

ORIGINAL ARTICLE:

Dual Faces of Gaming: Exploring Mediating Role of Extroversion on Gaming Addiction and Mood

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ABSTRACT

OBJECTIVE

To investigate the relationship between video game addiction, extroversion, and mood states among undergraduates in Pakistan.

STUDY DESIGN

A correlational survey design was employed to examine the associations between gaming addiction, extroversion, and mood states.

PLACE & DURATION OF STUDY

The study was conducted across various educational institutes in Pakistan, in a period of three months.

SUBJECTS AND METHODS

A sample of 203 undergraduates was recruited using purposive sampling. Validated scales, including the Game Addiction Inventory for Adults, Introversion-Extroversion Scale, and Brief Mood Introspection Scale, were administered to assess gaming addiction, personality traits, and mood, respectively. Pearson correlation, hierarchical regression, and mediation analyses were performed to analyze the data.

RESULTS

Significant positive correlations were found between extroversion and game addiction and between extroversion and mood states. Hierarchical regression revealed that extroversion significantly predicted arousal/calm mood ($\beta=.27$, $p<.001$), accounting for 10.5% of the variance, while game addiction contributed only 3% and was not a significant predictor. Mediation analysis indicated that extroversion partially mediated the relationship between game addiction and mood, suggesting that gaming influences emotional states indirectly by enhancing extroverted behaviors.

CONCLUSION

The findings highlight that extroverts are more susceptible to game addiction due to their attraction to socially stimulating gaming environments. The study underscores the need for culturally adapted interventions to address gaming addiction.

KEYWORDS

Video game addiction, extroversion, mood states, psychological impacts, Pakistan.

INTRODUCTION

In the modern era of digital devices, gadgets in all spheres of human activity are rapidly increasing, making it impossible to imagine a world without them¹. The presence of technology everywhere has not just changed daily life, but also led to the rise of different behavioral issues, such as video game addiction. Video game addiction is a serious mental health issue that affects a significant number of individuals globally. As per the DSM-5-TR, video game addiction is characterized as the habitual and repeated utilization of the internet to engage in gaming regularly with varied players². It is difficult to disagree that, for many years, most children have spent their childhood playing various games, including physical and board games. But nowadays, children are immersed in internet games³. Online gaming has become a global phenomenon, and individuals in Pakistan have also been affected by this addiction. The availability of smartphones, tablets, and gaming platforms has surged in Pakistan⁴. A considerable public health concern in Pakistan is the rise of problematic gaming behavior, especially among teenagers and

young people. According to a recent survey, 57% of the respondents participated in online gaming, and 12.5% of these individuals were identified as having gaming addiction⁵.

Game addiction also has effects on mood and behavior. Mood is typically described as a temporary feeling, emotional tone, or overall attitude. As a short-term emotional condition, it changes based on an individual's situation⁶. Over 20 million individuals in Pakistan, representing 10% of the country's population, are affected by various mental health conditions⁷. Approximately 100 million adults worldwide suffer from major depressive disorder (MDD), which continues to be the most common mental illness. A variety of symptoms impacting mood, anxiety, and sleep habits are indicative of the disorder⁸. When studied the prevalence of video game use and addiction in gambling disorder and compared them to subjects with non-video game use concerning their gambling behavior, psychopathology, and personality characteristics, it was concluded that gambling disorder patients with video game use were younger and presented with more dysfunctional personality traits, and had more general psychopathology⁹.

A person's personality is unique and develops in response to stimuli from both the environment and oneself¹⁰. The American Psychological Association defines personality as the unique variations in how individuals think, feel, and act¹¹. A closed personality is associated with introversion, making it more self-centered and challenging to connect with others. On the other hand, an open personality, associated with extroversion, is found in individuals oriented outward and engaged in social interactions. These individuals are sociable, friendly, and adept at understanding the emotions of others¹². More pathological gamblers are male than females and spend more time playing video games. A sample of 622 students was interviewed to identify pathological students. The results showed that pathological students were around 1.93%. In the sample, the most frequent gaming time for students was 1 or 2 hours, both online and offline games were considered¹³.

