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RESEARCH ARTICLE

The Suppressor Effect of Presenteeism in The Relation Between Gaming Addiction and School Engagement Among Children

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Abstract
The purpose of this study was to investigate the impact of presenteeism on the correlation between gaming addiction and school engagement among secondary school students. The participants of the study comprised 300 children aged between 12 and 16 who were in secondary schools in the Aegean region in Türkiye. The mean age of the children was 13.52 (SD = 0.65). The study will use the 'Computer Game Addiction Scale for Children (CGAD)' to measure children's addiction to computer games, the 'Child-Adolescent Presenteeism Scale (C-APS)' to measure presenteeism levels in classroom, and the 'School Engagement Scale (SAS)' to measure school engagement. The analyses were conducted using the SPSS 23 software package at significance levels of .05 and.01. Pearson product-moment correlation analysis was used to determine the relationships between variables, and multiple regression analysis was used to determine the predictive power of variables for each other. The results of both Pearson correlation and bootstrapping showed a negative relationship between gaming addiction, presenteeism, and school engagement. Furthermore, a positive correlation was observed between presenteeism and game addiction. The regression analyses also found similar results. To better understand developmental differences in anxious emotion variance during childhood and adolescence, it is important to disaggregate aspects of anxious emotions and pay attention to potential suppressive effects.

Keywords
Game Addiction, Presenteeism, School Engagement

INTRODUCTION

In today's age of information technologies, technological developments occur so rapidly that the generation gap between parents and children is quite large. It is even possible to see this difference between siblings. To understand this difference, it would be appropriate to make "computer children" and tablet (android) children analogies. In Turkiye, the term "computer children", which is used for firsth and middle adults, has turned into the term "tablet (android) children", which is used for primary and secondary school students. It is indisputable that this transformation has both positive and negative effects on the individual and society. Computer/tablet games can cause addiction after a while for children who do not have the opportunity to play natural, traditional and classic games such as tip cheese, tip cheese, dreidel etc.

There is no mention of internet addiction in the main section of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). However, the additional section includes the subject of "internet game addiction", which is planned to be classified in the future. The only technological addiction included in the DSM-5-TR is the "Internet gaming disorder" (IGD) defined by Young (2009) as the sub-category of Internet addiction. Based on the criteria of gambling disorder in DSM-5 (APA, 2013), Internet gaming

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disorder is defined as a usage situation in which the person remains dehydrated, hungry and sleepless for a long time, up to 8-10 hours a day and up to 30 hours a week (Şakiroğlu and Akyol, 2018). The diagnostic criteria of IGD defined in the DSM-5-TR (APA, 2022) are as follows: a) the mind constantly being occupied with Internet games b) deprivation symptoms c) gradual increase of the time spent on Internet games d) decrease of control throughout Internet gaming e) continuing to play Internet games (Pontes and Griffiths, 2016: 2-3).

According to Gruesser and Thalemann (2006), computer game addiction is the type of behavioral addiction in which users prefer to play the games rather than do other activities or routines, postpone their duties because they are playing the games, and confuse the games with real-life situations (Horzum, 2011). In recent years, computer game addiction has started to be treated as a psychological problem in the scientific world by associating it with various psychological problems (Kuss, 2013; Reiterer, 2010). It is stated that children who play computer games pathologically have reduced interactions with their peers or the quality of these interactions decreases (Aydın, Oflu, and Yalçın, 2021; Colwell and Kato, 2003). Some of the children and young people who play computer games have reached or exceeded the addiction level by exaggerating the fun activity. (Reiterer, 2010; Thalemann, 2010). It can now be said that they are not just a player but also an addict. People who have a compulsive addiction to computer gaming begin to postpone the important things in their daily life. As the dose of procrastination increases, these players become unable to function in daily life and among family and society (Chip Online, 2014; Vollmer, Randler, Horzum, and Ayas, 2014). Many studies have shown that education, social environment, family, real-virtual separation, and auto control are among the most important factors that trigger the relationship between pleasure, violence, gender characteristics, time control, and computer game addiction (Basha, 2021; Chiu, Lee and Huang 2004; Charlton and Danfort, 2007; Griffiths, Davies and Chappell, 2004; Oggins and Sammis, 2012). Game addiction causes social and/or emotional problems (Lemmens, Valkenburg and Peter, 2009), which in turn leads to game addicts to neglect their sleep, nutrition, hobbies, and social lives to create more time for gaming (Ciris, Baskonus, Kartal, and Tasdemir, 2022; Wang, Sheng, and Wang, 2019; Young, 2009). According to mental health professionals, addiction to games is when damage occurs in the individuals' functioning at different levels such as school, family, work, and psychological functions (Gentile, 2009; Mohammad, Jan, and Alsaedi, 2023; Zamani, Chashmi, and Hedayati, 2009).

