Gaming when things get tough? Examining how emotion regulation and coping self-efficacy influence gaming during difficult life situations

Abstract

Research suggests that gaming can play an important role in dealing with life difficulties, but few studies have examined this directly. Building on recent research, the current study set out to develop a measure of gaming in difficult life situations (GDLS) and explored the role of emotion regulation and coping self-efficacy as predictors of this behaviour. A total of 667 gamers completed the online survey. Initial analyses demonstrated validity and reliability of the GDLS scale (α=.92), with players turning to gaming as a distraction from life difficulties, to feel a sense of achievement, to connect with others, and for in-game connection and simulation. Multiple regression analysis showed that younger age, more time spent gaming in general, and lower coping self-efficacy predicted gaming in difficult life situations, but emotion regulation was non-significant. The study presents novel insights and a new measure for future research in this area.

1. **Introduction**

Video and online gaming is an enjoyable activity for millions of individuals worldwide. It fulfils basic psychological needs by boosting feelings of competence, autonomy and relatedness in line with Self-Determination Theory (Deci & Ryan, 2000; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010). Motives for gaming have been of longstanding interest. Yee (2006) found that individuals were drawn to gaming for three main reasons: to gain power and progress in the game (achievement), to be part of a group and gain social support (social) or to find information that an average player is unaware of (immersion). The framework by Demetrovics et al. (2011) outlined seven motives for gaming. Several align with Yee (2006); including *social* motivations, *skills development* and *competition* which link to achievement, and *fantasy* and *recreation* which link to immersion. Of interest is the addition of *escapism* and *coping* motives by Demetrovics et al's (2011), where escapism is a means of avoiding problems faced in the real world, while coping entails gaming as a way of channelling distress and aggression in order to improve mood. This shows the wide-ranging motives for gaming and points to the potential for gaming to play an important role in dealing with stressful and difficult life periods. Little research to date has, however, examined gaming behaviours in difficult life situations or the potential individual or psychological factors that could drive this.

1.1 Gaming in difficult life situations

Increasing literature explores the potential benefits associated with gaming. For example, gaming is linked to pleasurable cognitive states of 'flow' (Czikszentmihalyi, 1990; Nah, Eschenbrenner, Zeng, Telaprolu, & Sepehr, 2014). This optimal psychological state is arguably a distraction from life stresses, as being absorbed in a game allows for escape

through experience of positive emotions (Hemenover & Bowman, 2018) that could lead to mood repair and provide relief from stress and boredom (Bowman & Tamborini, 2012; Russoniello, Fish, & O'Brien, 2013). While beneficial, this can also lead to an over-reliance on games to provide a cognitive distraction and relief from suffering, which can lead to problematic gaming (Snodgrass et al., 2014). However, problematic use can also ensue on other forms of online media. Research shows links between experiences of stressful life events and higher risk of problematic internet use in general (Velezmoro et al., 2010; Yan et al., 2014), and a study in the Netherlands found that 57% of individuals used some form of online coping after experiencing a negative life event (van Ingen, Utz, & Toepoel, 2016). Gaming may, thus, not be unique in individuals seeking relaxation and escape from stress, but it is potentially a more immersive environment for doing so as a result of the attentional demand in games being higher (Rieger et al., 2015).

In addition to positive emotional effects, gaming also presents cognitive and social benefits (Granic, Lobel, & Engels, 2014). Cognitive benefits include more accurate attention allocation, enhanced mental rotation, and faster reaction time (Colzato et al., 2013; Green & Bavelier, 2015; Nuyens et al., 2019), while social benefits include enhanced social capital through interactions with others (Kowert, Domahidi, & Quandt, 2014; Trepte, Reinecke, & Juechems, 2012). Therefore, apart from merely distraction and escape, individuals encountering life difficulties may engage in gaming for positive mood effects and social connection. Gaming can also enhance coping skills (Colder Carras et al., 2018; Procci, Bowers, Wong, & Andrews, 2013), reduce depressive symptoms (Russoniello et al., 2013) and contribute to positive functioning that supports mental health (Jones, Scholes, Johnson, Katsikitis, & Carras, 2014). Simple puzzle games mitigated flashbacks of past trauma (James et al., 2015), and even violent video games led to mood repair and reduction of depression and hostile emotions by presenting opportunities for players to exert control over their

environment and act in goal-directed ways (Ferguson & Rueda, 2010). Benefits in health-outcomes have also been found (Primack et al., 2012), including gaming influencing psychological wellbeing among cancer survivors (Francis, Comello, & Marshall, 2016). Clearly, games can offer a range of benefits, but few studies have explored how and why individuals engage in gaming during difficult life situations.

A recent qualitative study offered some novel insights into this area, highlighting six themes around player engagement in gaming during difficult life situations, including: *much needed respite* (offering an escape from daily stresses), *dealing with feelings* (supporting individuals in working through their emotions), *connection* (facilitating social connections and social support), *personal change and growth* (stimulating individuals to make positive changes), *gaming as a lifeline* (providing a lifeline in times of existential doubt), and *gaming as an obstacle to living well* (potential detriment to wellbeing by preventing individuals from facing problems) (Iacovides & Mekler, 2019). These themes reflect both the benefits and downfalls associated with gaming during life difficulties, and outcomes likely vary due to various individual and psychological factors. In addition to exploring gaming in difficult life situations, it is thus also important to examine factors that could underpin this such as emotion regulation and coping self-efficacy.

