ORIGINAL ARTICLE

Trait Emotional Intelligence and Internet Gaming Disorder Among Gamers: The Mediating Role of Online Gaming Motives and Moderating Role of Age Groups

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Abstract

Personality differences are important determinants of problematic online behaviors. The purpose of the present study was to investigate the mediating role of loneliness, depression, and online gaming motives and moderating role of age on the relationship between trait emotional intelligence (EI) and Internet gaming disorder (IGD) via the construction of a multiple mediation model. A total of 478 online gamers completed a self-report online survey, including validated psychometric scales assessing the aforementioned constructs. Results indicated that trait EI was directly and indirectly associated with IGD and that the motive of escape was a partial mediator between trait EI and IGD among the total sample and adult gamers, but not among adolescents. Moreover, trait EI was associated with coping, skill development, fantasy, and recreation gaming motives only among total sample and adult gamers, and the escape motive was positively associated with IGD among total sample and adult gamers. However, among these relationships, only the association between trait EI and fantasy was significantly moderated by age group. Furthermore, the direct effect of trait EI was stronger among adolescent gamers when compared to adult gamers. Results showed that trait EI is inversely associated with IGD and affects gaming for different motives among adolescent and adult gamers.

Keywords Internet gaming disorder · Trait emotional intelligence · Depression · Loneliness · Gaming motives · Escape

Recently, the World Health Organization (WHO; 2018) recognized gaming disorder (both online and offline) in the eleventh revision of the *International Classification of Diseases* (ICD-11) as a disorder that threatens public health and well-being. The WHO described gaming disorder as manifesting (i) impaired control over gaming, (ii) increasing priority given to gaming, and (iii) continuation of gaming despite its negative consequences. Consequently, Internet gaming disorder (IGD) can have major detrimental effects on individuals including depression, anxiety, stress,

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psychosocial problems, and lower psychological well-being and consequently deserves recognition and further examination (see Kuss and Griffiths 2012 for a review).

To date, there has been much research investigating the mechanisms that lead to IGD. Systematic reviews have concluded that personality is one of the prominent factors that play a pivotal role in the onset and development of IGD (Gervasi et al. 2017; Şalvarlı and Griffiths 2019), although the role of trait EI on IGD is still less known compared with other popular personality theories (e.g., Big Five, HEXACO [Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience]). Moreover, motives for gaming (e.g., gaming to escape) and using gaming as a coping to deal with psychosocial problems (e.g., depression, loneliness) are among the important factors that contribute to IGD (Ballabio et al. 2017; Laconi et al. 2017). Nevertheless, previous studies examining the factors that may influence IGD have mostly relied on the direct effects models, although research needs to consider mediation effects and interaction of different core elements (e.g., demographic characteristics of the gamers [Griffiths and Wood 2000]) to accomplish more in-depth understanding of the mechanisms that promote IGD (Brand, Young, Laier, Wölfling, & Potenza, 2016; Kardefelt-Winther 2014). Based on the aforementioned rationale, the present study investigated the direct and indirect effects of trait EI on IGD via gaming motives, depression, and loneliness in adult and adolescent samples.

Trait Emotional Intelligence and Internet Gaming Disorder

Trait EI (defined as a constellation of emotional perceptions) can be assessed using self-report questionnaires and rating scales (Petrides et al. 2007). It is a personality trait that comprises different facets including well-being (e.g., trait happiness and optimism), self-control (e.g., emotion control, stress management, impulse control), sociability (e.g., social awareness, emotion management, assertiveness), and emotionality (e.g., emotion perception, expression, trait empathy) (Petrides and Furnham 2001; Petrides et al. 2016). Although to some extent, trait EI overlaps with other personality theories (such as the Big Five), and despite some critics arguing that trait EI does not capture any unique personality variance, it has a distinct place in the personality spectrum and lies at the lower levels of personality hierarchies with its relative specific focus on emotions (Petrides et al. 2016; Petrides et al. 2007). Trait EI and its components may also have a role in behavioral addictions similar to their role in chemical addictions (Kun and Demetrovics 2010).