Presenteeism

The concept of presenteeism has mostly been explained as either full participation or "absenteeism" (Johns, 2010:520). Presenteeism refers to the state of apparent physical existence, presence, and existence in the relevant institution (Dewa, Daid, and Ettner 2007; D'abate and Erik, 2007). The notion of presenteeism has been used in the literature for the psychological state of employees. Presenteeism is when employees go to work even if they are sick or injured (Cullen and McLaughlin, 2006; Demirgil and Mucevher, 2017), which is considered as an overwhelming situation for the employees (Cooper, 1998; Lowe, 2004). The emergence of this expression or this problem, is mostly used in the business world and job environment. Presenteeism is defined as the psychological absenteeism (Cooper, 1998) of the employees due to the work stress they experience despite being at work and continuing to work while they are ill (Aronsson, Gustafsson and Dallner, 2000; Schulze and Steyn, 2007). It has been stated that the causes of presenteeism should be investigated not only in the context of health at work or worker health, but also in other fields (Patel, Budhwar and Varma, 2012:216).

As a matter of fact, Matsushita et al. (2011) mentioned that presentism can be seen in the school environment. The indicators of presenteeism among students are as follows: not being present in lessons even though they are attending the lesson, seeming as if they are listening while they are in lessons when in fact their minds are elsewhere, engaging in other activities during the lessons, which causes low performance. One way to characterize presenteeism is a student's decreased performance as a result of health issues (Sarıçam and Çetintaş, 2015:1504). Students' presenteeism may be an indicator of other health problems and may lead to absenteeism and academic failure in the future. Paying attention to the lesson, participating in class discussions, attending class, attending class on time, and taking notes during class are important components for the concept of presence (Sarıçam and Özbey, 2019). Individuals who are not psychologically present in

the lesson will not feel a sense of belonging at school.

School engagement

One of the important indicators of students feeling a sense of belonging at school and adopting the requirements of the school is school loyalty (Akın et al., 2013). The common point among the definitions of the concept of "school engagement" in the literature is the "commitment" and "engagement" of the student in the school environment (Fredricks, Blumenfeld, and Paris, 2004), which is considered as an integral part (Furlong and Christenson, 2008). It is a structure that includes engagement to school, positive behavior, and psychological connections to the school environment (Önen, 2014:221), being attached to the school and feeling a sense of belonging at school (Finn, 1993; Osterman, 2000), believing that school is valued and respected (Goodenow, 1993; Savi, 2011), identifying with school (Finn, 1989), having positive and negative emotional reaction towards school issues (Skinner and Belmont, 1993) and having a sense of love and loyalty (Wilson, 2004). Arastaman (2009), based on definitions, said that the student's engagement with the school includes their participant behavior as well as feeling good about school.

Osterman (1998) treated school engegament and school loyalty as an interchangeable quality and found that students with school engagement received more support from their friends, teachers, and the qualities of school life, which in turn increased the students' engagement (Cetin, 2018). School engagement can be an important determinant of adolescent mental health. Caraway, Tucker, Reinke, and Hall (2003) argued that adolescents' non-school days (days spent out of school) status had very serious consequences including substance abuse, child pregnancies, involvement in criminal events, and dropping out from school. Besides, it was determined that students with low levels of school engagement had a higher risk of dropping out (Janosz, Archambault, Morizot, and Pagani, 2008). It has been claimed that failing at school and not feeling attached to school can lead to substance abuse in adolescents (Shek, 2006). According to McNeely and Falci (2004), adolescent risk behavior such as emotional problems, suicidal tendencies, substance abuse, violence, and adolescent pregnancies is due to the student's poor relationship with the school. On the other hand, school engegament has been found to have a protective effect on both the physical and emotional states of adolescents (Chapman, Buckley, Sheehan, Shochet, and Romaniuk, 2011).