1.2 Emotion Regulation, Coping Self-Efficacy and Gaming

Emotion regulation refers to one's implicit or explicit attempt to modify the felt emotion (Gross, 2015; Gross & John, 2003). In line with the widely accepted process-model of emotion regulation, two strategies exist based on the time at which they are initiated in the emotion generation process (Gross, 1998; Gross & Thompson, 2007). *Cognitive reappraisal* refers to a shift in the way an individual thinks about a given situation which alters its

emotional impact (Gross, 1998; Gross & John, 2003). This is the antecedent-focused strategy in the process-model as it occurs early and intervenes prior to the emotion response being fully generated, which alters its emotional course and can reduce negative feelings (Gross & John, 2003). This is an adaptive strategy. In contrast, *Expressive suppression* is a response-focused strategy that occurs once the emotional response has already been fully generated (Gross, 1998; Gross & John, 2003). It, thus, relies on effortful management of an emotional response, with individuals inhibiting and modifying their behavioural response to the felt emotion (Gross & John, 2003). Individuals may successfully suppress behavioural responses to negative emotions, but this may not reduce the experience of negative feelings and can allow them to remain unresolved (Gross, 2015; Gross & Thompson, 2007). This is a maladaptive strategy. Better emotion regulation has positive outcomes in relation to mental health and wellbeing (Balzarotti, Biassoni, Villani, Prunas, & Velotti, 2014; Gross & Muñoz, 1995), whereas difficulties in emotion regulation are associated with psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Nolen-Hoeksema & Aldao, 2011).

Difficulties in emotion regulation have also been implicated in problematic gaming (Kökönyei et al., 2019) and Internet Gaming Disorder (Wichstrøm et al., 2019), with individuals with Internet Gaming Disorder demonstrating lower likelihood of cognitive reappraisal and higher likelihood of expressive suppression (Yen et al., 2018). Difficulties in emotion regulation are linked to using gaming as a maladaptive coping strategy leading to problematic behaviour (Blasi et al., 2019; Loton et al., 2016; Maroney et al., 2019). However, gaming can also be beneficial in developing emotion regulation strategies in non-clinical populations (Villani et al., 2018). For example, adolescents who play regularly are better at regulating their emotions, though they also tend to experience emotions more intensely and express them less frequently compared to irregular players (Gaetan, Bréjard, & Bonnet, 2016). Interactivity and immersion within the game allow for more intense experience of

emotion due to rich game narratives and connection with one's in-game character acting as emotional stimuli (Villani et al., 2018). Experiences of failure within the game also require emotion regulation strategies in order to succeed (Granic et al., 2014; Juul, 2013; Villani et al., 2018). Thus, emotion regulation is an important construct for further exploration in the context of gaming in difficult life situations.

Coping is another relevant construct, defined as behavioural and cognitive efforts that allow an individual to manage stressful situations (Lazarus & Folkman, 1984). Two coping styles are identified in psychological literature, namely, problem-focused coping (i.e. strategies that aim to remove or reduce the cause of distress) and emotion-focused coping (i.e. reducing the emotional distress that a problem caused) (Lazarus & Folkman, 1984). In addition to gaming potentially being a maladaptive, avoidance-focused coping strategy to life stressors via escapism and distraction (Brand et al., 2016; Maroney et al., 2019), gaming can also enhance positive emotions (Hemenover & Bowman, 2018) and assist with mood repair (Bowman & Tamborini, 2012). It can also help in recovery from stress and strain, with recovery conceptualised as a stage past coping as it aided in replenishing depleted resources (Reinecke, 2009). More specifically, those who had higher levels of work fatigue and daily hassles, those who associated stronger recovery experiences with gaming, and those who had an emotion-focused coping style were more likely to engage in gaming during stressful situations (Reinecke, 2009). Clearly coping and coping styles are relevant to explore in the context of gaming, but coping-self-efficacy may also be key. Coping self-efficacy relates to an individual's confidence and perceived ability to cope when facing life challenges (Chesney et al., 2006). Confidence in being able to effectively manage life difficulties may be relevant in the extent to which players seek out gaming in difficult situations, but this construct has not yet been explored in this research area.

1.3. Current study

Research has uncovered a range of links between gaming and experience of life stressors, including specific gaming motives associated with escapism and coping (Demetrovics et al., 2011), the potential for gaming to improve mood (Hemenover & Bowman, 2018) and its role in recovery from stress (Reinecke, 2009). Emotion regulation and coping self-efficacy are relevant in the ability to manage stressful situations in general and have shown links to gaming behaviour (Bowditch, Chapman, & Naweed, 2018; Villani et al., 2018; Yen et al., 2018), but they have not been explored in combination in the context of gaming in difficult life situations.

Although previous literature shows important links between gaming and life stressors, few studies have examined this beyond focusing on gaming motives or problematic gaming. The recent study by Iacovides and Mekler (2019) presented novel insights into gaming behaviour during difficult life situations and showed the complexity of the issue, with potential for both benefits and problematic outcomes. Understanding the extent to which individuals use gaming in difficult life situations thus warrants further study, along with exploring the role of emotion regulation and coping self-efficacy in this context. Therefore, two research questions form the basis of the current study: *How can we measure the extent to which individuals engage in gaming in difficult life situations?* (RQ1) and *Can emotion regulation and coping self-efficacy predict gaming in difficult life situations?* (RQ2).

For the purpose of the current study 'difficult life situations' are conceptualised as negative, stressful situations in one's personal or social life that require an individual to use coping strategies, similar to conceptualisations by Iacovides and Mekler (2019). Specific examples of such situations may include periods of heightened stress in general, or more specific experiences like coping with loss, family or relationship breakdowns, questioning

one´s identity, job loss, or moving home. Using four of the six themes presented by Iacovides and Mekler (2019) which were deemed most important to pursue further, the current study first set out to develop a quantitative measure of gaming behaviour in difficult life situations to build on previous findings (Aim 1). Secondly, using the new measure, the study explored the role of emotion regulation variables cognitive reappraisal and expressive suppression and coping self-efficacy as predictors of gaming in difficult life situations (Aim 2). Although links between these variables and gaming exist in general, they have not been examined in relation to gaming in difficult life situations specifically, therefore, hypotheses are non-directional.

