with higher scores being indicative of a higher degree of problematic internet use, whereas lower scores would indicate a lower degree of problematic internet use. The Questionnaire showed good reliability of .92 (Ranjbar et al., 2014). Alpha reliability of the scale was found to be .86 for the Pakistani sample in this research.

**Cyberbullying Perpetration Scale.** The Cyberbullying Perpetration Scale utilized in this survey was originally an initiative of Lee et al. (2017)

and then obtained modified form by Iqbal and Jamiee (2021). The scale consists of 29 items divided into 4 subscales: Verbal/Written, Visual/Sexual, Social Exclusion, and Cyber Mobbing. The potential range varies from 27 to 108, with higher scores represent greater level of cyberbullying perpetration and lower scores indicate lower level of perpetration. The scale demonstrated good internal consistency, with a reliability coefficient of  $\alpha = .93$  (Lee et al., 2017). In this study reliability of this scale was found to be .86 for the Pakistani sample.

## Procedure

To collect data, students from different public and private universities in Rawalpindi and Islamabad were approached. Participants were informed about the objectives of research, to ensure full understanding and voluntary participation. Initially, consent was taken and scales were filled by participants. All information about participants was kept confidential by anonymizing the data of the participants and storing securely. Participants were then thanked for their collaboration in fulfilling the objectives of study after completion of the questionnaire booklet. All the ethical consideration was followed in a very strict way throughout the research process. Before data collection, approval was obtained from the relevant institutional review board (IRB) and ethics committee to follow ethical guidelines.

## Results

Statistical Package for the Social Sciences version 25 was used for the analysis in the present study. Regression analysis was used to assess the influence of Machiavellianism and problematic internet use on perpetration of cyberbullying. The present study also considered demographic variables such as gender, family system, and parental education.

**Table 1**

*Hierarchical Regression Results for Cyberbullying Perpetration (N = 433)*

Variables	B	95 % CI for B		SE B	B	R <sup>2</sup>	$\Delta R^2$
		LL	UL				
Step 1						.10	.10
Constant	22.78**	15.55	30.01	3.67			
Machiavellianism	1.07**	.77	1.37	.15	.32**		
Step 2						.24	.14
Constant	7.14**	-.37	14.66	3.82			
Machiavellianism	.74**	.45	1.02	.14	.22**		
Problematic Internet Use	.55**	.42	.67	.06	.38**		

Note. \*\* $p < .001$ .

Hierarchical regression analysis was performed to test the hypothesis that Machiavellianism and problematic internet use have a significant impact on cyberbullying perpetration. In step 1, Machiavellianism accounts for a 10% variance of explaining cyberbullying perpetration. In step 2, the R<sup>2</sup> value indicates that Machiavellianism and problematic internet use as predictors account for 24% variance in predicting cyberbullying perpetration. The increase in R<sup>2</sup> ( $\Delta R^2$ ) from step 1 to step 2 is .14, indicating that the additional variance in the dependent variable explained in step 2 of the model, with the addition of problematic internet use, stands at 14%. Overall, both of these predictors significantly predicted cyberbullying perpetration, which indicates that Machiavellianism and problematic internet use have a significant impact on cyberbullying

perpetration. Furthermore, the confidence intervals for both predictors did not include zero, confirming their significance.

Table 2 represents the moderating role of the family system between Machiavellianism and cyberbullying perpetration. Machiavellianism significantly predicted cyberbullying ( $B = 2.11$ ,  $t = 4.24$ ,  $p < .001$ ), with a 95% confidence interval (CI) of 1.13 to 3.08, indicating that higher Machiavellian traits were associated with increased cyberbullying behaviors. The result revealed a negative and significant moderating impact of the family system between Machiavellianism and cyberbullying perpetration, with a CI of -1.30 to -0.08, confirming that the moderation effect was statistically meaningful, supporting H2a.

