Empathy and Video Game Addiction in Adolescents: Serial Mediation by Psychological Resilience and Life Satisfaction

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Abstract

In this study, it was examined whether empathy is related to video game addiction and whether psychological resilience and life satisfaction mediate this relationship. The sample comprised 324 Turkish adolescents (aged between 11 and 15, mean of age was 13.01), who completed measures of empathy, psychological resilience, life satisfaction, and video game addiction. The results of the serial multiple mediation analysis demonstrated that empathy had a significant direct effect on video game addiction. Psychological resilience had a mediating effect on the association between empathy and video game addiction. Also, life satisfaction had a mediating effect on the association between empathy and video game addiction. Psychological resilience and life satisfaction, serially (in combination) mediated the relationship between empathy and video game addiction. The results of the present study are discussed within the related literature. It is suggested that video game addiction interventions should focus on increasing empathy, psychological resilience, and life satisfaction.

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INTRODUCTION

Video games (electronic games and computer games can be used interchangeably with video games) have become a part of modern culture since the 1970s. William Higinbotham's experiment named Tennis for Two (1958) is regarded as the first two players game. Tennis for Two can be considered as the beginning of the video game industry (Ahl, 2008). The video game industry has become a $ 159 billion industry by 2020. It is estimated that 2.7 billion people played video games in 2020 (Field Level Media, 2020). Video games, which are seen as an entertainment tool in modern culture, can cause behavioral addiction in some cases (Derevensky et al., 2019). Due to the increasing prevalence of video game addiction, it is considered as a *"condition for further study"* in DSM-5 (American Psychiatric Association, 2013). DSM-5 stated that video game addiction is characterized by *"persistent and recurrent use of the internet to engage in-games, often with other players, leading to clinically significant impairment or distress"* (American Psychiatric Association, 2013, p. 795). It was also stated that the diagnostic criteria for technology addictions (e.g., video game addiction) may be similar to the criteria for substance use addiction or gambling addiction. Epidemiological estimates of internet and video game addiction range from 1 percent to 26.8 percent (Susman et al., 2018). These rates show that a substantial part of the society is addicted to video games.

Empathy and Video Game Addiction

Empathy is defined as the ability to correctly understand the feelings of another and sharing correctly these feelings with another (Decety & Lamm, 2006). Empathy skill is seen as a vitally important skill for individuals' social interactions. Lack of empathy can cause individuals to be unable to establish healthy social interactions (Kalisch, 1973). It was found that the amount of playing video games is related to decreasing individuals' quality interpersonal interaction and increasing their social anxiety levels (Lo et al., 2005). Individuals also meet their socializing needs while playing computer games (Griffiths et al., 2015; Weinstein & Aboujaoude, 2015). Besides, computer games provide individuals with the opportunity to socially connect with other players and be part of a group (Olle & Westcott, 2018). Therefore, it can be expected that there is a negative relationship between empathy and game addiction.

Rehbein et al. (2015) defined computer game addiction as the *"use of games to escape from negative mood or real-life problems"*. Coping with negative moods is associated with emotion regulation strategies (Bloore et al., 2020). Individuals' negative emotions can be regulated by computer games or internet activities (Lindenberg et al., 2020). Emotion regulation is a concept that contributes to the empathy of individuals. Emotion regulation and empathy in adolescents are linked (Henschel et al., 2020). Therefore, lack of empathy may result from difficulties in regulating individuals' emotions. It can be thought that the inability to cope with negative mood may cause play computer games excessively.

Empathy has a mediating effect between violent games and aggression (Bartholow et al., 2005), and also exposure to violent video games were found to be associated with low empathy (Funk et al., 2003). Accordingly, it was thought that empathy and video game addiction may be related. Besides, a relationship was found between the level of empathy and video game preferences (Siyez & Baran, 2017). A relationship has also been found between empathy and internet addiction (Hui et al., 2019; Lachmann et al., 2018). Empathy is a concept related to addiction, and it has been argued that empathy can cause addiction in the context of cause-effect relationships and vice versa (Ferrari et al., 2014). In this study the view that empathy causes game addiction was adopted. A relationship has been found between empathy concern and social media addiction (Dalvi-Esfahani et al., 2021). It has also been found that low empathy is associated with problematic internet use (Melchers et al., 2015). Based on all these findings, it is thought that empathy is associated with game addiction.