H1: Cognitive reappraisal predicts gaming in difficult life situations.

H2: Expressive suppression predicts gaming in difficult life situations.

H3: Coping self-efficacy predicts gaming in difficult life situations.

2. Method

2.1. Design

A quantitative cross-sectional survey design was utilised, with data collected online via the JISC Online Survey platform.

2.2. Participants

The study required participants to be 16 or older and to engage in at least one gaming session per week in order to take part. In total 667 participants aged 16-64 (M=25.65, SD=7.59) completed the survey (471 males, 170 females, 17 non-binary, 9 unspecified). On average, participants played 20.57 hours (SD=14.52) of video and online games during a typical week, and 24.16 hours (SD=18.77) in a week when stressed. Favourite game genres

included: role-playing (24.6%, n=164), first-person shooter (17.7%, n=118), simulation (11.2%, n=75), adventure (10.2%, n=68), action (9.5%, n= 61) and Massively Multiplayer Online Role Playing Games (9.5%, n= 61).

2.3. Measures

In addition to demographics participants also completed the following scales:

2.3.1. Gaming in Difficult Life Situations (GDLS) scale

Four themes from Iacovides and Mekler (2019) formed the framework used to develop the scale items: *much needed respite*, *connection*, *dealing with feelings* and *gaming as a lifeline*. An exhaustive list of items were developed and the item pool was systematically reviewed by the researchers. Items were removed if they contained ambiguous wording, tapped into more than one behaviour, or presented a duplication of ideas. This resulted in a 34-item scale for data collection.

Participants were given a definition of 'difficult life situations' along with examples in line with the current study conceptualisation (defined in section 1.3) in order to frame the issue under investigation. The scale instructed participants as follows: '*Thinking about difficult life situations you have faced recently, how often do you…*'. Example items include: "Immerse in a game in order to interrupt negative/unproductive thought loops?" (*much needed respite* theme); "Try to solve your difficulty by playing as someone else who is in a similar situation?" (*dealing with feelings* theme); "Ask for help/advice about your situation while playing with other people" (*connection* theme); and "Feel that you have more of a sense of purpose while gaming?" (*gaming as a lifeline* theme). Participants responded on a 5-point Likert scale (1-Almost Never/Never, 2-Some of the time, 3-Half of the time, 4-Most of the time, 5-Almost Always/Always) in line with response options from previous scales on gaming motives (Demetrovics et al., 2011). Higher scores reflect a higher tendency to resort

to gaming in difficult life situations. Validity and reliability analyses are reported in the results section.

2.3.2. Motives for Online Gaming Questionnaire (MOGQ; Demetrovics et al., 2011)

The MOGQ measured participants' reasons for gaming and was included as an additional means of validating the GDLS scale that was developed for the current study. Individuals' motives for gaming should conceptually correlate with the behavioural indicators of the GDLS. For example, those who report higher escapism motives on the MOGQ should theoretically score higher on *much needed respite* items associated with the GDLS scale, and those who report higher social motives on the MOGQ should score higher on the *connection* items associated with the GDLS.

The 27-item scale reflects seven subscales: Social (e.g. 'I play online games because I can get to know new people'), Escapism (e.g. 'I play online games because gaming helps me to forget about daily hassles', Competition (e.g. 'I play online games because it is good to feel that I am better than others'), Coping (e.g. 'I play online games because gaming helps me get into a better mood'), Skill Development ('I play online games because it improves my coordination skills'), Fantasy (e.g. 'I play online games because I can do things that I am unable to do or I am not allowed to do in real life') and Recreation (e.g. 'I play online games because it is entertaining'). Given that our study focus was on both video and online gaming and the MOGQ makes reference to 'online gaming' only, we adapted the item wording to exclude the word 'online' for each item. Participants responded on the same 5-point Likert scale as was used in the GDLS scale. Higher scores indicate higher motives for gaming related to that subscale. The scale has a Cronbach's alpha between .79-.90 across subscales (Demetrovics et al., 2011).

2.3.3. Coping Self-Efficacy (Chesney et al., 2006)

This 26-item scale measures participants' perceived ability to effectively cope with life challenges and threats. Participants indicate how confident or certain they are that they can perform a list of behaviours when they are dealing with life challenges. Scale items reflect adaptive coping and include items on problem-focused and emotion-focused coping. Participants rate items on an 11-point Likert scale with anchor points: 0 ('cannot do at all'), 5 ('moderately certain can do') and 10 ('certain can do'). Total scores are calculated, with higher scores indicating higher coping self-efficacy. The scale has a Cronbach's alpha of .95 (Chesney et al., 2006).

2.3.4. Emotion Regulation Questionnaire (Gross & John, 2003)

This 10-item scale measures an individual's tendency to regulate their emotions and is comprised of two subscales: cognitive reappraisal (e.g. "I control my emotions by changing the way I think about the situation I'm in") and expressive suppression (e.g. "I control my emotion by not expressing them", reverse scored). Participants respond on a 7-point Likert scale (1-strongly disagree to 7-strongly agree). Total scores are calculated for each subscale, with higher scores on cognitive reappraisal indicating a higher tendency to construe an emotional situation in a more positive way (α=.80) and higher scores on expressive suppression indicating a higher tendency to suppress emotions (α=.73) (Gross & John, 2003).

