
# Intrapersonal and interpersonal emotion regulation and identity: A preliminary study of avatar identification and gaming in adolescents and young adults

T. Müller , C. Bonnaire

PII: S0165-1781(20)33288-1
DOI: https://doi.org/10.1016/j.psychres.2020.113627
Reference: PSY 113627

To appear in: *Psychiatry Research*

Received date: 22 July 2020
Accepted date: 28 November 2020

Please cite this article as: T. Müller , C. Bonnaire , Intrapersonal and interpersonal emotion regulation and identity: A preliminary study of avatar identification and gaming in adolescents and young adults, *Psychiatry Research* (2020), doi: https://doi.org/10.1016/j.psychres.2020.113627

# Intrapersonal and interpersonal emotion regulation and identity: A preliminary study of avatar identification and gaming in adolescents and young adults

**Intrapersonal and interpersonal emotion regulation and identity: A preliminary study of avatar identification and gaming in adolescents and young adults**

Müller T.[a], Bonnaire C.[b,c]

a Université de Paris, Boulogne-Billancourt, France

b Université de Paris, Laboratoire de Psychopathologie et Processus de Santé, F-92100 Boulogne-Billancourt, France

c Centre Pierre Nicole, Consultation Jeunes Consommateurs, Croix-Rouge Française, 75005 Paris, France

**Correspondence concerning this article should be addressed to:**
Céline Bonnaire
Université de Paris
Institut de Psychologie
Laboratoire de Psychopathologie et Processus de Santé
71 Avenue Édouard Vaillant
92100 Boulogne-Billancourt
France
Tel: +33 1 76 53 29 52
celine.bonnaire@u-paris.fr; celine.bonnaire@parisdescartes.fr

**Highlights**

- PGs exhibited dysfunctional inter- and intra-emotion regulation processes
- PGs presented difficulties in the identity-formation process
- Factors associated with IGD deferred by gender
- In females, inter- emotion regulation, commitment, and in-depth exploration are associated with IGD
- In males, negative emotions, suppressive expression, and ruminative exploration are associated with IGD

**Abstract**

The aim of this study was to investigate the relationships between the process of identity formation, emotion regulation (intrapersonal and interpersonal), avatar identification, and gaming in adolescents and young adults. Data (from eight standardized questionnaires) were collected from 37 non-gamers (NGs), 133 non-problematic gamers (NPGs), and 37 problematic gamers (PGs). The results showed that PGs had higher scores in lack of emotional consciousness, lack of emotional clarity, and expressive suppression, while also having lower scores in cognitive reappraisal and interpersonal emotion regulation than NPGs or NGs. They also had higher scores in ruminative exploration and lower scores in exploration in depth. In addition, factors associated with Internet gaming disorder (IGD) differed by gender. In females, lack of emotional clarity, interpersonal emotion regulation, commitment, and in-depth exploration were associated with IGD. In males, however, negative emotions, lack of emotional consciousness, lack of emotional clarity, suppressive expression, and ruminative exploration were associated with the disorder. These results highlighted the need to consider gender specificities when caring for video game-players and using of therapies or psychotherapeutic techniques to improve their emotional processes and promote their identity-construction.

**Keywords:** internet gaming disorder, avatar identification, identity, emotion regulation, interpersonal emotion regulation, gender



## 1. Introduction

Adolescence is marked by a crucial developmental task: identity construction (Erikson, 1968). Among the first theorists of identity development, Erikson (1950, 1968)

postulated that identity formation is a dynamic life-long process, which, according to Marcia's approach is based on two core identity processes - identity exploration and identity commitment – that contribute to build a coherent sense of identity (Marcia, 1980, 1988), meaning ''when the individual has subordinated his childhood identifications to a new kind of identification achieved by absorbing sociability and in competitive apprenticeship with and among his age mates'' (Erikson, 1959, p. 155).

Erikson (1968) underlined the importance of the psychosocial dimension of identity construction. Exploring the environment is accompanied by major risks, such as exposure to ridicule, self-doubt, and shame (Erikson, 1968). Especially considering that in adolescence, emotions are experienced more intensely than in other stages of life, such experiences can pose potential hazards to developing youths (Blakemore, 2008; Somerville et al., 2013). Thus, for adolescents, peers can become attachment figures and as such relationships breed significant and intense emotional experiences, they sometimes present an emotional challenge (Allen and Miga, 2010). Adolescents must then learn how to cope with such challenging situations, thereby developing new emotional regulation strategies (Allen and Manning, 2007; Ayduk and Kross, 2010; McRae et al., 2010). Some individuals, however, choose not to cope with these experiences alone, turning to others in order to understand and regulate their emotions (Zaki and Williams, 2013). When people pursue emotional goals through social processes, they engage in interpersonal emotion regulation (inter-ER) (Dixon-Gordon et al., 2015; Parkinson and Manstead, 2015; Williams et al., 2018; Zaki and Williams, 2013). Inter-ER presupposes that the individual has already acquired emotional regulation capacities within the parent-child attachment relationship and through the co-regulation experience between parent and child (Allen and Miga, 2010).

To develop emotion regulation skills and to construct an identity, adolescents require a moratory period, which is a period of intense experimentation that is not accompanied by

negative consequences (Erikson, 1972). Massively multiplayer online video games (MMOs) appear to be a suitable playground to satisfy the moratory needs of adolescents, as they allow one to experience oneself through avatar identification (AI), the process in which one perceives oneself as a character in the game. In the online game context, this experimentation with identity takes place in relation to others, making it interpersonal (Young, 2009). Moreover, unlike with other media, in video games, the border between the physical reality and the virtual becomes blurred by more personal and more immersive experiences, such as scenarios that adapt to the player's decisions and stimuli that encourage the player to ignore reality (Kuo et al., 2017; Raymon et al., 2016; Young, 2008). When a gamer is absorbed in a game, the AI intensifies, momentarily leading to the belief that the gamer is the avatar; the gamer may hence adopt some aspects of the avatar's identity (Li et al., 2013). This multiplicity appears beneficial for adolescent identity development because adolescents can explore many identities by experiencing many avatars or, for example, changing their avatar's appearance (Wolton, 2012). The avatar then constitutes a virtual version of oneself that is sometimes compensatory or even restorative (Gaetan et al., 2015; Parmentier and Rolland, 2009). A recent study found that adolescents problematic gamers (PGs) had a stronger activation of neural areas related to the concept of self when answering items about their avatar than when answering items concerning themselves (Choi et al., 2018). This provided neural evidence that PGs had a higher level of AI than non-problematic gamers (NPGs), bringing to question the relationship between identity construction, gaming and AI, as well as the difference between PGs and NPGs with regards to identity construction.

Based on the reviewed literature, it seems that only a few studies have investigated the links between gaming and identity (Badrinarayanan et al., 2015; Bessière et al., 2007; Borca et al., 2015; Guegan et al., 2015; Israelashvili et al., 2012). Moreover, none of them has investigated this relationship according to Luyckx et al.'s (2013) five-dimension model, the

most evolved contemporary model of identity construction. Instead, many empirical studies have been based on Erikson's work, investigating identity formation (Schwartz, 2001). Most of these studies have used Marcia's (1966, 1989) identity status model, which is the most important paradigm in the post-Eriksonian identity research. This model consisted of four identity statuses that were qualitatively different, beginning with the two major identity construction processes, exploration and commitment (Kroger and Marcia, 2011). Exploration refers to a period of active questioning and taking into account goals, moral values, and alternative convictions, while commitment is the choice and adoption of one or several of these alternatives (Côté, 2009). Several researchers have extended Marcia's conceptualizations and proposed new identity formation models (see Meeus, 2011, for a review), which led to the introduction of a new empirically validated identity status. These new models were important developments on Marcia's conceptualization, which allowed for a better understanding of the diversity and complexity of Erikson's work on identity (Klimstra et al., 2012); the aim of these new conceptualizations was to study and to better understand the underlying processes of identity development, not only to classify individuals. In this new line of research, two models, which were particularly complementary, seemed especially relevant and close to Erikson's conceptualization of the psychosocial development stages: the three-dimension model by Crocetti et al. (2008) and Luyckx et al.'s (2006, 2008, 2013) heuristic five-dimension model of identity.

Based on the three-dimension model of identity (commitment, exploration in depth, and reconsideration of commitment), a recent piece of research has shown that regular massively multiplayer role playing gamers (MMORPGs) ($n$ = 176, mean age of 21.86) had a higher level of commitment reconsideration and lower levels of commitment and exploration in depth than control participants ($n$ = 239, mean age of 21.20) (Bacchini et al., 2017). The results of this study also showed that being a gamer was positively associated with

commitment reconsideration and negatively associated with exploration in depth. Bacchini et al. (2017) concluded that regular MMORPGs had difficulties in the identity construction process. Nevertheless, the study did not control for Internet gaming disorder (IGD; APA, 2013) and only one type of MMOs had been studied. Recent popular video games, such as Fortnite (Deleuze et al., 2019), were not investigated. Based on the limitations of this study, it seems important to study gamers of various types of MMOs.