Present study

According to the data included in the 2015-2019 Strategic Plan of the Turkish Ministry of National Education, 14.8% of primary school students, 35% of secondary school students, and 34.8% of high school students had been absent for more than 20 days. According to International Student Assessment Program (PISA) 2012 data, the rate of students who were late to class in the Organization for Economic Co-operation and Development (OECD) countries was 35%, while this rate was determined as 44% in Turkey (TEDMEM, 2016). These statistical findings are important indicators of school engagement in Turkey. According to the 2016 data of the Turkish Statistical Institute (TSI), the rate of desktop computers in households was 22.9%, the rate of the portable computers was 36.4%, the rate of tablets was 29.6% and the rate for mobile phones was 96.9%. According to the 2023 data of the Central Intelligence Agency (CIA), in Turkey 51.4 million mobile phones are used. It is projected that there will be 78.59 million smartphone users by 2028, marking a new peak (Statista, 2023). Considering that the majority of these are smartphones, it is clear that Turkey utilizes information technologies more than many countries. However, these indicators are also risk indicators for digital addiction. Although previous studies on presenteeism in the workplace and educational environments reported that the concept of presenteeism was due to health problems, it has been claimed that there may be different variables that cause student presenteeism (Çetintaş and Sarıçam, 2016; Sarıçam and Çetintaş, 2015). Based on this claim, the present study aimed to examine the possible relationships between computer game addiction, presenteeism, and school engagement among secondary school students. In the study the answers to the following research questions were sought:

- Is there a meaningful relationship between computer/tablet game addiction and school engagement in secondary school students?
- Is there a meaningful relationship between secondary school students' presenteeism in class and school engagement?
- Does computer/tablet game addiction meaningfully predict presenteeism in class and

school engagement among secondary school students?

The suppressor effect is a very old concept. It was not used much in research for a while due to doubts about the statistical technique used and its theoretical infrastructure (Conger, 1974; Lancaster, 1999; Rosenberg, 1973). However, in recent years, studies on the suppressor effect have increased (Moscoso and Salgado, 2021; Salgado, Blanco, and Moscoso, 2019; Schilbach et al, 2023). In this study, the relationship between gaming addiction and school engagement was examined in the context of presenteeism, which is the suppressor variable, and it was aimed to contribute to the discussions.

MATERIALS AND METHODS

Participants

A total of 300 pupils from secondary schools in Kütahya in Türkiye were chosen as participants through the use of a convenience sampling technique. 52.3% of the participants were female (N=157) and 47.7% were male (N=143). Exactly half of the participants were students in the 7th grade, while the other half were students in the 8th grade. The ages of the participants ranged between 12 and 16 and the mean age was 13.52 (SD=0.65). Approval was granted by the Uşak University Social and Human Sciences Scientific Research and Publication Ethics Board (approval number: 2023-180, date: 20.09.2023). Written permission was obtained from the owners of the scales, and informed consent was obtained from the families of the children participating in the study. The study ensured the protection of children's rights and implemented the necessary measures to uphold them.

Data Collection Instruments

Computer Game Addiction Scale for Children (CGAS-C):

This tool was developed by Horzum, Ayas, and Çakır-Balta (2008) for the assessment of the level of video game addiction among children. CGAS-C includes four subscales and 21 items. A 5-point Likert scale ranging from 1 – Never, 3 – Sometimes, 5 – Always is used to score the instrument. The higher the score on the scale the higher the addiction level. The reliability coefficients for the scale obtained via Cronbach's alpha were α=.85 for the whole scale, α= .83 for the "cannot give up playing games" subscale, α=.60 for the "associating computer games with real-life" subscale, α=.45 for the "neglecting responsibilities because of computer games" subscale and α=.50 for the "preferring playing on the computer to other activities" subscale. In the present study, the internal consistency coefficient for CGAS-C was found as .84 for the whole scale.

Child and Adolescents Presenteeism Scale (CAPS):

This instrument was formulated by Matsushita et al. (2011) to gauge the presenteeism levels of undergraduates. The scale has two sub-dimensions, namely completing work and avoiding distraction. Sarıçam et al. (2013) adapted the scale to Turkish. It was later revised by Sarıçam and Çetintaş (2015) for children and adolescents. CAPS is a 5-point Likert-type scale ranging from 1 = never to 5 = always. It consists of 10 items (i.e. `I was able to finish hard homework/school tasks`, `I have enough energy to complete the assignments/homework/tasks`, `I need to take breaks from my homework`). The Cronbach's alpha internal consistency reliability coefficient was α = .76 for the whole scale among children and α = .83 for adolescents.

