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IMPACT OF VIDEO GAMING ON SOCIAL CONNECTEDNESS AMONG ADOLESCENTS

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Abstract

Background: A substantial growth in the levels of video gaming among adolescents escalates concerns about one's social connectedness and overall well-being. Though moderate gaming has the potential to promote positive cognitive and social outcomes (Granic et al., 2014), excessive gaming is associated with social isolation and mental illness (Lemmens et al., 2011) like Internet Gaming Disorder (Petry et al., 2014). **Objective:** This research addresses the existing research gap by examining the relationship between video gaming, social connectedness and adolescent demographics such as age, gender, birth order and family type. **Methods:** A cross-sectional, quantitative study was conducted by obtaining data from 300 adolescents (150 males and 150 females) between the ages of 13 and 18 through standardized tools, including the Social Connectedness Scale-Revised (Lee & Bernard Robbins, 1995) and 7-item Gaming Addiction Scale (Lemmens et al., 2011). Data analysis included regression analysis, Pearson correlation, and independent sample t-tests. **Results:** Regression analysis revealed that age and social connectedness were significant predictors of gaming activity. Pearson correlation showed a strong negative association between video gaming and social connectedness. Independent sample 't' - test revealed higher involvement of male in video gaming and female in social connectedness. Birth order and family type, however, had no significant effects. **Conclusion:** These results highlight the importance of educators, parents mental health professionals and policymakers to establish programs, interventions and regulatory frameworks for the development of social skills and responsible gaming practices among adolescents.

Keywords: Video Gaming, Social Connectedness, Adolescents, Mental health, Internet gaming disorder

1. INTRODUCTION

Social connectedness reflects the quality of relationships and feelings of belonging with one's social networks. Lee & Robbins has defined social connection as a subjective awareness to being close related to the social world (Lee & Bernard Robbins, 1995). It explains the capacity through which people become able to maintain meaningful relations or hold affective bonds or be in possession of a sense of community. This concept has been identified as a basic element of human welfare in the domains of psychology, sociology, and public health. The transition of any individual from childhood to adolescence is highly impacted by one's social connection (Blum et al., 2022). Adolescents' social connection includes one's families, friends and community networks. Out of all possible connections family act as a prime source for adolescents' emotional support and guidance, whereas peers influence their self-concept and social behaviour (Armsden & Greenberg, 1987). An individual rely on their social connections mainly to develop their own identities (Erik H. Erikson, 1968), enhance their resilience, and foster emotional health (Judith G et al., 2006).

Individuals at this stage are likely to spend more time with peers and engage one into various activities since they sort for sense of independence from their parents. Social platforms of gaming, entertainment and messaging aids in expanding one's social network, develop and maintains it (Uhls et al., 2017). Among adolescents, rather than other sources of social engagement, video gaming has emerged as a notable factor that contributes to adolescents' socialization process in both positive and negative ways (Solanki, 2024).

Video games are playing electronic games on one's computer or console or via mobile device. These games have different variations in terms of genres and levels that can be played individually or by forming teams. In modern days, video gaming oversteps age and cultural boundaries and has become popular worldwide (Anderson & Dill, 2000).

Video game positively affects teen friendship intimacy (Pouwels et al., 2021) and improves social connectivity by giving adolescents a chance to engage with their friends virtually. For instance, gamers cooperate and compete with each other, as well as interact with people from all walks of life when playing multiplayer online games. All this leads to online groups and friendships, which act excellent for adolescents who might face challenges in trying to communicate with people in person. Prosocial behaviors, compassion and social skills are also developed through playing prosocial games which emphasize teamwork, cooperation, mutual help and sharing of resources with other members (Shoshani et al., 2021).