Few studies have evaluated emotion regulation among gamers (Marchica et al., 2019). For example, Gaetan et al. (2016) showed that regular gamers regulated their emotions more than non-regular gamers. This finding led the authors to consider the possibility that the virtual environment may promote or facilitate emotion regulation, regardless of the strategy used. Only seven studies have studied the links between IGD and emotion regulation, proving a negative link between the two (Amendola et al., 2019; Blasi et al., 2019; Estévez et al., 2017; Wichstrøm et al., 2018). While Yen et al. (2018) reported that IGD gamers had significantly higher scores of expressive suppression and lower scores of cognitive reappraisal than control subjects, a high score of emotion regulation could presumably be a protective factor against IGD (Liau et al., 2015). Furthermore, the important interactive dimensions of MMOs could allow for inter-ER strategies. Online interactions differ from real-life interactions since it is possible to disconnect from the game and therefore protect oneself from overly intense emotions (Sioni et al., 2017). Moreover, in video games, the other is not physically present, which could promote emotional avoidance (Bonnaire et al., 2019). However, no studies have investigated inter-ER among gamers and few have considered intra-ER. Furthermore, No studies have explored the links between these two emotion regulation processes and the identity construction process among gamers. Thus, the aim of this study was to investigate the links between emotion regulation (inter- and intra-ER), identity construction, avatar identification, and video game use among adolescents, comparing PGs,

NPGs, and non-gamers (NGs). Furthermore, to compare the results with other studies (Bonnaire and Baptista, 2019; Bonnaire and Phan, 2017; Choo et al., 2015; Wallenius and Punamäki, 2008), whether or not factors associated with IGD differed by gender was also investigated.

## 2. Method

### *2.1. Participants and procedure*

A sample of 201 adolescent and young-adult players and non-players of video games, aged between 12 and 25 (m = 19.02, SD = 4.20), were included in this study. Young adults (n = 140) were recruited using Facebook groups dedicated to MMOs, while the adolescent (< 18 years old) participants (n = 61) were recruited from a Parisian school. The young-adult group consisted of 53 female and 87 male participants, aged 18 to 25 (m = 21.02, SD = 1.65) and the adolescent group consisted of 21 female and 40 male participants, aged 12 to 17 (m = 14.43, SD = 2.90). Of the 356 young-adults recruited online, there were 211 dropouts and 140 participants answered the entire online questionnaire. For adolescents, a parental consent form was required for participation.

Participants were divided into three groups according to their scores on the Game Addiction Scale (GAS; Lemmens et al., 2009) and their responses to game frequency. Non-gamers (NGs; *n* = 37) were defined as those who played less than once a month, non-problematic gamers (NPGs; *n* = 133) played more than once a week and had less than four items at the GAS, and problematic gamers (PGs; *n* = 31) played more than once a week and had four items or more at the GAS.

### *2.2. Measures*

Participants' characteristics, including gender, amount of time spent on video game from Monday to Friday after school, and during the weekend (in minutes), type of preferred game played, and gaming mode (massively multiplayer online or off line) were evaluated.

The questionnaire incorporated the short version of the GAS (Lemmens et al., 2009) in French, validated by Khazaal et al. (2016). As recommended by Lemmens et al. (2009), confirmation of four items or more was considered to indicate addictive use of video games.

The Player-Avatar Identification Scale (PAIS) is a 23-item questionnaire, in which participants are asked to answer based on their experiences with video games (Li et al., 2013). The PAIS evaluates four dimensions: feelings during play, absorption during play, positive attitudes toward the game avatar, and importance of the avatar to one's self-identity.

The Dimension of Identity Development Scale (DIDS), French version (Zimmerman et al., 2015) was used to evaluate the five-dimensional identity model developed by Luyckx, et al. (2005, 2006, 2008). In addition to the classical commitment and exploration dimensions, they introduced a new dimension that permits to capture the maladaptive side of identity formation: ruminative exploration. Thus, in this ~~is a~~ 25-item questionnaire ~~by Luyckx, et al. (2008) that assesses~~ the five identity processes are: commitment making (CM), identification with commitment (IC), exploration in breadth (EB), exploration in depth (ED), and ruminative exploration (RE).

The Utrecht-Management of Identity Commitments Scale (U-MICS), French version (Zimmerman et al., 2012), ~~by Crocetti et al. (2008)~~ is a 13-item questionnaire that assesses the three-dimensional identity model elaborated by Crocetti et al. (2008), evaluating the three critical identity processes: commitment, in-depth exploration, and reconsideration of commitment. These items can be filled out to asses identity dimensions is various domains. Given the attention paid in our study to the interpersonal dimension, only the interpersonal domain items (i.e., friendships) were considered. ~~In this study, the French version of the~~

~~questionnaire (Zimmerman et al., 2012) was used, focusing only on the interpersonal domain items (i.e., friendships) were considered.~~

The Identity subscale of the Erikson Psychosocial Stage Inventory (EPSI) by Rosenthal et al. (1981). The EPSI is a widely used tool, based on the Eriksonian conceptualization of personal identity that contains subscales assessing several of Erikson's (1950, 1968) stages. As highlighted by Dimitrova et al. (2019), the use of the EPSI in addition to the identity status approach is important for a more holistic understanding of identity. The Identity subscale of the EPSI (12 items) provide a single set of scores, which reflect identity synthesis and the absence of identity confusion (Schwartz et al., 2009). ~~which examines the first six of Erikson's psychosocial stages, using 12 items for each subscale~~

The Positive and Negative Affect Schedule (PANAS) is an adjective checklist that contains two 10-item subscales designed to measure positive affect (PA) and negative affect (NA) through self-reports (Watson et al., 1988). Participants were given the French version of the PANAS (Bouffard et al., 1997) and asked to rate the degree to which certain emotions were felt, using a general time frame to assess trait affectivity.

The Difficulties in Emotion Regulation Scale (DERS) by Gratz and Roemer (2004), French version (Dan-Glauser and Scherer, 2013) was used to measure intra-ER. In order to achieve successful emotion regulation, individual need to understand, accept, and modulate emotions (Gratz and Roemer, 2004), which means that the construct of emotion regulation have several facets. The instrument developed by Gratz and Roemer (2004), simultaneously evaluate difficulties in several domains of emotion regulation. ~~The tool consists of~~ In this study, two scales was used: the lack of emotional awareness scale, which captures inattention to emotional responses, and the lack of emotional clarity scale, which reflects the extent to which individuals are unclear about which emotions they are experiencing.

The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA) was used to measure the two intra-ER strategies operationalized, according to Gross's (1998) process-oriented approach: cognitive reappraisal and expressive suppression. Originally designed for adults, this scale has recently been adapted and validated for children and adolescents (Gullone and Taffe, 2012). Cognitive reappraisal is a cognitive change strategy that involves redefining a potentially emotion-eliciting situation in such a way that its emotional impact is changed. Expressive suppression is a form of response modulation involving the inhibition of ongoing emotional expressive behavior. These two strategies are commonly used in everyday life (John and Gross, 2004).

Finally, the Interpersonal Regulation Questionnaire (IRQ), which evaluates both the tendency to pursue inter-ER and the perceived efficacy of inter-ER was used to evaluate inter-ER (Williams et al., 2018; Zaki & Williams, 2013). This scale includes four subscales of four items each: a negative-tendency (NT) subscale, negative-efficacy (NE) subscale, positive-tendency (PT) subscale and positive-efficacy (PE) subscale.

### *2.3. Statistical analysis*

All statistical analyses were carried out using SPSS software (version 20). The analyses were conducted in three stages, first comparing the three groups, then examining the predictive value of the variables for IGD, and finally, relationships between inter- and intra-ER, between avatar and identity, and between emotion regulation and identity.

First, the PG, NPG, and NG groups were compared. The continuous questionnaires were compared using a one-way analysis of variance, followed by a post hoc Bonferroni adjustment test to ascertain the direction of the differences. For the categorical data, differences in percentages were compared using the Chi square test. To test the effect sizes,

Cohen's d for the continuous variables and Phi-squared or Kramer's V for the categorical data were calculated. A p-value of less than .05 was considered statistically significant.

Second, univariate logistic regressions were conducted to examine whether the continuous variables had predictive value for IGD. After testing for the whole sample, logistic regressions were executed a second time, stratified by gender. Odds ratios (ORs) and 95% confidence intervals (CIs) were generated using the logistic regressions.

Finally, linear regressions were conducted to examine the relationships between inter- and intra-ER, and between avatar identification and identity.

## 3. Results

### *3.1. Sociodemographic and gaming data*

According to the results of the GAS, 15.4% ($n$ = 31) of the whole sample were classified as PGs (see Table 1). A large proportion of this group were males (83.87%) compared to a relatively small proportion of females (16.13%). The representation of males was significantly higher than that of females ($\varphi c$ = .50, $p$ < .001).

Compared to NPGs, PGs spent significantly more time playing video games during the week, $F$(1, 162) = 7.14, $p$ = .008, and the weekend, $F$(1, 162) = 14.49, $p$ < .001. The most played video games across groups were Fortnite (15.8%) (see Table 2). PGs also had significantly higher scores on feelings during play ($F$(1, 162) = 6.02, $p$ = .015), absorption during play ($F$ (1, 162) = 16.67, $p$ < .001), and positive attitudes toward the game avatar ($F$(1, 162) = 13.23, $p$ < .001) compared to NPGs. In PGs, positive attitudes toward the game avatar were positively associated with the EPSI's identity subscale ($\beta$ = 0.64 [0.92–2.44], $p$ < .001) and almost all of the identity processes of the DIDS. Specifically, CM ($\beta$ = 0.42 [0.12–1.97], $p$ = .019), IC ($\beta$ = 0.53 [0.35–1.42], $p$ = .02), EB ($\beta$ = 0.40 [0.09–1.19], $p$ = .024), and ED ($\beta$ =

0.52 [0.21–0.91], $p$ = .003) were positively associated with positive attitudes toward the game avatar.