School Engagement Scale (SES):

The original scale was developed by Fredricks, Blumenfeld, Friedel, and Paris (2005). The scale is a 5-point Likert-type scale, with 1 representing never and 5 representing always. The scale allows for a minimum score of 19 and a maximum score of 95. Akın et al. (2013) translated SES into Turkish. According to the findings of the confirmatory factor analyses, 19 items produced three components as their original form, and the three-dimensional model was well-fitted (CMIN=289.67, df=142, RMSEA=.058, NFI=.94, NNFI=.96, CFI=.97, IFI=.97, RFI=.93, SRMR=.056). The loadings of the factors varied from.30 to.71. The overall scale's Cronbach's alpha internal consistency coefficient was found to be.87, that of the subscales measuring cognitive, emotional, and behavioral involvement was found to be .81, .82, and.62, respectively. The test-retest reliability coefficient was as *r*=.78 for the whole scale. The corrected item-total correlations ranged from .26 to .71. In this study, the Cronbach's alpha internal consistency coefficient was found to be α=.77 for the whole scale, α=.67 for the cognitive engagement subscale, α=.59 for the emotional engagement subscale and α=.64 for behavioral engagement subscale.

Data Analysis and Procedure

The data collected were transferred to the computer environment using SPSS 23 software package. Pearson product-moment correlation analysis was applied to determine the relationship between the variables and stepwise regression analysis was used to determine the suppressor role of presenteeism in the relationship between computer/tablet/smartphone game addiction and school engagement. Classical suppression occurs when the variable in the equation has zero or minimal correlation with the dependent variable, but simultaneously shows a large correlation with another predictor variable included in a regression equation (MacKinnon, Krul, and Lockwood, 2000; Tzelgov and Henik, 1991). On the other hand, McNemar (1945) pointed out the paradoxical quality associated with a suppressor stating that it was possible to increase prediction with a variable that has a negative correlation with the criterion, provided there is a high correlation with another variable that correlates with the criterion. This suppressor refers to the negative suppression effect. Similarly, reciprocal or cooperative suppression, which involves cases in which two predictors either (a) correlate oppositely with the criterion, but is positively related to one another or (b) are both correlated positively with the criterion but negatively with one another; in these cases, including both predictors in the regression equation increases both of their beta weights (Conger, 1974). The negative suppression effect was tested using the Venn diagram of Lancaster (1999) and Paulhus, Robins, Trzesniewski, and Tracy (2004) [see Figure 1]. The steps of the suppressor analysis for the present study are as follows: [see Figure 2]: (1) game addiction and presenteeism are covariate variables (path a), (2) presenteeism is a significant predictor for school engagement (path -b), (3) game addiction is a significant predictor for school engagement (path c) and (4) when game addiction and presenteeism are included in the equation together the coefficient value of game addiction for school engagement should become more significant or stronger (path c′). The coefficient value of presenteeism will go in a reverse direction (path +b′). Finally, to test the correlation and regression models, bootstrapping procedures were employed with a 10.000 random resampling (Davison and Hinkley, 1997; Efron and Tibshirani, 1993; Lee and Rodgers, 1998). The significance level was accepted as 0.05 ($p < 0.05$).

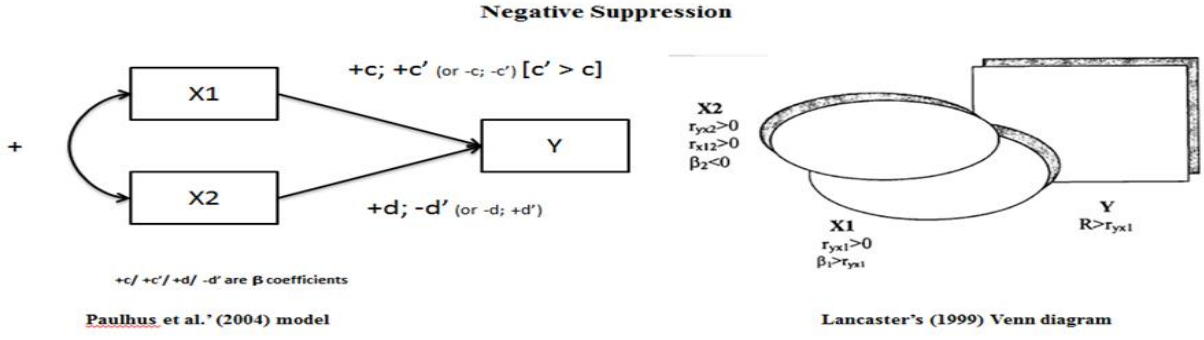

Figure 1. Negative suppression path

RESULTS

Findings of the Correlation Analysis

Pearson Moment Correlation Analysis was applied to examine whether there were any relationships among the variables or not, and the findings are given in Table 1.