While there may be some benefits, spending much time on video gaming might be detrimental to social connectedness. One of the most critical problems is social displacement, whereby the time devoted to gaming displaces face-to-face interactions with people around that makes offline social circles smaller in size and lower in quality (Kowert et al., 2014). This can further lead to social isolation, which is defined as difficulty in establishing and maintaining interpersonal relationships due to decreased social skills. Moreover, increased video gaming that interferes with the day to day activities of individuals is classified as an indicator of Internet Gaming Disorder (IGD). IGD leads to decreased social connectivity alongside, they also experience anxiety, despair, physical discomfort (Yan et al., 2024).

There are few theories that ease the understanding of analysing the link between adolescents' video gaming and social connectedness, which gives different perspectives into how gaming connects to wellbeing and social relationships. According to the Social Learning Theory, Bandura postulated that adolescents learn social skills by viewing and relating with their peers in the gaming context (Bandura, 1986). People pick up behaviors through imitation and observation as said in the Social Learning Theory. Video games, especially multiplayer and internet games, facilitate social learning and the development of social competence through a virtual environment where players cooperate, compete, and communicate (Solanki, 2024). According to Uses and Gratifications Theory, people deliberately seek out media, including video games, to fulfill particular needs like amusement, escapism, and sociability (Katz et al., 1973). Bronfenbrenner's Ecological Systems Theory, 1979 provides a very holistic perspective about social connectedness by emphasizing the interconnected levels of influence from intimate family and friends (microsystem) to societal and cultural environments (macrosystems). Vygotsky's Sociocultural Theory, 1978 also indicates social connection as a fundamental aspect in cognitive and affective development as well as shaping the adolescent's experience by its cultural resources as well as its group learning process. Contemporary theories like Self-determination theory (SDT) by Deci and Ryan, 1985 described social connectedness as a basic and fundamental component for humans for their psychological well-being which comprises relatedness, competence and autonomy.

Since adolescents at present consider video gaming has an important source for social connection, leisure, and there is also a significant growth in prevalence of Internet Gaming Disorder, it is important to understand the impact of video gaming on social connectedness at present context (Yan et al., 2024, Blum et al., 2022). This study might help to form base for intervention and prevention methods.

2. MATERIALS AND METHODS

2.1 Research Design

This study is a quantitative, cross-sectional survey that examines the relationship between video gaming, social connectedness, and few demographic factors such as age, gender, birth order and family type among adolescents of age 13 -18 years. Multiple regression analysis was used to determine the predictive influence of demographic parameters and social connectedness on video gaming activity, and a correlational method was used to investigate the relationships between the variables under consideration.

2.2 Objectives of the study

- To understand the relationship between video gaming and social connectedness among adolescents
- To investigate the role of social connectedness and demographic factors (age, gender, family type, birth order) in predicting video gaming behaviour.
- To explore the gender differences in video gaming and social connectedness among adolescents.
- To provide insights for educators, mental health professionals, parents and policy makers on cultivating healthy gaming habits through enhancing social connections among adolescents.

2.3 Sample

The study adopted purposive sampling and focused on 300 adolescents (150 males and 150 females) from different educational institutions between the ages of 13 and 18 in Chennai to represent diversity. The data was collected through both offline and online mode using questionnaire and google forms. Adolescents who frequently engage in video gaming, not identified with "Internet Gaming Disorder (IGD)" according to DSM-5 and ICD-11 and given consent to participate in the study was considered as samples. Those excluded were video game non-players, adolescents with severe forms of psychological disorders that might impact on their social relationships, and those outside the study age group.

2.4 Tools used

2.4.1 Gaming addiction scale (GAS shorter version) by Lemmens et al, 2011

The seven item GAS (Shorter version) developed for adolescents are rated using a five-point Likert scale ranging from 1 (never) to 5 (very often). The scale measures 7 criteria of video gaming with one question from each criterion

that includes Salience, Tolerance, Mood modification, Withdrawal, Relapse, Conflict and Problems. Higher scores more than 4 criteria denotes video gaming addiction. This scale has a Cronbach's alpha of 0.86 and concurrent validity.