2.4. Procedure and Ethics

The study received full ethical approval from the University of Buckingham. It was advertised on Reddit pages, including subreddits of specific games (e.g. r/destiny2) and more general gaming subreddits (e.g. r/videogames). Clicking on the survey link led participants to an information sheet describing the inclusion criteria, aims of the study, and types of

questions participants can expect. Given the focus on difficult life situations, the information sheet contained details to ensure an informed decision on participation was made. Participants were discouraged from taking part if they believed this could cause adverse effects. Other ethical considerations were also presented (e.g. anonymity, data usage, right to withdraw). Indicating consent on the information sheet led participants to the survey and a full debrief was provided with contact for support services.

2.5. Data Analysis

Data was downloaded into SPSS-26 for analysis. A Principal Component Analysis (PCA) was utilised to validate the GDLS scale and assess its factor structure, followed by item analysis to assess reliability. Correlations with the MOGQ (a conceptually similar measure) were examined as additional validation. The role of emotion regulation and coping self-efficacy on gaming in difficult life situations were examined via correlations and hierarchical multiple regression analysis, controlling for player age and time spent gaming in a typical week.

3. Results

3.1. GDLS scale: Validity and Reliability

To examine the factor structure of the newly developed GDLS scale, a PCA with a Direct Oblimin rotation was undertaken. The Kaiser-Meyer-Olkin measure was .93 and Bartlett's Test of Sphericity was significant $(p<.001)$, indicating suitability for PCA. Given the scale was conceptualised and developed according to four themes from previous qualitative findings, the PCA was set to extract four factors. Examination of the eigenvalues

against the scree plot without specifying number of factors to extract indicated a point of inflection at 4, thus confirming the original decision. The four-component solution explained 52.53% of the total variance. Items with factor loadings below .4 on a given factor and items that cross-loaded on more than one factor were removed from the scale. Of the original 34 items, 26 were retained following PCA (see Table 1).

[INSERT TABLE 1 ABOUT HERE]

The four factors clearly mapped onto the original themes that provided the framework for the scale. Factor 1 was labelled 'Distraction from difficulties' (6 items) and related to players using gaming to distract themselves from problems they were experiencing (linking to the *much needed respite* theme). Factor 2 was labelled 'Connection with others' (8 items) and related to players using gaming to connect with others and seek social support (linking to the *connection* theme). Factor 3 was labelled 'In-game character connection and simulation' (7 items) and is associated with players using gaming to simulate their offline challenges in an effort to cope (linking to the *dealing with feelings* theme). Factor 4 was labelled 'Sense of purpose' (5 items) and related to players using gaming to feel a sense of achievement when dealing with difficulties (linking to the *gaming as a lifeline* theme). The Cronbach's alpha was .92 overall (Distraction from difficulties α=.90; Connection with others α=.84; In-game character connection and simulation α=.84; Sense of purpose α=.81), indicating high reliability. Inter-item analysis indicated that removal of any additional items would decrease reliability, thus all 26 items were retained.

Further validation of the GDLS scale involved correlating the four subscales with an established measure of gaming motives. The MOGQ (Demetrovics et al., 2011) examines reasons why individuals engage in gaming with specific subscales also linking to elements of

coping, escapism and social support and some of these should correlate with the behavioural indicators of the GDLS if they measure a similar construct.

[INSERT TABLE 2 ABOUT HERE]

Table 2 demonstrates that the GDLS subscales correlate with the MOGQ in ways conceptually expected. All four GDLS subscales positively correlated with coping motives. Distraction from difficulties was strongly positively correlated with escapism (r=.75) and fantasy (r=.42), while connection with others showed strong positive correlations with social motivates (r=.72). In-game character connection and simulation and sense of purpose were strongly correlated with fantasy (r=.56; r=.47 respectively). These strong correlations add further weight to the validation of the GDLS scale.

3.2. Correlations and Multiple Regression

Although four subscales emerged in the GDLS scale, exploratory analyses linked to RQ2 were conducted with the overall score of the scale as an initial investigation into this area. Descriptive statistics and correlations of the main study variables are shown in Table 3. GDLS scores significantly correlated with all study variables: significant positive correlations were found with time spent gaming in an average week and expressive suppression, while significant negative correlations were found for age, coping self-efficacy and cognitive reappraisal. A strong positive correlation was found between cognitive reappraisal and coping self-efficacy (r=.68). Coping self-efficacy was also negatively correlated with expressive suppression (r=-.17). Age was negatively correlated with GLDS scores, cognitive reappraisal and coping self-efficacy, suggesting that younger players tended to score lower on each of these measures. In contrast, positive correlations were found between age and time spent gaming and expressive suppression, indicating that older players tended to score higher on

14

these measures. Time spent gaming was also positively correlated with expressive suppression and negatively correlated with cognitive reappraisal and coping self-efficacy.

[INSERT TABLE 3 ABOUT HERE]

To examine whether the main variables cognitive reappraisal, expressive suppression and coping self-efficacy predicted gaming in difficult life situations, a hierarchical multiple regression analysis was conducted. Age and time spent gaming in an average week were controlled for and were entered at Step 1 of the analysis, while the three main variables were entered at Step 2. The dependent variable was the total score on the GDLS. Assumptions related to regression analysis were tested. The Durbin-Watson statistic was appropriate indicating independence of errors (2.06); the tolerance statistics (between .52-.99) and the VIF (between 1.00-1.94) showed multicollinearity was not a concern. Data was non-normally distributed (all variables had a Shapiro-Wilk of less than .05), thus bootstrapping was applied.

The regression model statistically significantly predicted GDLS scores. The control variables explained 9.6% of the variance. Variance explained increased to 11.7% with the inclusion of the main variables at Step 2. As shown in Table 4, time spent gaming in an average week was the stronger predictor of GDLS scores (β=.22). Age and coping self-efficacy also predicted GDLS scores (β=.16 for both variables), thus H3 is accepted. Cognitive reappraisal and expressive suppression did not predict GDLS scores, thus H1 and H2 are rejected.

