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## Self-Regulation as a Mediator of the Associations Between Passion for Video Games and Well-Being

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### Abstract

Video games can satisfy people's basic psychological needs of autonomy, competence, and relatedness. This may lead them to develop a passion for the activity, which can be harmonious or obsessive. These different types of passions are associated with different well-being outcomes: harmonious passion (HP) is associated with positive effects such as Satisfaction with Life (SWL), obsessive passion (OP) is associated with adverse effects such as psychological distress. Although time spent playing video games has sometimes been found to be a predictor of poor well-being, there is a lack of understanding in its role in explaining the relationship between passion and well-being compared with other factors. Self-regulation is an important factor in predicting habits, including video game play. In this cross-sectional study ( $N=182$ ), we investigated whether self-regulation or playtime better mediated the associations between different passion orientations and well-being (i.e., SWL, global subjective well-being, and psychological distress) among video game players. A path analysis revealed that people with higher HP for video games reported higher levels of self-regulation and those with higher OP for video games reported lower levels of self-regulation. Our findings also indicate that self-regulation provides a more comprehensive explanation for the relationship between passion and well-being. Overall, this study provides further support for the importance of self-regulation as a determinant of well-being in video game players rather than more arguably surface-level metrics such as time spent playing. These findings have implications for game developers and clinicians who design interventions for individuals who may experience unregulated video game play.

**Keywords:** video games, passion, well-being, self-regulation

### Introduction

PLAYING VIDEO GAMES is among the most popular leisure activities, with an estimated 3.0 billion players worldwide.<sup>1</sup> Games are designed to satisfy people's basic psychological needs for competence, autonomy and relatedness,<sup>2</sup> which can lead players to develop a passion for video gaming.<sup>3</sup> Such passion can be harmonious and/or obsessive.<sup>4,5</sup> Harmonious passion (HP) for gaming has been associated

with positive outcomes, such as social capital and life satisfaction<sup>6,7</sup>; however, obsessive passion (OP) for gaming has been associated with negative outcomes, such as loneliness and psychological distress.<sup>6,7</sup>

Because people invest considerable time and effort in their passions,<sup>8</sup> previous research has mostly focused on negative well-being outcomes in relation to time spent playing,<sup>9</sup> yet other evidence suggests that how people engage with video games might better explain the relationship between passion

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and well-being.<sup>10</sup> Using the theoretical frameworks of Dualistic Model of Passion and self-regulation, the current research sought to advance our understanding of how passion for gaming is associated with well-being by examining the mediating roles of self-regulation ability and time spent gaming.

### Dualistic Model of Passion

Passion is a strong inclination toward activities in which people find value and enjoyment and as a result are willing to invest time and effort.<sup>3,8</sup> HP arises from autonomous internalization of an enjoyable activity, engaged in willingly in balance with other life activities.<sup>8</sup> Need satisfaction within a target activity and in daily life has been found to predict greater HP for an activity.<sup>11–14</sup> HP predicts greater levels of subjective vitality and life satisfaction,<sup>15</sup> greater work-related satisfaction and performance,<sup>16</sup> and decreased burn-out.<sup>17</sup> HP for gaming has been associated with positive affect,<sup>18</sup> fewer negative physical symptoms resulting from excessive time spent playing video games,<sup>19</sup> skill development, motivation to relax and recreate, post-play energy, increased social capital, reduced loneliness, and improved life-satisfaction and mental health.<sup>6,7,13,14</sup>

OP arises when an individual experiences a controlled internalization of an activity into their personal identity, whereby intrapersonal or interpersonal contingencies compel them to engage in the activity for social acceptance, self-esteem, or due to uncontrollable excitement from engagement.<sup>8</sup> Greater OP for an activity is associated with need frustration and absence of need satisfaction in daily life,<sup>11–14</sup> and higher levels of need satisfaction with the activity.<sup>11</sup> OP for an activity is thought to be a compensatory strategy to combat failures in satisfying basic needs in other areas of life.<sup>7,11</sup> OP is associated with adverse outcomes, including increased interpersonal conflicts,<sup>20</sup> tension resulting from work/life balance,<sup>21</sup> negative affect, and rumination.<sup>4,5</sup> OP for gaming is associated with dissociation motivation<sup>22</sup> and ill-being.<sup>6,7,13</sup>

### Time Spent Gaming

Passion for gaming could influence well-being through time spent gaming.<sup>9,23</sup> Excessive amounts of time spent playing video games has been shown to predict decreased levels of offline social support and increased levels of depressive and anxious symptoms.<sup>23</sup> Kirby et al.<sup>9</sup> similarly found time spent gaming to negatively predict psychological well-being; however, this relationship was fully mediated when accounting for problematic play and immersion.