**Table 2**

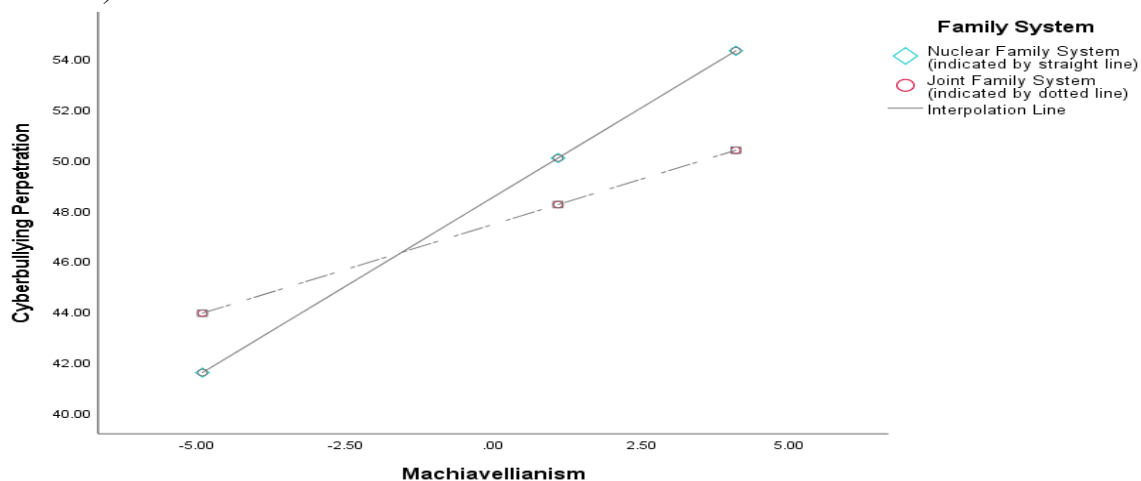
*Moderating Role of Family System in Predicting Cyberbullying Perpetration From Machiavellianism and Problematic Internet Use (N = 433)*

Variables	B	t	p	95 % CI	
				LL	UL
Constant	49.59	22.51	.00	45.26	53.92
Machiavellianism	2.11	4.24	.00	1.13	3.08
Family System	-1.07	-.72	.47	-4.00	1.85
Machiavellianism $\times$ Family System	-.69	-2.24	.02	-1.30	-.08
R <sup>2</sup>	.11				
Constant	50.88	24.81	.00	46.85	54.91
Problematic Internet Use	.68	3.56	.00	.30	1.06
Family System	-1.73	-1.24	.21	-4.45	.99
Problematic Internet Use $\times$ Family System	-.04	-.34	.73	-.29	.20
R <sup>2</sup>	.19				

The study also assessed the moderating role of the family system on the relationship between PIU and cyberbullying perpetration. The result revealed a non-significant moderating impact of the family system on the relationship between PIU and cyberbullying perpetration.

**Figure 1**

*Interaction Effect of Machiavellianism with Family System on Cyberbullying Perpetration Among University Students (N = 433)*



The moderation graph is further developed to understand the nature of the moderating effect. The differential slope across the two family configurations suggest a pronounced effect of Machiavellianism on cyberbullying. As shown in Figure 1, the line is steeper for the nuclear family system, however, in the case of the joint family system line is much flatter. This shows that the impact of Machiavellianism on cyberbullying perpetration is much stronger in nuclear family system

as compared to the joint family system. There is a stronger propensity for nuclear families towards cyberbullying perpetration under the influence of Machiavellian traits as compared to their counterparts in the joint family system. This underscores the significance of family structure as a moderating variable that influences the extent to which Machiavellian tendencies manifest into cyberbullying perpetration.

**Table 3**  
*Gender Differences on Study Variables (N = 433)*

Variables	Girls		Boys		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>(n = 211)</i>		<i>(n = 222)</i>				
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Machiavellianism	22.89		24.86		-4.46	.001	.42
Problematic internet use	41.34		44.33		-2.90	.000	.30
Cyberbullying perpetration	44.36		52.40		-5.55	.000	.53

The results of the t-tests showed significant gender differences thereby showing that boys exhibited higher dispositions of Machiavellianism, coupled with higher tendencies of PIU and cyberbullying perpetration. Cohen's *d* effect sizes were calculated for each variable, with Machiavellianism, perceived social support and cyberbullying perpetration showing moderate effect sizes.

The Table 4 presented two-way ANOVA that examines the interaction between maternal and paternal education across study variables. For Machiavellianism, the results reveal a significant interaction effect between maternal education and paternal education. Specifically, participants reported higher Machiavellianism scores when both maternal and paternal education levels were till intermediate. On the other hand, when either maternal or paternal education was graduate and above, the inclinations toward Machiavellianism were comparatively lower. This indicates that higher parental education levels are

associated with lower Machiavellian tendencies in individuals.

Regarding problematic internet use, the results show a non-significant relationship between maternal education and paternal education. However, in case of cyberbullying perpetration, the analysis depicted a significant relationship between maternal education and paternal education. Participants reported higher cyberbullying perpetration scores when paternal education was lower and maternal education was higher. While cyberbullying perpetration reduced when both parents have high education.