Individuals with decreased trait EI are more likely to experience elevated psychological and interpersonal problems (Petrides et al. 2016) which may facilitate potential problematic online use (Kuss and Griffiths 2012). The socioemotional system (which boosts individuals' proneness to exciting and risky activities such as problematic technology use) controls individuals' emotions, and having cognitive control over these emotions is an important preventive factor against involvement in problematic behaviors (Casey et al. 2008; Shulman et al. 2016).

A few studies have associated trait EI with technological addictions such as smartphone addiction (Van Deursen et al. 2015) and Internet addiction (Beranuy et al. 2009), but only two studies have shown that trait EI may play a contributory role in the development of online gaming addiction. More specifically, Che et al. (2017) reported that the self-management of the emotions component of emotional intelligence was negatively associated with online gaming addiction among adolescents. Another study with adolescents reported that trait EI was indirectly related to problematic online gaming through mindful

awareness (Kircaburun, Griffiths, & Billiuex, 2019). Individuals having a hard time dealing with their emotions and/or who have lower levels of emotion-related personality facets may develop and maintain IGD to avoid dealing with real-life emotions. Therefore, high trait EI should be directly associated with lower IGD scores.

The Mediating Role of Loneliness, Depression, and Online Gaming Motives

Gamers have different motivations for gaming, and examining these different motives is important in understanding gaming behavior (Demetrovics et al. 2011). Individuals' online gaming motives have been classified into seven dimensions comprising social, escape, competition, coping, skill development, fantasy, and recreation motives (Demetrovics et al. 2011). Specific motives for gaming have repeatedly been associated with IGD, especially escape, competition, and coping motives (Kuss et al. 2012; Laconi et al. 2017). For instance, engaging in online gaming to escape real-life struggles and to experience different fantasies was a partial mediator between psychiatric impairments and IGD among Italian online gamers (Ballabio et al. 2017). Escape and competition motives partially explained the association of psychiatric symptoms with IGD in a large-scale Hungarian study (Király et al. 2015). Similarly, depressed and lonely individuals tend to cope with their negative feelings and ruminative thoughts that arise from their depression and loneliness by engaging in excessive gaming which for some individuals can be problematic (Kuss and Griffiths 2012). Psychological variables such as loneliness and stress are indirectly associated with IGD via gaming motives (Kardefelt-Winther 2014), although a few studies have found depression to remain significant after controlling for online gaming motives (Laconi et al. 2017). Given that depression and loneliness are associated with gaming motives, considering them altogether is likely to provide further understanding concerning the prominent role of interrelated core components of IGD (Brand et al., 2016).

In addition, the adverse effect of poor trait EI on elevated feelings of depression and loneliness is well established (Mavroveli et al. 2007). Trait EI is thought to affect individuals' psychological well-being and mental health (Fernandez-Berrocal et al. 2006; Petrides and Furnham 2001; Salovey 2001; Zhang et al. 2015) because having higher facets of trait EI provides individuals adequate social support and resilience against bad experiences and helps them face real-life struggles (Mayer et al. 1999; Petrides and Furnham 2001; Salovey 2001). Similarly, individuals' preference for gaming may vary in parallel to their emotion-related personality characteristics (Herodotou et al. 2011). Despite the scarcity of empirical evidence, one study reported that trait EI was positively related to social and achievement preferences for play and negatively associated with achievement-oriented, instrumental practices (Herodotou et al. 2011). Nevertheless, individuals with lower trait EI may use gaming for maladaptive motivations such as escape and coping, while others may engage in gaming to obtain social skill development, and recreation gratifications.