In recent years, the significant increase in using video games has been raising health issues. The extent of this phenomenon has led the WHO to include gaming disorder in the list of mental health conditions. Addict specialists notice that addict subjects are unclear about pleasure with happiness when linking emotional states to their addictive activities¹⁴. There are four major reasons for internet gaming: entertainment, getting along with friends, stress relief, and habitual gaming. The habitual group has a higher risk for internet gaming addiction¹⁵. The literature is scarce on the interaction of these variables hence current study was conceived to investigate the relationship between video game addiction, extroversion, and mood states among undergraduates in Pakistan.

SUBJECTS AND METHODS

Participants

The current study utilized a correlational survey methodology, gathering a sample of 203 undergraduates from different institutes aged 17 to 28 ($M= 20.91$, $SD= 2.01$) which was more than the estimated sample determined by the online calculator¹⁶. Purposive sampling was employed for the data collection.

Instruments

The study utilized the Game Addiction Inventory for Adults to evaluate gaming disorders among adults¹⁷, the Introversion-Extroversion scale to assess individual personality traits¹⁸, and the Brief Mood Introspection Scale to measure mood¹⁹. All three scales have good psychometric properties.

Procedure

After the ethical approval the participants were approached and informed consent was obtained. The research tools were administered to the participants and data was entered to SPSS. Pearson correlation, hierarchical regression, and mediation analyses were performed to analyze the data.

RESULTS

The participants included in our study were nearly equally distributed in gender, with 112 males (45.17%) and 91 females (44.82%). The educational status showed a wide variation of students from BS VII or VIII/MSc III or IV (36.45%), followed by BS semester I or II (21.67%), BS semester III or IV (15.56%), FA, FSC or ICS (13.79%), and BS semester V or VI/MSc I or II (12.31%).

Significant positive correlations were found between extroversion and game addiction and between extroversion and mood states (see table 1). Hierarchical regression revealed that extroversion significantly predicted arousal/calm mood ($\beta=.27$, $p<.001$), accounting for 10.5% of the variance, while game addiction contributed only 3% and was not a significant predictor (see table 2). Mediation analysis indicated that extroversion partially mediated the relationship between game addiction and mood, suggesting that gaming influences emotional states indirectly by enhancing extroverted behaviors (see table 3).

Table 1

Pearson Correlation Analysis

Variable	1	2	3
1 Mood	-	-	-
2 Extrovert	.32**	-	-
3 Game addiction	.15*	.29**	-

Note * $p<0.05$, ** $p<0.01$

Table 2

Hierarchical regression

Variable	<i>B</i>	95% CI for <i>B</i>		<i>SEB</i>	β	R^2	ΔR^2
		LL	UL				
Step 1						.07	.07*

Age	.27	-.15	.70	.22	.13		
Gender	1.84	.66	3.01	.60	.22*		
Education	.03	-.60	.66	.32	.01		
Birth order	-.04	-.37	.30	.17	-.01		
Institute	-.41	-1.10	.28	.35	-.10		
Step 2						.09	.02*
Total family income	1.50	.00	.00	.00	.04		
Total family members	.16	-.12	.44	.14	0.92		
Family system	1.25	.03	2.48	.62	.15*		
Step 3						.07	.02**
Game addiction	0.24	.00	.05	0.12	.14*		
Step 4						.13	.06***
Extrovert	6.24	2.93	9.54	1.68	.27***		

Note *p<0.05, **p<0.01, ***p<0.001

Table 3

Mediation Analysis

		Consequent						
		M (Extrovert)			Y (Mood)			
Antecedent		β	SE	P	B	SE	p	
Game addiction (X)	a_1	.29	.00	.000***	c'	.06	.01	.424
Extrovert (M)					b_1	.31	1.63	.000***
Constant	I	.00	.02	.000***	I	.77	.87	.000***
		$R^2=.08$				$R^2=.11$		
		$F(1,201) = 18.81, p<.001$				$F(2,200) = 12.15, p<.001$		