While it may seem unexpected for the proportions to be similar, it's important to remember that the focus of a two-way ANOVA is not solely on the distribution of participants across individual levels of the independent variables. Instead, it aims to analyze the combined effects of these variables on the dependent variable, as well as any potential interaction effects between them.

**Table 4**

*Two-Way ANOVA for the Interaction Effect of Maternal and Paternal Education on Study Variables (N = 433)*

Var	Maternal Education	Paternal Education	N	M	SD	F	p	$\eta^2$	95 % CI	
									LL	UL
Mac.	Till Intermediate	Till Intermediate	134	24.99	4.20	5.17	.02	.01	24.21	25.76
		Graduate & above	67	24.55	4.19				23.45	25.64
	Graduate & above	Till Intermediate	61	25.03	3.55				23.88	26.17
		Graduate & above	171	21.40	5.21				21.71	23.08
PIU	Till Intermediate	Till Intermediate	134	44.03	10.07	.78	.37	.00	42.20	45.87
		Graduate & above	67	44.17	10.13				41.58	46.77
	Graduate & above	Till Intermediate	61	43.21	11.48				49.49	45.93
		Graduate & above	171	41.33	11.32				39.71	42.96
CBP	Till Intermediate	Till Intermediate	134	49.38	15.05	16.17	.00	.03	46.85	51.92
		Graduate & above	67	48.04	15.94				44.45	51.63
	Graduate & above	Till Intermediate	61	58.44	13.85				54.68	62.20
		Graduate & above	171	44.40	14.82				42.15	46.65

*Note:* Mac. = machiavellianism; PIU = problematic internet use; CBP = cyberbullying perpetration.

### Discussion

This study determines the impact of Machiavellianism and problematic internet use on cyberbullying perpetration. It also intended to examine the role of various demographics like family system, gender, education of parents, and gender differences.

The results of the study showed that Machiavellianism positively predicted cyberbullying perpetration among university students. In the previous studies, it was determined that Machiavellianism, being a part of dark triad personality led to act of cyberbullying perpetration among students (Giumetti et al., 2021; Yuan et al., 2020). A study conducted by Blötner and Bergold (2023) examined the relationship between personality traits and bullying, proved Machiavellianism as a positive marker of bullying attitudes and behaviors among youth. Machiavellianism showed manipulative personality characteristics and actions that involve personal gains

(Wright et al., 2020). Therefore, cyberbullying may be a way for Machiavellian individuals to gain power or control over others. Kircaburun et al. (2019) reported that cyberbullying perpetrators experienced a sense of power allied with Machiavellian by damaging people online. In a similar manner present study also focused on the perspective of people having high Machiavellianism are more prone to cyberbullying perpetration.

The study also highlight that problematic internet use significantly positively predicted cyberbullying perpetration among university students, which is in accordance

with literature (Küçük et al., 2023; Yudes et al., 2022). Previous studies highlighted that spending too much time on the internet can have a negative impact on productive internet usage and positively linked to risk-taking behaviors specifically in form of cyberbullying (Arrivillaga et al., 2020; Teng et al., 2020), which

results in academic burnout, poor family and peer relations, sleep issues, depression, suicidal ideation, and substance use (Mandasari, 2020; Tóth-Király et al., 2021). As a result, individuals with excessive internet use exhibit increased cyberbullying and hostility towards other fellow students (Dhaka & Naris, 2019), and behave in a more aggressive manner (Agbaria, 2021). Problematic internet users had poor control over their impulses or in regulating their emotions, which then vent out in form of harming others.

On the basis of demographic analysis family system significantly moderates between Machiavellianism and cyberbullying perpetration. Findings highlight that participants belonged to nuclear family systems showed high Machiavellianism and cyberbullying perpetration. Pakistan being a state of collectivist culture, family values played a crucial role in shaping positive behaviors, though lack of extended families caused youth to indulge in unethical behaviors (Nadeem & Sully de Luque, 2018). This trend has also been reported by Talwar (2022) that students from the nuclear family system have more inclinations toward cyberbullying perpetration because they were exposed to loneliness, or an aloof environment.

On the other hand, the participants from the joint family system with the support of extended family have more moral values and ethical code of conduct, social support, involved less in negative behaviors (Parker et al., 2022; The Editors of Encyclopedia Britannica, 2017), not harm others for personal gains and find less time to connect socially with other people using technology (Talwar, 2022). On the other hand, the family system did not moderate the intricate relationship between problematic internet use and cyberbullying perpetration. After COVID-19 the use of technology became compulsory for children of any age, even parents were also involved in the learning of the latest technologies (Abi-Jaoude et al., 2020; Drouin et al., 2020). Which led to use of internet as source of information, hence family system showed no impact between problematic internet use and cyberbullying perpetration (Boulianne & Theocharis, 2018).