Przybylski and Weinstein<sup>24</sup> suggested that patterns of engagement may be more important than the amount of time spent on screen-based activities. In fact, time spent on video gaming is more strongly associated with HP than OP<sup>25</sup>; did not significantly predict problematic gaming when accounting for OP<sup>26</sup>; and time spent playing video games may improve affective well-being.<sup>27</sup> As such, it is important to look beyond time spent playing video games and consider how players are able to regulate themselves to fit video game play in with their other activities.<sup>10</sup>

### Self-Regulation

Self-regulation is an important trait for affective well-being and predicting success in life.<sup>28,29</sup> It involves setting goals, observing and evaluating actions in comparison with

internal and external standards, and altering behaviors using self-reactive incentives and reflective processes to control impulses and attain goals.<sup>30–32</sup>

Prior studies found self-regulation was an important factor in predicting video game engagement.<sup>10,33–36</sup> People with low levels of self-regulation tend to exhibit more problematic video gaming behaviors, including rigid habits of gaming.<sup>33,34</sup> Previous research has also established that OP is associated with greater impulsivity and activity addiction, and low self-regulatory capacity,<sup>20,37,38</sup> which supports the idea that low levels of self-regulation could account for a negative association between OP for video games and well-being.

In contrast, HP has been found to be positively associated with self-regulation and knowledge management in the context of e-learning.<sup>39,40</sup> Thus, greater self-regulation could account for the positive association between HP for video games and well-being.

### Current Study

This study investigates the potential well-being costs and benefits of OP and HP for gaming by examining the potential mediating roles of self-regulation and time spent playing video games. Based on the literature overview presented earlier, we expected self-regulation to play a stronger mediating role, but thought it was important to establish this while controlling for playtime.

Hypothesis 1 (H1): HP will have a positive indirect effect on well-being outcomes (greater life satisfaction and well-being, and less psychological distress) through greater self-regulation.

Hypothesis 2 (H2): OP will have a negative indirect effect on well-being outcomes (lower life satisfaction and well-being, and greater psychological distress) through lower self-regulation.

Research Question (RQ): Does time spent gaming mediate the positive relationship between HP and well-being or the negative relationship between OP and well-being?

### Methods

#### Participants

We recruited 182 participants (133 males, 45 females, and 4 other), aged 17–69 years ( $M = 29.56$ ,  $SD = 8.59$ ),\* on video gaming-related Facebook groups. Participants were 17 years or older, provided informed consent, and had an interest and active participation in video games (they reported playing video games 2–96 hours/week,  $M = 23.85$ ,  $SD = 17.78$ ). They could win one of three \$40USD Amazon gift cards. Only completed questionnaires were used in the analyses. Ethics approval was provided by the Queensland University of Technology Ethics Committee (approval number 2000000387).

#### Measures

Participants were asked to indicate their age, gender, and estimated hours of weekly video game play. They filled out the 12-item Passion Scale<sup>21</sup> (HP  $\alpha = 0.71$ ; OP  $\alpha = 0.80$ ), the 31-item Short Self-Regulation Questionnaire<sup>41</sup> ( $\alpha = 0.93$ ),

\*Supplementary analyses confirmed that our reported pattern of results did not change when accounting for age (Supplementary Tables S1–S3).

TABLE 1. EXAMPLE ITEMS AND RESPONSE SCALES FOR THE MEASURES

Scale	Example item(s)	Response scale
Passion scale	<i>Video gaming</i> reflects the qualities I like about myself ( <i>harmonious passion</i> ) If I could I would only play <i>video games</i> ( <i>obsessive passion</i> )	1 = <i>Strongly disagree</i> , 7 = <i>Strongly agree</i>
Short Self-Regulation Questionnaire	I usually only have to make a mistake one time to learn from it ( <i>impulse control</i> ) I set goals for myself and keep track of my progress ( <i>goal setting</i> )	1 = <i>Strongly disagree</i> , 5 = <i>Strongly agree</i>
Kessler Psychological Distress scale	During the past 30 days, how often did you feel...—Nervous?	1 = <i>None of the time</i> , 5 = <i>All of the time</i>
Wellbeing Profile—Medium (GSWB)	I do not get upset easily ( <i>emotional stability</i> ) All things considered, I would describe myself as a happy person ( <i>positive emotions</i> ) There are people in my life who really care about me ( <i>positive relationships</i> )	1 = <i>Completely disagree</i> , 9 = <i>Completely agree</i>
SWL scale	In most ways my life is close to ideal	1 = <i>Strongly disagree</i> , 7 = <i>Strongly agree</i>

GSWB, Global Subjective Wellbeing; SWL, Satisfaction with Life.

the 6-item Kessler Psychological Distress Scale<sup>42</sup> ( $\alpha=0.89$ ), the 15-item Wellbeing Profile-Medium,<sup>43</sup> which assesses Global Subjective Wellbeing (GSWB) ( $\alpha=0.90$ ), and the 5-item Satisfaction with Life (SWL) scale<sup>44</sup> ( $\alpha=0.89$ ). See Table 1 for example items and response scales.