Conversely, in NPGs, the U-MICS scale results showed absorption during play and commitment ($\beta$ = 0.53 [0.35–1.42], $p$ = .02), as well as importance of the avatar to one's self-identity and in-depth exploration ($\beta$ = 0.22 [0.01–0.12], p = .012) being positively associated. Absorption during play and in-depth exploration ($\beta$ = 0.20 [0.01–0.08], $p$ = .024) and importance of the avatar to one's self-identity and ruminative exploration ($\beta$ = 0.19 [0.00–0.08], $p$ = .027) were also found to be positively associated.

### *3.2. Emotion and emotion regulation*

The results of the PANAS showed that NPGs had significantly higher PA scores, $F$(2, 198) = 3.72, $p$ = .026, than NGs ($d$ = 0.45, $p$ = .029) and PGs had higher NA scores, $F$(2, 198) = 3.75, $p$ = .025, than NPGs ($d$ = 0.54, $p$ = .040) (see Table 3). Furthermore, PGs had significantly higher scores on the lack of emotional awareness scale, $F$(2, 198) = 5.39, $p$ = .005, than NGs ($d$ = 0.64, $p$ = .004) and NPGs ($d$ = 0.45, $p$ = .038). PGs also had significantly higher scores on the lack of emotional clarity scale, $F$(2, 198) = 5.07, $p$ = .007, than NGs ($d$ = 0.67, $p$ = .020) and NPGs ($d$ = 0.57, $p$ =.008).

For intra-ER, PGs had a significantly lower score on cognitive reappraisal, $F$(2, 198) = 3.01, $p$ = .052, than NGs ($d$ = 0.54, $p$ = .047) and a significantly higher score on expressive suppression, $F$(2, 198) = 4.54, $p$ = .012, than NGs ($d$ = 0.72, $p$ =.009).

For inter-ER, PGs had a lower total inter-ER score, $F$(2, 198) = 8.66, $p$ <0.001, than NGs ($d$ = 0.97, $p$ < .001) and NPGs ($d$ = 0.41, $p$ = .05). Furthermore, NPGs had a lower total inter-ER score than NGs ($d$ = 0.62, $p$ = .014). For the NT subscale of the IRQ, $F$(2, 198) = 8.77, $p$ < .001, PGs had lower scores than NPGs ($d$ = 0.45, $p$ = .001) and NGs ($d$ = 1.02, $p$ = .05), and NPGs had lower scores than NGs ($d$ = 0.58, $p$ = .012). For the NE subscale, $F$(2, 198) = 5.70, $p$ = .004, PGs had lower scores than NGs ($d$ = 0.70, $p$ = .004) and NPGs ($d$ =

0.24, $p$ = .026). For the PT subscale, $F$(2, 198) = 4.37, $p$ = .014, PGs had lower scores than NGs ($d$ = 0.75, $p$ = .012). Finally, for the PE subscale, $F$(2, 198) = 3.09, $p$ = .048, PGs had lower scores than NGs ($d$ = 0.56, $p$ = .047). All dimensions of the intra-ER were associated with all dimensions of the inter-ER in the whole sample (See Table 6).

### *3.3. Identity*

With regards to the DIDS, only ruminative exploration distinguished PGs and NPGs ($F$(2,198) = 3.79, $p$ = .024). Table 4 details the results for the DIDS, U-MICS, and EPSI measures of identity. In the U-MICS questionnaire, NGs obtained higher scores than PGs on the in-depth exploration scale, $F$(2,198) = 3.79, $p$ = .027. Finally, the identity subscale of the EPSI, $F$(2,198) = 5.62, $p$ = .004, revealed that PGs had significantly lower scores than NGs ($d$ = 0.76, $p$ = .015) and NPGs ($d$ = 0.61, $p$ = .004).

### *3.4. Factors associated to problematic gaming*

Table 5 shows the univariate logistic regressions assessing the contributions of emotions, intra-ER, inter-ER, identity, and AI, to IGD.

In the whole sample, the emotional factors associated with PG were NA ($p$ = .032) from the PANAS; cognitive reappraisal (tendency) and expressive suppression ($p$ = .030) from the ERQ-CA; lack of emotional awareness ($p$ = .006) and lack of emotional clarity ($p$ = .003) from the DERS. In terms of the IRQ, PG was associated with overall inter-ER ($p$ = .005), and more specifically with NT ($p$ = .005), NE ($p$ = .045), PT ($p$ = .048), and PE ($p$ = .030). The identity measures showed that the identity stage measured by the EPSI ($p$ = .002), the RE process from the DIDS (tendency), and the in-depth exploration process of the U-MICS ($p$ = .036) were also associated with PG. Finally, with regard to AI, feelings during play ($p$ = .002), absorption during play ($p$ <0.001), positive attitudes toward the game avatar ($p$ <0.001), and importance of the avatar to one's self-identity ($p$ = .044) were significantly associated with PGs.

More specifically, in females, emotional factors associated with PGs were lack of emotional clarity ($p$ = .044), overall inter-ER ($p$ = .004), NT ($p$ = .017), NE ($p$ = .017), PT ($p$ = .006), and PE ($p$ = .007). The identity stage of the EPSI ($p$ = .011), commitment ($p$ = .033), and in-depth exploration ($p$ = .027) were the identity factors associated with PGs, and absorption during play ($p$ = .020), measured by the PAIS was the AI factor associated with PGs.

In males, emotional factors associated with problematic gaming were NA ($p$ = .023), expressive suppression ($p$ = .023), lack of emotional awareness ($p$ = .012), and lack of emotional clarity ($p$ = .008). Identity ($p$ = .008) and RE (tendency) were also associated with PGs in males, and feelings during play ($p$ = .022), absorption during play ($p$ = .002), and positive attitudes toward the game avatar ($p$ <0.001) were significantly associated with PGs.

## 4. Discussion

The aim of this study was to investigate the links between emotion regulation (inter- and intra-ER), identity construction processes, AI and video game use among adolescents and young adults.

### *4.1. Emotion and gaming*

The results showed that gamers (both PGs and NPGs) had higher levels of positive emotions than non-gamers. Video games thus appear to be an effective means of generating positive emotions. Several studies have shown a relationship between playing one's favorite video game and mood improvement or an increase in positive emotions (Russoniello et al., 2009, Ryan et al., 2006). In contrast, however, PGs had significantly higher scores of negative emotions than NPGs. These results contradicted the results of Gaetan et al.'s (2016) study in which regular and non-regular gamers did not differentiate themselves in terms of positive or negative emotions. These discrepancies may be linked to the tools used in the study. Gaetan et al. used the Affective Intensity Measure (Larsen and Diener, 1987), not the PANAS. This

result could also underline the importance of including a control group of non-gamers in the analyses and evaluating IGD, which is positively associated with negative emotions in males in our study.

In contrast, compared to NGs and NPGs, PGs had a significantly higher lack of emotional awareness and clarity, highlighting the emotion-processing difficulties in PGs. In accordance with other recent studies on MMORPGs (Blasi et al., 2019), these two dimensions were associated with IGD, but in our study, only male participants showed this association. In females, only the lack of emotional clarity was associated with IGD. These results were similar to Amedola et al.'s (2019) results, although they did not control for gender in their regression analyses.

### *4.2. Emotion regulation and gaming*

As in previous studies (Yen et al., 2018), our study demonstrated that subjects with IGD had lower cognitive reappraisal and higher expressive suppression, and that cognitive reappraisal is negatively associated with IGD, while expressive suppression is positively associated with IGD. Nevertheless, gender differences revealed that only expressive suppression is positively associated with IGD in males. This result could explain PGs' higher scores on negative affect. Indeed, expressive suppression would reduce the behavioral expression of negative emotions without altering the emotions themselves (John and Gross, 2004). This poor functioning strategy could lead the individual to repeat the gaming behavior and could perhaps contribute to maintain the behavior. Indeed, video game environments are particularly helpful in dealing with negative affect (Blasi et al., 2019; Hemenover and Bowman, 2018; Villani et al., 2018). As Gaetan et al. (2016) suggested, adolescents who are unable to recognize their own emotions (labelled as alexithymia in the study and lack of emotion awareness and clarity in ours) may use the virtual environment of video games as an opportunity to experiment with and regulate their emotions.

Even if adolescents still sometimes rely on their parents for help in regulating emotions, they must develop alternative methods, ranging from relying on peers to using internal cognitive strategies. Our results confirmed the interdependence between inter- and intra-ER. However, as Zaki and Williams (2013) asserted, people may have individual preferences for inter- and intra-ER for regulating their emotions. In our study, both PGs and NPGs used significantly less inter-ER processes overall than NGs. PGs had a lower tendency to engage in both positive and negative inter-ER strategies. Compared to NGs and NPGs, they also had a lower tendency to relieve their negative emotions by seeking out the company of others and disclosing their emotional experiences, finding such strategies less efficient. Compared to NGs, they also had a lower tendency to increase positive emotions by seeking out the company of others, finding this strategy less efficient as well. This result probably reflects the difficulty PGs face in interpersonal relationships and their preference for computer-mediated relationships (Lo et al., 2005). This result could explain the PGs' higher scores on negative affect, as authors (Coan et al., 2006) demonstrated that having greater access to social resources often helps individuals to perceive stressful events as less threatening and thus relieves their negative emotional reactions.

In contrast, all inter-ER dimensions were negatively associated with IGD. This result confirms the idea that emotional proximity with peers has a protective function against IGD (Liu et al., 2017). However, this result is true only for females, who overall seemed to consider inter-ER and its efficiency to be important. As such, it seems that individuals can attribute varying degrees of value to both inter- and intra-ER (Zaki and Williams, 2013), but gender can further influence this variance. For example, in females, no intra-ER strategies were associated with IGD, while all inter-ER dimensions were linked to IGD, thus demonstrating the greater tendency for females to use inter-ER strategies. Thus, and in line

with Nolen-Hoeksema (2012), greater tendency for one gender to use a certain strategy of ER could have consequences for gender differences in psychopathology.