Based on gender differences revealed that boys have higher inclinations toward Machiavellianism, problematic internet use, and cyberbullying perpetration. Similar to this, study found that males reported higher cyberbullying perpetration as

compared to female participants (Lee et al., 2023; Xu & Zheng, 2022). Furthermore, Kozybska et al. (2022) showed that boys are involved more in problematic internet use as compared to girls. From a primary age, boys are often socialized to be more assertive, competitive, and focused on achieving power and dominance. Testosterone hormone, which exists at higher levels in boys, played a significant role in aggression, and this is indirectly linked to high risk taking and pleasure seeking behaviors (Jhangiani & Tarry, 2022). Study highlighted that boys have a greater risk of adopting offending behaviors because they have more risk for aggressive tendencies as compared to females (Im et al., 2018).

Lastly, the study determined that lower level of parents' education was linked to high Machiavellianism, while high level of fathers education was related to lower Machiavellianism. Kiadarbandsari et al. (2016) found that a high level of parental education led to positive youth development. It may be due to exposure to ethical values and critical thinking brought by educated parents on their children. Educated parents can engage in meaningful discussions with their children, addressing moral dilemmas, ethical considerations, and values. This open dialogue helps children develop an open understanding of moral concepts. However, problematic internet use seemed less influenced by parental education, due to use of technology even by parents. As they involved in the learning of the latest technologies with their children to promote their positive usage (Drouin et al., 2020). The study suggested that low parental guidance and lesser knowledge about the latest technology may result in the child's involvement in problematic internet use (Trninić et al., 2023). This evidence can be indirectly linked with the present study as low parental education lead to involvement in problematic internet use. Through proper research evidence and logical discussion, it was proved that Machiavellianism lead to problematic internet use and cyberbullying perpetration among university students.

### **Limitations and Suggestions**

Though the study fulfils the major literature gap, still it has following limitations. Design was giving a limited direction, with selection of limited sample. Qualitative and experimental research design will give more dimensions to the future studies. The research was limiting the generalizability of findings to broader age groups by focusing on sample of



university students. Future studies should encompass diverse demographics to better understand cyberbullying across different life stages. The study could further explore the nuanced interactions between various family dynamics and cyberbullying perpetration, considering additional factors like parental involvement and communication patterns.

### Conclusion

Machiavellianism and problematic internet use predicted cyberbullying. Machiavellian traits—manipulative inclinations for personal gain—and problematic internet use were found to predict cyberbullying. Moderation results showed that participants from nuclear families show high Machiavellianism and cyberbullying perpetration. Boys showed high Machiavellianism, problematic internet use, and cyberbullying perpetration. Parental education, especially fathers' education, was also linked to cyberbullying perpetration, suggesting that parental knowledge influence children's online behaviors.

**Funding:** Not applicable.

**Conflict of interest:** The authors declare that there is no conflict of interest.

**Ethical approval:** Ethical approval was gained from National Institute of Psychology, Quaid-i-Azam University, Islamabad, Pakistan.

**Data availability:** The data that support the findings of this study are available on request from the corresponding author.

