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RELATIONSHIP BETWEEN PROBLEMATIC GAMING AND EMOTIONAL INTELLIGENCE AND EMPATHY IN EARLY ADOLESCENCE

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Abstract

The aim of this study was to determine the relationship between problematic gaming and emotional intelligence and empathy in early adolescence. The study involved *N* = 143 participants, seventh- and eighth-grade students; *n* = 76 participants being female. Three instruments were used in the study. E-questionnaire: Emotional Empathy Scale and Imagination Scale, Emotional Skills and Competencies Questionnaire, and Problematic Online Gaming Questionnaire.

The research has revealed that problematic gaming is negatively correlated with emotional intelligence, i.e., that adolescents who score higher on the online gaming questionnaire have lower levels of emotional intelligence, and vice versa. Furthermore, problematic gaming is negatively associated with adolescent empathy; adolescents who assess the more frequent presence of behaviors characteristic of problematic gaming have a lower level of empathy, and vice versa. Regarding gender differences, the research showed that, unlike girls, boys are more likely to show behaviors characteristic of problematic gaming, and that the negative association between emotional intelligence and problematic gaming occurs only in boys, while in girls it is absent. The findings of this research indicate the existence of a negative association between empathy and emotional intelligence and problematic gaming, but it does not determine its

direction. Further research is needed to shed light on the nature of this association. The findings of this research may serve as a starting point for future more extensive, longitudinal research on the relationship between problematic gaming and emotional functioning.

Keywords: adolescents, computer games, emotional intelligence, empathy

Sažetak

Cilj ovog rada bio je utvrditi odnos problematičnog igranja računalnih igara i emocionalne inteligencije i empatije u ranoj adolescenciji. U istraživanju je sudjelovalo *N*=143 sudionika, učenika sedmih i osmih razreda, pri čemu je *n*=76 sudionika bilo ženskog roda. U istraživanju su se koristila tri instrumenta; e-upitnik: Skala emocionalne empatije i Skala mašte, Upitnik emocionalnih vještina i kompetentnosti i Upitnik pretjeranog igranja igara na internetu.

Istraživanjem je utvrđeno kako je problematično igranje računalnim igrama negativno povezano s emocionalnom inteligencijom, odnosno da adolescenti koji imaju veće rezultate na upitniku pretjeranog igranja igara na internetu imaju nižu razinu emocionalne inteligencije i obrnuto. Također je problematično igranje računalnih igara negativno povezano s empatijom adolescenata; adolescenti koji procjenjuju češću prisutnost ponašanja karakterističnih za problematično igranje računalnih igara imaju nižu razinu empatije. Ispitujući rodne razlike, pokazalo se kako dječaci u većoj mjeri od djevojčica iskazuju prisutnost ponašanja karakterističnih za problematično igranje računalnim igrama te se negativna povezanost emocionalne inteligencije i problematičnog igranja računalnih igara javlja kod dječaka dok se kod djevojčica ona gubi. Nalazi ovog istraživanja ukazuju na postojanje negativne povezanosti empatije i emocionalne inteligencije s problematičnim igranjem računalnih igara. Međutim, njome nije utvrđen njezin smjer te su potrebna daljnja istraživanja koja bi rasvijetlila prirodu te povezanosti. Nalazi ovog istraživanja mogu poslužiti kao polazišna točka budućim opsežnijim, longitudinalnim istraživanjima povezanosti problematičnog igranja računalnih igara i emocionalnog funkcioniranja i razvoja emocionalne inteligencije od djetinjstva do odrasle dobi.

Ključne riječi: adolescenti, emocionalna inteligencija, empatija, računalne igre

INTRODUCTION

With the development of the Internet and information and communication technologies, the presence of the Internet and computer games in the lives of children and young people has increased over the last two decades. Computer games have been present in children's lives since their birth and have become an integral part of their upbringing, so in recent years an increasing number of studies have addressed the impact of playing computer games on the healthy development of children and young people. According to some researchers (e.g., Bavelier, Green, Pouget, and Schrater, 2012; Powers, Brooks, Aldrich, and Palladino, 2013) playing computer games improves young people's cognitive abilities; it has a positive impact