Table 1 showed that game addiction had positive relationships with presenteeism and its subscales, namely completing work and avoiding distraction [r= .74; .64; .71, respectively, p<.01]. increased, while school engagement decreased. On the other hand, when presenteeism levels decreased school engagement levels increased.

Moreover, game addiction had negative relationships with school engagement and its subscales, namely behavioral engagement, emotional engagement and cognitive engagement [r= -.76; -.58; -.81; -.61, respectively, p<.01]. Furthermore, presenteeism had negative relationships with school engagement and its subscales, namely behavioral engagement, emotional engagement and cognitive engagement [r= .74; .64; .71, respectively, p<.01]. It was seen that as game addiction increased presenteeism also

Table 1. Descriptive Statistics and Correlation Values

Variables	1.GA	2.CW	3.AD	4.P	5.BE	6.EE	7.CE	8.SE
1. Game addiction (GA)	-	.64**	.71**	.74**	-.58**	-.81**	-.61**	-.76**
2.Completing work (CW)		-	.64**	.90**	-.26**	-.48**	-.31**	-.40**
3.Avoiding distraction (AD)			-	.91**	-.40**	-.55**	-.36**	-.50**
4.Presenteeism (P)				-	-.36**	-.57**	-.37**	-.49**
5.Behavioral engagement (BE)					-	.57**	.67**	.85**
6.Emotional engagement (EE)						-	.75**	.88**
7.Cognitive engagement (CE)							-	.91**
8.School engagement (SE)								-
Mean	68.23	9.71	14.01	23.72	10.24	14.69	14.61	39.54
SD	17.41	4.13	4.35	7.70	4.44	4.47	4.35	11.67

Note. **p < .01.

Bootstrapping Process

With the bootstrapping process, the aim was to compute the distributions of the significance of the Pearson correlation coefficients. Through this method, it is possible to simulate the population distribution of a statistic (mean, variance, correlation, standard errors, differences between means, time series and prediction lines, etc.) with confidence. As a consequence, 10.000 re-sampling was conducted with bootstrapping and bootstrap coefficients were created with 95% CI confidence intervals as well as the proportion of the samples above zero. The results are displayed in Table 2.

Table 2. Bootstrapping Results of the Pearson Correlation Coefficients

Variables			1.GA	2.CW	3.AD	4.P	5.BE	6.EE	7.CE	8.SE
1. GA	BCa 95% Confidence Interval	Lower	-	.56	.65	.68	-.66	-.85	-.68	-.81
		Upper	-	.70	.76	.79	-.49	-.77	-.52	-.70
2.CW	BCa 95% Confidence Interval	Lower		-	.58	.88	-.35	-.56	-.40	-.48
		Upper		-	.70	.92	-.16	-.39	-.20	-.31
3.AD	BCa 95% Confidence Interval	Lower			-	.90	-.49	-.62	-.46	-.58
		Upper			-	.93	-.30	-.46	-.26	-.41
4. P	BCa 95% Confidence Interval	Lower				-	-.45	-.64	-.46	-.57
		Upper				-	-.26	-.49	-.27	-.41
5. BE	BCa 95% Confidence Interval	Lower					-	.47	.59	.81
		Upper					-	.65	.74	.88
6. EE	BCa 95% Confidence Interval	Lower						-	.69	.85
		Upper						-	.80	.90
7. CE	BCa 95% Confidence Interval	Lower							-	.89
		Upper							-	.93
8. SE	BCa 95% Confidence Interval	Lower								-
		Upper								-
Mean	BCa 95% Confidence Interval	Lower	66.26	9.25	13.53	22.87	9.75	14.18	14.12	38.23
		Upper	70.16	10.17	14.49	24.56	10.76	15.22	15.12	40.93
SD	BCa 95% Confidence Interval	Lower	16.12	3.80	4.08	7.19	4.01	4.13	3.93	10.50
		Upper	18.62	4.46	4.61	8.18	4.84	4.80	4.75	12.80

