

Effect of game addiction on reactive-proactive aggression in adolescents

Oguz Emre

Inonu University Faculty of Medicine, Department of Child Development, Malatya, Turkey

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Abstract

Aim: Rapid advances in technology cause children to become acquainted with technological products at an earlier age. Today's children and adolescents, called the Generation Z, use digital technology effectively. Video game addiction can affect mental health in the next generation of children and adolescents and lead to aggressive behavior. The aim of this study was to identify the effect of game addiction on reactive proactive aggression in secondary education students.

Material and Methods: The data of the research, which was patterned by the relational screening method, was collected from secondary education students who attended high schools in Malatya city center. The sample group consists of 192 secondary education students who were randomly selected from within the population. The data of the study was collected through "The Game Addiction Scale for adolescents" and "Reactive-Proactive Aggression Scale (RPAS)". Independent Groups t test, ANOVA and Linear Regression Analysis were used in the analysis of the data.

Results: The study found that gender has a significant effect on reactive proactive aggression. Aggression levels of male adolescents were significantly higher than females. Aggression levels of adolescents in the 10th grade were found to be higher than those of the adolescents in the other grades.

Conclusion: According to the research results, game addiction accounts for 53% reactive-proactive aggression.

Keywords: Adolescent; game addiction; reactive-proactive aggression

INTRODUCTION

With each passing day, the developments in the technological field cause children to become acquainted with technological devices at an earlier age. Today's children and adolescents who is called Generation Z are actively using digital technology (1). With technological developments, children find themselves in the digital gaming world, unlike the conventional games (2-4). Computers, smartphones, tablets or games consoles offer many entertainment and games that appeal to children and adolescents. Video games and online games played over the internet make parents to worry about their children (5). Children's willingness to play digital games continuously and their inability to delay these requests leads to addiction (4). Digital games are used today as a means of spending the leisure time and entertainment (6). Children and adolescents are more likely to overuse the

gaming facilities offered by technological tools, or become more involved and increase the risk of being addicted. Therefore, children and adolescents pose the greatest risk group under threat of game addiction (7,8).

Playing games in a digital environment allows people to have fun and get entertained. Adolescents play games than adults over the age of 26 more intensely (9). Games played over the Internet are posing a greater risk of becoming addictive (10). Adolescents who play video games for less than 2 hours per day and have fun contribute positively to their development (6). However, it is stated that games that are played in digital environment isolate the child from his/her own environment and negatively affect his/her social development (11). Also, video game addiction is known to cause a decline in school achievement and an increase in violent and criminal behavior (10). Koçak and Köse (6) stated that adolescents who play more than 2 hours

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Corresponding Author: Oguz Emre, Inonu University Faculty of Medicine, Department of Child Development, Malatya, Turkey

E-mail: oguz.emre@inonu.edu.tr

of video games during the day experience socialization problems in family, school and friendship relations. (12). Excessive playing of video games cause serious health problems (13). Video game addiction leads to mental health problems and aggressive behavior in children and adolescents (14-17). It is stated that aggression among primary and secondary education students has become a serious problem and that aggressive behavior in the school environment must be intervened and prevented (18).

Aggression is dealt with in two dimensions, reactive and proactive in the literature (19). Reactive aggression is an individual's response to an incitement, frustration, or threat that is directly and impulsively manifested in order to protect himself or herself. Reactive aggression is accompanied by strong outbursts of anger. Proactive aggression is when one acts aggressively with purposes such as to gain power and reputation over another person, or to gain acceptance (20). Anderson and Bushman (21) highlights that violent video games pose a public health threat to children and adolescents. Their research shows that mass media leads to aggressive behavior in children and adolescents. Today, it is stated that approximately half of the students are problematic internet users (2). Video games, especially violent games, are very popular among adolescents. Violent games are among the major factors leading to reactive aggression (15).

The overall goal of this research is to examine the impact of game addiction on reactive and proactive types of aggression in adolescents.

MATERIAL and METHODS

Research Model

Research is in the relational screening model which is one of the screening models. In the relational screening model, it is difficult to establish a cause-effect relationship, but it is possible to infer the cause-effect relationship between variables with complex methods (22).

Population and Sampling

Research group consist of students who are receiving their secondary education in High Schools in the Centre district of Malatya Province. Sample group consist of 192 secondary education students who were chosen from Research group with convenience sampling method. Convenience sampling method is used in the situations where it makes the research more practical and the researches prefers easy accessibility (Yildirim & Simsek, 2006). Demographics of the Study Group are presented in Table 1.