on young people's mental health self-assessment, and a child's self-image as well as their involvement in school activities (Durkin and Barber, 2002). Playing computer games provides adolescents with many opportunities to create a sense of achievement by winning a game as well as opportunities to meet people and make friends with whom they interact in virtual reality, develop a sense of belonging and find ways to relieve stress (Mittal and Sindhu, 2012). However, numerous studies have shown that gaming has negative effects on children's development, as well. According to some authors (e.g., Anderson et al., 2010; Gentile et al., 2015), computer games increase the risk of gaming addiction, aggressive behavior (Anderson, 2004; Dill and Dill, 1998), and unhealthy competitiveness (Adachi and Willoughby, 2011). Given the many positive and negative consequences of playing computer games, in recent years an increasingly prevalent thesis has appeared that computer and Internet games themselves are neither good nor bad, but that the key factors are the time children and young people spend gaming and the intensity of player activity. Przybylski (2014) compared the impact of computer games on children and adolescents (aged 10 to 15) regarding the daily time they spend gaming. Low-level gaming (up to one hour) has been associated with a positive effect on children and young people, while high-level gaming (more than three hours per day) are associated with negative outcomes. It is also interesting to note that there are no positive or negative effects of gaming on children who play computer games between 1 to 3 hours a day and that they do not differ from children who do not play computer games at all. The positive outcomes in moderate gameplay are manifested in greater life satisfaction, prosocial behavior, and the presence of fewer externalized and internalized problems when compared to other groups (those who do not play computer games and those who play it excessively). These research findings confirm the thesis presented by some authors that computer games today have a purpose similar to one of the traditional games as they represent opportunities for identity development (Przybylski, Weinstein, Murayama, Lynch and Ryan, 2012). They also represent cognitive and social challenges (Ferguson and Olson, 2013), which was once the purpose of traditional games. However, the same game can have negative effects on children and young people if they spend more than half their daily free time playing it. Such examples may reveal negative trends in the adjustment, i.e., children may develop internalized and externalized problems, a lower degree of prosocial behavior, and life satisfaction compared to children who do not play computer games (Przybylski, 2014). Therefore, it can be concluded that the problem arises when gaming becomes the most important preoccupation in children's and young people's lives when it becomes excessive, problematic, and in some cases even addictive. When people spend more time with gaming than planned, ignoring other activities in their lives (Ng and Wierner-Hastings, 2005; Smyth, 2007), social relationships (Cole and Griffiths, 2007; Peters and Malesky, 2008) and when they show withdrawal symptoms (Griffiths, 2010; Young, 1998) then such gaming is called *problematic gaming* (Demetrovics et al., 2012). According to the model of problematic gaming set by Demetrovicsc et al. (2012), this form of behavior can be described in six dimensions: preoccupation, overuse, immersion, social isolation, interpersonal conflicts, and withdrawal. Boys, children with lower self-esteem,

those who discover more about themselves on the Internet, and those who more often commit violence both face-to-face and via the Internet manifest more symptoms of problematic gaming (Šincek, Tomašić Humer and Duvnjak, 2017). Previous research has also revealed that boys and young male adults play computer games more often than girls and young female adults (Dill and Dill, 1998; Doyle, 2014; Funk and Buchman, 1996) and that games played by boys are more violent compared to those played by girls (Doyle, 2014). Funk and Buchmann (1996) state that boys in early adolescence play computer games for about twice as many hours as girls do in that period of life.

Problematic gaming is also associated with maladaptive coping strategies for dealing with unpleasant emotions. The negative impact of excessive gaming has also been found in people over 18 years of age. For example, Di Blasi et al. (2019) found in their research that problematic players escape in the world of games as a maladaptive coping strategy for dealing with adverse emotional experiences.