Mediators as Psychological Resilience and Life Satisfaction

Psychological resilience can be defined as the ability to adapt to negative situations in a positive way. When the adolescents in the risk group in terms of psychological resilience were compared, it was found that adolescents with a high level of psychological resilience were less likely to become addicted to gambling (Goldstein et al., 2012; Lussier et al., 2007). Besides, it has been found that the alcohol consumption level of university students has a negative correlation with psychological resilience. (Johnson et al., 2011). Also, psychological resilience has been considered as a protective factor in-game addiction (Robertson et al., 2018). In this direction, it was thought that psychological resilience is negatively related to game addiction.

Life satisfaction has been considered as a key indicator for an individual to adapt to changes that occur as a result of living conditions (Diener et al., 1999; Turan & İskender, 2020). Life satisfaction is defined as the individual's cognitive evaluation of their life (Pavot, 1991). Interventions aimed at increasing the quality of life are thought to contribute to the general health status of the individuals (Raphael, 1996; Zullig, 2001). Zullig (2001) showed that there is a significant relationship between decreased life satisfaction and smoking, alcohol, and drug addiction. Differences in life satisfaction can change adolescents' coping strategies. Adolescents may show addictive behaviors to cope with changes in life satisfaction (Zullig, 2001). Also, a relationship was found between life satisfaction and internet addiction (Lachmann, et al., 2018). Therefore, it is thought that is a relationship between life satisfaction and video game addiction.

Emotional competencies such as empathy are required for successful social interaction (Seidel et al., 2012). Empathy is related positively to social connection, life satisfaction and negatively to depression, social anxiety, and psychopathology (Morelli et al., 2015). Empathy is positively related to psychological resilience (Cao & Chen, 2020; 2021) and life satisfaction (Wang et al., 2019). Empathy is an important skill that includes understanding and feeling the emotional states of individuals. Empathy also is positively correlated with positive emotions (Morelli et al., 2017). Positive emotions predicted increases in both resilience and life satisfaction (Cohn et al., 2009). So, it is thought that empathy is related to both psychological resilience and life satisfaction.

Vinayak & Judge (2018) found that both empathy and resilience are predictors of psychological well-being. Psychological resilience is a dynamic structure that includes adolescents' ability and capacity to cope successfully with risk factors (Stewart et al., 1997). Psychological resilience factors predict psychological well-being (Gullone & Cummins, 1999). Psychological resilience also is considered an important variable and a protective factor in increasing the life satisfaction of adolescents (Arslan, 2019; Caqueo-Urízar, 2020). Previous studies have shown that there is a positive relationship between psychological resilience and life satisfaction (Karreman & Vingerhoets, 2012; Shi et al., 2015; Tümlü & Recepoğlu, 2013). Resilience also is a predictor of life satisfaction in the students of success and failure (Abolghasemi & Varaniyab, 2010).

Psychological resilience has been considered as a mediator variable in many studies. Arslan (2019) found that psychological resilience predicts life satisfaction in adolescents and it plays a mediating role in the relationship between social exclusion and life satisfaction. Karreman & Vingerhoets (2012) found that resilience is related to life satisfaction and it has a mediating effect relationship between attachment and well-being. Resilience also is found to be the mediator variable in the relationship between mindfulness and life satisfaction (Bajaj & Pande, 2016). It has been found to have a mediator role in the relationship between stress and life satisfaction (Shi et al., 2015). Caqueo-Urízar (2020) found that resilience also predicts life satisfaction and it plays a mediating role in the relationship between ethnic identity and life satisfaction. It is thought that psychological resilience may have a mediating role in the relationship between empathy and video game addiction in adolescents.