### Reference

- Abi-Jaoude, E., Naylor, K. T., & Pignatiello, A. (2020). Smartphones, Social Media Use and Youth Mental Health. *Canadian Medical Association Journal*, 192(6), 136–141. National Library of Medicine. <https://doi.org/10.1503/cmaj.190434>
- Agbaria, Q. (2020). Internet addiction and aggression: The mediating roles of self-control and positive affect. *International Journal of Mental Health and Addiction*, 19(4), 1227–1242. <https://doi.org/10.1007/s11469-019-00220-z>
- Al-Masalha, H., Hnaif, A., & Kanan, T. (2020). Cyber-Crime Effect on Jordanian Society. *International Journal of Advances in Soft Computing and its Applications*, 12(3), 2074–8523. <http://188.247.81.52/PapersUploaded/2020.3.10.pdf>
- Antonietta, M., Carone, N., Fontana, A., & Barone, L. (2023). Problematic Internet Use in Emerging Adulthood. *Journal of Media Psychology*, 35(5), 316–324. <https://doi.org/10.1027/1864-1105/a000386>
- Arrivillaga, C., Rey, L., & Extremera, N. (2020). Adolescents' problematic internet and smartphone use is related to suicide ideation: Does emotional intelligence make a difference? *Computers in Human Behavior*, 110, 106375. <https://doi.org/10.1016/j.chb.2020.106375>
- Auriemma, V., Iorio, G., Roberti, G., & Morese, R. (2020). Cyberbullying and empathy in the age of hyperconnection: An interdisciplinary approach. *Frontiers in Sociology*, 5. <https://doi.org/10.3389/fsoc.2020.551881>
- Barlett, C. P., Rinker, A., & Roth, B. (2021). Cyberbullying perpetration in the COVID-19 era: An application of general strain theory. *The Journal of Social Psychology*, 161(4), 1–11. <https://doi.org/10.1080/00224545.2021.1883503>
- Blais, J., Aelick, C. A., Scully, J. M., & Pruysers, S. (2024). Antisocial personality traits as potential risk factors for cyberstalking: only aspects of psychopathy and narcissism matter. *Psychiatry Psychology and Law*, 1–20. <https://doi.org/10.1080/13218719.2024.2404833>
- Blötner, C., & Bergold, S. (2023). The Machiavellian bullying revisited: A closer look at differences and processes of Machiavellian bullying and cyberbullying perpetration. *Aggressive Behavior*, 49(6), 568–579. <https://doi.org/10.1002/ab.22095>
- Cebollero-Salinas, A., Orejudo, S., Cano-Escoriaza, J., & Íñiguez-Berrozpe, T. (2022). Cybergossip and Problematic Internet Use in cyberaggression and cybervictimisation among adolescents. *Computers in Human Behavior*, 131(0747-5632), 107230. <https://doi.org/10.1016/j.chb.2022.107230>
- Chandrima, R. M., Kircaburun, K., Kabir, H., Riaz, B. K., Kuss, D. J., Griffiths, M. D., & Mamun, M. A. (2020). Adolescent problematic internet use and parental mediation: A Bangladeshi structured interview study. *Addictive Behaviors Reports*, 12, 100288. <https://doi.org/10.1016/j.abrep.2020.100288>
- Chen, J. K., Yang, B., Wang, L. C., Chang, C. W., & Lin, C. Y. (2023). Is psychological distress a risk factor or an outcome of school Violence and cyberbullying perpetrated by adolescents? A short-term longitudinal panel study. *Journal of*