Prior research showed clearly that gaming, and especially problematic (excessive) gaming, can be associated with the emotional functioning of adults, but also of children and young people. The importance of emotional functioning and emotional intelligence throughout life is particularly emphasized during adolescence. While entering adolescence, young people strive for independence, plan their future and career, create romantic relationships, hope to create their own family, etc. Furthermore, adolescents learn their roles and ways to fit into the world of adults, question their identity, and build their future selves. Emotions and emotional intelligence play a significant role during that period. Emotion regulation difficulties, such as difficulties in identifying and expressing emotions are associated with the emergence of developmental difficulties in children and adolescents (Mullin and Hinshaw, 2007; Southam-Gerow and Kendall, 2002) and might be considered a risk factor for delinquent behavior and drug abuse in adolescence (Dorard, Berthoz, Phan, Corcos, and Bungener, 2008; Zimmermann, 2006). Vučenović, Hajncl, and Takšić (2014) state that numerous studies have found that low levels of emotional intelligence are a significant predictor of interpersonal conflicts and that adolescents with lower levels of emotional intelligence exhibit more aggressive and conflicting behaviors than their peers with higher levels of emotional intelligence. Emotional intelligence is defined as the ability to understand and manage emotions, both one's own and those of others. It refers to a combination of skills including empathy, self-control, self-awareness, sensitivity to other people's feelings, persistence, self-motivation (Karibeeran and Mohanty, 2019), as well as expression and emotion regulation, communication, and conflict resolution processes (Ioannidou and Konstantikaki, 2008). The environment has a great influence on the experiencing and expression of emotions. Environmental factors such as parents, teachers, peers, but also the media (and thus computers and computer games) affect the emotions and emotional responses of adolescents (Brand and Klimes - Dougan, 2010).

Computer games may have positive effects on the development of emotional intelligence as they promote adaptive and flexible emotion regulation. They support coping with frustration and anxiety in adaptive ways (Aldao, Nolen-Hoeksema, and Schweizer, 2010, as cited in Carissoli and Villani, 2019). Multiplayer games that require players' mutual cooperation can positively affect intra-group cohesion, empathy, mutual support, and collaborative behavior (Greitemeyer and Cox, 2013; Greitemeyer, Osswald, and Brauer, 2010). Granic, Lobel, and Engels (2014) also discussed the emotional, social, and motivational benefits of gaming such as keeping the players in a zone of proximal development, as well as the optimal balancing of frustration and achievements by using immediate and concrete feedback thus resulting in practicing persistence in both gaming and real-life tasks. By playing computer games, children acquire strategies to deal with stress and learn to regulate their emotions (Granić et al., 2014).

Along with the emotion regulation skill, the influence of computer games has also been associated with empathy as an integral part of emotional intelligence, especially with regard to the correlation between playing violent computer games and empathy. Empathy is the ability to empathize, the degree to which an individual feels sadness and compassion for the suffering of others (Anderson et al., 2010). Playing violent computer games is associated with empathy, i.e., research (e.g. Anderson, 2004; Funk, Baldacci, Pasold, and Baumgardner, 2004) has confirmed a negative correlation between playing violent computer games and empathy. It is believed that playing violent computer games is associated with a decrease in sensitivity to aggression, which is then manifested in a decrease in the level of empathy (Zhen, Xie, Zhang, Wang, and Li, 2011). However, not all researchers have confirmed such findings. DeCamp and Ferguson (2017) state that numerous recent studies have found that the small effect of exposure to violent games on the occurrence of aggression in players (often mentioned in previous research) disappears when controlling other factors such as gender, race, family circumstances, partner relationships, etc. It should also be noted that the direction of this correlation does not have to be one-way. Longitudinal research conducted by Gentile et al. (2011) found that long-term gaming, poorer social skills, lower levels of empathy, and higher levels of impulsivity increase the risk of developing gaming disorder.

The underlying mechanisms and levels of emotional intelligence and empathy differ in boys and girls. Depending on the methods to measure emotional intelligence and empathy, the results obtained in the literature have been contradictory. While most of the literature (e.g. Mandell and Pherwani, 2003; Mayer, Caruso, and Salovey, 1999) indicates that girls are more emotionally intelligent than boys, some authors (e.g. Ciarrochi, Chan and Bajgar, 2001) state that young men are nevertheless more successful in the domain of emotional intelligence related to self-regulation of their own emotions. Similar results have been found with empathy, i.e., girls show higher levels of empathy than boys (Rueckert and Naybar, 2008; Toussaint and Webb, 2005). A higher level of empathy is associated with a lower level of aggression in girls, as well as their greater concern for the victims, their feelings, and their suffering (Eisenberg,