2.4.2 Social Connectedness Scale-Revised by Lee, R.M., & Robbins, S.B., 1995

Social Connectedness Scale-Revised is an 8-item scale that assess the degree to which youth feel connected to others in their social environment. Responses to the scale range from 1 (strongly disagree) to 6 (strongly agree), where the higher score denotes higher social connectedness. The scale has high reliability (internal consistency α >.92) and validity which includes concurrent validity, construct validity, convergent validity and discriminant validity.

2.5 Statistical analysis

Data were analyzed using IBM SPSS (Statistical Package for the Social Sciences) Version 26. Descriptive Statistics which include frequency distributions, mean and standard deviation were used to summarize demographic characteristics and video gaming behavior. Pearson's correlation analysis was used to test the correlation between video gaming and social connectedness. Multiple Regression Analysis calculated prediction ability of social connectedness and demographic variables (age, gender, family type, birth order) on video gaming behavior.

3. RESULTS

Table 1 Descriptive Statistics

Personal details	Groups	N = 300	%	Mean	SD
Age	13	58	19.33	3.503	1.945
	14	66	22.00		
	15	46	15.33		
	16	12	4.00		
	17	33	11.00		
	18	85	28.33		
Gender	Male	150	50	1.500	0.501
	Female	150	50		
Family Type	Nuclear	198	66	1.340	0.475
	Joint	102	34		
Birth Order	Singletons	72	24	1.760	0.839
	With one sibling	150	50		
	With more than 1 sibling	78	26		

Among 300 adolescents' samples (150 males and 150 females) 19.33% aged 13, 22.00% aged 14, 15.33% aged 15, 4.00% aged 16, 11.00% aged 17 and 28.33% aged 18 out of which 24% were singletons, 50% were adolescents born with one sibling and 26% were adolescents born with multiple siblings. A majority of participants came from nuclear families (66%), while the rest belonged to joint families (34%).

Table 2 Pearson Correlations among Variables

Variables	Correlating variable	N	Correlation Coefficient (r)
Video gaming	Social connectedness	300	-0.923**
Age	Video gaming	300	-0.150**
Gender	Video gaming	300	-0.216**
Family Type	Video gaming	300	0.008 NS
Birth Order	Video gaming	300	-0.006 NS
Age	Social connectedness	300	0.020 NS
Gender	Social connectedness	300	0.223**
Family Type	Social connectedness	300	-0.011 NS
Birth Order	Social connectedness	300	-0.035 NS

Table 2 represents the relationships between video gaming, social connectedness, and demographic variables. A strong negative correlation ($r = -0.923$, $p < .01$) was found between video gaming and social connectedness, which indicates that increased video gaming is significantly associated with lower levels of social connectedness. Focusing on relationship between video gaming and demographic variables, age was found to be in significant negative correlation ($r = -0.150$, $p < .01$), which suggests that younger adolescents tend to engage more in video gaming than older ones. There is also significant negative correlation with gender ($r = -0.216$, $p < .01$), which shows that males are more likely to engage in video gaming rather than females. But no significant relationships were observed with family type and birth order. Moving on to relationship between social connectedness and demographic variables, gender has a positive significant correlation ($r = 0.223$, $p < .01$), with females showing higher levels of social connectedness. However, age, family type and birth order shows no significant correlations with social connectedness.

Table 3 Independent sample 't' test showing gender differences among variables

Variable	Sample	N	Mean	SD	t-value	df	p-value
Video gaming	Male	150	16.35	5.06	3.816	298	0.000
	Female	150	14.19	4.77			
Social connectedness	Male	150	31.85	10.61	3.957	298	0.000
	Female	150	36.35	9.05			

Table 3 examines the gender differences in video gaming and social connectedness among adolescents. The result revealed that male adolescents (M = 16.35, SD = 5.06) reported significantly higher levels of video gaming compared to females (M = 14.19, SD = 4.77), t(298) = 3.816, p < .001. Whereas, female adolescents (M = 36.35, SD = 9.05) reported significantly higher levels of social connectedness compared to males (M = 31.85, SD = 10.61), t(298) = 3.957, p < .001.