- Interpersonal Violence*, 38(15-16), 9215-9238. <https://doi.org/10.1177/08862605231163249>
- Cheng, C., Chan, L., & Chau, C. (2020). Individual differences in susceptibility to cybercrime victimization and its psychological aftermath. *Computers in Human Behavior*, 108, 106311. <https://doi.org/10.1016/j.chb.2020.106311>
- De Kimpe, L., Ponnet, K., Walrave, M., Snaphaan, T., Pauwels, L., & Hardyns, W. (2020). Help, I need somebody: Examining the antecedents of social support seeking among cybercrime victims. *Computers in Human Behavior*, 108, 106310. <https://doi.org/10.1016/j.chb.2020.106310>
- Dhaka, P., & Naris, C. (2019). A Study of the Correlation Between Internet Addiction and Aggressive Behavior Among the Namibian University Students. *Lecture Notes on Data Engineering and Communications Technologies*, 1–9. [https://doi.org/10.1007/978-981-10-7641-1\\_1](https://doi.org/10.1007/978-981-10-7641-1_1)
- Drouin, M., McDaniel, B. T., Pater, J., & Toscos, T. (2020). How parents and their children used social media and technology at the beginning of the covid-19 pandemic and associations with anxiety. *Cyberpsychology, Behaviour, and Social Networking*, 23(11), 727-736. <https://doi.org/10.1089/cyber.2020.0284>
- Ferreira, P. C., Simão, A. M. V., Paiva, A., & Ferreira, A. (2019). Responsive bystander behaviour in cyberbullying: a path through self-efficacy. *Behaviour & Information Technology*, 39(5), 511–524. <https://doi.org/10.1080/0144929x.2019.1602671>
- Giumetti, G. W., Kowalski, R. M., & Feinn, R. S. (2022). Predictors and outcomes of cyberbullying among college students: A two wave study. *Aggressive Behaviour*, 48(1), 40-54. <https://doi.org/10.1002/ab.21992>
- Hay, C., & Ray, K. (2020). General Strain Theory and Cybercrime. The Palgrave Handbook of International Cybercrime and Cyberdeviance, 583–600. [https://doi.org/10.1007/978-3-319-78440-3\\_21](https://doi.org/10.1007/978-3-319-78440-3_21)
- Hussain, Z., Savcı, M., Kircaburun, K., & Griffiths, M. D. (2023a). Personality and instagram use motives with problematic instagram use among adolescents: a cross-sectional study. *International Journal of Düzce Educational Sciences*, 1(1), 1-12. <https://dergipark.org.tr/en/pub/ijdes>
- Im, S., Jin, G., Jeong, J., Yeom, J., Jekal, J., Lee, S. I., Cho, J. A., Lee, S., Lee, Y., Kim, D. H., Bae, M., Heo, J., Moon, C., & Lee, C. H. (2018). Gender differences in aggression-related responses on eeg and ecg. *Experimental Neurobiology*, 27(6), 526–538. <https://doi.org/10.5607/en.2018.27.6.526>
- Islam, M. M., Uddin, M. A., Islam, L., Akter, A., Sharmin, S., & Acharjee, U. K. (2020). Cyberbullying Detection on Social Networks Using Machine Learning Approaches. 2020 *IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE)*. <https://doi.org/10.1109/csde50874.2020.9411601>
- Jabłońska, M. R., & Zajdel, R. (2020). The Dark Triad Traits and problematic Internet use: Their structure and relations. *Polish Sociological Review*, 212(4), 477-496. <https://www.ceeol.com/search/article-detail?id=919093>
- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction*, 82(4), 331-342. <https://doi.org/10.1111/j.1360-0443.1987.tb01490.x>
- Jessor, R. (1987). Risky driving and adolescent problem behavior: An extension of problem-behavior theory. *Alcohol, Drugs & Driving*, 3(3-4), 1–11.
- Jhangiani, D. R., & Tarry, D. H. (2022). *Personal and Cultural Influences on Aggression*. <https://opentextbc.ca/socialpsychology/>
- Jones, D. N., & Paulhus, D. L. (2014). Introducing the short dark triad (sd3): a brief measure of dark personality traits. *Assessment*, 21(1), 28-41. <https://doi.org/10.1177/1073191113514105>
- Kiadarbandsari, A., Madon, Z., Hamsan, H. H., & Mehdinezhad Nouri, K. (2016). Role of Parenting Style and Parents' Education in Positive Youth Development of Adolescents. *Pertanika Journal of Social Sciences & Humanities*, 24(4). <http://www.pertanika.upm.edu.my/>
- Kircaburun, K., Kokkinos, C. M., Demetrovics, Z., Király, O., Griffiths, M. D., & Çolak, T. S. (2019). Problematic online behaviors among adolescents and emerging adults: Associations between cyberbullying perpetration, problematic