2000). Furthermore, girls use empathy to a greater extent, e.g., when making decisions (Harenski, Antonenko, Shane, and Kiehl, 2008; Robertson et al., 2007), thus it is possible that girls rely more on their empathy in deciding whether to react aggressively in different life situations (Zhen et al., 2011). Also, in adulthood, women report higher levels of empathy than men, both in self-assessment measures and in measures of assessment of others (Raboteg-Šarić, 1995). Raboteg-Šarić (1995) indicates that it is possible that these gender differences have their roots in socialization. Bringing up girls is based on the principle of care, that is, girls are raised to be empathetic towards others, full of understanding for their conditions, moods, and personality traits. Unlike girls, when raising boys, the emphasis is on the principles of justice (Karniol, Gabay, Ochion, and Harari, 1998).

RESEARCH OBJECTIVE AND RESEARCH PROBLEMS

Accordingly, the aim of this paper is to investigate the relationship between emotional intelligence and empathy and problematic gaming, as well as to examine whether there are gender differences in these relationships in early adolescence.

Therefore, the following research problems were formulated:

Examine the relationship between emotional intelligence and problematic gaming in early adolescence.

H1: A significant negative correlation is expected between problematic gaming and emotional intelligence.

Examine the relationship between empathy and problematic gaming in early adolescence.

H2: A significant negative correlation is expected between empathy and problematic gaming.

Examine gender differences in the correlation between emotional intelligence and empathy and problematic gaming.

H3: Compared to girls, a higher negative association between problematic gaming and empathy and emotional intelligence is expected to occur in boys

METHOD

Participants

The study involved *N* = 143 participants (*n* = 76 participants were female). The participants were seventh and eighth-grade students at an elementary school in Županja. The seventh grade consisted of *n* = 73 participants and the eighth-grade *n* = 70 participants.

Instruments

Three instruments were used in the study. E-questionnaire: Emotional Empathy Scale and Imagination Scale, Emotional Skills and Competencies Questionnaire, and Problematic Online Gaming Questionnaire.

The e-questionnaire (Raboteg-Šarić, 1991, 1993) contains two scales that measure different aspects of empathic experience, namely: Emotional Empathy Scale and Imagination Scale. The total score on the subscales is created as the average value of all responses on each subscale. The questions included information on how participants felt or coped with certain situations. Here are some examples of questionnaire items *"When I watch a movie, I imagine that I am one of the characters in the movie* ", "*I immerse myself completely in the feelings of the characters in the novel* ", *"I get sad when I see helpless people* " ... Participants assessed the proposed items on a scale from 0 to 4. Number 0 represents the response *"does not apply to me at all* ", number 1 *"mostly does not apply to me* ", number 2 *"neither applies nor does not apply to me* ", number 3 *"mainly applies to me*" and number 4 *"completely applies to me "*(Rabotek-Šarić, 1991, 1993). The emotional empathy scale consists of 19 items, and the Cronbach's alpha internal consistency coefficient in this study is 0.902. The remaining 6 items in the questionnaire were applied for measuring imagination (Cronbach alpha 0.784). However, given the aim of this research, the obtained results on this subscale were not used.

The emotional skills and competence questionnaire by Vladimir Takšić (1998) was developed based on Mayer and Salovey's emotional intelligence model (1996; 1997; according to Takšić, 1998). A 15-item version of the questionnaire was used in this study. Examples of questionnaire items are *"I am able to maintain a good mood even if something bad happens* ", *"I am able to tell the difference if my friend is sad or disappointed* ", *"I do not have difficulty persuading a friend that there is no reason to worry* "... Each item is assigned a score value from 1–5 for the participants to assess. Number 1 represents the response *"strongly disagree* ", number 2 *"mostly disagree* ", number 3 *"neither disagree nor agree* ", number 4 *"mostly agree* " and number 5 *"strongly agree* ". The result is obtained by calculating the arithmetic mean of all values estimated in the Questionnaire. This questionnaire model indicates the adaptive function of emotions, the emotion regulation of others and self, the assessment, as well as the expression of emotions both in oneself and others. The Emotional Skills and Competencies Questionnaire provides a general assessment of individual differences in emotional intelligence. In this study, The Cronbach's alpha internal consistency coefficient on the results in the Emotional Competence Questionnaire (UEK-15) is 0.844.