Relationships have been found between life satisfaction and somatization, general health, anxiety, depression, anger, paranoid thoughts, sleep disturbance (Arrindell et al., 1991). A low level of life satisfaction is associated with individuals' addictive behaviors (Zullig, 2001). Life satisfaction has also been considered as a mediator variable in many studies. Life satisfaction has been found to have a mediating effect in the relationship between distressing events and neurotic impairment (Baruffol et al., 1995). It has been found that life satisfaction has a mediating role in the relationship between positive-negative effect and Cognitive Symptoms of Problematic Internet Use (Senol-Durak & Durak, 2010). It was also found that life satisfaction has a mediator role in the relationship between childhood maltreatment and depressive symptoms (De Vasconcelos et al., 2020). It is thought that life satisfaction may have a mediating role in the relationship between empathy and game addiction in adolescents.

In many studies resilience has been shown to predict life satisfaction (Abolghasemi & Varaniyab, 2010; Vinayak & Judge, 2018; Gullone & Cummins, 1999; Arslan, 2019; Caqueo-Urízar, 2020; Karreman & Vingerhoets, 2012; Shi et al., 2015; Bajaj & Pande, 2016). When the relationships between empathy, game addiction, psychological resilience, and life satisfaction are evaluated in general, it can be thought that psychological resilience and life satisfaction have a serial mediating effect on the relationship between empathy and game addiction. Therefore I proposed the following hypotheses:

H1. Empathy is negatively related to video game addiction.

H2. Psychological resilience mediates the relationship between empathy and video game addiction.

H3. Life satisfaction mediates the relationship between empathy and video game addiction.

H4. Psychological resilience and life satisfaction serially mediate the relationship between empathy and video game addiction.

METHOD

Participants

The sample consists of 324 adolescents 172 females (53%) and 152 males (47%) from Turkey. The ages of the study participants ranged from 11 to 15. The average age of the participants in the study is 13.01. The weekly computer game playing time is 4.67 hours. Permission was obtained from the ethics committee of the author's university for the study. The study was conducted at all by using the Declaration of Helsinki ethical guidelines. The characteristics of participants are presented in Table 1.

Table 1. Sample characteristics

Variable	Frequency (*n*)	*%*
Gender		
Female	172	53,09
Male	152	46,91
Grade		
6	87	26,85
7	108	33,33
8	129	39,82
Financial status		
National minimum wage and below	189	58,33
National minimum wage above	135	41,67
Grade (Out of 100)		
70 and over	188	58,03
From 50 to 70	110	33,95
50 and below	26	8,02

Measures

Fmpathy Scale for Children and Adolescents Turkey Form

The scale was developed by Bryant (1982). The adaptation study of the scale was conducted by Gürtunca (2013). The scale consists of 21 items. It is a structured yes/no questions type scale. "1" point is given for each "yes" answer and "0" point is given for "no" answer. High scores from the scale indicate a high level of life empathy. The minimum score that can be obtained from the scale is 0 and the maximum score is 21. In this study, the internal consistency reliability coefficient of the scale was found to be .64.

Adolescent Psychological Resilience Scale

The scale was developed by Bulut et al. (2013). The scale consists of 29 items. It is a 4-point Likert-type scale. High scores from the scale indicate a high level of psychological resilience. The minimum score that can be obtained from the scale is 29 and the maximum score is 116. In this study, the internal consistency reliability coefficient of the scale was found to be .80.

The Satisfaction with Life Scale

The scale was developed by Diener et al. (1985). The adaptation study of the scale was conducted by Köker (1991). The scale consists of 5 items. It is a 7-point Likert-type scale. High scores from the scale indicate a high level of life satisfaction. The minimum score that can be obtained from the scale is 5 and the maximum score is 35. In this study, the internal consistency reliability coefficient of the scale was found to be .67.

The Game Addiction Scale for Adolescents-Short Form

The scale was developed by Anlı & Taş (2013). The scale consists of 9 items. It is a 5-point Likert-type scale. High scores from the scale indicate a high level of video game addiction in line with the criteria for the diagnosis of DSM V. The minimum score that can be obtained from the scale is 9 and the maximum score is 45. In this study, the internal consistency reliability coefficient of the scale was found to be .71.