Table 4 Regression Analysis Summary for Predicting Video Gaming (VGA)

Model	R	R^2	Adjusted R^2	RMSE	F	df	p
M_0	0.000	0.000	0.000	5.504	-	-	-
M_1	0.893	0.797	0.794	2.294	231.463	5, 294	<.001

ANOVA for M_1

Source	Sum of Squares	df	Mean Square	F	p
Regression	6090.373	5	1218.075	231.463	<.001
Residual	1547.174	294	5.262	-	-
Total	7637.547	299	-	-	-

Coefficients for M_1

Variable	Unstandardized Coefficients (B)	Standard Error	Coefficients (β)	t	p
Intercept	37.920	2.413	-	15.717	<.001
Age	-0.878	0.252	-0.338	-3.486	<.001
Social Connectedness	-0.611	0.050	-1.217	-12.300	<.001
Gender	0.558	0.323	0.054	1.727	0.085
Family Type	-0.176	0.281	-0.016	-0.624	0.533
Birth Order	0.146	0.159	0.024	0.915	0.361

Note: M_1 includes Age, Social Connectedness (SC), Gender, Family Type, and Birth Order as predictors. The intercept model (M_0) is omitted as it does not provide meaningful information.

Table 4 presents a multiple regression analysis examining the influence of Age, SC, Gender, Family type, and Birth order on the dependent variable (VGA). The results reveal an R^2 value of 0.797 and an Adjusted R^2 of 0.794, indicating that 79.7% of the variance in the dependent variable is explained by the model. The RMSE value of 2.294 reflects the model's prediction accuracy. The ANOVA table indicates that the regression model is statistically significant, F (5,294) = 231.463, p<.001, signifying that the independent variables collectively have a significant effect on the dependent variable. Examining the coefficients, Age (β = −0.338, t = −3.486, p<.001) and SC (β = −1.217, t = −12.300, p<.001) were found to have statistically significant effects on Video gaming. However, Gender (β = 0.054, t = 1.727, p =0.085), Family type (β = − 0.016, t = −0.624, p = 0.533), and Birth order (β = 0.024, t = 0.915, p=0.361) did not exhibit significant effects.

4. DISCUSSION

The main objective of the present study was to investigate the relationship that exist between video gaming, social connectedness and specific demographic variables such as age, gender, family type and birth order among adolescents of age 13 to 18. Though prior researches analysed the significance of establishment of social relationships for maintaining one's psychological well-being during the adolescent stage of development (García-Gil et al., 2023; Marja & Stian, 2021), this study provides in-depth understanding of how these factors interact, to be aware of how video gaming habits affect adolescents' social development.

The result of this current study indicates that adolescents who involve oneself much into video games are more often to have lower levels of social connectedness through a strong statistical negative association between both the variables. This finding also aligns with past studies that observed the similar impacts including the limitation of social skills acquisition (García-Gil et al., 2023) and increased social isolation due to excessive video gaming, where the later was identified to replace the meaningful time spent on social contacts (Kowert et al., 2014; Lemmens et al., 2011). The regression analysis of this study provides a critical new piece of information regarding the predictors of video gaming. The model explained 79.7% of the variance in video gaming, which denotes a strong predictive

relationship. The reflected level of variance is in accordance with previous studies that emphasized on considering multiple factors like combination of personal, social, and familial factors (Hee Ryung et al., 2018; Jin et al., 2021) for examining video gaming behaviors (Colder Carras et al., 2018; Perry et al., 2018). Out of other factors that was under consideration in this study, social connectedness was found to be a huge negative predictor of video gaming behavior, which indicates that increase in the level of social connectedness might decrease the adolescent's tendency to engage oneself in video gaming. This coincides with research studies pointing out that social connection and interpersonal bonds intensify the problems of excessive video gaming (Teng et al., 2020). This outcome is in accordance with studies that have already discovered that excessive video game use can lead to behaviors that eventually result in social isolationism (Kowert et al., 2014; Lemmens et al., 2011). Reduction of chances in face to face social interactions due to excessive involvement in gaming might be a notable reason for decreased social connectedness (Kowert et al., 2014).