Problematic Online Gaming Questionnaire - a short form (POGQ-SF, Pápay, et al., 2012) consists of 12 items. This is a short form of the Problematic Online Gaming Questionnaire (Demetrovisc et al.) (2012) which contains 18 questions. Examples of questionnaire items are*," When you are not gaming, how often do you think about playing a game or think about how would*

it feel to play at that moment ", "*How often do you feel depressed or irritable when not gaming only for these feelings to disappear when you start playing?* ", *How often do the people around you complain that you are gaming too much?* ". Participants rate their statements (agreement with the above statements) on a 5-point Likert-type scale, where 1 means *"never"* and 5 *"always".* The average of all questionnaire responses represents the total score on the scale. The questionnaire investigates six dimensions of problematic gaming; preoccupation, over-playing, immersion in games, social isolation, conflicts with others, and withdrawal. In this study, the Cronbach's alpha internal consistency coefficient for the Problematic Online Gaming Questionnaire is 0.913.

Procedure

The research was approved by the Ethics Committee at the Faculty of Education in Osijek. Completion of the questionnaire lasted one school hour and was conducted in groups. The purpose of the research was explained to the students with an emphasis on the voluntary participation and confidential nature of the study. Participants were instructed to read the instructions at the beginning of each questionnaire before completing them.

Results

Table 1 shows the basic descriptive statistics on the measured variables (arithmetic means, standard deviations, and response variable range). The asymmetry indices (skewness and kurtosis) do not exceed the values of +/- 4 (excluding the empathy variable, which does not deviate significantly), thus parametric statistics were applied in further analyzes.

Table 1. Descriptive statistics on variables examined in the study (assessments on emotional intelligence, empathy, and problematic gaming); N = 143.

	Minimum response values (Theoretical minimum)	Maximum response values (Theoretical maximum	Arithmetic mean	Standard deviation	*Skewness*	*Kurtosis*
emotional intelligence	1.00 (1.00)	4.67 (5.00)	3.46	(0.615)	-2.40	(2.64)
empathy	0. 00 -0.00	(3.89) -4.00	2.71	-0.727	-4.63	-1.78
problematic gaming	1.00 (1.00)	5.00 (5.00)	2.16	0.937	3.38	-0.20

As can be seen in Table 1, for easier interpretation, the results on the Problematic Online Gaming Questionnaire are expressed as average values. Pápaya et al. (2012), the authors of the applied scale, expressed the result as the sum of all items in the Questionnaire. Thus, the possible result ranges from a minimum of 12 to a maximum of 60. According to Pápayai et al. (2012), the cut-off value for determining problematic gaming is 32. Expressing the results in this way, the arithmetic mean of the determined results in this research was 25.87 (SD = 11.240), and of the 143 participants, 39 of them (27.27%) scored higher than 32 on the scale. That is, according to Pápaya et al (2012) it can be concluded that 27.3% of participants were diagnosed with the problematic gaming disorder. On the other hand, 19 participants (13.3%) scored a minimal result, i.e., they answered that none of the offered behaviors and experiences in the Scale ever refers to them.

Investigating the individual behaviors and experiences listed in the Questionnaire, playing games longer than planned is a behavior for which most participants responded that it happens to them often or always (32.2%). Also, a relatively high percentage of participants, 30.8%, reported often or always losing track of time when playing games. On the other hand, behaviors and experiences that participants reported as mostly not referring to were cancel and/or skip hanging out with a friend on account of playing a game (69.2% have never behaved like that) as well as frequent quarrels with parents or friends as a consequence of gaming (67. 1% of them have never behaved like that).

In order to determine the possible correlation between problematic gaming and emotional intelligence and empathy, the Pearson correlation coefficient between the results on the mentioned variables was calculated.

It can be seen from Table 2 that a negative association between problematic gaming and emotional intelligence and empathy has been found in children.

Table 2. Pearson correlation coefficients of the results obtained on the scales of emotional intelligence, empathy, and problematic gaming (N = 143).