Data Analysis

PROCESS macro was used to perform mediation analysis. PROCESS is a macro that can work with SPSS, SAS, and R statistical package programs. In the present study PROCESS macro for SPSS was used. PROCESS macro provides to *"estimating direct and indirect effects in single and multiple mediator models"*. Model 6 of PROCESS macro is a serial multiple mediator model. Model 6 of PROCESS Macro has been applied in the present study (Hayes, 2018). Model 6 was used for to examine the mediation effects of how empathy affects psychological resilience, how psychological resilience affects life satisfaction, and how life satisfaction affects video game addiction, with psychological resilience and life satisfaction as mediators. SPSS PROCESS macro provides isolation of each mediator's (psychological resilience [hypothesis 2] and life satisfaction [hypothesis 3]) indirect effect separately. Also, it provides exploration of two mediators (psychological resilience and life satisfaction) indirect effects [hypothesis 4] in serially (van Jaarsveld et al., 2010). It is used the method 5000 bootstrap samples and 95% CIs of the indirect effects for the mediational analyses (Hayes, 2018).

RESULTS

Preliminary Analyses

Descriptive statistics and binary correlations of the study are presented in Table 2. Findings indicated that video game addiction was negatively related with life satisfaction (r = − .27), psychological resilience (r = −.34), and empathy (r = − .29). Empathy was positively related with life satisfaction (r = .25) and psychological resilience (r = .26). Life satisfaction was positively related with empathy (r = .25).

Table 2. Descriptive statistics and binary correlations among study variables

Variable	1	2	3	4	*M*	SD	Skewness	Kurtosis
1- Empathy	-				14.47	3.21	-.540	-.033
2- Psychological resilience	.26	-			91.13	10.77	-.551	-.034
3- Life satisfaction	.25**	.42**	-		22.37	7.54	-.195	-.676
4- Game addiction	-.29**	-.34**	-.27**	-	18.02	6.19	.495	-.453

**p < .001

The findings showed that the skewness values ranged from − .55 to .50 and kurtosis values ranged from − .68 to -.03. It was found that all reliability coefficients of the measures are above .60. All Mahalanobis distance values was below 15. The VIF values ranged from 1.25 to 1.41 and the tolerance values ranged from .80 to –.91. There was no problem of multicollinearity and residuals.

Serial Multiple Mediational Analyses

Results of the serial multiple mediation analyses are presented in Figure 1. It was found a negative direct effect of empathy on video game addiction (total effect, *b* = − .563, *p* < .001). When the mediators (psychological resilience and life satisfaction) were included, the analysis results showed that this coefficient was reduced but it was still significant (direct effect, *b* = − .388, *p* < .01]. Empathy was also found to be a positive predictor of psychological resilience (*b* = .867, *p* < .001) and life satisfaction (*b* = .365, *p* < .01). According to the results, Hypothesis 1 has been confirmed.

It was found a significant indirect effect of empathy on video game addiction via psychological resilience (*b* = − .116, SE = .04, *95%* CI = [− .201, − .050]). Also, the indirect effect of empathy on video game addiction via life satisfaction was also significant (*b* = − .036, SE = .02, *95%* CI = [− .086, − .001]). According to results in the relationship between empathy and video game addiction, psychological resilience and life satisfaction have mediating effects separately. Hypothesis 2 and hypothesis 3 have been confirmed.

Lastly, the indirect effects of empathy on video game addiction via both psychological resilience and life satisfaction were tested. The relationship was significant with a point estimate of -.023 (testing serial multiple mediation; SE = .01, *95%* CI = − .051, − .001). According to results in the relationship between empathy and video game addiction, psychological resilience and life satisfaction have mediating effects serially. Hypothesis 4 has been confirmed.

Table 3. Indirect effect of empathy on video game addiction via psychological resilience and life satisfaction

Path	Coefficient	95% CI	
		LL	UL
Empathy ➔ Psychological resilience ➔ Video game addiction	− .116	− .201	− .100
Empathy ➔ Life satisfaction ➔ Video game addiction	− .036	− .086	− .001
Empathy ➔ Psychological resilience ➔ Life satisfaction ➔ Video game addiction	− .023	− .051	− .001
Total effect	− .563	− .765	− .362
Direct effect	− .388	− .591	− .186
Total indirect effect	− .175	− .265	− .100