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Table 1. Breakdown of socio-demographic characteristics of adolescents participating in the study

Socio-demographic characteristics	Number	%
Gender		
Female	141	73.4
Male	51	26.6
Grade Level		
9	43	22.4
10	34	17.7
11	27	14.1
12	88	45.8
Family Type		
Extended	38	19.8
Nuclear	146	76.0
Single Parent	8	4.2
Marital Status Of Parents		
Parents are alive, married, together	173	90.1
Parents are divorced, separated	8	4.2
Mother deceased	4	2.1
Father deceased	6	3.1
Parents deceased	1	0.5
Number Of Siblings		
No siblings	6	3.1
One sibling	29	15.1
Two siblings	49	25.5
Three siblings	43	22.4
Four siblings and more	65	33.9
Socioeconomic Status Of The Family		
Bottom	10	5.2
Middle	169	88.0
Top	13	6.8
Social Media Account		
Exist	149	77.6
None	43	22.4
Total	192	100

Data Collection Tools

The Personal Information Form includes questions about the gender, family type, marital status of parents, number of siblings, and socioeconomic status of the secondary education students included in the research.

The Game Addiction Scale for adolescents; the Game Addiction Scale, adapted into Turkish by Ilgaz (24), was developed by Lemmens, Valkenburg and Peter (25). The original scale consists of 21 items and 7 sub-dimensions. The adaptation study was conducted with the participation of 265 adolescents and the internal consistency coefficient was calculated as 0.92. In the scale, There are seven sub-dimensions, these are clarity (items 1, 2, and 3), durability (items 4, 5, and 6), status change (items 7, 8, and 9), withdrawal (items 10, 11 and 12), relapse (items 13,

14 and 15), conflict (items 16, 17, and 18) and problems (items 19, 20 and 21). The Cronbach's alpha value of the Game Addiction scale was calculated as .87 for the whole scale.

Reactive-Proactive Aggression Scale (RPAS); developed by Raine et al (26) with the goal of distinguishing the level of reactive and proactive aggression. It was adapted into Turkish by Uz Bař and Yurdabakan (27). In the scale, there are 23 items in the 3-point Likert type (0 = never, 1 = sometimes, 3 = often) and two sub-dimensions. 11 items measure reactive aggression and 12 items measure proactive aggression. The Cronbach alpha coefficients of the scale were. 84 for the reactive aggression subscale, .86 for the proactive aggression subscale, and .90 for the total aggression. High scores on the scale indicate a high level of aggression. The Cronbach's alpha value of the Turkish adapted scale was calculated as .82 for the reactive aggression subscale, .82 for the proactive

aggression subscale, and .87 for the whole scale.

Analysis of the Data

Percent, mean, and standard deviation were used to evaluate the sociodemographic characteristics of adolescents. The conformity of the data for normal distribution was analyzed by Kolmogorov Smirnov test. Independent Groups t test, Anova and Kruskal Wallis test were used. Linear regression analysis was performed to assess the effect of variables and game addiction on reactive proactive aggression.

RESULTS

The findings of the research are explained in this section.

When Table 2 is examined, the results of ANOVA and Independent Groupst Test regarding the sociodemographic variables of the adolescents, and the mean RPAS score are seen. Female adolescents have significantly lower levels

Table 2. Comparison of sociodemographic variables and RPAS score averages of adolescents participating in the study

Socio-demographic characteristics	Number	%	Reactive-proactive Aggression Scale (RPAS)	
			X±SS	Testing and significance
Gender				
Female	141	73.4	10.7±7.79	t=3.91
Male	51	26.6	13.4±9.44	p=0.04
Grade Level				
9th grade	43	22.4	8.8±6.12	
10th grade	34	17.7	14.7±9.30	F=4.29
11th grade	27	14.1	13.9±5.62	p=0.00
12th grade	88	45.8	10.7±9.04	
Family Type				
Extended	38	19.8	13.57±11.10	
Nuclear	146	76.0	11.10±7.40	F=1.41
Single Parent	8	4.2	12.28±8.34	p=0.23
Marital Status of Parents				
Parents are alive, married, together	173	90.1	11.34±8.08	
Parents are divorced, separated	8	4.2	10.87±8.02	
Mother deceased	4	2.1	12.75±17.30	F=0.86
Father deceased	6	3.1	13.16±8.99	p=0.48
Parents deceased	1	0.5	26.00±0.00	
Number of Siblings				
No siblings	6	3.1	11.33±13.75	
One sibling	29	15.1	11.20±9.37	
Two siblings	49	25.5	11.46±7.83	F=0.014
Three siblings	43	22.4	11.48±8.14	p=0.76
Four siblings and more	65	33.9	11.64±7.98	
Socioeconomic Status of The Family				
Bottom	10	5.2	11.00±13.25	
Middle	169	88.0	11.17±7.49	t=2.001
Top	13	6.8	15.92±12.67	p=0.13
Social Media Account				
Exist	149	77.6	11.61±8.36	t=0.375
None	43	22.4	11.06±8.24	p=0.70