	Emotional intelligence	empathy	problematic gaming
emotional intelligence	1	0.399 **	- 0.263 **
empathy	0.399 **	1	- 0.248 **
problematic gaming	- 0.263 **	- 0.248 **	1

Notes: ** p <0.01;

The results show that participants with lower emotional intelligence more often express behaviors and experiences characteristic of problematic gaming, i.e., the research participants who report having more often behaviors and experiences characteristic of problematic gaming also have lower emotional intelligence (r = -0.26, p <0.01). As for empathy, the correlation is also negative and low. Adolescents who report expressing problematic gaming behaviors more frequently, also have lower empathy, i.e., adolescents with a lower level of empathy behave more frequently and have experiences characteristic of problematic gaming (r = -0.25, p <0.01).

Gender-related differences in gaming

The study analyzed gender differences in the association between problematic gaming and emotional intelligence, as well as between problematic gaming and empathy. Tables 3 and 4 show descriptive data and correlations between the examined variables in the boys' and the girls' subsample. The theoretical minimum and maximum values of the measured variables are the same as in Table 1 and are therefore not restated here.

Table 3. Descriptive data on research variables (emotional intelligence, empathy, and problematic gaming) in boys (n = 67) and in girls (n = 76).

Variables	Gender	Minimum response values	Maximum response values	Arithmetic mean	Standard deviation
emotional intelligence	boys	1.00	4.67	3.41	0.711
	girls	2.53	4.47	3.50	0.516
empathy	boys	0.00	3.63	2.41	0.778
	girls	1.26	3.89	2.98	0.557
problematic gaming	boys	1.00	5.00	1.96	1.093
	girls	1.00	4.08	1.84	0.849

Table 4. Pearson correlation coefficients of the results obtained on the scales of emotional intelligence, empathy, and problematic gaming in the boys' subsample (n=67) and the girls' subsample (n=76).

Variables	Gender	Emotional intelligence	empathy	problematic gaming
emotional intelligence	boys	1	0.443 **	-0.312 *
	girls	1	0.339 **	-0.186
empathy	boys	0.443 **	1	-0.168
	girls	0.339 **	1	-0.061
problematic gaming	boys	-0.312 *	-0.168	1
	girls	-0.186	-0.061	1

Legend: ** p <0.01; * p <0.05

A statistically significant association between problematic gaming and emotional intelligence occurred in the boys' subsample. Boys who demonstrate a higher presence of problematic gaming behaviors also display lower emotional intelligence, i.e., those with a lower level of emotional intelligence more often show the presence of behaviors characteristic of problematic gaming.

As can be seen in Table 4, the correlation between emotional intelligence and empathy and problematic gaming does not exist in girls, thus according to the results, it can be concluded that problematic gaming in girls is not associated with emotional intelligence and empathy.

Boys and girls differ in the results on empathy questionnaires (t = -5.115, p <0.01, d = -0.85) and in problematic gaming (t = 4.668, p <0.01, d = 0.78). The effect size, Cohen's d, in both of these measures is close to 0.80, which according to Kolesarić and Tomašić Humer (2017) is considered a large effect size.

On average girls score higher on the empathy scale (M = 2.98, SD = 0.557) compared to boys (M = 2.41, SD = 0.779). Boys score higher in the Problematic Online Gaming Questionnaire (M = 2.52, SD = 0.903) compared to girls (M = 1.84, SD = 0.849).

There is no difference between boys and girls on the emotional intelligence scale (t = -0.866, p > 0.05).

DISCUSSION

In the last 30 years, information technologies have been developing rapidly, and perhaps the greatest growth and development is visible in the computer game industry. Computer games have become commonplace for children and adults. Nowadays, children grow up with computer games which have become one of the elements that might positively or negatively affect their development. Occupation with computer games, constant thinking about them, neglect of other activities and obligations are just some of the signs of excessive gaming, which negatively affect the development of children and youth. This study examined the relationship between problematic gaming and emotional intelligence and empathy.