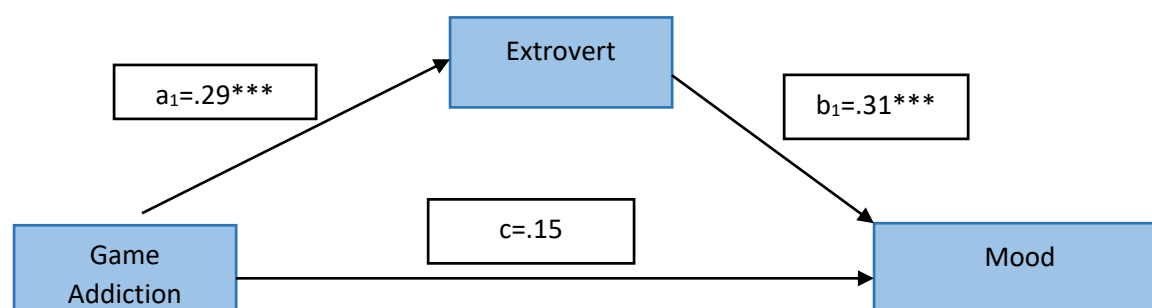


Figure 1: The Mediation Model

A simple mediation analysis was conducted using ordinary least squares path analysis (performed by the PROCESS SPSS macro). As illustrated in Figure 1, the relationship between game addiction and mood was partially mediated. Extrovert individuals have more tendency towards game addiction which can lead to specific mood states.

DISCUSSION

The results have shown a significant relationship between arousal/calm mood, game addiction, and extrovert personality. Extroversion plays a mediating role between game addiction and mood state. The correlation between extroverts and arousal/calm mood and between extroverts and game addiction suggests that extroverts have a positive association with a positive mood²⁰ and are more prone to game addiction possibly due to their attraction to socially stimulating gaming environments. The old stereotype that introverts are more game addicts because of their nature of staying home and avoiding social interaction is challenged as the study reveals that extroverts are more game addicts. The reason could be making new friends, enjoying the company of different people, and being more sociable. Instead, it suggests that extroverts may be drawn to multiplayer games that offer social interaction, which could increase their risk of addiction. While the direct link between gaming and emotional regulation is weak, the indirect influence through extroversion is striking—gaming amplifies extroverted behaviors, which in turn foster positive emotional states. The hierarchical regression analysis showed that extroversion significantly predicted arousal/calm mood, accounting for 10.5% of the variance, while game addiction added only 3% and was not a significant predictor. The mediation analysis further highlighted that extroversion mediates the relationship between game addiction and arousal/calm mood, suggesting that gaming influences emotional states indirectly by enhancing extroverted behaviors. Alarming, gaming addiction is on the rise in Pakistan²⁰, with its psychological impacts often tilting toward the negative mood. These findings call for a deeper exploration of how gaming shapes mental health, urging us to balance its benefits against its risks²¹.

The current study employed three self-report measures to collect data from participants, which are inherently susceptible to social desirability bias, response bias, and potential deception. To mitigate these limitations, the use of cross-rating methods, where external evaluators assess participants, could provide a more objective approach and reduce the influence of biased responses. Additionally, all measures utilized in this research were originally developed within individualistic cultural contexts, raising concerns about their applicability and validity in the collectivist setting of Pakistan. Therefore, it is imperative to validate these instruments within the cultural framework of Pakistan to ensure their relevance and accuracy. Furthermore, while all assessments were administered in English, and participants were academically proficient, translating, adapting, and conducting cross-language validation of these measures into Urdu would enhance their accessibility and reliability for the local population, aligning with best practices in culturally sensitive research.