In terms of demographic variables, age showed a notable negative correlation with video gaming. This indicates the developmental difference that exist among younger and older adolescents, and such younger players might show a escalated propensity towards play and exploration of virtual environments (García-Gil et al., 2023; Özçetin et al., 2019). Thus, the younger ones are found in higher frequencies playing video games as compared to other activities in social and academic contexts (ESA, 2020). It was also found that age is a significant negative predictor of video gaming. Previous studies had indicated that it may be because of the novelty and immersive nature of the game that might first attract younger people to it, which results in increased usage among them (ESA, 2020; Przybylski et al., 2010). Additionally, young adolescents has less time constraints and a higher tendency to spend time on digital entertainment, which increases the chance of engaging in video gaming (Sherry et al., 2006) comparing to older individuals who reflect a shift in leisure activities due to increased responsibilities, social commitments (Phan et al., 2012; Savci & Aysan, 2017) and prioritizing face-to-face interactions over screen time (Przybylski et al., 2010) often have less time for gaming. Interestingly, age was not strongly related to social connectedness. It may mean that factors other than age, including personal characteristics or even the dynamics of a family, can influence the ability to form social relationships (Allen, 2020).

The negative association of gender with increased playing supports a trend well-established in gaming research that males are more likely to prefer video gaming in adolescent stage (Sherry et al., 2006). Compared to female adolescents, male adolescents reported playing video games at far higher levels. This is in line with previous studies, where it was shown that males have a greater likelihood of engaging in video game activities (Sherry et al., 2006). This may be due to factors such as higher interest in competitive gaming, more preference for action-based games (Klimmt & Hartmann, 2006; Männikkö et al., 2019) which are found more frequently in the video game market, social facilitation in the context of male peer groups (Shen & Williams, 2011) and gender expectations (Lopez-Fernandez et al., 2019; Sherry et al., 2006). Though there is an association, the regression analysis showed no effect of gender on video gaming. This non-significant effect is particularly noteworthy, as it challenges traditional view that males are greater in number than the females in playing video games and supports the contemporary findings that suggest both the gender engage equally in playing. This may be because of significant rise in preference for various gaming genre among females, which enables both the gender to involve in various video gaming on almost equal ratio (Mandryk et al., 2020; Phan et al., 2012).

Similarly, the positive correlation between social connectedness and gender reflects the female social orientation. This is in agreement with study results indicating that women have a greater probability than men to value social connections, provide emotional support, hold social values, and to participate in social relationships (Lopez-Fernandez et al., 2019; Marja & Stian, 2021). During adolescence, girls are inclined to sustain stronger social bonds resulting in exhibiting more prosocial actions (Allahverdipour et al., 2010). This result is also consistent with studies that indicate women prioritize social relationships and emotional intimacy, which may strengthen social ties (Rose & Rudolph, 2006). This could be because girls are encouraged to prioritize interpersonal relationships and to be more relational (Cross & Madson, 1997; Etchells et al., 2016). Females, therefore, may opt for socially bonding hobbies such as in-person contact and social media use rather than lonely pursuits such as video gaming.

Surprisingly, neither birth order nor family type reflected significant correlations and impact on video gaming, indicating that these demographic characteristics are less influential in shaping video gaming behaviour when compared to individual characteristics like social connectedness (Jin et al., 2021; Wang et al., 2018). This finding runs counter to earlier studies that supported the existence of relationship between them (Edward L, 2003; Klimmt & Hartmann, 2006; Nader et al., 2023). These results, however, may indicate the widespread availability of video games across all household types and onset of transforming family structures. Similarly, there was no apparent association between social connection and age, birth order, or family type, indicating that demographic characteristics had no noticeable impact on an individual's degree of social connectivity.