The results of this research show that emotional intelligence is negatively associated with problematic gaming. Research participants with lower self-assessments of emotional intelligence also score slightly higher on the Problematic Online Gaming Questionnaire. That is, research participants who demonstrate a greater presence of behaviors characteristic of problematic gaming also show lower emotional intelligence. Salovey and Sluyter (1999) state that not all children have the same opportunity to adopt and develop emotional skills. Learning emotional skills begins in the family, in good parent-child relationships. Parents help children recognize and adopt emotions (Salovey and Sluyter, 1999). The child comes into contact with the computer and computer games early in his childhood, therefore, if the child is left to himself/herself, he/she will not be able to limit the time spent gaming. The more time he/she spends gaming, the less he/she will interact with his/her family and peers, hence he/she will not be able to adopt, recognize and develop his/her emotions, which can affect his/her emotional intelligence. The findings of the conducted research coincide with the findings of the Seo, Kang, and Chae (2012) research. These authors conducted research involving 2199 adolescents. The results of their research indicate that emotional competencies (positive emotions, emotional expression, and emotional intelligence) decline with more frequent gaming. Frequent gaming also increased the occurrence of unpleasant emotions such as depression, anxiety, loneliness, repulsion, paranoia, and psychosis, and decreased the occurrence of positive emotions. Based on the findings of this and previous research, we can conclude that computer games can have a negative impact on emotional intelligence. It is assumed that such results occur due to a lack of social contact in the real world because emotions cannot be authentically displayed through virtual characters in computer games, so children and adolescents who overplay computer games have little or no experience in recognizing and defining emotions in themselves and others.

We cannot identify whether a lower emotional intelligence causes increased gaming, or the increased gaming affects a lack of emotional intelligence. It is possible that children, precisely because they have not developed competencies for recognizing and managing emotions, seek escape from real life into computer games. Gaetan, Brejard, and Bonnet (2016) state that there is a possibility that adolescents who are unsuccessful in managing and expressing emo-

tions or simply fail to recognize them well in others and therefore use the virtual environment in video games as an opportunity to experiment and manage their emotions, play games more often. However, such solutions do not always have to be effective nor can emotion regulation always be transferred from the virtual world to the real world which in turn can result in the preference of the virtual world over the real one (Gaetan, Brejard, and Bonnet, 2016).

The results on the empathy scale are similar to those found on the emotional intelligence scale. Such results are also expected given that empathy is considered one aspect of emotional intelligence. Problematic gaming is negatively associated with empathy. Adolescents who score higher on the Problematic Online Gaming Questionnaire have a lower level of empathy, i.e., children who have a lower level of empathy are more likely to show the presence of behaviors characteristic of excessive gaming. It is undoubtedly important to note that this negative correlation, although it exists, is very low (r = -0.25, p <0.01). Previous research on the connection between empathy and problematic gaming (differently operationalized) has yielded contradictory results. Che et al. (2017) and Zhang et al (2016; according to Hui, Wu, and Pun, 2019) found the existence of a negative association between empathy and symptoms of gaming addiction. Given that some of the behaviors examined by the Problematic Online Gaming Questionnaire (which was used in this study) are characteristic of addictive behavior and/or may lead to the same (e.g., *How often do you feel depressed or irritable when not gaming only for these feelings to disappear when you start playing?* or *How often do you daydream about gaming?* etc.) such results were expected. Young people who are overly preoccupied with playing or thinking about computer games may distance themselves from the real world and the way the world works (Jennett et al., 2008). Empathy plays an important role in the world we live in both for the person himself/herself and the people around the person. However, how necessary and important is it in the world of computer games? It is also possible that people who have difficulties in emotional regulation and who do not cope with the world where emotional intelligence is an important element for successful cooperation and socializing, escape into a world of games where emotions do not play such a big role. Similar to the conclusions of Di Blasi et al. (2019), perhaps young people, as well as adults, use escapism as a maladaptive coping strategy for dealing with unpleasant emotions or emotions in general that they do not know how to regulate. On the other hand, Collins and Freeman (2013) examined the level of empathy between people diagnosed with problematic gaming disorder, people who play computer games but have not developed problems associated with problematic gaming, and people who do not play computer games. These authors found that there were no differences in levels of empathy between these three groups of study participants. These results indicate that the relationship between empathy and problematic gaming is complex and that further research is needed for some other possible variables that could affect this relationship (e.g., self-esteem, self-regulation, gamers' ability to identify themselves with the characters in computer games, etc.)