### *4.3. Identity and gaming*

The tools used in this study yielded varying results on identity construction. Firstly, PGs presented difficulties in the construction of their identity overall, as was demonstrated by their significantly lower scores on the EPSI subscale compared to NPGs and NGs and the relationship between IGD and this subscale in both males and females. Additionally, in line with Erikson's (1972) claims, adolescents who do not succeed in forming a strong identity are at risk of never achieving genuine intimacy or stable long-term relationships, making adulthood a considerable challenge. It is then interesting to look at the different identity construction processes.

Regarding Luyckx et al.'s (2008) model, only the maladaptive identity construction process, ruminative exploration, appeared more prevalent among PGs than in NPGs. Moreover, this identity formation process was positively associated with IGD, but only in males. Furthermore, constantly dwelling on one's identity choices without being able to settle on an identity appeared to be a predictive factor of IGD (Luyckx et al., 2013). This last dimension constitutes a threat to identity development because it leads to the individual being trapped in endless explorations without being able to firmly commit (Klimstra et al., 2012). It is possible that PGs are unable to make choices and thus remain trapped in the multiplicity identities offered by video games and avatars.

Regarding Crocetti et al.'s (2008) model, exploration in depth, which represents the extent to which individuals actively deal with actual commitments, reflect on their choices, look for new information, and talk with others about these commitments (Meeus et al., 2002), was significantly lower in PGs than in NGs. In addition, this process was negatively associated with IGD. This result is consistent with Bacchini et al.'s (2017) findings, led

among regular players. PGs can also present difficulties, manifested, for example, in immaturity regarding the identity formation process. Nevertheless, this process, which corresponds to inter-ER, was only associated with IGD in females, again supporting the idea that inter-ER is meaningful only for females.

### *4.4. Avatar identification, identity, and gaming*

Regarding the importance of avatars for identity, all the scores of the AI dimensions were significantly higher among PGs. Furthermore, and in line with others studies on MMORPGs and multiplayer online battle arena gamers, all of the AI dimensions are positively associated with IGD (Mancini et al., 2019; T'ng and Pau, 2020). Regarding identity construction processes in PGs, only positive attitudes towards the avatar were positively associated with the various identity constructions evaluated by the DIDS (i.e., commitment, identification with commitments, exploration in breadth and in depth). In NPGs, however, absorption during play and the importance of the avatar to one's self-identity were positively associated with the process of in-depth exploration in the U-MICS. Absorption during play was positively associated with commitment and avatar importance was positively associated with reconsideration of commitment in the U-MICS as well. Thus, in line with Borca et al.'s (2015) claims, experiences in online environments could promote the process of identity exploration and, eventually, identity construction. However, AI and the investment into the avatar and the game vary from player to player. Therefore, that which can aid maturation in some can hinder it in others.

This study was the first to investigate the links between IGD, identity formation processes, and emotion regulation, thus representing a novelty in this research field. Furthermore, it is also the first study to investigate inter-ER in video gamers and explore it not only across, but also between genders. This research also considered all MMOs, not only MMORPGs. The inclusion of a control group and the comparison of PGs, NPGs, and NGs

was also an important feature, as it allowed for intricate investigations of what was specific to gamers with disorders, gamers without disorders, and non-gamers.

In spite of the novel contributions, there were several limitations to this study. Firstly, gender comparisons between the gamer types were not conducted due to imbalance of female participants across groups. Additionally, in spite of the study being about development, it was cross-sectional nature, thus making it impossible to determine the direction of the associations between the data. Moreover, the long questionnaire may have induced fatigue among the participants. Furthermore, the self-reported evaluation did not allow for controlling of social desirability, which is inextricably related to adolescent identity formation. Therefore, the results must be considered with care. This research should be viewed as a preliminary study and the results require confirmation through replication using larger samples. Finally, only a single measure was used for emotion regulation. The auto-evaluation tools of emotion regulation usually measure one or two emotion regulation strategies. However, the Emotion Regulation Interview (Werner et al., 2001) assesses five emotion regulation strategies as described in Gross' model through a semi-directive interview. The format of the interview allows for clarification of the concepts and offers examples of each emotion regulation strategy category in order to help the participants to identify which ones they really use (Petit et al., 2015).

The results of the present study suggested that PGs had difficulties related to various emotional processes and the identity construction process. PGs obtained higher scores in lack of emotional consciousness, lack of emotional clarity, and expressive suppression, and obtained lower scores in cognitive reappraisal and inter-ER. In contrast, they had higher scores in ruminative exploration and lower scores in exploration in depth. Based on comparisons of results by gender, however, it seemed that factors associated with IGD differed by gender. In females, lack of emotional clarity, inter-ER, commitment, and

exploration in depth were associated with IGD, whereas in males, negative emotions, lack of emotional consciousness, lack of emotional clarity, expressive suppression, and ruminative exploration are associated with IGD.

Given our results (difficulties in intra-ER strategies, lower tendency to engage in both positive and negative inter-ER strategies, and difficulties in identity development), and the relationship between Neuroticism and negative affect (Terracciano et al., 2003), depression and positive affect (Clarck and Watson, 1991), we could suggest that PGs have higher Neuroticism and depression scores, and interpersonal difficulties (i.e. socially avoidance as measured by the Inventory of Interpersonal Problems, Barkham et al., 1996). On the contrary, NGs who use both intra and inter ER strategies, have no identity confusion and higher exploration in depth score could be more prone to Openness to Experience and Agreeableness (as measured with the NEO-PI-R by Costa and McCrae, 1992). Finally, NPGs, who had higher positive affect, no difficulties in the construction of their identity and higher tendency to relieve their negative emotions by seeking out the company of others and disclosing their emotional experiences, finding this strategy efficient, and given the relationship between Extraversion and positive affect (Lucas and Fujita, 2000; Terracciano et al., 2003), should score higher in this personality dimension. Further studies are necessary to confirm these hypotheses.

The results provided interesting perspectives regarding psychotherapy. Indeed, it seems relevant to focus therapeutic work on identity construction and emotional processes, two highly interdependent dimensions. In this study, and in countless past studies (Gentile et al., 2011; Mihara and Higuchi, 2017; Müller et al., 2015; Rehbein et al., 2010), IGD seems to concern mostly young males. Therefore, it seems important to focus on the identified factors when considering treatment interventions. Children learn how to cope with negative emotions when facing situations of distress and danger through their experiences with attachment

figures (Estévez et al., 2017). Emotion regulation is affected by specific parenting practices and behaviors related to the socialization of emotion (Morris et al., 2007). Thus, children learn about emotion regulation in order to reach goals mostly within the parent-child relationship (Thompson, 1994). As a result, family therapy seems particularly relevant for male PGs. In particular, multidimensional family therapy, which is centered on adolescent development and construction, seems pertinent (Bonnaire, et al., 2019).

The established links between emotional processes and IGD scores raise the critical question if whether the participants answered the study according to their video game experiences or their real-life experiences. Future research should take care to study distinctively emotional process mobilized in real life and those mobilized in video games.

**Authors' contributions**

Tiphaine Müller and Céline Bonnaire contributed to the study conception and design. Material preparation, and data collection were performed by Tiphaine Müller. Analysis were performed by Céline Bonnaire and Tiphaine Müller. The first draft of the manuscript was written by Tiphaine Müller and Céline Bonnaire commented on previous version of the manuscript. All authors read and approved the final manuscript.

**Conflict of interest:** The author has no conflicts of interest to disclose.

## References

Amendola, S, Spensieri, V, Guidetti, V., 2019. The relationship between difficulties in emotion regulation and dysfunctional technology use among adolescents. J. Psychopathol. 25, 10-17.

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, (fifth ed.). American Psychiatric Association, Washington, DC. https://doi.org/10.1176/appi.books.9780890425596.744053.

Allen, J.P., Manning, N., 2007. From safety to affect regulation: attachment from the vantage point of adolescence. New Dir. Child. Adolesc. Dev., 117, 23-39. https://doi.org/10.1002/cd.192.

Allen, J.P., & Miga, E. (2010). Attachment in adolescence: a move to the level of emotion regulation. Journal of Social and Personal Relationship, 27, 181-90. https://doi.org/10.1177/0265407509360898

Bacchini, D., De Angelis, G., Fanara, A., 2017. Identity formation in adolescent and emerging adult regular players of massively multiplayer online role-playing games. Comput. Human Behav. 73, 191-199. https://doi.org/10.1016/j.chb.2017.03.045

Badrinarayanan, V.A., Sierra, J.J., Martin, K.M., 2015. A dual identification framework of online multiplayer video games: The case of massively multiplayer online role playing games (MMORPGs). J. Bus. Res. 68, 1045-1052. https://doi.org/10.1016/j.jbusres.2014.10.006

Barkham, M., Hardy, G., & Startup, M., 1996. The IIP-32: A short version of the inventory of interpersonal problems. Br. J. Clin. Psychol. 32, 21-35. https://doi.org/10.1111/j.2044-8260.1996.tb01159.x

Bessière, K., Seay, A F., Kiesler, S., 2007. The ideal elf: Identity exploration in World of Warcraft. Cyberpsychol. Behav. 10, 530-535. https://doi.org/10.1089/cpb.2007.9994

Blakemore, S.J., 2008. The social brain in adolescence. Nat. Rev. Neurosci. 9, 267-275.