The Moderating Role of Age Groups

Age has an important role on the development of trait EI and IGD (Festl et al. 2013; Mayer et al. 1999; Van Rooy et al. 2005). Individuals' trait EI develops with age. When compared to adolescents, adults are better at perception and management of their emotions and have lower impulsivity and sensation-seeking tendencies as well as more adaptive coping styles than maladaptive ones (Mayer et al. 1999; Van Rooy et al. 2005). Furthermore, a large-scale representative study found that adolescents scored significantly higher on problematic gaming than younger and older adults and that ratio of problematic game users among adolescents was above average compared with adults

(Festl et al. 2013). This suggests that more individuals tend to have lower trait EI and use IGD to deal with their trait EI-related problems and more particularly among adolescents compared to adults. Furthermore, adults may engage in gaming with more adaptive and beneficial motivations compared to adolescents. Therefore, there may be significant differences on the aforementioned direct and indirect relationships among adolescent gamers and adult gamers. Consequently, grounding on the previously presented rationale, the present study examined the direct and indirect role of trait EI on IGD via gaming motives, depression, and loneliness in total sample, adolescents, and adults.

Methods

Participants and Procedure

A total of 478 Turkish online gamers, aged between 14 and 38 years (M_{age} = 20.88, SD = 4.79, 96% male, 39% adolescents), participated anonymously and voluntarily in an online survey study. Participants were recruited from several online gaming social media group forums (*World of Warcraft*, *Dota*, *Dota 2*, *Hearthstone*, *Playerunknown's Battlegrounds*, *Counter Strike*, and *League of Legends*). Details for participating in the study were announced and promoted in these social media forums, and all of the participants were informed about the details of the study. All participants had to provide informed consent in order to begin answering the survey items. Participants were separated into two groups according to their age in order to examine multigroup moderation between different age groups. The ones below age of 19 years were in the adolescent gamer group (n = 185), and the remainder belonged to adult gamers group (n = 293).

Measures

Demographics and Gaming Use

Participants were asked about their gender, age, most intensely played online game genre (choosing one option from MMORPG [massively multiplayer online role-playing games], MOFPS [multiplayer online first-person shooter] games, and MMORTS [massively multiplayer online real-time strategy] games), and their weekly time of gaming in hours (less than 7 h, between 7 and 14 h, between 15 and 28 h, between 29 and 42 h, and more than 42 h).

Ten-Item Internet Gaming Disorder Test (IGDT-10)

The IGDT-10 (Király et al. 2017) comprises 10 items, which represent the nine criteria outlined in the DSM-5 (with two separate items examining a single criterion), on a 3-point Likert scale ("never," "sometimes," and "often"). These three options were offered in order to have more realistic and accurate responses from the participants. In scoring, "never" and "sometimes" options were recoded as 0 and "often" as 1. Also, since Item 9 and 10 belong to the same criterion, scoring of these items was recoded accordingly. The scores of the scale ranged between 0 and 9, and participants who scored 5 and higher were categorized as risky ("disordered") gamers. The scale was adapted to Turkish by the research team using standardized translation procedures (Beaton et al. 2000). After introducing two suggested error modifications, confirmatory factor analysis (CFA) with the Turkish form of the scale indicated a good fit to the data (χ^2/df = 1.75, RMSEA = 0.04 [CI 90% (0.02, 0.06)],

SRMR = 0.03, CFI = 0.97, GFI = 0.98). In the present sample, Cronbach's alpha for the scale was 0.77 with three response categories and 0.73 when dichotomized.

Motives for Online Gaming Questionnaire: 14 (MOGQ-14)

The MOGQ-14 was derived from the 27-item MOGQ (Demetrovics et al. 2011) and comprises 14 items on a 5-point Likert scale (from "never" to "always") with two items for each online gaming motivation: social, escape, competition, coping, skill development, fantasy, and recreation (e.g., "…because I can meet many different people," "…because it makes me forget real life," "… because I like to win," "…because it helps me get rid of stress," "…because it improves my coordination skills," "…to feel as if I was somebody else," and "…because I enjoy gaming"). The Turkish form (Kircaburun et al. 2018) of the scale reported good fit to the data (χ^2/df = 1.94, RMSEA = 0.05 (CI 90% [0.03, 0.06]), SRMR = 0.04, CFI = 0.98, GFI = 0.97). The Cronbach's alphas of the seven motives of the Turkish form were high (0.71–0.88; see Table 1).

Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF)

The TEIQue-SF (Petrides 2009) comprises 20 items on a 7-point Likert scale (from "absolutely disagree" to "absolutely agree") and comprises four factors: well-being (e.g., "I generally believe that things will work out fine in my life"), self-control (e.g., "I tend to get 'carried away' easily"), emotionality (e.g., "I often find it difficult to recognize what emotion I'm feeling"), and sociability (e.g., "I can deal effectively with people"). A global trait EI score is obtained via combination of these sub-factors (Petrides 2009). Former studies have reported optimal validity and reliability of the Turkish form (Deniz et al. 2013). The scale also showed high internal consistency in the present (0.84).

UCLA Loneliness Scale-Short Form (ULS-4)

The ULS-4 (Hays and DiMatteo 1987) comprises four items (e.g., "People are around me but not with me") on a 4-point Likert scale (from "never" to "often") that assesses individual's levels of perceived loneliness. Former studies have reported optimal validity and reliability of the Turkish form (Eskin 2001). The scale also showed adequate internal consistency in the present study (0.73).

Short Depression-Happiness Scale (SDHS)

The Turkish form of SDHS comprises three items (e.g., "I felt that life was meaningless") on a 4-point Likert scale (from "never" to "often") that assesses individual's levels of depressive feelings (Joseph et al. 2004). Former studies have reported optimal validity and reliability of the Turkish form (Kircaburun et al. 2019). The scale also showed high internal consistency in the present study (0.88).

Statistical Analysis

In order to analyze the data, the present study used frequency and descriptive statistics, Pearson correlation tests, confirmatory factor analysis (CFA), and path analyses. These were applied using SPSS 23.0 and AMOS 23.0 software. Total, direct, and indirect associations of independent and mediator variables on outcome variable were calculated using the bootstrapping

Table 1 Pearson's correlations reliability coefficients of the study variables

	1	2	3	4	5	6	7	8	9	10	11
1. Internet gaming disorder	-										
2. Trait emotional intelligence	-0.41***	-									
3. Depression	0.39***	-0.58***	-								
4. Loneliness	0.38***	-0.64***	0.61***	-							
5. Social	0.12**	0.09	0.01	-0.03	-						
6. Escape	0.44***	-0.37***	0.39***	0.39***	0.25***	-					
7. Competition	0.20***	-0.02	0.08	-0.01	0.22***	0.15**	-				
8. Coping	0.28***	-0.11*	0.15**	0.09	0.21***	0.54***	0.18***	-			
9. Skill development	0.13**	0.17***	-0.03	-0.05	0.42***	0.23***	0.31***	0.35***	-		
10. Fantasy	0.31***	-0.24***	0.24***	0.27***	0.20***	0.56***	0.14**	0.33***	0.24***	-	
11. Recreation	-0.02	0.16**	-0.08	-0.07	0.22***	0.00	0.13**	0.22***	0.25***	0.06	-
Mean	0.27	3.62	2.48	2.83	2.84	3.06	3.37	3.64	3.21	2.39	4.65
SD	0.24	0.69	1.06	0.95	1.30	1.26	1.22	1.13	1.29	1.41	0.57
Cronbach's α	0.77	0.84	0.88	0.73	0.86	0.74	0.77	0.78	0.82	0.86	0.76

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

method with 5000 bootstrap samples and 95% bias-corrected confidence intervals. Goodness-of-fit criteria determined in a previous study were used in order to designate model fit (by Hu and Bentler 1999). Accordingly, thresholds for good and acceptable fit values are as follows: Root mean square residuals (RMSEA) < 0.05 and standardized root mean square residuals (SRMR) < 0.05 are good, comparative fit index (CFI) > 0.95 and goodness of fit index (GFI) > 0.95 are good, also RMSEA < 0.08 and SRMR < 0.08 are acceptable, and CFI > 0.90 and GFI > 0.90 are acceptable. Moderation analyses were carried out via using two estimands to calculate the significance of differences among the direct and indirect relationships of the variables (Gaskin 2016).

Results

The majority of the participants were male (96%) and adult (61%), 17% of the gamers played videogames for more than 42 h a week, and 11% used gaming less than 7 h a week. Among massively multiplayer online (MMO) games, participants' most preferred online gaming types ($\chi^2(3) = 26.61$, $p < 0.001$) were role-playing (MMORPG) games (41%), first-person shooter (MOFPS) games (36%), and real-time strategy (MMORTS) games (23%). Mean scores, standard deviations, correlation coefficients, and reliability coefficients of the variables are shown in Table 1.