Analyzing gender differences in the correlation between emotional intelligence and problematic gaming, it is apparent that this negative correlation is statistically significant in boys while in girls it disappears. These results are related to the fact that boys are more likely than girls to report some form of problematic gaming disorder, hence to the fact that boys score higher on the problematic gaming scale (M = 2.52, SD = 0.903) compared to girls (M = 1.84, SD = 0.849). These data are consistent with earlier research findings. Šincek, Tomašić Humer, and Duvnjak (2017) in a sample of Croatian children and adolescents (aged 11 to 21) found that boys are more likely to report being regular gamers than girls and that boys score higher on the Problematic Online Gaming Questionnaire compared to girls. Similar results have been found by researchers in other countries. For example, Hellström, Nilsson, Leppert, and Aslund (2015) found in a sample of 7,757 Swedish adolescents that 10.7% of adolescent boys and 1.9% of adolescent girls play computer games for more than 5 hours on weekdays, and 19.3% adolescent boys and 2.3% adolescent girls during weekends.

Although a negative correlation between empathy and problematic gaming was determined on the entire sample of participants when the sample is divided by gender that correlation, becomes statistically insignificant. These results may be due to fewer participants when the sample is divided into subsamples. The results of this study are similar to the ones obtained by Doyle (2014) who found a negative correlation between empathy and playing violent computer games in a sample of 90 children aged 9 to 12, as well as that boys more frequently spend more time playing violent computer games than girls. However, it is important to note here that the research established a correlation, but not the direction of that correlation. On the one hand, it is possible that boys and young men reduce the level of empathy by playing violent computer games more often than girls, but on the other hand, it is possible that, unlike in girls, this lower level of empathy in boys influence on them to play these games.

The limitations of this research primarily relate to a relatively small number of participants, especially when the sample is divided according to the gender of the participants, thus imposing caution when generalizing the findings of the research. Furthermore, since this has been correlational research, no conclusions are allowed to be drawn regarding the cause-and-effect relationship. Therefore, future research should investigate the long-term effects of problematic gaming on empathy and emotional intelligence. Only longitudinal research could determine the direction of the relationship between these constructs as well as the background of gender differences that occur in them. Future research should examine (and control) some other characteristics of children and young people that may affect the emotional intelligence/empathy and behavior inherent in problematic gaming, e.g., self-esteem, personality traits, the way a person copes with frustration, and similar). Also, in addition to examining the behaviors associated with problematic gaming, future research should examine the type of computer game that children play most frequently or the games they are most attracted to. It is possible that the preferences for different types of computer games (especially in the case of

preference for violent computer games or games played in a team / individually) may have an impact on the relationship between problematic gaming and emotional intelligence/empathy.

Difficulties in the children's emotional development, as the development of emotional intelligence, might be manifested in both escaping into the world of games and unhealthy, excessive use of games. These insights can be used by parents, educators, teachers, professional associates in order to detect possible difficulties in emotional functioning as early and easily as possible, find the causes of these difficulties, and thus solve them more successfully and quickly. On the other hand, it is possible that excessive and problematic gaming negatively affects the development of emotional intelligence and empathy. Therefore, it is important for children and young people to recognize those behaviors that can lead to problematic gaming and prevent them. Given the high percentage of children gamers, increasing our understanding of the problematic gaming impacts is crucial for planning interventions that would reduce both the occurrence of excessive and addictive gaming and their potential negative effects on children and youth.

CONCLUSION

This study aimed to examine the relationship between problematic gaming and emotional intelligence and empathy as well as to examine the existence of gender differences in this relationship.

Research has found that problematic gaming is negatively associated with emotional intelligence. Adolescents who express behaviors characteristic of problematic gaming to a greater extent also show a lower level of emotional intelligence and a lower level of empathy, and vice versa. The research has also found that boys more often than girls show the presence of some of the characteristics of problematic gaming and a lower level of empathy. Furthermore, a negative association between problematic gaming and emotional intelligence has been obtained only in boys, while in girls it does not appear.

Gaming has become commonplace for a large number of children, and it in itself does not have to bring negative effects. However, excessive gaming is negatively associated with various aspects of child and youth development. This research has found that excessive and problematic gaming could be associated with possible social and emotional developmental difficulties in young people.

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