[INSERT TABLE 4 ABOUT HERE]

4. Discussion

4.1. GDLS Scale

The study first set out to develop a measure of gaming in difficult life situations, which was conceptualised using previous qualitative research (Iacovides & Mekler, 2019).

The GDLS scale demonstrated construct validity with the items mapping onto four factors in line with the four themes on which they were based. Stringent thresholds were applied for item inclusion resulting in the removal of 8 items, and the final 26-item scale demonstrated high reliability.

The 'distraction from difficulties' subscale reflects gaming as a tool to shift attention from real-life problems, while 'sense of purpose' reflects gaming as a means of experiencing a sense of achievement when dealing with difficulties. These subscales align with research showing the mood repair and stress relief potential of gaming (Hemenover & Bowman, 2018; Russoniello et al., 2013) and the motivational and emotional benefits that can result (Granic et al., 2014). However, escapism through cognitive distraction can also lead to problematic gaming when used as an avoidance strategy (Snodgrass et al., 2014). These subscales represent more indirect ways of using gaming to cope with problems, with focus on escapism and seeking positive emotions.

In contrast, 'connection with others' reflects gaming as a means of social connection and support-seeking, which aligns with research showing positive social effects including enhanced social capital (Kowert et al., 2014; Trepte et al., 2012). Finally, 'in-game character connection and simulation' reflects active attempts to deal with feelings through simulation of challenges. Exerting control over a virtual environment may aid in coping. As previously noted, games can enhance coping (Colder Carras et al., 2018; Procci et al., 2013) and support mental health and wellbeing (Jones et al., 2014). These subscales reflect more direct behavioural attempts to deal with problems through gaming. The development of the GDLS scale extends the work by Iacovides and Mekler (2019) and shows that gaming during difficult life situations can include both indirect (escapism and mood repair) and direct (actively dealing with challenges) behaviours.

The four subscales were correlated with an established measure of gaming motives (Demetrovics et al., 2011) and findings showed strong correlations in ways conceptually anticipated. For example, all four subscales were strongly positively correlated with coping motives on the MOGQ, distraction from difficulties was strongly correlated with escapism on the MOGQ, and connection was strongly correlated with social motivations on the MOGQ, thus demonstrating criterion-related validity of the GDLS. The initial validation and inter-item analysis of the GDLS measure showed that it presents a coherent factor structure that is conceptually aligned with previous research and can successfully measure different behavioural indicators of gaming in difficult life situations. While further validation is necessary, initial findings indicate that the scale is measuring the construct of interest. Being the first scale to measure these constructs quantitatively, it paves the way for further research in this area. This can be particularly useful in examining potential factors that could underpin this behaviour.

4.2. Role of emotion regulation and coping self-efficacy

Using the new GDLS measure, the second study aim was to explore the role of emotion regulation (cognitive reappraisal and expressive suppression strategies) and coping self-efficacy as predictors of gaming behaviour in difficult life situations as previous research has shown links between these constructs and gaming more broadly. For example, difficulties in emotion regulation was associated with Internet Gaming Disorder (Yen et al., 2018), with escapism in gaming being a maladaptive attempt to regulate emotions (Blasi et al., 2019; Brand et al., 2016; Loton et al., 2016;). However, gaming also presents contexts for developing healthy emotion regulation due to many games rewarding players for down-regulating negative affective states (Granic et al., 2014; Lobel et al., 2014).

In the current study, maladaptive emotional regulation (i.e. lower cognitive reappraisal and higher expressive suppression) was correlated with higher engagement in gaming in difficult life situations. Coping self-efficacy was negatively correlated with expressive suppression and positively correlated with cognitive reappraisal, indicating that maladaptive emotion regulation was associated with lower perceived ability to be able to cope with challenges. Lower coping self-efficacy also positively correlated with gaming in difficult life situations. Despite maladaptive emotion regulation and lower coping self-efficacy correlating with gaming in difficult life situations, only coping self-efficacy emerged as a significant predictor. Previous studies note the recovery potential of gaming (Reinecke, 2009) but dysfunctional coping styles have shown problematic gaming effects (Brand et al., 2016). Those with lower confidence in their ability to be able to effectively handle life challenges may be drawn to gaming as a distraction from difficulties and a means of regulating emotions to feel a sense of achievement. However, this study also suggests that individuals can use gaming as a direct attempt at coping with challenges, including seeking support from others and simulating their challenges and exerting control over them in a virtual environment. This opens up the possibility that those with lower coping self-efficacy may use gaming to enhance coping and help them deal with their life difficulties, and this is an important area for further investigation.

Apart from the main study variables, younger age and more time spent gaming were significant predictors of gaming in difficult life situations. Younger players may generally have more time to spend gaming than older players, and these variables were positively correlated. However, younger age was also correlated with higher expressive suppression, lower cognitive reappraisal and lower coping self-efficacy. Age differences in stress and coping show longstanding research interest, with consideration about changes being developmental (i.e. inherent and stage-like changes as people age) or contextual (i.e. result of

changes in what people must cope with) (Folkman, Lazarus, Pimley, & Novacek, 1987). Results tend to show developmental interpretations (Folkman et al., 1987; Skinner & Zimmer-Gembeck, 2007), but contextual interpretations are also applicable (Folkman et al., 1987). Studies show that older individuals engage in less escapist (Aldwin, 1991) and more proactive coping when dealing with life stresses (Neubauer, Smyth, & Sliwinski, 2019), with a general trend of increasing adaptive emotion regulation (Zimmermann & Iwanski, 2014). Thus, younger players who are still developing adaptive emotion regulation and coping skills may be turning to gaming when experiencing strain.