of reactive proactive aggression than male adolescents. The level of aggression of 10th grade students was found to be significantly higher than the other grade levels (Table 2).

The total average score of secondary education students from the GAS was 39.33, the minimum score was 21 and the maximum score was 105. The RPAS total score average is 11.48. The minimum score could be obtained from the scale is 0 and the maximum score is 42 (Table 3).

When Table 4 is examined, the effect of game addiction on

reactive proactive aggression was determined according to Linear Regression Analysis. Thus, they are calculated as $R=0.726$; $R^2=0.53$ According to this finding, it can be stated that 53% of the total variance for RPAS total score and sub-dimension scores is explained by game addiction (Table 4).

Table 5 shows the results of Linear Regression Analysis to investigate the effect of sociodemographic variables on reactive proactive aggression. They are calculated as $R=.613a$, $R\text{ Square}=.42$ It was seen that 42% of the total variance in the RPAS dependent variable was explained

Table 3. Descriptive statistics of game addiction and reactive-proactive aggression scale score of adolescents

Game Addiction Scale for Adolescents (GAS)	Min-Max	X	SS
GAS Total Score	21-105	39.33	19.85
Clarity	3-15	5.83	3.27
Durability	3-15	6.13	3.60
Status Change	3-15	6.86	3.61
Withdrawal	3-15	5.30	3.35
Relapse	3-15	5.06	3.48
Conflict	0-6	0.94	1.34
Problems	3-15	5.43	3.28
FReactive-Proactive Aggression Scale			
Reactive-Proactive Aggression Scale Total Score	0-22	3.11	4.34
Proactive	0-22	8.37	4.90
Reactive	0-42	11.48	8.32

Table 4. Regression analysis of the effect of adolescents' game addiction level on reactive proactive aggression

Model	Unstandardized Coefficients		Standardized Coefficients	t	p
	B	Std. Error	Beta		
(Constant)	3-15	5.83		6.187	0.00
Game Addiction Scale	3-15	6.13	0.404	6.079	0.00
Reactive	3-15	6.86	0.404	6.079	0.00
Proactive	3-15	5.30	0.502	7.981	0.00

a. Dependent Variable: Reactive Proactive Aggression Scale
 $R=.726$, $R\text{ Square}=.53$, $p=.000^{**}$, $*p<0.05$ $**p<0.001$

Table 5. Regression analysis of sociodemographic characteristics of adolescents and their effects on reactive proactive aggression related to aggression levels

Model	Understandardized Coefficients		Understandardized Coefficients	t	p
	B	Std Error	Beta		
Constant	-5.975	7.065	-	-.846	.08
Gender	4.051	1.557	.216	2.602	.00
Grade Level	0.873	0.558	.129	1.565	.69
Family Type	-1.875	1.142	-.123	-1.643	.09
Marital Status Of Parents	-0.100	0.604	.089	1.217	.48
Number Of Siblings	0.269	0.805	-.014	-.166	.31
Socioeconomic Status Of The Family	3.035	1.707	.126	1.778	.37
Social Media Account	-0.515	1.434	-.026	-.359	.65

Dependent Variable: Reactive Proactive Aggression Scale
 Predictors: (Constant), gender, class level, family type, marital status of parents, number of siblings, socioeconomic status of family, whether or not there is a social media account.
 $R=.613a$, $R\text{ Square}=.42$, $\text{Adjusted } R\text{ Square}= 0.067$, $SE=8.03$, $\text{Variance}=42.0\%$ $F=2.524$, $p=0.00$, $*p<0.05$ $**p<0.001$

by some sociodemographic variables at a significant level ($p < .001$). According to the results of the regression analysis, gender has a significant effect on the level of reactive proactive aggression. In other words, gender is the predictor of reactive proactive aggression (Table 5).