#### Data analysis

We defined and tested a path model in which HP and OP were predictors, self-regulation and playtime were parallel mediators, and the well-being measures were outcomes (Fig. 1). We assessed total effects to confirm previous findings. Then, we investigated indirect effects of HP and OP on well-being outcomes through self-regulation and playtime to evaluate potential mediation effects. Path analysis was conducted in JASP Version 0.14.1.<sup>45</sup>

#### Results

All of the total effects were significant (Table 2). OP was negatively associated with GSWB and SWL, and positively associated with psychological distress. Conversely, HP was positively associated with GSWB and SWL, and negatively associated with psychological distress.

Table 3 shows the indirect effects from OP and HP on the well-being measures through self-regulation and playtime. The indirect effects of HP on well-being were significant and consistently linked HP with better well-being through greater self-regulation. The indirect effects of OP on well-being were significant and consistently linked OP with worse well-being through lower self-regulation. Conversely, only one of the indirect effects through playtime reached significance, that is, a negative indirect effect of OP on GSWB through more playtime.

The analysis of direct effects (Table 4) showed that after controlling for the mediators, OP was positively associated with psychological distress, whereas the associations with GSWB and SWL were not significant. The direct effect of HP on psychological distress did not reach significance, but effects on GSWB and SWL were significant and positive.

#### Discussion

This study analyzed whether self-regulation or playtime mediated the associations between different passion orientations and well-being among video gamers. Path analysis of total effects revealed the expected associations between HP and better well-being outcomes and between OP and worse

FIG. 1. Mediated pathway model.

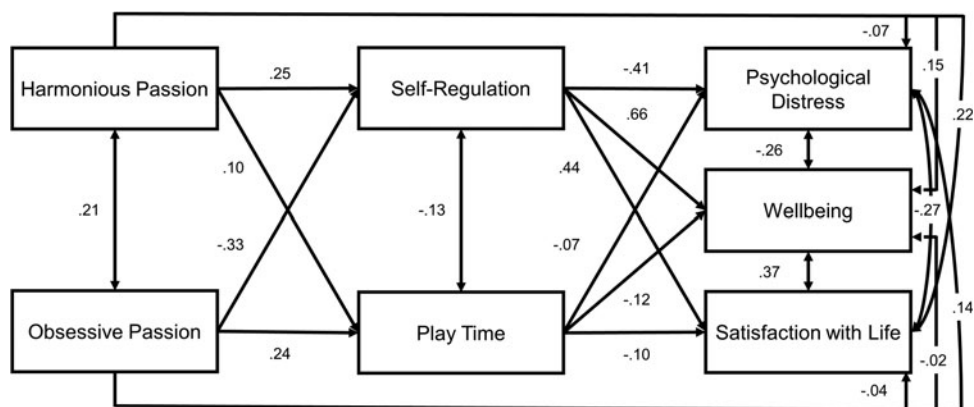


TABLE 2. STANDARDIZED TOTAL EFFECTS OF PASSION ON WELL-BEING

	<i>Psychological distress</i>	<i>GSWB</i>	<i>SWL</i>
OP	0.26***	-0.27***	-0.21***
HP	-0.18*	0.30***	0.32***

\**p* < 0.05; \*\*\**p* < 0.001.

HP, harmonious passion; OP, obsessive passion.

well-being outcomes. Examination of the indirect effects revealed significant mediation of the associations between HP and all well-being outcomes through greater self-regulation, supporting H1, and between OP and all well-being outcomes through lower self-regulation, supporting H2.

In relation to the RQ, there was limited support for time spent gaming as a mediator. It mediated the negative association between OP and GSWB, but none of the other indirect effects were significant. After controlling for the mediators, there remained direct effects of OP on psychological distress and of HP on GSWB and SWL, suggesting the operation of additional mechanisms.