The same relationships were found with time spent gaming, i.e. those who spent more time gaming demonstrated poorer emotion regulation and lower coping self-efficacy. This may point to research on risk factors for problematic gaming (Hollett & Harris, 2020; Maroney et al., 2019; Yen et al., 2018), particularly when life stresses lead to a reliance on gaming to relieve negative emotions and provide a diversion from problems (Snodgrass et al., 2014). Thus, maladaptive emotion regulation and lower coping self-efficacy may drive individuals to engage in more time spent gaming to mitigate stress and strain that is felt, with time spent gaming being the strongest predictor for gaming behaviour during difficult life situations in the current study. Considering this alongside the age findings, future research should investigate additional relevant factors, both developmental and contextual, such as resilience, social support and self-esteem as well as types of challenges individuals face. This is important as it has the potential to uncover effective strategies for enhancing coping among younger individuals as well as intervening on those who may be at risk of using gaming as a maladaptive coping strategy. Given that maladaptive coping strategies have been linked to more depressive symptoms (Nolen-Hoeksema & Aldao, 2011), further studies can inform interventions linked to mental health outcomes and prevention of problematic gaming among those at risk.

4.3. Limitations and Future Directions

Of the main study variables, coping self-efficacy was the only significant predictor of gaming in difficult life situations and there may be a range of factors that could lead individuals to feel less confident in their abilities to cope when facing challenges. These could be developmental or contextual, but may also be linked to other psychological factors such as mental health and resilience, individual traits such as self-esteem and personality, or social factors such as social support and social competence. Future research should examine such factors in the context of gaming during difficult life situations. Moreover, with age a significant predictor, future research should explore younger gamers. Studies show that gaming influences children as young as 8 years old, predicting their social competence (Hygen et al., 2019). Higher social competence at ages 8 and 10 predicted less time spent gaming two years later (Hygen et al., 2019). Future research should thus explore gaming in younger age groups, which can provide insights that could aid in developing strategies for enhancing coping and resilience. Gender differences should also be investigated as studies show differences in emotion regulation (Nolen-Hoeksema & Aldao, 2011) self-esteem, social support and life satisfaction (Matud et al., 2014), and stress, rumination and depression between males and females (Jose & Brown, 2008). The current study also did not consider whether participants displayed any signs of problematic gaming despite previous research indicating that playing as a means of avoidance and escape can lead to problematic gaming (Snodgrass et al., 2014). Understanding the underlying risk and protective factors has important implications in terms of research and practice.

Finally, while the current study addresses some gaps in current research and presents a new measure, the findings are based on an overall score on the GDLS measure as an initial exploratory study. The results showed that there are in fact four distinct subscales in relation to gaming behaviours in difficult life situations which represent both direct and indirect acts

for coping with life challenges. Future research should examine the subscales separately as there may be differential effects of variables on these different behaviours. To this end, further validation on the GDLS scale with other gaming samples should be undertaken.

4. Conclusion

Individuals differ in the ways they cope and adjust to difficult life situations. For some, life challenges can lead to impaired functioning while others demonstrate resilience over their experiences, and variables such as emotion regulation and coping self-efficacy represent risk and protective factors in this regard. This exploratory study showed that players turn to gaming when facing life difficulties in both indirect (distraction from difficulties and desire to feel a sense of achievement) and direct (seeking social support and simulating challenges within the game) ways. Correlations indicated that maladaptive emotion regulation and lower coping self-efficacy were associated with gaming during difficult life situations, but lower coping self-efficacy was the only significant predictor. Time spent gaming along with younger age also predicted gaming during difficult life situations. The study paves the way for future research via a newly validated measure and outlines additional variables for examination including individual, psychological, social, developmental and contextual. Further research can build on these findings and has potential to inform effective strategies for enhancing coping and resilience, and interventions for at-risk individuals. Importantly, even within the negative connotations that gaming could elicit, resorting to gaming when dealing with life difficulties can also have beneficial outcomes. Adding to knowledge on gaming as an outlet during difficulties has potential clinical and therapeutic implications.

5. References

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237.

Aldwin, C. M. (1991). Does age affect the stress and coping process? Implications of age differences in perceived control. *Journal of Gerontology*, *46*(4), P174–P180.

Balzarotti, S., Biassoni, F., Villani, D., Prunas, A., & Velotti, P. (2014). Cognitive emotion regulation strategies as predictors of well-being in adults. *J Happiness Stud*.

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. *Journal of Behavioral Addictions*, *8*(1), 25–34. https://doi.org/10.1556/2006.8.2019.02

Bowditch, L., Chapman, J., & Naweed, A. (2018). Do coping strategies moderate the relationship between escapism and negative gaming outcomes in World of Warcraft (MMORPG) players? *Computers in Human Behavior*, *86*, 69–76. https://doi.org/10.1016/j.chb.2018.04.030

Bowman, N. D., & Tamborini, R. (2012). Task demand and mood repair: The intervention potential of computer games. *New Media & Society*, *14*(8), 1339–1357. https://doi.org/10.1177/1461444812450426

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.

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British Journal of Health Psychology*, *11*(3), 421–437.

Colder Carras, M., Kalbarczyk, A., Wells, K., Banks, J., Kowert, R., Gillespie, C., & Latkin, C. (2018). Connection, meaning, and distraction: A qualitative study of video game play and mental health recovery in veterans treated for mental and/or behavioral health problems. *Social Science & Medicine (1982)*, *216*, 124–132. https://doi.org/10.1016/j.socscimed.2018.08.044

Colzato, L. S., van den Wildenberg, W. P., Zmigrod, S., & Hommel, B. (2013). Action video gaming and cognitive control: Playing first person shooter games is associated with improvement in working memory but not action inhibition. *Psychological Research*, *77*(2), 234–239.

Czikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268.

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*(3), 814–825.

Ferguson, C. J., & Rueda, S. M. (2010). The hitman study. *European Psychologist*.

Folkman, S., Lazarus, R. S., Pimley, S., & Novacek, J. (1987). Age differences in stress and coping processes. *Psychology and Aging*, *2*(2), 171.

Francis, D. B., Comello, M. L. G., & Marshall, L. H. (2016). How does gameplaying support values and psychological well-being among cancer survivors? *Games for Health Journal*, *5*(2), 128–134.

Gaetan, S., Bréjard, V., & Bonnet, A. (2016). Video games in adolescence and emotional

    functioning: Emotion regulation, emotion intensity, emotion expression, and

    alexithymia. *Computers in Human Behavior*, *61*, 344–349.

    https://doi.org/10.1016/j.chb.2016.03.027

Granic, I., Lobel, A., & Engels, R. C. (2014). The benefits of playing video games. *American*

    Psychologist, *69*(1), 66.

Green, C. S., & Bavelier, D. (2015). Action video game training for cognitive enhancement.

    Current Opinion in Behavioral Sciences, *4*, 103–108.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review*

    of General Psychology, *2*(3), 271–299.

Gross, J. J. (2015). The extended process model of emotion regulation: Elaborations,

    applications, and future directions. *Psychological Inquiry*, *26*(1), 130–137.

Gross, J. J., & John, O. P. (2003). *Individual differences in two emotion regulation processes:*

    Implications for affect, relationships, and well-being.

Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical*

    Psychology: Science and Practice, *2*(2), 151–164.

Gross, J. J., & Thompson, R. A. (2007). *Emotion regulation: Conceptual foundations*.

Hemenover, S. H., & Bowman, N. D. (2018). Video games, emotion, and emotion regulation:

    Expanding the scope. *Annals of the International Communication Association*, *42*(2),

    125–143.

Hollett, K. B., & Harris, N. (2020). Dimensions of emotion dysregulation associated with

    problem video gaming. *Addiction Research & Theory*, *28*(1), 38–45.

Hygen, B. W., Belsky, J., Stenseng, F., Skalicka, V., Kvande, M. N., Zahl-Thanem, T., &

    Wichstrøm, L. (2019). Time spent gaming and social competence in children:

    Reciprocal effects across childhood. *Child Development*.

Iacovides, I., & Mekler, E. D. (2019). The Role of Gaming During Difficult Life

    Experiences. *Proceedings of the 2019 CHI Conference on Human Factors in*

    Computing Systems, 1–12.

James, E. L., Bonsall, M. B., Hoppitt, L., Tunbridge, E. M., Geddes, J. R., Milton, A. L., &

    Holmes, E. A. (2015). Computer game play reduces intrusive memories of

    experimental trauma via reconsolidation-update mechanisms. *Psychological Science*,

    26(8), 1201–1215.

Jones, C., Scholes, L., Johnson, D., Katsikitis, M., & Carras, M. C. (2014). Gaming well:

    Links between videogames and flourishing mental health. *Frontiers in Psychology*, *5*,

    260.

Jose, P. E., & Brown, I. (2008). When does the gender difference in rumination begin?

    Gender and age differences in the use of rumination by adolescents. *Journal of Youth*

    and Adolescence, *37*(2), 180–192.

Juul, J. (2013). *The art of failure: An essay on the pain of playing video games*. MIT press.

Kökönyei, G., Kocsel, N., Király, O., Griffiths, M. D., Galambos, A., Magi, A., …

    Demetrovics, Z. (2019). The role of cognitive emotion regulation strategies in

    problem gaming among adolescents: A nationally representative survey study.

    Frontiers in Psychiatry, *10*, 273.

Kowert, R., Domahidi, E., & Quandt, T. (2014). The Relationship Between Online Video

    Game Involvement and Gaming-Related Friendships Among Emotionally Sensitive

    Individuals. *Cyberpsychology, Behavior and Social Networking*, *17*(7), 447–453.

    https://doi.org/10.1089/cyber.2013.0656

Lam, L. T., Peng, Z., Mai, J., & Jing, J. (2009). Factors associated with Internet addiction

    among adolescents. *Cyberpsychology & Behavior*, *12*(5), 551–555.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing

    company.

Lobel, A., Granic, I., & Engels, R. C. (2014). Stressful gaming, interoceptive awareness, and

    emotion regulation tendencies: A novel approach. *Cyberpsychology, Behavior, and*

    Social Networking, *17*(4), 222–227.

Loton, D., Borkoles, E., Lubman, D., & Polman, R. (2016). Video Game Addiction,

    Engagement and Symptoms of Stress, Depression and Anxiety: The Mediating Role

    of Coping. *International Journal of Mental Health and Addiction*, *14*(4), 565–578.

    https://doi.org/10.1007/s11469-015-9578-6

Maroney, N., Williams, B. J., Thomas, A., Skues, J., & Moulding, R. (2019). A Stress-

    Coping Model of Problem Online Video Game Use. *International Journal of Mental*

    Health and Addiction, *17*(4), 845–858. https://doi.org/10.1007/s11469-018-9887-7

Nah, F. F.-H., Eschenbrenner, B., Zeng, Q., Telaprolu, V. R., & Sepehr, S. (2014). Flow in

    gaming: Literature synthesis and framework development. *International Journal of*

    Information Systems and Management, *1*(1–2), 83–124.