According to path analysis, global trait EI was directly and indirectly associated with IGD via escape motive among total sample and adults (Table 2). Trait EI was negatively associated with escape motive, loneliness, and depression. Moreover, there were differences of relationships among variables between age groups. The direct association of trait EI on IGD was slightly higher among adolescent gamers. Trait EI was negatively associated with coping and fantasy motives and positively with recreation and skill development only among total sample and adults; these pathways were not significant among adolescent gamers (Fig. 1). Age groups had a significant moderating role on the direct link from trait EI to fantasy. Tested model explained 31%, 33%, and 34% of the variance in IGD among total sample, adolescent gamers, and adult gamers, respectively.

Discussion

The present study examined the direct and indirect associations of global trait EI with IGD by developing a multiple mediation model. Results showed that trait EI had a moderate total impact on IGD and was directly and indirectly associated with IGD via online gaming motive of escape among total sample and adult gamers. Trait EI was also associated with all gaming motives except competition and social.

The present study indicates that individuals who have more negative perceptions of their emotion-related abilities and behaviors are more likely to be disordered online gamers (and gaming therefore has more negative effects on their lives). Individuals who have a higher ability to recognize, control, and regulate their feelings are more successful in their social relationships (Petrides et al. 2016), in which these individuals would feel a less need to escape from their reality than those who have lower trait EI. Therefore, high trait EI can be an important protective factor against IGD. Moreover, poor trait EI is also a risk factor for adolescents' psychological control and behavior problems including internalizing (e.g., anxious, withdrawn, somatic complaints) and externalizing (e.g., aggressive, rule-breaking)

**Table 2** Standardized estimates of total, direct and indirect effects on Internet gaming disorder

	Effect(S.E.)		
	Total sample	Adolescents	Adults
TEI ➜ IGD (total effect)	-0.41***(0.04)	-0.44***(0.07)	-0.39***(0.05)
TEI ➜ IGD (direct effect)	-0.20**(0.06)	-0.25**(0.08)	-0.18*(0.08)
TEI ➜ IGD (total indirect effect)	-0.21**(0.04)	-0.19**(0.06)	-0.22**(0.06)
TEI ➜ Escape ➜ IGD (indirect effect)	-0.07**(0.01)	-0.04(0.02)	-0.09**(0.01)

Note: IGD Internet gaming disorder *TEI* Trait emotional intelligence. Only significant indirect effects are shown in the table

*p < 0.05, **p < 0.01, ***p < 0.001

problem behaviors (Gugliandolo et al. 2015), of which these behaviors can lead to higher IGD (Kuss and Griffiths 2012).