Blasi, M.D., Giardina, A., Giordano, C., Coco, G.L., Tosto, C., Billieux, J., Schimmenti, A., 2019. Problematic video game use as an emotional coping strategy: evidence from a sample of MMORPG gamers. J. Behav. Addict. 8, 25-34. https://doi.org/10.1556/2006.8.2019.02

Bonnaire, C., Baptista, D., 2019. Internet gaming disorder in male and female young adults: the role of alexithymia, depression, anxiety and gaming type. Psychiatry Res. 272, 521-530. http://dx.doi.org/10.1016/j.psychres.2018.12.158

Bonnaire, C., Liddle, H., Har, A., Nielsen P., Phan, O., 2019. Why and how to include parents in the treatment of adolescents presenting Internet gaming disorder? J. Behav. Addict. 8(2), 201-2012. http://dx.doi.org/10.1556/2006.8.2019.27

Bonnaire, C., Phan, O., 2017. Relationships between parental attitudes, family functioning and Internet gaming disorder in adolescents attending school. Psychiatry Res. 255, 104-110. https://doi.org/10.1016/j.psychres.2017.05.030

Borca, G., Bina, M., Keller, P.S., Gilbert, L.R., Begotti, T., 2015. Internet use and developmental tasks: Adolescents' point of view. Comput. Human Behav. 52, 49-58. https://doi.org/10.1016/j.chb.2015.05.029

Bouffard, L., Bastien, E., Lapierre, S., 1997. Validation du PANAS (Positive affect and negative affect scales). Université de Sherbrooke: QC.

Choi, E.J., Taylor, M.J., Hong, S.B., Kim, C., Kim, J.W., McIntyre, R.S., 2018. Gaming-addicted teens identify more with their cyber-self than their own self: Neural evidence. Psychiatry Res. Neuroimaging 279, 51-59. https://doi.org/10.1016/j.pscychresns.2018.05.012

Choo, H., Sim, T., Liau, A. K. F., Gentile, D. A., Khoo, A. 2015. Parental influences on pathological symptoms of video-gaming among children and adolescents: A prospective study. J Child Fam Stud. 24(5), 1429-1441. https://doi.org/10.1007/s10826-014-9949-9

Clark, L.A., Watson, D., 1991. Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. J. Abnorm. Psychol. 100(3), 316-336.

Coan, J. A., Schaefer, H. S., Davidson, R. J., 2006. Lending a hand: Social regulation of the neural response to threat. Psychol. Sci. 17, 1032–1039. http://dx.doi.org/10.1111/j.1467-9280.2006.01832.x

Côté, J.E., 2009. Identity formation and self-development in adolescence, in: Lerner R.M., Steinberg L. (Eds.), Handbook of adolescent psychology. John Wiley & Sons, New York, pp. 266-304.

Costa, P.T., Jr; McCrae, R.R., 1992. Professional manual of the Revised NEO Personality Inventory (NEO-PIR) and NEO Five-Factor Inventory (NEO-FFI). Odessa, FL: Psychological Assessment Resources, Inc.

Crocetti, E., Rubini, M., Luyckx, K., Meeus, W., 2008. Identity Formation in Early and Middle Adolescents From Various Ethnic Groups: From Three Dimensions to Five Statuses. J. Youth Adol., 37, 983-96. https://doi.org/10.1007/s10964-007-9222-2

Dan-Glauser, E.S., Scherer, K.R., 2013. The difficulties in emotion regulation scale (DERS): factor structure and consistency of a French translation. Swiss J. Psychol. 72(1), 5-11. https://doi.org/10.1024/1421-0185/a000093

Deleuze, J., Maurage, P., Schimmenti, A., Nuyens, F., Melzer, A., Billieux, J., 2019. Escaping reality through videogames is linked to an implicit preference for virtual over real-life stimuli. J. Affect. Disord. 245, 1024-31. https://doi.org/10.1016/j.jad.2018.11.078

Dimitrova, R., Hatano, K., Sugimura, K., & Ferrer-Wreder, L., 2019. The Erikson Psychosocial Stage Inventory in adolescent samples: Factorial validity and equivalence of identity as measured from the United States and Japan. Eur. J. Psychological Assess. 35(5), 680-684. https://doi.org/10.1027/1015-5759/a000456

Dixon-Gordon, K. L., Bernecker, S. L., Christensen, K., 2015. Recent innovations in the field of interpersonal emotion regulation. Curr. Opin. Psychol. 3, 36-42. http://dx.doi.org/10.1016/j.copsyc .2015.02.001

Erikson, E.H., 1950. Childhood and society. Norton, New York.

Erikson, E. H., 1959. Identity and the life cycle. International Universities Press, New York.

Erikson, E.H., 1968. Identity, youth and crisis. Norton, New York.

Estévez, A., Jáuregui, P., Sánchez-Marcos, I., López-González, H., Griffiths, M., 2017. Attachment and emotion regulation in substance addictions and behavioral addictions. J. Behav. Addict. 6(4), 534-544. https://doi.org/10.1556/2006.6.2017.086

Gaetan, S., Bréjard, V., Bonnet, A., 2016. Video games in adolescence and emotional functioning: emotion regulation, emotion intensity, emotion expression, and alexithymia. Comput. Human Behav. 61, 344-349. https://doi.org/10.1016/j.chb.2016.03.027

Gaetan, S., Therme, P., Bonnet, A., 2015. The addictive use of video games is it an adaptive solution to the self-perception and depressive symptomatology in young adolescents (11–14 years)? Neuropsychiatr. Enfance Adolesc. 63(4), 250-257. https://doi.org/10.1016/j.neurenf.2014.09.001

Gentile, D.A., Choo, H., Liau, A., Sim, T., Li, D., Fung, D., Khoo, A., 2011. Pathological video game use among youths: a 2-year longitudinal study. Pediatrics 127, 318-330. https://doi.org/10.1542/peds.2010-1353

Gratz, K.L., Roemer, L., 2004. Multidimensional assessment of emotion regulation and dysregulation: development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. J. Psychopathol. Behav. Assess. 26(1), 41-54. https://doi.org/10.1007/s10862-008-9102-4

Gross, J.J., 1998. The emerging field of emotion regulation: An integrative review. Rev. Gen. Psychol. 2, 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Guegan, J., Moliner, P., Buisine, S., 2015. Why are online games so self-involving: A social identity analysis of massively multiplayer online role-playing games. Eur. J. Soc. Psychol. 45, 349-355. https://doi.org/10.1002/ejsp.2103

Gullone, E., Taffe, J., 2012. Emotion regulation questionnaire for children and adolescents (ERQ-CA): a psychometric evaluation. Psychol. Assess. 24(2), 409-417. https://doi.org/10.1037/a0025777

Hemenover, S.H., Bowman, N.D., 2018. Video games, emotion, and emotion regulation: Expanding the scope. Annals Int. Communication Association 42(2), 125-143. http://dx.doi.org/10.1080/23808985.2018.1442239

Israelashvili, M.K., Kim, T., Bukobza, G., 2012. Adolescents' over-use of the cyber world-Internet addiction or identity exploration? J. Adolesc. 35, 417-424. https://doi.org/10.1016/j.adolescence.2011.07.015

John, O.P., Gross, J.J., 2004. Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. J. Pers. 72, 1301–1334. https://doi.org/10.1111/j.1467-6494.2004.00298.x

John, O.P., Gross, J.J., 2007. Individual differences in emotion regulation, in: Gross, J.J. (Ed.), The Handbook of Emotion Regulation. Guilford Press, New York, pp. 351-372.

Khazaal, Y., Chatton, A., Rothen, S., Achab S., Thorens, S., Zullino, D., Gmel G., 2016. Psychometric properties of the 7-item game addiction scale among French and German speaking adults. BMC Psychiatry 16(1), 132. https://doi.org/10.1186/s12888-016-0836-3

Klimstra, T.A., Luyckx, K., Meeus, W.H.J., 2012. Personal identity in Belgium and The Netherlands. New Directions Child Adolesc. Dev. 138, 19-34. https://doi.org/10.1002/cad.20020

Kroger, J., Marcia, J.E., 2011. The identity statuses: Origins, meanings, and interpretations, in: Schwartz, S.J., Luyckx, K., Vignoles, V.L. (Eds.), Handbook of identity theory and research. Springer, New York, pp. 31–54.