- social media use, and psychosocial factors. *International Journal of Mental Health and Addiction*, 17(1), 891-908. <https://doi.org/10.1007/s11469-018-9894-8>
- Kożybska, M., Kurpisz, J., Radlińska, I., Skwirczyńska, E., Serwin, N., Zabielska, P., Kotwas, A., Karakiewicz, B., Lebiecka, Z., Samochowiec, J., & Flaga-Gieruszyńska, K. (2022). Problematic internet use, health behaviours, depression and eating disorders: a cross-sectional study among polish medical school students. *Annals of General Psychiatry*, 21(1). <https://doi.org/10.1186/s12991-022-00384-4>
- Küçük, S., Uludaşdemir, D., & Karşıgil, P. (2023). Problematic Internet Use and Cyberbullying in University Students. *Journal of Psychiatric Nursing*, 14(4). <https://doi.org/10.14744/phd.2023.26023>
- Lee, J., Abell, N., & Holmes, J. L. (2017). Validation of measures of cyberbullying perpetration and victimization in emerging adulthood. *Research on Social Work Practice*, 27(4), 456-467. <https://doi.org/10.1177/1049731515578535>
- Lee, M. H. L., Kaur, M., Shaker, V., Yee, A., Sham, R., & Siau, C. S. (2023). Cyberbullying, social media addiction and associations with depression, anxiety, and stress among medical students in Malaysia. *International Journal of Environmental Research and Public Health*, 20(4), 31-36. <https://doi.org/10.3390/ijerph20043136>
- Leite, Â., Cardoso, S., & Paula Monteiro, A. (2023). Dark Personality Traits and Online Behaviors: Portuguese Versions of Cyberstalking, Online Harassment, Flaming and Trolling Scales. *International Journal of Environmental Research and Public Health*, 20(12), 6136–6136. <https://doi.org/10.3390/ijerph20126136>
- López-Castro, L., & Priegue, D. (2019). Influence of Family Variables on Cyberbullying Perpetration and Victimization: A Systematic Literature Review. *Social Sciences*, 8(3), 98. <https://doi.org/10.3390/socsci8030098>
- Mandasari, B. (2020). The impact of online learning toward students' academic performance on business correspondence course. *EDUTECH: Journal of Education and Technology*, 4(1), 98–110. <https://doi.org/10.29062/edu.v4i1.74>
- McMurphy, L. (2020). *It Takes a Village: Alternatives to the Nuclear Family and How the Traditional Model Fails Us*. <https://hdl.handle.net/10877/13129>.
- Nadeem, S., & Sully de Luque, M. F. (2018). Developing an understanding of the human resource (HR) complexities in Pakistan with a GLOBE cultural lens. *Journal of Management & Organization*, 26(4), 1–19. <https://doi.org/10.1017/jmo.2017.79>
- O'Reilly, C., & Mohan, G. (2023). Parental influences excessive Internet use among adolescents. *Internet Research*, 33(7), 86-110. <https://doi.org/10.1108/INTR-12-2021-0904>
- Pan, A., Chan, J., Zou, A., Li, N., Basart, S., Woodside, T., Zhang, H., Emmons, S., & Hendrycks, D. (2023). *Do the Rewards Justify the Means? Measuring Trade-Offs Between Rewards and Ethical Behavior in the Machiavelli Benchmark*. <https://proceedings.mlr.press/v202/pan23a/pan23a.pdf>
- Parker, K., Hallingberg, B., Eriksson, C., Ng, K., Hamrik, Z., Kopcakova, J., Movsesyan, E., Melkumova, M., Abdrakhmanova, S., & Badura, P. (2022). Typologies of joint family activities and associations with mental health and wellbeing among adolescents from four countries. *Journal of Adolescent Health*, 71(1), 55-62. <https://doi.org/10.1016/j.jadohealth.2022.02.017>
- Quintana-Orts, C., Rey, L., & Neto, F. (2020). Beyond Cyberbullying: Investigating When and How Cybervictimization Predicts Suicidal Ideation. *Journal of Interpersonal Violence*, 088626052091364. <https://doi.org/10.1177/0886260520913640>
- Ramsay, J. E., Wang, D., Yeo, J. S. E., Khong, Z. Y., & Tan, C. S. (2023). Perceived authenticity, Machiavellianism, and psychological functioning: An inter-domain and cross-cultural investigation. *Personality and Individual Differences*, 204, 112049. <https://doi.org/10.1016/j.paid.2022.112049>
- Ranjbar, H., Thatcher, A., Greyling, M., Arab, M., & Nasri, N. (2014). Validation of the Persian version of the problematic internet use questionnaire (PIUQ). *Iranian Journal of Psychiatry*, 9(4), 248–252.
- Rogoza, R., & Cieciuch, J. (2019). Structural investigation of the Short Dark Triad