These total effect findings are consistent with past research, which found that HP for gaming was associated with more favorable physical and psychological outcomes<sup>6,7,13,19</sup>; OP for screen-based activities was associated with worse well-being outcomes<sup>6,7,11,13,14</sup>; and OP for gaming was associated with physical symptoms from extended gaming.<sup>19</sup> Our mediation analysis extends previous research and suggests that self-regulation may be a key mechanism that accounts for the positive association of HP for gaming and well-being and the negative association of OP for gaming and well-being.

The positive association between HP and self-regulation is consistent with the view that those with HP engage in activities in harmony with other responsibilities by setting goals and monitoring their behaviors.<sup>8</sup> The negative association between OP and self-regulation is consistent with the idea that those with OP feel a “need” to engage in an activity and struggle to balance involvement with other responsibilities, surrendering to their impulses.<sup>34</sup> Our findings support previous research on the benefits of HP over OP for self-regulation in an e-learning context<sup>39</sup> and negative implications of OP for future self-regulatory efforts<sup>37</sup> and activity addiction.<sup>20,37</sup>

Time spent gaming accounted for some of the association between OP and GSWB, indicating the potential costs of spending too much time on video games. This could be due to opportunity costs, or the associated rumination and neg-

TABLE 3. STANDARDIZED INDIRECT EFFECTS OF PASSION ON WELL-BEING THROUGH SELF-REGULATION AND PLAYTIME

	<i>Self-regulation</i>	<i>Playtime</i>
OP → psychological distress	0.14***	-0.02
HP → psychological distress	-0.11**	-0.01
OP → GSWB	-0.22***	-0.03*
HP → GSWB	0.17**	-0.01
OP → SWL	-0.15***	-0.02
HP → SWL	0.11**	-0.01

\**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001.

TABLE 4. STANDARDIZED DIRECT EFFECTS OF PASSION ON WELL-BEING AFTER CONTROLLING FOR SELF-REGULATION AND PLAYTIME

	<i>Psychological distress</i>	<i>GSWB</i>	<i>SWL</i>
OP	0.14*	-0.02	-0.04
HP	-0.07	0.15*	0.22*

\**p* < 0.05.

ative affect about neglected responsibilities.<sup>4,5</sup> This indirect effect was small and did not extend to the other well-being outcomes.

Comparing the mediating roles of self-regulation and time spent gaming indicates that self-regulation provides a more comprehensive explanation for the relationship between passion and well-being. Similarly, previous research found that time spent gaming fails to significantly contribute to poor outcomes when other factors such as problematic gaming are taken into account.<sup>9</sup> Given the links between low observed self-regulation and problematic gaming,<sup>33</sup> our findings provide further support for the importance of self-regulation as a determinant of well-being in video gamers.

With the growing popularity of video game streaming and competitive/professional play, a significant time investment may become increasingly normalized much as in traditional sports. We suggest being able to regulate *when* one plays may be more important for well-being than simply *how much* someone plays.

Limitations

This study had limitations. First, the cross-sectional correlational design limits our ability to draw causal inferences. Second, the accuracy of self-reported time spent gaming may not correspond with objectively measured playtime.<sup>46</sup> Third, the sample consisted of predominantly men (73 percent). However, supplementary analyses (Supplementary Table S4) revealed that gender was not associated with any of our variables. Fourth, our analyses treat HP and OP independently; future research could usefully consider the quadripartite model of passion (allowing for situations in which a person exhibits high levels of OP and HP).<sup>19</sup>

Finally, this study did not investigate different self-regulatory mechanisms (e.g., executive functioning and cognitive flexibility),<sup>47</sup> which limits our explanation of which mechanisms might be most important in mediating the relationship between passion and well-being outcomes.

Future Directions and Implications

Our findings indicate that the negative relationship between OP and well-being is partly explained by lower levels of self-regulation. This suggests that targeting self-regulation directly could be effective in minimizing the negative impacts of OP. For example, prompting players to take regular breaks (e.g., between levels)<sup>48,49</sup> may create a design friction<sup>50</sup> that facilitates self-regulation. Alternatively, teaching younger video game players basic self-regulation skills may prove effective.

Alternatively, developing higher levels of HP could help improve self-regulation and well-being. Passion has been

shown to be susceptible to experimental manipulation through behavioral priming.<sup>37</sup> Finding ways to prime video game players to think of times when they engaged with video games harmoniously may induce more balanced gameplay behaviors. Shedding light on underlying mechanisms could assist health professionals treating those suffering distress from unregulated video gaming behaviors by informing useful intervention methodologies.

#### Author Disclosure Statement

No competing financial interests exist.

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#### Supplementary Material

Supplementary Table S1  
Supplementary Table S2  
Supplementary Table S3  
Supplementary Table S4

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