Note. CI = confidence interval, LL = lower limit, UL = upper limit

As a result, all hypotheses of the present study have been confirmed (see Table 3). The results have been indicated that empathy negatively predicts video game addiction. It was found that there is an indirect relationship between low empathy and high video game addiction. The results showed that the relationship between low empathy and high video game addiction is partially mediated by lower levels of psychological resilience and lower levels of life satisfaction (see figure 1)
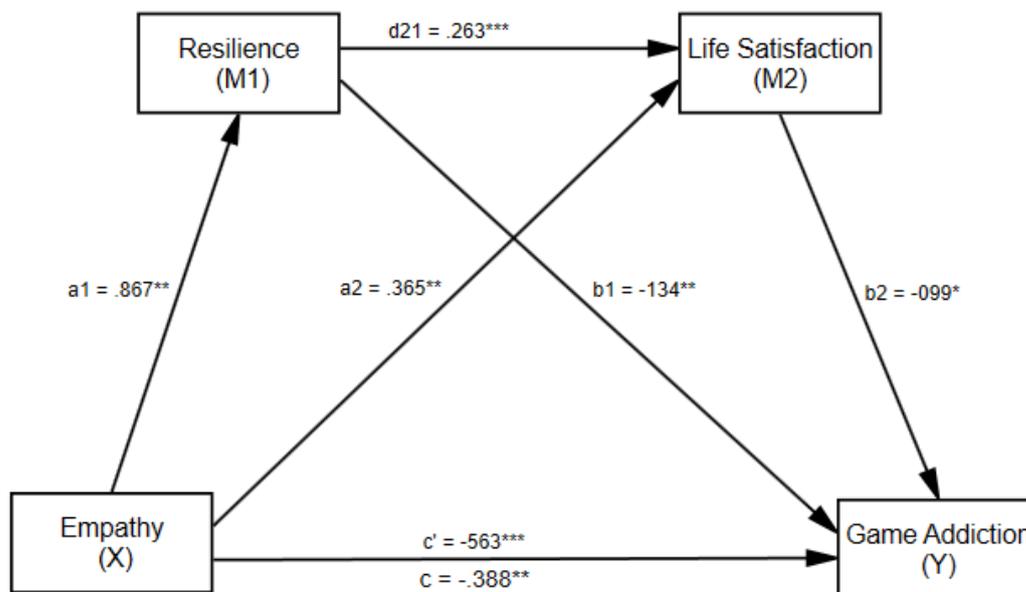

Figure 1. The results of serial multiple mediational model

Note. *$p < .05$, **$p < .01$, **$p < .001$. Values shown are unstandardized coefficients

DISCUSSION

This study has been designed to obtain better insight into the possible associations between empathy and video game addiction with the possible serial role of psychological resilience and life satisfaction as mediators. The first hypothesis of the present study was empathy will be negatively related to video game addiction. Video game addiction is a behavioral addiction experienced by many individuals today (Derevensky et al., 2019; Savci et al., 2021). As hypothesized in the present study empathy is related to video game addiction negatively. Video game addiction is closely related to social interaction and being part of a group (Olle & Westcott, 2018). Empathic individuals can establish healthy interpersonal communication (Kalisch, 1973). The reason why empathy negatively

predicts video game addiction may be related to social relations. Besides, empathy is considered as a protective factor in terms of game addiction (Olle & Westcott, 2018). Therefore, video game addiction interventions should be aimed at increasing empathy in parallel to the findings of this research.

Video game addiction is a concept closely related to emotional processes. For example, an fMRI study conducted by Leménager et al. (2014) found that individuals who are addicted to video games have a robustly emotional identification with their avatar than with a photo of themselves. Empathy is a concept that expresses the correct understanding of emotions (Decety & Lamm, 2006). Empathy contributes people to share emotions and sharing emotions provides to maintain good relationships (Jackson et al., 2015). Therefore, the relationship between empathy on video game addiction is obtained as a result of this study and this result is consistent with previous research findings.

As a result of this study, it was found that there is a negative relationship between empathy and video game addiction. Video game addiction is considered a problem that can be seen intensely in adolescence and adolescents are considered to be a risk group for video game addiction (Griffiths et al., 2015). Considering the negative relationship between empathy and video game addiction obtained as a result of this study, empathy can be considered as a protective factor in the process of video game addiction. Parents' expressing their feelings to their children and providing environments where their children can express their feelings may increase children's empathy skills. Increasing empathy can also prevent computer addiction in children and adolescents. Video game addiction in adolescents may also cause low school grades (Anand, 2007; Chiu et al., 2004; Leung & Lee 2011; Skoric et al., 2009). In this direction, it can be thought that the healthy and empathic relationship between family-child and the interventions to increase empathy by experts (eg counselors, teachers) can contribute to the prevention of video game addiction in children and to contribute to their academic success.