Kuo, A., Hiler, J.L., Lutz, R.J., 2017. From Super Mario to skyrim: a framework for the evolution of video game consumption. J. Consum. Behav. 16, 101-20. https://doi.org/10.1002/cb.1620

Larsen, J., Diener, E., 1987. Affect intensity an individual differences characteristic: a review. J. Res. Pers. 21, 1e39. https://doi.org/10.1111/j.1467-6494.1996.tb00819.x

Lemmens, J.S., Valkenburg, P.M., Peter, J., 2009. Development and validation of a game addiction scale for adolescents. Media Psychol. 12, 77-95. https://doi.org/10.1080/15213260802669458

Li, D.D., Liau, A.K., Khoo, A., 2013. Player-avatar identification in video gaming: concept and measurement. Comput. Human Behav. 29, 257-63. https://doi.org/10.1016/j.chb.2012.09.002

Liau, A.K., Choo, H., Li, D.,. Gentile, D.A., Sim, T. Khoo, A., 2015. Pathological video-gaming among youth: a prospective study examining dynamic protective factors. Addict. Res. Theory 23, 301-308. https://doi.org/10.3109/16066359.2014.987759

Liu, S., Yu, C., Conner, B. T., Wang, S., Lai, W., Zhang, W., 2017. Autistic traits and internet gaming addiction in Chinese children: The mediating effect of emotion regulation and school connectedness. Res. Dev. Disabil. 68, 122-130. https://doi.org/10.1016/j.ridd.2017.07.011

Lo, S.K., Wang, C.C., Fang, W., 2005. Physical interpersonal relationships and social anxiety among online game players. Cyberpsychol. Behav. 8(1), 15-20. https://doi.org/10.1089/cpb.2005.8.15

Lucas, R. E., Fujita, F., 2000. Factors influencing the relation between extraversion and pleasant affect. J. Pers. Soc. Psychol. 79(6), 1039-1056. https://doi.org/10.1037/0022-3514.79.6.1039

Luyckx, K., Goossens, L., Soenens, B., 2006. A developmental contextual perspective on identity construction in emerging adulthood: Change dynamics in commitment formation and commitment evaluation. Dev. Psychol. 42(2), 366-380. https://doi.org/10.1037/0012-1649.42.2.366

Luyckx, K., Goossens, L., Soenens, B., Beyers, W., Vansteenkiste, M., 2005. Identity statuses based upon four rather than two identity dimensions: Extending and refining Marcia's paradigm. J. Youth Adol. 34, 605-618. https://doi.org/10.1007/s10964-005-8949-x.

Luyckx, K., Klimstra, A., Duriez, B., Van Petegem, S., Beyers, W., 2013. Personal identity processes from adolescence through the late 20's: age trends, functionality, and depressive symptoms. Soc. Dev. 22(4), 701-721. https://doi.org/10.1111/sode.12027

Luyckx, K., Schwartz, S.J., Berzonsky, M. D., Soenens, B., Vansteenkiste, M., Smits, I., et al., 2008. Capturing ruminative exploration: Extending the four-dimensional model of identity formation in late adolescence. J. Res. Pers. 42, 58-82. https://doi.org/10.1016/j.jrp.2007.04.004

Mancini, T., Imperato, C., Sibilla, F., 2019. Does avatar's character and emotional bond expose to gaming addiction? Two studies on virtual self-discrepancy, avatar identification and

gaming addiction in massively multiplayer online role-playing game players. Comput. Human Behav. 92, 297-305. https://doi.org/10.1016/j.chb.2018.11.007

Marchica, L.A., Mills, D.J., Derevensky, J.L., Montreuil, T.C., 2019. The role of emotion regulation in video gaming and gambling disorder: A systematic review. Can. J. Addict. 10(4), 19-29. https://doi.org/10.1097/CXA.0000000000000070

Marcia, J. E., 1966. Development and validation of ego-identity status. J. Pers. Soc. Psychol. 3(5), 551-558. https://doi.org/10.1037/h0023281

Marcia, J. E., 1980. Identity in adolescence, in: Adelson J. (Ed.), Handbook of adolescent psychology. Wiley, New York, NY, pp. 159-187.

Marcia, J. E., 1988. Common processes underlying ego identity, cognitive/moral development, and individuation, in: Lapsley D. K., & Power, F. C. (Eds.), Self, ego, and identity: Integrative approaches. Springer-Verlag, New York, NY, pp. 211-266.

Marcia, J.E., 1989. Identity and intervention. J. Adolesc. 12(4), 401-410. https://doi.org/10.1016/0140-1971(89)90063-8

McRae, K., Hughes, B., Chopra, S., Gabrieli, J.D.E., Gross, J.J., Ochsner, K.N., 2010. The neural bases of distraction and reappraisal. J. Cogn. Neurosci. 22, 248-262. https://doi.org/10.1162/jocn.2009.21243

Meeus, W., 2011. The study of adolescent identity formation 2000–2010: A review of longitudinal research. J. Res. Adolesc. 21, 75-94. https://doi.org/10.1111/j.1532-7795.2010.00716.x

Meeus, W., Iedema, J., Maassen, G.H., 2002. Commitment and exploration as mechanisms of identity formation. Psychol. Rep. 90, 771e785. http://dx.doi.org/10.2466/pr0.2002.90.3.771.

Mihara, S., Higuchi, S., 2017. Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: A systematic review of the literature. Psychiat. Clin. Neuros. 71(7), 425-444. https://doi.org/10.1111/pcn.12532

Müller, K.W., Janikian, M., Dreier, M., Wölfling, K, Beutel, M.E., Tzavara, C., Richardson C, Tsitsika A., 2015. Regular gaming behavior and internet gaming disorder in European adolescents: results from a cross-national representative survey of prevalence, predictors, and psychopathological correlates. Eur. Child Adolesc. Psychiatry 24, 565-574. https://doi.org/10.1007/s00787-014-0611-2

Morris, A.S., Silk, J.S., Steinberg, L., Lyers, S.S., Robinson, L.R., 2007. The role of the family context in the development of emotion regulation. Social Development 16(2), 361-388.

Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: the role of gender. Annual Rev. Clin. Psychol. 8, 161-187. https://doi: 10.1146/annurev-clinpsy-032511-143109

Parkinson, B., Manstead, A.S.R., 2015. Current emotion research in social psychology: Thinking about emotions and other people. Emotion Rev. 7, 1-10.

Parmentier, G., Rolland, S., 2009. Les consommateurs des mondes virtuels : construction identitaire et expérience de consommation dans Second Life. Recherche Application Marketing 24, 44-56. https://doi.org/10.1177/076737010902400303

Petit, G., Luminet, O., Maurage, F., Tecco, J., Lechantre, S., Ferauge, M., Gorss, J.J., de Timary, Ph., 2015. Emotion Regulation in Alcohol Dependence. Alcohol. Clin. Exp. Res. 39(12), 2471-2479. https://doi.org/10.1111/acer.12914

Raymon, A., Soutter, B., Hitchens, M., 2016. The relationship between character identification and flow state within video games. Comput. Human Behav. 55, 1030-1038. https://doi.org/10.1016/j.chb.2015.11.012

Rehbein, F., Kleinmann, M., Möble, T., 2010. Prevalence and risk factors of video game dependency in adolescence: results of a German nationwide survey. CyberPsychol. Behav. Soc. Networking 13, 269-277.

Rosenthal, A.A., Gurney, M.R., Moore, S.M., 1981. From trust to intimacy: A new inventory for examining Erikson's Stages of psychosocial development. J. Youth Adolesc. 10, 525-37. https://doi.org/10.1007/BF02087944

Russoniello, C.V., O'Brien, K., Parks, J.M., 2009. EEG, HRV and psychological correlates while playing Bejeweled II: A randomized controlled study, in: Wiederhold, B.K., Riva, G. (Eds.), Annual review of cybertherapy and telemedicine 2009: Advance technologies in the behavioral, social and neurosciences (Vol. 7). The Netherlands, Amsterdam: Interactive Media Institute and IOS Press, pp. 189–192.

Ryan, R.M., Rigby, C.S., Przybylski, A., 2006. The motivational pull of video games: A self-determination theory approach. Motiv. Emot. 30, 347-363. https://doi.org/10.1007/s11031-006-9051-8

Schwartz, S.J., 2001. The evolution of Eriksonian and, Neo-Eriksonian identity theory and research: A review and integration. Identity: Int. J. Theory Res. 1, 7-58. https://doi.org/10.1207/S1532706XSCHWARTZ

Schwartz, S.J., Zamboanga, B.L., Wang, W., & Olthuis, J.V., 2009. Measuring identity from an Eriksonian perspective: Two sides of the same coin? J. Pers. Assess. 2, 143-154. https://doi.org/10.1080/00223890802634266

Sioni, S.R., Burleson, M.H., Bekerian, D.A., 2017. Internet Gaming Disorder: social phobia and identifying with your virtual self. Comput. Human Behav. 71, 11-5. https://doi.org/10.1016/j.chb.2017.01.044

Somerville, L.H., Jones, R.M., Cornell, W., Ruberry, E.J., Dyke, J.P., Glover, G., et al., 2013. Medial prefrontal cortex and the emergence of self-conscious emotion in adolescence. Psychol. Sci. 24(8), 1554–1562. https://doi.org/10.1177/0956797613475633

Terracciano, A., McCrae R.R., Costa, P.T. Jr., 2003. Factorial and construct validity of the Italian Positive and Negative Affect Schedule (PANAS). Eur. J. Psychol. Assess.. 19(2):131-141. https://doi.org/10.1027//1015-5759.19.2.131

T'ng, S.T., Pau, K., 2020. Identification of Avatar Mediates the Associations Between Motivations of Gaming and Internet Gaming Disorder Among the Malaysian Youth. International J. Ment. Health Addiction available at https://doi-org.sirius.parisdescartes.fr/10.1007/s11469-020-00229-9

Villani, D., Carissoli, C., Triberti, S., Marchetti, A., Gilli, G., Riva, G., 2018. Videogames for emotion regulation: A systematic review. Games Health J. 7(2), 85-99. https://doi.org/10.1089/g4h.2017.0108

Wallenius, M., Punamäki, R.L., 2008. Digital game violence and direct aggression in adolescence: A longitudinal study of the roles of sex, age, and parent-child communication. Journal of Applied Dev. Psychol. 29(4), 286-294. https://doi.org/10.1016/j.appdev.2008.04.010

Watson, D., Clark, L.E., Tellegen, A., 1988. Development and validation of brief measures of positive and negative affect: the PANAS scales. J. Pers. Soc. Psychol. 54, 1063-1070. https://doi.org/10.1037//0022-3514.54.6.1063

Werner, K.H., Goldin, P.R., Ball, T.M., Heimberg, R.G., Gross, J.J., 2011. Assessing emotion regulation in social anxiety disorder: The emotion regulation interview. J. Psychopathol. Behav. Assess. 33(3), 346-354. https://doi.org/10.1007/s10862-011-9225-x

Wichstrøm, L., Stenseng, F., Belsky, J., von Soest, T., Hygen, B.W., 2018. Symptoms of Internet Gaming Disorder in Youth: Predictors and Comorbidity. J. Abnorm. Child Psychol. available at https://doi.org/10.1007/s10802-018-0422-x

Williams, W.C., Morelli, S.A., Ong, D.C., Zaki, J., 2018. Interpersonal Emotion Regulation: Implications for Affiliation, Perceived Support, Relationships, and Well-Being. J. Pers. Soc. Psychol. 115(2), 224-54. https://doi.org/10.1037/pspi0000132

Wolton, D., 2012. When gaming is communicating [Les jeux vidéo : quand jouer c'est communiquer]. Hermès, Paris.