Trait EI was also associated with all online gaming motives except social and competition gratifications. However, only the escape motive was a significant mediator between TEI and IGD. Also, when included into the equation with gaming motives, loneliness and depression did not affect IGD. Gamers who had higher TEI scores were playing online games more for skill development and recreation motives and less for escape, coping, and fantasy medium. This result is partially consistent with the study that reported positive correlation between trait EI and gaming preference of social practices (Herodotou et al. 2011). Some individuals use
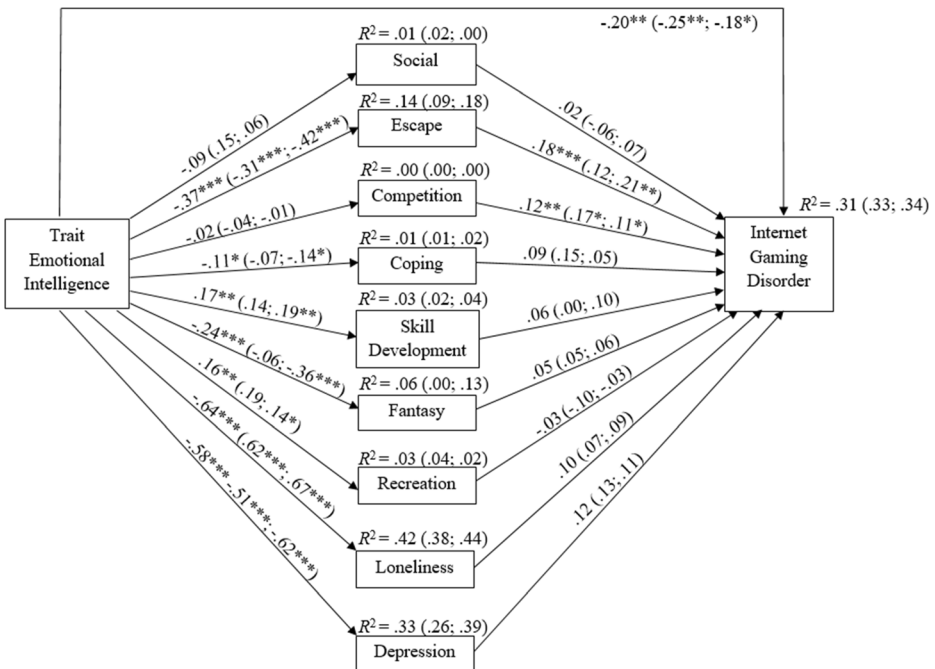
Fig. 1 Final model of the pathways. For clarity, covariances between mediator variables have not been depicted in the figure. The values outside of the brackets are standardized coefficients between variables among total sample, while the left and right side of the brackets represent standardized coefficients among adolescent and adult gamers, respectively; *p < 0.05, **p < 0.01, ***p < 0.001

games as a maladaptive mood modifying, coping, and escaping activity from real-life social and emotional struggles and negative life events (Gervasi et al. 2017), while others (e.g., who have high TEI) use gaming via adaptive motivations which can be explained by those individuals' online activity use which arises from their needs, and motivations to compensate their real-life lackness (Kardefelt-Winther 2014) and individual differences prominently affect their needs and motivations.

Finally, there were age differences in the model. The relationships of trait EI with coping, skill development, fantasy, and recreation motives were significant only among adult gamers, although age group has a significant moderating role only on the link from trait EI to fantasy. Nonetheless, these results suggest a need for further investigation of the role of age groups on the relationship between trait EI and gaming-related variables. A large-scale study with adolescents and young adults supports the notion that trait EI has different effects on individuals' psychology and behavioral patterns among adolescents and adults (Kristensen et al. 2014). It was found that different dimensions of trait EI predicted different symptoms of ADHD among adolescents and adults (Kristensen et al. 2014). It is therefore believed that the present findings have essential contributions to further exploration of the role of trait EI on gaming motives among adolescents and adults.

There are several limitations to this study that should be noted when interpreting the results. First, the study was conducted via using cross-sectional surveys; therefore future studies should investigate these variables using longitudinal studies to establish causality. Second, the study used quantitative surveys to collect data; therefore future studies may wish to use other qualitative or mixed-method approaches to gain a deeper understanding of the relationships between variables. Third, the cross-sectional self-report nature of the study means that causal relationships between variables cannot be proved and that other biases may have compromised the data (e.g., biases concerning memory recall and social desirability). Nonetheless, the present study had strengths that contribute to the small literature concerning the relationships between trait EI and problematic technology use. It was demonstrated that trait EI is associated with IGD directly and indirectly via higher online gaming motive of escape among total sample and adult gamers.

Compliance with Ethical Standards

Conflict of Interest The authors declare no conflict of interest.

Ethics The study conducted with the approval of the ethical committee and complied with the 1975 Helsinki Declaration.

References

Ballabio, M., Griffiths, M. D., Urbán, R., Quartiroli, A., Demetrovics, Z., & Király, O. (2017). Do gaming motives mediate between psychiatric symptoms and problematic gaming? An empirical survey study. *Addiction Research & Theory, 25*, 397–408.

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*, 3186–3191.

Beranuy, M., Oberst, U., Carbonell, X., & Chamarro, A. (2009). Problematic Internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computers in Human Behavior, 25*, 1182–1187.