DISCUSSION

The aim of this study is to examine the effect of game addiction on reactive and proactive types of aggression in adolescents. According to the results of the study, 53% of adolescents' game addiction explained the reactive proactive aggression. In a similar study of Hazar et al. (28), the sample group consisted of middle school students, and it was found that the game, digital game addiction and aggression levels of students were correlated with each other. According to the findings of another study, a significant positive correlation was found between video game attitudes and aggression tendencies of secondary education students (29). Gvendi et al. (30) concluded that children who play digital games uncontrolled and who have a high playing time have high levels of digital game addiction and aggression. In addition, as the duration of video game playing increased, the tendency of indirect aggression also increased (29). People who play violent games have been observed to display higher levels of open and reactive aggression behaviors (15). Research by Koak and Kse (6) also showed that adolescents who are addicted to video games have low quality of life, low communication between family and friends, and low academic achievement. Adolescents who play video games for less than 2 hours per day and have fun contribute positively to their development. Video games with aggressive behavior increase aggression and reduce behavior of assistance and collaboration outside the virtual environment (31). Another study found that roughly half of secondary education students were problematic video game users. In addition, video game addiction was found to be moderately associated with social anxiety (2).

In the literature, it is stated that boys play video games more than girls (32). It has been noted that the consumption of violent games is higher in boys than in girls (33). The study found that gender has a significant effect on reactive proactive aggression. In their research, Amedahe and Owusu-Banahene (34) emphasized that boys display more aggressive behavior than girls. In addition, there are studies that emphasize that gender does not play any role in aggression levels (35-36).

Another important finding of the study is that male adolescents have significantly higher levels of aggression than female adolescents. According to the findings of another study, in terms of gender, male students had higher game addiction than female students. Students with upper socio-economic level were found to have higher game addiction compared to students in middle and lower SES (3). In the study of Taş et al. (37), it was found that there was no significant difference towards gender in terms of both internet addiction level and game addiction level.

Another finding obtained in the study is that the level of aggression of 10th grade adolescents is higher than those of other grades. Since individual differences are high in 10th grade students, it is usual for them to display the same behavior at different levels. The desire to be strong may have caused these adolescents to display aggressive behavior toward their peers. It can be said that the disposition of showing violent behaviour towards their peers is caused by the effort of showing themselves as superior. Karataş (38), in a study conducted to examine whether the anger and aggression levels of 9th, 10th and 11th grade students differed according to some variables, they found that there were significant differences in the level of aggression and anger of the students in terms of grade levels. 11th grade students' aggression scores were found to be high. Similarly, when the findings of other studies were examined, it was seen that the aggression scores of the high school senior students were higher than the scores of the other students (39). Contrary to these findings, in a similar study, it was stated that the students' aggression scores did not differ according to their grade levels (40). Some suggestions can be made based on the research findings;

Different variables that may affect reactive proactive aggression and game addiction can be examined. It is recommended to obtain in-depth information using qualitative research patterns to identify the causes that push adolescents into aggression and the underlying causes of violent game preferences. School, family, non-governmental organizations and municipalities should conduct various activities in cooperation to remove adolescents from aggressive behavior and game addiction.

Ethical considerations

The adolescents who volunteered to participate in the study were informed about the study, and their relevant questions were answered. It has been noted that the selected adolescents were willing and able to answer the questions diligently, and free to leave at any time. Since the use of human beings in studies requires the protection of personal rights, a written informed volunteer consent was received from each adolescent and their family. Since the adolescents are under the age of 18, their families have also received written notification about the research.

CONCLUSION

According to the results of the study, it was found that game addiction significantly explained the reactive proactive aggression of the adolescents who participated in the study. In addition, reactive proactive aggression was found to be significantly higher in male adolescents than girls. When reactive proactive aggression was examined in terms of grade level variable, reactive proactive aggression was found to be significantly higher in adolescents attending 10th grade, which can be described as mid-level. In order to prevent unwanted situations such as game addiction and aggression during adolescence period, which is a significant period in children life,

especially the controlled use of technological products should be ensured. Additionally, the games played should not be violent and aggressive.

Competing interests: The authors declare that they have no conflict of interest.

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Ethical approval: This study was approved by the Institutional Ethics Committee and conducted in compliance with the ethical principles according to the Declaration of Helsinki.

Oguz Emre, ORCID: 0000-0001-6819-3151

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