Note. **p < .01. Note. Game addiction: GA, Completing work: CW, Avoiding distraction: AD, Presenteeism: P, Behavioral engagement: BE, Emotional engagement: EE, Cognitive engagement: CE, School engagement: SE

From Table 2 it can be inferred that the bootstrapping confidence intervals in the correlation coefficients did not include zero. Therefore, it can be said that all of the correlation coefficients in the model were significant after the bootstrapping process.

Suppression Findings

Stepwise regression analysis was applied to determine the coefficients of prediction among the variables. The findings of the analysis are given in Figure 2.

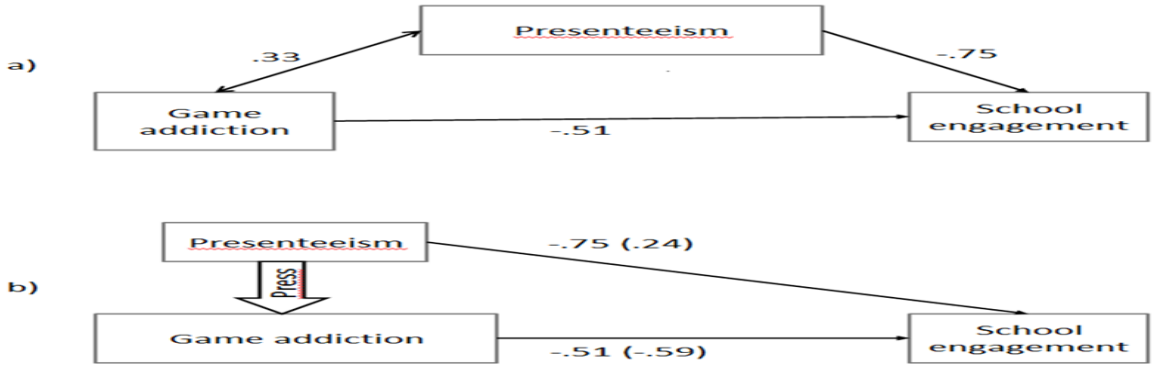

Figure 2. Findings of the Stepwise Regression Analysis

It can be seen from Figure 2 that in the first stage of regression (a), game addiction (β= -.51, p<.01) and presenteeism (β= -.75, p<.01) significantly predicted school engagement, separately. In the second stage of regression analysis (b), both game addiction (β= -.59, p<.01) and presenteeism (β= +.24, p<.01) significantly predicted school engagement. In the second stage of the regression analysis inclusion of the presenteeism variable into the regression model increased the school engagement-predicting capacity of game addiction from -.51 to -.59. Although a negative significant relationship was found between presenteeism and school engagement in the first stage (a) (Figure 1), presenteeism was found to be a positive significant predictor for school engagement in the second stage (b). Moreover, the regression analysis results that indicated the increase in the capability of game addiction in predicting school engagement further indicated that presenteeism (or game addiction) had a negative suppressive effect on the relationship between game addiction (or presenteeism) and school engagement.

Table 3. Bootstrapping Results of the Regression Model

Model stages					Estimate	BCa95% Confidence Interval Lower Level	Upper Level
Direct effect							
GA	↔	P			.33	.30	.36
P	→	SE			-.75	-.90	-.60
GA	→	SE			-.51	-.57	-.44
Indirect effect							
GA	↔	P	→	SE	-.59/+.24	-.67/+.08	-.49/+.39

Note. Game addiction: GA, Presenteeism: P, School engagement: SE.

It can be inferred from Table 3 that the bootstrapping confidence intervals in the direct and indirect effects did not include zero. Therefore, it can be said that all stages in the model were significant after the bootstrapping process.

DISCUSSION

The purpose of this study was to investigate potential connections between secondary school students' computer game addiction, presenteeism, and school engagement. For this purpose, firstly, the relationship between computer/tablet game addiction and presenteeism was examined. As a result of the study, it was observed that there was a positive relationship between computer/tablet game addiction and presenteeism in secondary school students. In other words, it was shown that presenteeism grew along with game addiction. This result concluded that secondary school students' computer/tablet game addiction affects their school life. Studies in the literature found that computer game addiction could decrease academic success (Horzum, Güngören and Kaymak-Demir, 2017; Wan, Wen, and Chiou, 2013), cause the deterioration of interpersonal relationships (Wan et al., 2013), cause delays in social skills (Gentile et al., 2011) and negatively affect family relations. The findings of the present study are in line with the

findings of those conducted on computer game addiction.