Brand, M., Young, K. S., Laier, C., Wölfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience & Biobehavioral Reviews, 71*, 252–266.

Casey, B. J., Jones, R. M., & Hare, T. A. (2008). The adolescent brain. *Annals of the New York Academy of Sciences, 1124*, 111–126.

Che, D., Hu, J., Zhen, S., Yu, C., Li, B., Chang, X., & Zhang, W. (2017). Dimensions of emotional intelligence and online gaming addiction in adolescence: The indirect effects of two facets of perceived stress. *Frontiers in Psychology, 8*, 1206.

Demetrovics, Z., Urbán, R., Nagygyörgy, K., Farkas, J., Zilahy, D., Mervó, B., ... & Harmath, E. (2011). Why do you play? The development of the motives for online gaming questionnaire (MOGQ). *Behavior Research Methods, 43*, 814–825.

Deniz, M. E., Özer, E., & Isik, E. (2013). Trait emotional intelligence questionnaire-short form: Validity and reliability studies. *Education and Science, 38*, 407–419.

Eskin, M. (2001). Adolescent loneliness, coping methods and the relationship of loneliness to suicidal behavior. *Turkish Journal of Clinical Psychiatry, 4*, 5–11.

Fernandez-Berrocal, P., Alcaide, R., Extremera, N., & Pizarro, D. (2006). The role of emotional intelligence in anxiety and depression among adolescents. *Individual Differences Research, 4*, 16–27.

Festl, R., Scharkow, M., & Quandt, T. (2013). Problematic computer game use among adolescents, younger and older adults. *Addiction, 108*, 592–599.

Gaskin, J. (2016). *Gaskination's statistics*. Retrieved October 13, 2018, from http://statwiki.kolobkreations.com/index.php?title=Main_Page. Accessed 26 Nov 2019.

Gervasi, A. M., La Marca, L., Costanzo, A., Pace, U., Guglielmucci, F., & Schimmenti, A. (2017). Personality and Internet gaming disorder: A systematic review of recent literature. *Current Addiction Reports, 4*, 293–307.

Griffiths, M., & Wood, R. T. (2000). Risk factors in adolescence: The case of gambling, videogame playing, and the Internet. *Journal of Gambling Studies, 16*, 199–225.

Gugliandolo, M. C., Costa, S., Cuzzocrea, F., & Larcan, R. (2015). Trait emotional intelligence as mediator between psychological control and behaviour problems. *Journal of Child and Family Studies, 24*, 2290–2300.

Hays, R. D., & DiMatteo, M. R. (1987). A short-form measure of loneliness. *Journal of Personality Assessment, 51*, 69–81.

Herodotou, C., Kambouri, M., & Winters, N. (2011). The role of trait emotional intelligence in gamers' preferences for play and frequency of gaming. *Computers in Human Behavior, 27*, 1815–1819.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structural analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling, 6*, 1–55.

Joseph, S., Linley, P. A., Harwood, J., Lewis, C. A., & McCollam, P. (2004). Rapid assessment of well-being: The Short Depression-Happiness Scale (SDHS). *Psychology and Psychotherapy: Theory, Research and Practice, 77*, 463–478.

Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior, 31*, 351–354.

Király, O., Urbán, R., Griffiths, M. D., Ágoston, C., Nagygyörgy, K., Kökönyei, G., & Demetrovics, Z. (2015). The mediating effect of gaming motivation between psychiatric symptoms and problematic online gaming: An online survey. *Journal of Medical Internet Research, 17*, e88.

Király, O., Sleczka, P., Pontes, H. M., Urbán, R., Griffiths, M. D., & Demetrovics, Z. (2017). Validation of the ten-item Internet Gaming Disorder Test (IGDT-10) and evaluation of the nine DSM-5 Internet Gaming Disorder criteria. *Addictive Behaviors, 64*, 253–260.

Kircaburun, K., Jonason, P. K., & Griffiths, M. (2018). The dark tetrad traits and problematic online gaming: The mediating role of online gaming motives and moderating role of game types. *Personality and Individual Differences, 135*, 298–303.