- questionnaire in Polish population. *Current Psychology*, 38(3), 756-763. <https://doi.org/10.1007/s12144-017-9653-1>
- Sakakihara, A., Haga, C., & Osaki, Y. (2019). Association between mothers' problematic internet use and the thinness of their children. *Cyberpsychology, Behavior, and Social Networking*, 22(9), 578-587. <https://doi.org/10.1089/cyber.2018.0685>
- Sánchez-Fernández, M., Borda-Mas, M., & Mora-Merchán, J. (2023). Problematic internet use by university students and associated predictive factors: A systematic review. *Computers in Human Behavior*, 139, 107532. <https://doi.org/10.1016/j.chb.2022.107532>
- Seum, T., Meyrose, A.-K., Rabel, M., Schienkiewitz, A., & Ravens-Sieberer, U. (2022). Pathways of Parental Education on Children's and Adolescents's Body Mass Index: The Mediating Roles of Behavioral and Psychological Factors. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.763789>
- Shafiq, S., & Batool, S. (2023). Socio demographic risk factors of bullying and victimization in adolescents: prevalence-based study. *Journal of Islamic International Medical College (JIIMC)*, 18(1), 50-55. <https://journals.riphah.edu.pk/index.php/jiimc/>
- Sun, Y. (2023). The role of family on internet addiction: A model analysis of co-parenting effect. *Cogent Social Sciences*, 9(1). <https://doi.org/10.1080/23311886.2022.2163530>
- Tajmirriyahi, M., Doerfler, S. M., Najafi, M., Hamidzadeh, K., & Ickes, W. (2021). Dark Triad traits recalled and current quality of the parent-child relationship: A non-western replication and extension. *Personality and Individual Differences*, 180, 110949. <https://doi.org/10.1016/j.paid.2021.110949>
- Tajmirriyahi, M., Ta, V. P., & Ickes, W. (2020). Measuring egocentrism as a trait-like personality attribute: the development and validation of the egocentrism scale. *Psychological Studies*, 65(4), 481-488. <https://doi.org/10.1007/s12646-020-00586-4>
- Talwar, P. (2022). Potential sociodemographic predictors of cyberbullying behaviour among university students. *Malaysian Journal of Psychiatry*, 31(1), 32-38. [https://doi.org/10.4103/mjp.mjp\\_7\\_22](https://doi.org/10.4103/mjp.mjp_7_22)
- Teng, Z., Pontes, H. M., Nie, Q., Xiang, G., Griffiths, M. D., & Guo, C. (2020). Internet gaming disorder and psychosocial well-being: A longitudinal study of older-aged adolescents and emerging adults. *Addictive Behaviors*, 110, 106530. <https://doi.org/10.1016/j.addbeh.2020.106530>
- Thatcher, A., & Goolam, S. (2005). Development and psychometric properties of the problematic internet use questionnaire. *South African Journal of Psychology*, 35(4), 793-809. <https://hdl.handle.net/10520/EJC98345>
- The Editors of Encyclopedia Britannica. (2017). Joint family | kinship group. In *Encyclopedias Britannica*. <https://www.britannica.com/topic/joint-family>
- Tóth-Király, I., Morin, A. J. S., Hietajärvi, L., & Salmela-Aro, K. (2021). Longitudinal Trajectories, Social and Individual Antecedents, and Outcomes of Problematic Internet Use Among Late Adolescents. *Child Development*, 92(4). <https://doi.org/10.1111/cdev.13525>
- Trninić, D., Kuprešanin Vukelić, A., & Mlinarević, J. (2023). Parental education in media literacy, social media, and internet safety for children in bosnia and herzegovina. *Journal of Media Literacy Education*, 15(2), 1-16. <https://doi.org/10.23860/JMLE-2023-15-2-1>
- Van de Weijer, S. G. A., & Moneva, A. (2022). Familial concentration of crime in a digital era: criminal behavior among family members of cyber offenders. *Computers in Human Behavior Reports*, 8, 100249. <https://doi.org/10.1016/j.chbr.2022.100249>
- Wang, L., & Jiang, S. (2021). The effects of strain and negative emotions on adolescent cyberbullying perpetration: An empirical test of general strain theory. *Current Psychology*. <https://doi.org/10.1007/s12144-021-02426-8>
- Wolff, C., & Wetzel, E. (2023). The development of machiavellianism, psychopathy, and narcissism in young adulthood. *Collabra*, 9(1), 1-31. <https://doi.org/10.1525/collabra.77870>
- Wright, M. F., Wachs, S., Huang, Z., Kamble, S. V., Soudi, S., Bayraktar, F., Li, Z., Lei, L., & Shu, C. (2022). Longitudinal Associations among Machiavellianism, Popularity Goals, and Adolescents' Cyberbullying Involvement: The Role of Gender. *The Journal of Genetic*

- Psychology*, 183(5), 482–493. <https://doi.org/10.1080/00221325.2022.2095251>
- Xu, W., & Zheng, S. (2022). Personality traits and cyberbullying perpetration among Chinese university students: the moderating role of internet self-efficacy and gender. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.779139>
- Yuan, G., Liu, Z., & An, Y. (2020). Machiavellianism, mindfulness, and cyberbullying among Chinese junior high school students: The mediating role of empathy. *Journal of Aggression, Maltreatment & Trauma*, 29(9), 1047-1058. <https://doi.org/10.1080/10926771.2019.1667467>
- Yudes, C., Rey, L., & Extremera, N. (2022). The moderating effect of emotional intelligence on problematic internet use and cyberbullying perpetration among adolescents: gender differences. *Psychological Reports*, 125(6), 2902-2921. <https://doi.org/10.1177/00332941211031792>
- Zhu, X., Geng, Y., Sai, X., Yang, M., Toh, C. W., Zhan, T., Yu, J., & Shi, L. (2019). Moderating effects of gender and Machiavellianism on outcomes associated with negative life events among adolescents. *Current Psychology*, 40(9), 4563–4570. <https://doi.org/10.1007/s12144-019-00409-4>