In secondary school students, a positive relationship was found between computer/tablet game addiction and presenteeism and its subscales, namely completing work, and avoiding distraction. Studies conducted on computer game addiction among children and young adults have shown that computer game addiction can have various negative effects on development (Karacaoğlu, 2019). Computer games can affect students both psychologically and biologically (Chiu et al., 2004; Wan and Chiou, 2006). Even though computer games are used in the education of children, the use of entertainment purposes is predominant (Garris, Ahlers, and Driskell, 2002). In addition to using computers and the Internet to access information, using them for entertainment also increases the risk of addiction (Kıran, 2011:55).

In this study, it was observed that there was a negative relationship between computer/tablet game addiction and school engagement in secondary school students. A negative correlation was found between school engegament and its subscales (e.g. behavioral engegament, emotional engegament, and cognitive engegament), and computer/tablet game addiction in secondary school students. Addiction to online games has a bad impact on students' learning frequently. For example, students' online game addiction negatively affected their behavioral, emotional, and cognitive engagement (Sun, Sun, and Ye, 2023). According to Ye et al. (2023), students' behavioral, emotional, and cognitive engagement were negatively impacted by the problematic usage of short videos. Gentile et al. (2011) examined the relationship between digital game addiction, depression, and school success and found that while the depression, anxiety, social phobia and school success variances of the addicted players deteriorated the opposite was observed in normal players. Drummond and Sauer (2014) examined the data collected from more than 192,000 students from 22 countries participating in the 2009 PISA in terms of the relationship between adolescent science, mathematics and reading courses, and digital playtime. The findings of their study pointed out that the time spent playing digital games significantly affected the academic success of adolescents. Kovacevic, Minovic, Milovanovic, Pablos, and Starcevic (2013) also claimed that computer games affect the learning objectives and activities (Terry, Malik, Sinclair, Fines and Terry, 2014). The findings of the above-mentioned studies are in support of the findings of the present study.

A negative relationship was found between school engagement and its sub-scales (e.g. behavioral engegament, emotional engegament, and cognitive engegament), and presenteeism in secondary school students. Stated differently, students who have school engegament are present in the classroom both physically and mentally. Studies have shown that school engagement has various positive effects on students. According to a study by McNeely and Falci (2004), students with a high level of school engagement were less likely to drop out of school, be absent, or demonstrate behavioral problems. It has also been shown that students with high school engagement enjoy being in school (Curci, 2011). Also, it has been determined that students with a low level of school engagement have a higher risk of dropping out (Janosz et al., 2008). These findings are in line with the findings of the present study. School engagement and academic success (Finn and Rock, 1997) and school engagement levels (Sinclair, Christenson, Evelo and Hurley, 1998). Furthermore, in a study conducted by Chase Hilliard, Geldhof, Warren, and Lerner (2014) on high school students, it was concluded that school engagement positively predicted academic success and that it was an important predictor of academic success in terms of the behavioral, emotional and cognitive dimensions. On the other hand, in various studies in the literature have also been found that school engagement decreases the frequency of students dropping out of school (Janosz et al., 2008; Sinclair et al., 1998; Wang and Fredricks, 2014).

In one of the most important findings obtained in the present study was that the presenteeism and computer/tablet game addiction predicted the school engagement of the students separately. School engagement explained both computer/tablet game addiction and the presenteeism variable. Besides, the analysis result showing the increase in the ability of game addiction explaining school engagement also showed that the presenteeism in a course had a negative explanatory effect on the relationship between game addiction and school engagement. According to the 2018 data of Turkey Statistical Institute (Turkstat) computer and Internet use in individuals was 59.6% and 72.9%, respectively, for those between the ages of 16 and 74. In 2019 Internet use was reported to be 75.3%

among the individuals in this age group. Internet usage rates were 81.8% for males in the 16-74 age group and 68.9% for females. Home Internet access was found to reach 88% (TurkStat, 2018). This data shows that the Internet and computer use in Turkey, especially among young people, increased rapidly. Also, it was found that the time allocated by students to computer games gradually increased in Turkey (Onay, Hotomaroğlu, and Çağıltay, 2005; Tüzün, 2006). This has proved that students exhibit higher presenteeism, which is affected by the psychological absence in lessons (Hellgren et al., 2010).