Kircaburun, K., Griffiths, M. D., & Billieux, J. (2019). Trait emotional intelligence and problematic online behaviors among adolescents: the mediating role of mindfulness, rumination, and depression. *Personality and Individual Differences, 139*, 208–213.

Kırcaburun, K., Kokkinos, C. M., Demetrovics, Z., Király, O., Griffiths, M. D., & Çolak, T. S. (2019). Problematic online behaviors among adolescents and emerging adults: Associations between cyberbullying perpetration, problematic social media use, and psychosocial factors. *International Journal of Mental Health and Addiction, 17*, 891–908.

Kristensen, H. A., Parker, J. D., Taylor, R. N., Keefer, K. V., Kloosterman, P. H., & Summerfeldt, L. J. (2014). The relationship between trait emotional intelligence and ADHD symptoms in adolescents and young adults. *Personality and Individual Differences, 65*, 36–41.

Kun, B., & Demetrovics, Z. (2010). Emotional intelligence and addictions: A systematic review. *Substance Use & Misuse, 45*, 1131–1160.

Kuss, D. J., & Griffiths, M. D. (2012). Internet gaming addiction: A systematic review of empirical research. *International Journal of Mental Health and Addiction, 10*, 278–296.

Kuss, D. J., Louws, J., & Wiers, R. W. (2012). Online gaming addiction? Motives predict addictive play behavior in massively multiplayer online role-playing games. *Cyberpsychology, Behavior and Social Networking, 15*, 480–485.

Laconi, S., Pirès, S., & Chabrol, H. (2017). Internet gaming disorder, motives, game genres and psychopathology. *Computers in Human Behavior, 75*, 652–659.

Mavroveli, S., Petrides, K. V., Rieffe, C., & Bakker, F. (2007). Trait emotional intelligence, psychological well-being and peer-rated social competence in adolescence. *British Journal of Developmental Psychology, 25*, 263–275.

Mayer, J. D., Caruso, D. R., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence, 27*, 267–298.

Petrides, K. V. (2009). Psychometric properties of the Trait Emotional Intelligence Questionnaire (TEIQue). In: Parker J., Saklofske D., Stough C. (eds), Assessing emotional intelligence (pp. 85–101). Boston: Springer.

Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality, 15*, 425–448.

Petrides, K. V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology, 98*, 273–289.

Petrides, K. V., Mikolajczak, M., Mavroveli, S., Sanchez-Ruiz, M. J., Furnham, A., & Pérez-González, J. C. (2016). Developments in trait emotional intelligence research. *Emotion Review, 8*, 335–341.

Salovey, P. (2001). Applied emotional intelligence: Regulating emotions to become healthy, wealthy, and wise. In J. Ciarrochi, J. P. Forgas, & J. D. Mayer (Eds.), *Emotional intelligence and everyday life* (pp. 168–184). New York: Psychology Press.

Şalvarlı, Ş. I., & Griffiths, M. D. (2019). Internet gaming disorder and its associated personality traits: A systematic review using PRISMA guideline. *International Journal of Mental Health and Addiction*, 1–23. https://doi.org/10.1007/s11469-019-00081-6.

Shulman, E. P., Smith, A. R., Silva, K., Icenogle, G., Duell, N., Chein, J., & Steinberg, L. (2016). The dual systems model: Review, reappraisal, and reaffirmation. *Developmental Cognitive Neuroscience, 17*, 103–117.

Van Deursen, A. J., Bolle, C. L., Hegner, S. M., & Kommers, P. A. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in Human Behavior, 45*, 411–420.

Van Rooy, D. L., Alonso, A., & Viswesvaran, C. (2005). Group differences in emotional intelligence scores: theoretical and practical implications. *Personality and Individual Differences, 38*, 689–700.

World Health Organization (2018). Gaming disorder. Retrieved November 6, 2019, from: https://www.who.int/features/qa/gaming-disorder/en/

Zhang, W., Zou, H., Wang, M., & Finy, M. S. (2015). The role of the dark triad traits and two constructs of emotional intelligence on loneliness in adolescents. *Personality and Individual Differences, 75*, 74–79.

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