Neubauer, A. B., Smyth, J. M., & Sliwinski, M. J. (2019). Age Differences in Proactive

    Coping With Minor Hassles in Daily Life. *The Journals of Gerontology Series B:*

    Psychological Sciences and Social Sciences, *74*(1), 7–16.

    https://doi.org/10.1093/geronb/gby061

Nolen-Hoeksema, S., & Aldao, A. (2011). Gender and age differences in emotion regulation

    strategies and their relationship to depressive symptoms. *Personality and Individual*

    Differences, *51*(6), 704–708.

Nuyens, F. M., Kuss, D. J., Lopez-Fernandez, O., & Griffiths, M. D. (2019). The empirical

    analysis of non-problematic video gaming and cognitive skills: A systematic review.

    International Journal of Mental Health and Addiction, *17*(2), 389–414.

Pilar Matud, M., Bethencourt, J. M., & Ibáñez, I. (2014). Relevance of gender roles in life

satisfaction in adult people. *Personality and Individual Differences*, *70*, 206–211.

https://doi.org/10.1016/j.paid.2014.06.046

Primack, B. A., Carroll, M. V., McNamara, M., Klem, M. L., King, B., Rich, M., … Nayak,

S. (2012). Role of Video Games in Improving Health-Related Outcomes: A

Systematic Review. *American Journal of Preventive Medicine*, *42*(6), 630–638.

https://doi.org/10.1016/j.amepre.2012.02.023

Procci, K., Bowers, C., Wong, C., & Andrews, A. (2013). Minigames for mental health:

Improving warfighters' coping skills and awareness of mental health resources.

GAMES FOR HEALTH: Research, Development, and Clinical Applications, *2*(4),

240–246.

Ptacek, J. T., Smith, R. E., & Dodge, K. L. (1994). Gender Differences in Coping with Stress:

When Stressor and Appraisals Do Not Differ. *Personality and Social Psychology

Bulletin*, *20*(4), 421–430. https://doi.org/10.1177/0146167294204009

Reinecke, L. (2009). Games and recovery: The use of video and computer games to

recuperate from stress and strain. *Journal of Media Psychology*, *21*(3), 126–142.

Rieger, D., Frischlich, L., Wulf, T., Bente, G., & Kneer, J. (2015). Eating ghosts: The

underlying mechanisms of mood repair via interactive and noninteractive media.

Psychology of Popular Media Culture, *4*(2), 138.

Russoniello, C. V., Fish, M., & O'Brien, K. (2013). The Efficacy of Casual Videogame Play

in Reducing Clinical Depression: A Randomized Controlled Study. *Games for Health

Journal*, *2*(6), 341–346. https://doi.org/10.1089/g4h.2013.0010

Skinner, E. A., & Zimmer-Gembeck, M. J. (2007). The development of coping. *Annu. Rev.

Psychol.*, *58*, 119–144.

Snodgrass, J. G., Lacy, M. G., Dengah, H. J. F., Eisenhauer, S., Batchelder, G., & Cookson, R. J. (2014). A vacation from your mind: Problematic online gaming is a stress response. *Computers in Human Behavior*, *38*, 248–260. https://doi.org/10.1016/j.chb.2014.06.004

Tamborini, R., Bowman, N. D., Eden, A., Grizzard, M., & Organ, A. (2010). Defining media enjoyment as the satisfaction of intrinsic needs. *Journal of Communication*, *60*(4), 758–777.

Trepte, S., Reinecke, L., & Juechems, K. (2012). The social side of gaming: How playing online computer games creates online and offline social support. *Computers in Human Behavior*, *28*(3), 832–839.

van Ingen, E., Utz, S., & Toepoel, V. (2016). Online coping after negative life events: Measurement, prevalence, and relation with internet activities and well-being. *Social Science Computer Review*, *34*(5), 511–529.

Velezmoro, R., Lacefield, K., & Roberti, J. W. (2010). Perceived stress, sensation seeking, and college students' abuse of the Internet. *Computers in Human Behavior*, *26*(6), 1526–1530.

Villani, D., Carissoli, C., Triberti, S., Marchetti, A., Gilli, G., & Riva, G. (2018). Videogames for emotion regulation: A systematic review. *Games for Health Journal*, *7*(2), 85–99.

Wichstrøm, L., Stenseng, F., Belsky, J., von Soest, T., & Hygen, B. W. (2019). Symptoms of Internet Gaming Disorder in Youth: Predictors and Comorbidity. *Journal of Abnormal Child Psychology*, *47*(1), 71–83. https://doi.org/10.1007/s10802-018-0422-x

Yan, W., Li, Y., & Sui, N. (2014). The relationship between recent stressful life events, personality traits, perceived family functioning and internet addiction among college students. *Stress and Health*, *30*(1), 3–11.

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. *International Journal of*

    Environmental Research and Public Health, *15*(1), 30.

Zimmermann, P., & Iwanski, A. (2014). Emotion regulation from early adolescence to

    emerging adulthood and middle adulthood: Age differences, gender differences, and

    emotion-specific developmental variations. *International Journal of Behavioral*

    Development, *38*(2), 182–194.

Dear Author:

I am happy to report that your manuscript "Gaming when things get tough? Examining how emotion regulation and coping self-efficacy influence gaming during difficult life situations" has been accepted in its current form for publication in Games and Culture. Comments from the reviewer(s) who reviewed your manuscript are included at the end of this letter.

Please login to Manuscript Central as soon as possible to address any changes the editor or reviewer(s) might have requested and to complete your in-system author agreement form.

If you have any questions, please direct them to Sweety Singh who can be reached at gamesandculture@sagepub.com.

Thank you for your contribution to Games and Culture.

Sincerely,
Tanya Krzywinska
Editor, Games and Culture