Yen, J.Y., Yeh, Y.C., Wang, P.W., Liu, T.L., Chen, Y.Y., Ko, C.H., 2018. Emotional regulation in young adults with Internet Gaming Disorder. Int. J. Environmental Res. Public Health 15(30), 1-11. https://doi.org/10.3390/ijerph15010030

Young, K., 2009. Understanding online gaming addiction and treatment issues for adolescents. J. Marital Fam. Ther. 37, 355-72. https://doi.org/10.1080/01926180902942191

Zaki, J, Williams, W.C., 2013. Interpersonal Emotion Regulation. Emotion 13, 803-10. https://doi.org/10.1037/a0033839

Zimmerman, G., Biermann Mahaim, E., Mantzouranis, G., Genoud, P.A., Crocetti, E., 2012. Brief report: the identity style inventory (ISI-3) and the Utrecht-Management of Identity Commitments Scale (U-MICS): Factor structure, reliability, and convergent validity in French-speaking university students. J. Adolesc. 35, 461-465. https://doi.org/10.1016/j.adolescence.2010.11.013

Zimmerman, G., Lannegrand-Willems, L., Safond-Mottay, C., Cannard, C., 2015. Testing new identity models and processes in French-speaking adolescents and emerging adults students. J. Youth Adolesc. 44, 127-41. https://doi.org/10.1007/s10964-013-0005-7

Table 1. Sociodemographic data for the total sample (NGs, NPGs, and PGs)

| | Total (n = 201) | NGs (n = 37) | NPGs (n = 133) | PGs (n = 31) | p |
|---|---|---|---|---|---|
| | n/m (%/SD) | n/m (%/SD) | n/m (%/SD) | n/m (%/SD) | |
| **Age** | 19.02 (4.2) | 19.70 (4.5) | 18.60 (4.0) | 20.16 (3.15) | NA |
| **Gender** | | | | | |
| Female | 74 (36.82) | 32 (86.49) | 37 (27.82) | 5 (16.13) | |
| Male | 127 (63.18) | 5 (13.51) | 96 (72.18) | 26 (83.87)*** | |
| **Professional status** | | | | | |
| Student | 140 (69.65) | 29 (78.38) | 94 (70.68) | 17 (54.84) | |
| Employed | 39 (18.9) | 6 (16.2) | 28 (21.1) | 7 (23.3) | NA |
| Unemployed | 17 (8.45) | 2 (5.4) | 9 (6.8) | 4 (13.3) | |
| Inactive | 5 (0.6) | 0 | 2 (1.5) | 2 (6.7) | |
| **Schooling** | | | | | |
| College students | 47 (23.38) | 9 (24.32) | 35 (26.32) | 3 (9.68) | |
| High school students | 34 (16.92) | 2 (5.41) | 31 (23.31) | 1 (3.23) | NA |
| Further studies | 52 (25.87) | 18 (48.65) | 24 (18.05) | 10 (32.26) | |
| Apprenticeship | 7 (3.48) | 0 | 4 (3) | 3 (9.68) | |

NGs = non-gamers, NPGs = non-problematic gamers, PGs = problematic gamers, NA = not applicable; *** $p < .001$

Table 2. Gaming data for the total sample of gamers (NPGs and PGs)

| | Total ($n$ = 164) n/m (%/SD) | NPGs ($n$ = 133) n/m (%/SD) | PGs ($n$ = 31) n/m (%/SD) | $p$ |
|---|---|---|---|---|
| **Nb min/day VG M-F** | 145.6 (109.0) | 133.8 (111.2) | 193.9 (85.3) | 0.008 |
| **Nb min/day VG WE** | 294.7 (181.2) | 268.1 (179.6) | 406.8 (142.7) | < .001 |
| **Play MMO games** | | | | |
| Yes | 133 (93.5) | 104 (78.2) | 29(93.5) | NA |
| No | 31(6.5) | 29 (21.8) | 2(6.4) | |
| **Favorite game** | | | | |
| Fortnite | 26 (15.8) | 22 (17.5) | 4 (10.3) | |
| Apex Legends | 21 (12.8) | 14 (11.2) | 7 (17.9) | |
| CSGO | 19 (11.6) | 14 (11.2) | 6 (15.4) | NA |
| Overwatch | 10 (6.1) | 6 (4.8) | 4 (10.3) | |
| League of Legends | 7 (4.3) | 5 (4.0) | 2 (5.1) | |
| Autres | 82 (5.0) | 65 (51.6) | 16 (4.1) | |
| **PAIS** | | | | |
| Feelings during play | 12.8 (4.2) | 12.4 (4.2) | 14.4 (3.9) | 0.015 |
| Absorption during play | 7.3 (3.2) | 6.8 (3.0) | 9.3 (3.3) | < .001 |
| Positive attitudes toward the game avatar | 12.9 (4.5) | 12.3 (4.5) | 15.4 (3.4) | < .001 |
| Importance of the avatar to one's self-identity | 10.0 (4.5) | 9.8 (4.4) | 11.2 (5.2) | NA |

NPGs = non-problematic gamers, PGs = problematic gamers, Nb min/day VG M-F = number of minutes per day playing video games from Monday to Friday after school; Nb min/day VG WE = number of minutes per day playing video games during the weekend; MMO = massively multiplayer online; CSGO = Counter Strike Global Offensive; PAIS = Player–Avatar Identification Scale; NA = not applicable

Table 3. Emotion and emotion regulation data for the total sample (NGs, NPGs, and PGs)

| | Total ($n$ = 201) M (SD) | NGs ($n$ = 37) M (SD) | NPGs ($n$ = 133) M (SD) | PGs ($n$ = 31) M (SD) | $p$ | |
|---|---|---|---|---|---|---|
| **PANAS** | | | | | | |
| PA | 34.6 (6.9) | 31.8 (8.2) | 35.1 (6.2) | 35.4 (7.5) | .026 | NGs < NPGs<br>NGs < PGs |
| NA | 20.7 (6.2) | 21.7 (8.0) | 19.9 (5.5) | 22.9 (5.5) | .025 | NPGs < PGs |
| **DERS** | | | | | | |
| Lack of emotional awareness | 16.4 (4.9) | 14.9 (5.6) | 16.3 (4.2) | 18.7 (6.2) | .005 | NGs < PGs<br>NPGs < PGs |
| Lack of emotional clarity | 12.2 (3.9) | 11.6 (3.5) | 11.9 (3.9) | 14.2 (4.2) | .007 | NGs < PGs<br>NPGs < PGs |
| **ERQ-CA** | | | | | | |
| Cognitive reappraisal | 20.3 (5.2) | 21.8 (4.8) | 20.3 (5.0) | 18.8 (6.2) | .052 | PGs < NGs |
| Expressive Suppression | 12.3 (4.0) | 10.9 (3.8) | 12.3 (3.9) | 13.7 (4.0) | .012 | NGs < PGs |
| **IRQ** | | | | | | |
| Total | 55.8 (11.2) | 61.3 (7.7) | 55.5 (10.7) | 50.4 (13.9) | < .001 | PGs < NGs<br>PGs < NPGs<br>NPGs < NGs |
| NT | 11 .0 (3.9) | 12.9 (3.2) | 10.9 (3.7) | 9.1 (4.2) | < .001 | PGs < NGs<br>PGs < NPGs<br>NPGs < NGs |
| NE | 15.1 (3.5) | 16.7 (2.3) | 15.0 (3.3) | 14.0 (4.9) | .004 | NGs > PGs<br>NPGs > PGs |
| PT | 13.3 (3.7) | 14.7 (3.2) | 13.2 (3.7) | 12.1 (3.7) | .014 | PGs < NGs |
| PE | 16.3 (3.1) | 17.0 (2.2) | 16.4 (3.1) | 15.2 (4.0) | .048 | PGs < NGs |

NGs = non-gamers, NPGs = non-problematic gamers, PGs = problematic gamers; PANAS = Positive and Negative Affect Scale; PA = positive affect; NA = negative affect; DERS = Difficulties in Emotion Regulation Questionnaire; ERQ-CA = Emotion Regulation Questionnaire for Children and Adolescents; IRQ = Interpersonal Regulation Questionnaire; NT = Negative-Tendency; NE = Negative-Efficacy; PT = Positive-Tendency; PE = Positive-Efficacy