The link between narcissism and video game addiction has been demonstrated in previous studies (Kim et al., 2007). One of the most prominent features of narcissism is a lack of empathy (American Psychiatric Association, 2013). Narcissists lack empathic abilities and it can be seen that narcissists develop many behavioral addictions such as gambling addiction and game addiction (Bilevicius et al., 2019). Therefore, the relationship between narcissists' lack of empathy and behavioral addictions supports the findings of the present study.

The second hypothesis of this study is that resilience has a mediating role in the relationship between empathy and game addiction. One of the motivations to play computer games was considered to escape. Individuals who encounter stressors may sometimes use an escape-avoidance coping strategy. Escaping can be considered as the process of taking refuge in the virtual world from the difficulties of real-life (Laconi et al., 2017). Escape-avoidance coping is related negatively to resilience (Holahan et al., 1996; Rabenu & Yaniv, 2017). The mediating role of psychological resilience in the relationship between empathy and game addiction may arise from this situation. Playing excessive video games can cause sleep, eating, and nutritional disorders, personal and social interaction problems, depression, and anxiety. Due to the attractiveness, popularity, and easy accessibility of computer games, excessive computer game playing behavior may develop in many individuals (Derevensky et al., 2019). These relationships between psychopathology and game addiction support the mediating role of psychological resilience in video game addiction.

The third hypothesis of this research is that life satisfaction has a mediating role in the relationship between empathy and game addiction. Computer games, especially online games, are seen as a virtual socialization area where individuals experience social interactions today (Laconi et al., 2017). Bargeron & Hormes (2017) found a relationship between game addiction and high levels of anxiety, stress, depression, and low life satisfaction. Quality of life or life satisfaction may provide understand and intervention of the pathology -i.e. addiction-(Gullone & Cummins, 1999). Video game addicts have higher levels of depressive mood and lower levels of self-esteem (Laconi et al., 2017). Relationships between life satisfaction and psychopathology have been the subject of many studies.

There is a negative relationship between life satisfaction and psychopathology (Arrindell et al., 1991; Baruffol et al., 1995; De Vasconcelos et al., 2020). This may explain the mediating role of life satisfaction in the relationship between empathy and game addiction.

The fourth and final hypothesis of this study is to examine the serial mediating role of psychological resilience and life satisfaction in the relationship between empathy and video game addiction. In this direction, six direct effects and three indirect effects have been examined. In this study, empathy was directly related to psychological resilience, life satisfaction, and video game addiction; resilience directly affects life satisfaction and video game addiction; life satisfaction was found to have a direct effect on video game addiction. It was also found that psychological resilience (M1), life satisfaction (M2), and psychological resilience and life satisfaction in a series (M1 ---> M2) have a mediating role in the relationship between empathy and video game addiction. According to these results, it is suggested that video game addiction interventions should focus on increasing empathy, psychological resilience, and life satisfaction.

It is suggested that enhancing psychological resilience may contribute to the increasing life satisfaction of adolescents (Abolghasemi & Varaniyab, 2010). Psychological resilience is an important concept for the individual in all stages of life (Ryff & Singer, 2003). For instance, Smith & Hollinger-Smith (2015) found that higher resilience was associated with greater happiness scores in older adults. Faisal & Mathai (2017) found that resilience is related to wellbeing in adolescents. Psychological resilience is considered an important factor in increasing life satisfaction. There is also neurological evidence that psychological resilience predicts life satisfaction. Kong et al. (2015) showed the neural correlates of the relationship between resilience and life satisfaction. It was also suggested that resilience interventions be used to increase the well-being of clinical and non-clinical samples. In this direction, the verification of this hypothetically tested model (see figure 1) with neurological methods such as functional magnetic resonance imaging (fMRI) may contribute to the validity of the present study.

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