The school life of adolescent children affects their overall development (Wigfield et al., 2006). Furthermore, students' lack of a sense of belonging to their classrooms and schools causes them to be physically and/or psychologically absent. This situation is problematic in terms of presenteeism. While the rate of students who express their feelings about school in Turkey is approximately 61%, this rate is, on average, 73% in OECD countries. According to the 2015 sense of school belonging index, Turkey was one of the countries with the lowest sense of school belonging with a score of -0.44. In a study by Finn (1989), students who did not actively participate in activities or identify with their school since the beginning of their education were found to be at risk of absenteeism, leaning towards crime, and dropping out. According to Turgut (2015:79), the students' presence in school depends on whether their various psychological needs are met at school. According to the 2018 Annual Activity Report of the Turkish Ministry of National Education, when compared to the previous year the rate of students who were absent for 20 days or more in 2018 increase from 39.8% to 44.0% in vocational and technical secondary schools and from 32.2% to %36,0 in Anatolian imam hatip high schools (ERG, 2019). These data show that the relevant goals set for 2018 were not achieved and the 2019 goals were difficult to achieve. The student's engagement in school is considered an integral part of academic success, as it involves students' social and emotional connections in the school environment (Furlong and Christenson, 2008). Students' engagement in school is related to the belief adults have towards school. If the student believes that the adults in question care about themselves as an individual and take their education seriously, they become highly dependent on the school (Blum and Libbey, 2004). It is known that gaming addiction causes many health problems such as sleep disorders, eating disorders, and decrease in social skills. (King and Delfabbro, 2020; Zincir et al., 2023). In addition, gaming addiction also damages brain activities (Hosseini et al., 2021). A persistent condition of hyperarousal in the brain can result from gaming addiction (Yu, Abdullah, and Mansor, 2024). Presenteeism is also the fact that although the individual is physically present in the environment, she or he cannot be in the environment mentally. In other words, in the case of presenteeism, brain activities do not function adequately like gaming addiction. Therefore, gaming addiction can cause presenteeism and vice versa. In this study, presenteeism increased school engagement by putting pressure on gaming addiction.

Conclusion

In this study, the role of computer game addiction, mental absence in class, and the predictive role of school engagement in secondary school students were examined. A positive relationship was determined between computer/tablet game addiction and presenteeism in the course. Also, presenteeism was found to have a negative relationship with school engagement and its subscales, namely behavioral participation, emotional participation, and cognitive participation and computer/tablet addiction. There was a negative relationship between game addiction and school attachment. Furthermore, it was determined that the mental absence of the students (presenteeism) and computer/tablet game addiction predicted school engagement separately. It can be stated that the present study had various limitations.

First of all, in the study, a quantitative research method was followed to determine the possible relationships between computer game addiction, presenteeism, and school engegament among secondary school students. The data of the study were limited to the participants who studied in the province of Kutahya in the 2016-2017 academic year and volunteered to participate. The limitations of the study are important in evaluating and generalizing the results. Informative seminars can be organized for families regarding monitoring their children's usage of computers or the time spent on computers. By creating a more positive, more reliable, and more understanding school environment, students' school engagement can be increased. Efforts can be made to eliminate the factors that trigger presenteeism by causing stress

and pressure on students. In conclusion, examining the relationships between variables with different study groups is considered important in terms of the generalization of the results.

Authors' Contributions

Each author contributed equally to the manuscript in terms of data collection, statistical analyses, and conceptual framework. All authors reviewed the final manuscript.

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Conflict of Interest

The authors have stated that they have no potential conflicts of interest regarding the research, authorship, and/or publication of this article. The study of similar variables was partially presented in IVnd International Eurasian Educational Research Congress in Denizli, Türkiye. However, this study is different from the first one in terms of analysis, participants and content.

Ethical Aspects of The Study

Approval was granted by the Uşak University Social and Human Sciences Scientific Research and Publication Ethics Board (approval number: 2023-180, date: 20.09.2023). Written permission was obtained from the owners of the scales, and informed consent was obtained from the families of the children participating in the study.

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