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REFERENCES

1. Kabanova EE, Vetrova EA. The Use of Modern Electronic Gadgets in the Educational Process of the University. *European Journal of Contemporary Education*. Sep 2019; 8 (3). doi: 10.13187/ejced.2019.3.524.
2. Mohammad S, Jan RA, Alsaedi SL. Symptoms, Mechanisms, and Treatments of Video Game Addiction. *Cureus*. Mar. 2023; doi: 10.7759/cureus.36957.
3. Shaheen S, Ali SM. Factors impacting online gaming addiction on mental health of adolescents studying in the context of Karachi. *Evaluation Studies in Social Sciences (ESSS)*. 2022; 1: 11–25. doi: <https://doi.org/10.37134/esss.vol3.1.2.2022>.
4. Attiq S, Afzal H. Predictors of smartphone's gaming addiction among Generation Z consumers: An empirical investigation from Pakistan. *Pakistan Journal of Commerce and Social Sciences*. Dec 2023; 17(4):700–728.
5. Zaman M. *et al.*, Prevalence of gaming addiction and its impact on sleep quality: A cross-sectional study from Pakistan. *Annals of Medicine & Surgery*. Jun 2022; 78. doi: 10.1016/j.amsu.2022.103641.
6. Von Ah D, Kang D. Correlates of mood disturbance in women with breast cancer: patterns over time. *Journal of Advanced Nursing*. Mar 2008; 61(6):676–689. doi: 10.1111/j.1365-2648.2007.04563.x.
7. Nisar M, Mohammad RM, Fatima S, Shaikh PR, Rehman M. Perceptions Pertaining to Clinical Depression in Karachi, Pakistan. *Cureus*. Jul 2019; doi: 10.7759/cureus.5094.
8. Zaki NFW, Spence DW, BaHammam AS, Pandi-Perumal SR, Cardinali DP, Brown GM. Chronobiological theories of mood disorder. *Eur Arch Psychiatry Clin Neurosci*. Mar 2018; 268 (2): 107–118. doi: 10.1007/s00406-017-0835-5.
9. Jiménez-Murcia S *et al.*, Video Game Addiction in Gambling Disorder: Clinical, Psychopathological, and Personality Correlates. *BioMed Research International*. 2014. doi: 10.1155/2014/315062.
10. Ariga R, Amelia R, Sari S. Relationship of extrovert and introvert personality types against student achievement faculty of nursing USU. *J. Phys.: Conf. Ser.* Dec 2018; 1116:052007. doi: 10.1088/1742-6596/1116/5/052007.
11. Bergner RM. What is personality? Two myths and a definition. Apr 2020; 57:100759. doi: 10.1016/j.newideapsych.2019.100759.
12. Nugraha E, Wibowo R, Firmansyah H. Mood States and Game Performance in Invasion Game Activities: A Correlation Study Among Elementary School Students. In *Proceedings of the 4th International Conference on Sport Science, Health, and Physical Education (ICSSHPE 2019)*, Bandung, Indonesia: Atlantis Press, 2020. doi: 10.2991/ahsr.k.200214.027.
13. Esposito MR *et al.*, An Investigation into Video Game Addiction in Pre-Adolescents and Adolescents: A Cross-Sectional Study. May 2020; 56(5):221. doi: 10.3390/medicina56050221.

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14. Gros L, Dehue N, Lete J, Van De Leemput C. Video Game Addiction and Emotional States: Possible Confusion Between Pleasure and Happiness? *Front. Psychol* Jan 2020;10: 2894. doi: 10.3389/fpsyg.2019.02894.
15. Kim N, Kim MJ, Hughes TL, Kwak H, Kong ID. Relationships of internet gaming reasons to biological indicators and risk of internet gaming addiction in Korean adolescent male game users. *BMC Psychiatry*. Dec 2020; 20(1):341. doi: 10.1186/s12888-020-02714-w.
16. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*. May 2007; 39(2):175–191. doi: 10.3758/BF03193146.
17. Wong U, Hodgins DC. Development of the game addiction inventory for adults (GAIA). *Addiction Research & Theory*. Jun 2014;22(3):195–209. doi: 10.3109/16066359.2013.824565.
18. Grove GA. The Introversion-Extroversion Scale. 2016; doi: 10.13140/RG.2.1.2717.6086.
19. Mayer JD, Cavallaro R. Brief Mood Introspection Scale (BMIS): Technical and Scoring Manual (3rd Edition). 2019.
20. Zahra S, Ahsan S, Kiani S, Shahbaz K. Internet Gaming Disorder: An Emerging Addiction among Pakistani University Students. *NUST Journal of Social Sciences and Humanities*. Jun 2019; 5(1):87–104.
21. Ahmed Z, Ahmed M. An empirical study of the psychological effects of gaming on pakistani PUBG players. 8.

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