Table 4. Identity data for the total sample (NGs, NPGs, and PGs)

| | Total (n = 201) M (SD) | NGs (n = 37) M (SD) | NPGs (n = 133) M (SD) | PGs (n = 31) M (SD) | p | |
|---|---|---|---|---|---|---|
| **DIDS** | | | | | | |
| Commitment-making | 19.5 (4.9) | 19.2 (4.5) | 19.5 (5.0) | 19.8 (5.3) | NS | |
| Identification with commitment | 19.0 (4.8) | 19.7 (3.8) | 18.9 (4.8) | 18.5 (5.6) | NS | |
| Exploration in breadth | 19.4 (4.0) | 19.9 (3.6) | 19.3 (3.8) | 19.2 (5.3) | NS | |
| Exploration in depth | 18.8 (2.9) | 19.6 (2.1) | 18.5 (2.8) | 19.0 (3.6) | .082 | |
| Ruminative exploration | 13.8 (5.8) | 15.2 (5.2) | 13.0 (5.7) | 15.5 (6.0) | .024 | NPGs < PGs |
| **U-MICS** | | | | | | |
| Commitment | 3.3 (1.0) | 3.5 (0.9) | 3.2 (1.0) | 3.1 (1.1) | NS | |
| In-depth exploration | 2.7 (0.9) | 3.0 (0.8) | 2.7 (0.9) | 2.4 (0.9) | .033 | PGs < NGs |
| Reconsideration of commitment | 1.8 (0.9) | 1.7 (0.9) | 1.8 (0.0) | 1.8 (0.9) | NS | |
| **EPSI** | | | | | | |
| Identity | 43.0 (8.4) | 44.1 (5.8) | 43.7 (8.6) | 38.4 (8.8) | .004 | PGs < NGs<br>PGs < NPGs |

NGs = non-gamers, NPGs = non-problematic gamers, PGs = problematic gamers; DIDS = Dimension of Identity Development Scale; U-MICS = Utrecht-Management of Identity Commitments Scale; EPSI = Erikson Psychosocial Inventory Scale

Table 5. Factors associated with problematic gaming (univariate logistic regression analysis)

| | Total ($n$ = 201) | | | | Girls ($n$ = 74) | | | | Boys ($n$=127) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR | 95% CI | | $p$ | OR | 95% CI | | $p$ | OR | 95% CI | | $p$ |
| **Emotion/Emotion regulation** | | | | | | | | | | | | |
| PANSS – Positive affect | 1.02 | 0.96 | 1.08 | NS | 1.03 | 0.90 | 1.18 | NS | 1.00 | 0.94 | 1.07 | NS |
| PANSS – Negative affect | 1.07 | 1.01 | 1.13 | .032 | 1.09 | 9.96 | 1.24 | NS | 1.10 | 1.01 | 1.19 | .023 |
| DERS – Lack of emotion awareness | 1.12 | 1.03 | 1.22 | .006 | 1.12 | 0.94 | 1.33 | NS | 1.13 | 1.03 | 1.25 | .012 |
| DERS – Lack of emotion clarity | 1.16 | 1.05 | 1.05 | .003 | 1.23 | 1.01 | 1.51 | .044 | 1.17 | 1.04 | 1.32 | .008 |
| ERQCA – Cognitive reappraisal | 0.94 | 0.87 | 1.01 | .075 | 0.91 | 0.78 | 1.07 | NS | 0.95 | 0.87 | 1.03 | NS |
| ERQCA – Expressive Suppression | 1.12 | 1.01 | 1.025 | .030 | 1.24 | 0.96 | 1.60 | NS | 1.08 | 0.96 | 1.24 | .023 |
| IRQ - Total | 0.92 | 0.92 | 0.98 | .005 | 0.88 | 0.81 | 0.96 | .004 | 0.98 | 0.94 | 1.02 | NS |
| IRQ – Negative-Tendency | 0.86 | 0.77 | 0.95 | .005 | 0.67 | 0.48 | 0.93 | .017 | 0.90 | 0.80 | 1.01 | NS |
| IRQ- Negative-Efficacy | 0.90 | 0.82 | 1.00 | .045 | 0.73 | 0.57 | 0.95 | .017 | 0.97 | 0.86 | 1.09 | NS |
| IRQ – Positive-Tendency | 0.90 | 0.81 | 1.00 | .048 | 0.66 | 0.49 | 0.89 | .007 | 0.97 | 0.86 | 1.19 | NS |
| IRQ- Positive-Efficacy | 0.88 | 0.79- | 0.99 | .030 | 0.73 | 0.58- | 0.91 | .006 | 0.94 | 0.82- | 1.09 | NS |
| **Identity** | | | | | | | | | | | | |
| EPSI Identity | 0.93 | 0.89 | 0.97 | .002 | 0.88 | 0.80 | 0.97 | .011 | 0.93 | 0.87 | 0.98 | .008 |
| DIDS-Commitment | 1.02 | 0.94 | 1.10 | NS | 1.00 | 0.83 | 1.21 | NS | 1.01 | 0.93 | 1.11 | NS |
| DIDS- Exploration in breadth | 0.99 | 0.90 | 1.08 | NS | 0.90 | 0.74 | 1.11 | NS | 1.01 | 0.91 | 1.13 | NS |
| DIDS- Ruminative exploration | 1.06 | 0.99 | 1.14 | .081 | 1.01 | 0.86 | 1.19 | NS | 1.07 | 0.99 | 1.16 | .06 |
| DIDS- Identification with commitment | 0.97 | 0.90 | 1.05 | NS | 0.95 | 0.79 | 1.13 | NS | 0.98 | 0.89 | 1.07 | NS |
| DIDS- Exploration in depth | 1.04 | 0.91 | 1.19 | NS | 0.89 | 0.67 | 1.19 | NS | 1.09 | 0.93 | 1.27 | NS |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-MICS-Commitment | 0.78 | 0.54 | 1.14 | NS | 0.38 | 0.16 | 0.93 | .033 | 0.80 | 0.50 | 1.28 | NS |
| U-MICS-In-depth exploration | 0.63 | 0.41 | 0.97 | .036 | 0.29 | 0.10 | 0.87 | .027 | 0.80 | 0.49 | 1.28 | NS |
| U-MICS-Reconsideration of commitment | 1.05 | 0.71 | 1.57 | NS | 1.13 | 0.49 | 2.59 | NS | 1.06 | 0.66 | 1.71 | NS |
| **Avatar identification** | | | | | | | | | | | | |
| PAIS – Feelings during play | 1.17 | 1.06 | 1.30 | .002 | 1.25 | 0.96 | 1.63 | NS | 1.15 | 1.02 | 1.29 | .022 |
| PAIS – Absorption during play | 1.30 | 1.14 | 1.48 | < .001 | 1.55 | 1.07 | 2.24 | .020 | 1.26 | 1.09 | 1.46 | .002 |
| PAIS –Positive attitudes | 1.26 | 1.12 | 1.41 | < .001 | 1.20 | 0.96 | 1.50 | NS | 1.28 | 1.12 | 1.48 | <.001 |
| PAIS –Importance of avatar | 1.09 | 1.00 | 1.18 | .044 | 1.13 | 0.91 | 1.41 | NS | 1.07 | 0.98 | 1.17 | NS |

PANSS = Positive and Negative Affect Schedule; DERS = Difficulties in Emotion Regulation Questionnaire; ERQ-CA = Emotion Regulation Questionnaire for Children and Adolescents; IRQ = Interpersonal Regulation Questionnaire; EPSI = Erikson Psychosocial Inventory Scale; DIDS = Dimension of Identity Development Scale; U-MICS = Utrecht-Management of Identity Commitments Scale; PAIS = Player Avatar Identification Scale

Table 6. Relation between inter and intra-ER (univariate linear regression analysis)

| | IRQ – TOTAL | | | | Negative Tendency | | | | Negative-Efficacy | | | | Positive Tendency | | | | Positive-Efficacy | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | β | 95%CI | | *p* | β | 95%CI | | *p* | β | 95%CI | | *p* | β | 95%CI | | *p* | β | 95%CI | | *p* |
| ERQCA – CR | 0.34 | 0.45 | 1.02 | < .001 | 0.22 | 0.06 | 0.27 | .002 | 0.29 | 0.10 | 0.29 | < .001 | 0.28 | 0.10 | 0.29 | < .001 | 0.30 | 0.10 | 0.26 | < .001 |
| ERQCA – ES | -0.46 | -1.64 | -0.94 | < .001 | -0.56 | -0.66 | -0.43 | < .001 | -0.30 | -0.38 | -0.15 | < .001 | -0.30 | -0.40 | -0.15 | < .001 | -0.26 | -0.31 | -0.10 | < .001 |
| DERS – LEA | -0.29 | -0.97 | -0.36 | < .001 | 0.05 | -0.30 | -0.08 | .001 | -0.22 | -0.26 | -0.06 | .001 | -0.21 | -0.26 | -0.05 | .003 | -0.25 | -0.24 | -0.07 | < .001 |
| DERS – LEC | -0.18 | -0.89 | -0.11 | .012 | -0.14 | -0.27 | -0.00 | .045 | -0.13 | -0.24 | 0.01 | .062 | -0.12 | -0.24 | 0.01 | .074 | -0.16 | -0.24 | -0.02 | .023 |

ERQCA = Emotion Regulation Questionnaire for Children and Adolescents; ERQCA – CR = cognitive reappraisal of the Emotion Regulation Questionnaire for Children and Adolescents; ERQCA – ES = expressive suppression of the Emotion Regulation Questionnaire for Children and Adolescents; DERS = Difficulties in Emotion Regulation Questionnaire; DERS – LEA = lack of emotion awareness of the Difficulties in Emotion Regulation Questionnaire; DERS – LEC = lack of emotion clarity of the Difficulties in Emotion Regulation Questionnaire