5. CONCLUSION

The current study examined the relationships between video gaming, social connectedness and adolescent demographics such as age, gender, birth order, family type. The findings indicates that video gaming and social connectedness are strongly negatively correlated, suggesting that excessive video gaming may result in less social encounters in real life. Moreover, demographic factors such as age and gender significantly influenced social connectedness and video gaming activity; older adolescents and men reported lower social connectedness and higher

video gaming levels. These findings are in line with previous studies that demonstrated excessive use of digital gaming environments may result in social isolation and fewer in-person interactions (Kowert et al., 2014; Lemmens et al., 2011).

These findings provide significant implications that are essential for the adolescent's education, mental health, and well-being. The major understanding from the results is that, excessive gaming behaviors can be addressed through promoting social relationships for the holistic development of adolescents in a digitalized world. Campaigns, integrated skill development programs incorporating social skills learning, peer interaction and digital literacy can be conducted within and outside schools or institutions, which can promote awareness and enrich the adolescents' knowledge about responsible use of available online and gaming platform, risks involved in excessive use and ways to maintain balanced lifestyle (Granic et al., 2014). Researches indicate that engagement of adolescents in structured extracurricular activities, such as sport and social clubs, can promote the level of social connectedness by cultivating increased interest in face-to-face interactions, and gradually decrease the dependency of video gaming. Hence, teachers and counselors in school can actively involve in encouraging the adolescents to participate in face-to-face interaction, teamwork, and collaborative learning exercises to enhanced social skills (R Wentzel et al., 2012). Schools can also include digital wellness courses as part of the curriculum to address about excessive screen time and its influence on the social and emotional growth of students.

Since this inverse relationship might lead to consequences such as social alienation, loneliness, and enhanced susceptibility to depression and anxiety (Kowert et al., 2014; Lemmens et al., 2011), the mental health professionals should consider gaming behaviour also as an important element while focusing on promoting adolescents' mental health. Individual and group Cognitive-behavioral therapy (CBT) and social skills training can act beneficial for adolescents in promoting emotional intelligence and changing their gaming habits into healthy ones while improving real-life social interactions (King et al., 2017).

Although there are no important findings about family type and birth order, earlier studies have already shown that parents who have clear guidelines for screen time and are involved in their children's social life can reduce the adverse effects of excessive gaming (Coyne et al., 2018). Co-viewing, discussing online activities, and spending limited time on gaming might help adolescents keep good digital habits alongside maintaining their social connections (Padilla-Walker et al., 2020). The family-based intervention in the form of shared activities like hobby, family dinner, and playing outdoor games would further strengthen the social connections of the adolescents and minimize the excessive gaming.

Considering the increase in gaming activities among the teenagers, the government and policymakers should encourage massive initiatives that enhances the healthy gaming habits and well-being of adolescents. For example, regulations in certain countries upon the length of screen time for children to avoid gaming addiction and promote healthy well-being (WHO, 2019). Governments should involve with game developers in developing healthy gaming behaviors by integrated time management, social interaction rewards, and digital wellness reminders within the games. Public education programs for parents, teachers, and adolescents about the risks of excessive gaming and the value of social relations can also be established.

Though this research provides valuable insights, there are more aspects of gaming that can affect social connectedness and further research on this should be pursued. Examples include personality traits, game genres, and differences in online versus offline interactions during gaming. Longitudinal studies can also be conducted to understand how long-term changes from playing games will be reflected in adolescents' social development. Finally, cross-cultural studies might explain whether such findings apply to populations of different settings. Cultural differences in gaming and socialization do vary around the world (Kuss et al., 2013). In that sense, research on such variations may be applied to specially designed interventions for young individuals, particularly focusing on their diverse needs in various sociocultural environments.

Declaration of competing interest

The authors have no conflicts of interest to declare.

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