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Passion, Craving, and Affect In Online Gaming:  
Predicting How Gamers Feel When Playing and When Prevented from Playing

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**Abstract**

According to the Dualistic Model of Passion, two forms of passion can motivate a behavior: harmonious passion and obsessive passion. Across various life activities, studies have found that the two forms of passion show different relationships with affect, linking harmonious passion to positive affect and obsessive passion to negative affect. To investigate if this pattern also holds for online gaming, the present study investigated 160 gamers involved in playing massively multiplayer online role-playing games (MMOs) and examined positive and negative affect (a) when playing and (b) when prevented from playing. In addition, the effects of general affect and craving for playing MMOs were controlled for. Results were as expected from the Dualistic Model of Passion: Harmonious passion for online gaming predicted positive affect when playing whereas obsessive passion predicted negative affect when playing and when prevented from playing. Moreover, these effects remained unchanged when general affect and craving were controlled for. With this, the present research shows that individual differences in passion for online gaming explain unique variance in gaming-related emotions. Moreover, the present findings suggests that craving is a variable that future research on positive and negative affect in online gaming should pay closer attention to.

Keywords: digital gaming; passion; craving; affect

## **Introduction**

With ever more people having high-speed Internet access, online gaming has become increasingly popular, particularly among young adults. One of the most popular online games are massively multiplayer online role-playing games (MMORPGs or MMOs) such as World of Warcraft, which reached a worldwide subscriber base of over 12 million in 2010 (Blizzard Entertainment, 2010). While some research found that playing MMOs has harmful effects linking it to psychological problems such as Internet addiction (e.g., Parsons, 2005), other research found that playing MMOs has both positive and negative effects (e.g., Smyth, 2007). Following the latter perspective, the present study investigated the relationship between playing MMOs and positive and negative affect and the role that individual differences in passion for playing MMOs have in these relationships.

### **The Dualistic Model of Passion**

According to the Dualistic Model of Passion, two forms of passion can motivate a behavior: harmonious passion and obsessive passion (Vallerand et al., 2003). In harmonious passion, individuals engage in an activity entirely of their own free will, and engaging in the activity does not pose a conflict to other life domains. Here, the individual controls the passion. In obsessive passion, individuals engage in an activity because of intra- or interpersonal pressure, and engaging in the activity diverts time and resources away from other life domains. Here, the passion controls the person.

Research on harmonious and obsessive passion has investigated various life activities such as work, sports, dance, music, and studying (e.g., Carbonneau, Vallerand, Fernet, & Guay, 2008; Rip, Fortin, & Vallerand, 2006; Stoeber, Childs, Hayward, & Feast, 2011; Vallerand et al., 2003, 2006). Across activities, the findings show that harmonious passion tends to be associated

with positive characteristics, processes, and outcomes and obsessive passion with negative characteristics, processes, and outcomes. In particular, harmonious passion has been shown to be associated with self-reported positive affect, and obsessive passion with self-reported negative affect (e.g., Carbonneau, Vallerand, & Massicotte, 2010; Mageau & Vallerand, 2007; Philippe, Vallerand, Andrianarisoa, & Brunel, 2009; Vallerand et al., 2003, 2006; see Vallerand, 2008, 2010, for reviews).

However, the relationships between harmonious and obsessive passion and positive and negative affect are sometimes obscured when the two forms of passion overlap, as indicated by significant positive correlations (e.g., Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005; Ratelle, Vallerand, Mageau, Rousseau, & Provencher, 2004; Vallerand et al., 2003). In this case it is important to control for the overlap (e.g., by computing partial correlations or multiple regressions) to uncover the unique relationships of the two forms of passion (e.g., Vallerand et al., 2003).

### **Passion and Affect in Online Gaming**

Research on passion and affect in online gaming is limited. So far only two studies have investigated the relationships between harmonious and obsessive passion and positive and negative affect in online gaming. Moreover, both studies produced some unexpected findings. Consequently, further research is needed to investigate the relationships between harmonious and obsessive passion and positive and negative affect in online gaming.

The first study (C. K. J. Wang, Khoo, Liu, & Divaharan, 2008) investigated a sample of secondary school students and examined passion for online gaming and positive and negative affect when playing. Unfortunately, the measure of negative affect showed insufficient internal consistency (Cronbach's  $\alpha = .47$ ) so the study examined positive affect only. As expected,

harmonious passion showed a significant positive correlation with positive affect when playing. Unexpectedly, obsessive passion too showed a significant positive correlation.<sup>1</sup> Consequently, we reanalyzed the reported correlations by testing the difference between the correlations for significance (Meng, Rosenthal, & Rubin, 1992). Results showed that the positive correlation of harmonious passion was significantly larger than that of obsessive passion. Moreover, when we controlled for the significant overlap between harmonious and obsessive passion ( $r = .61, p < .001$ ) by computing partial correlations (Hays, 1973), obsessive passion ceased to show a significant positive correlation with positive affect, suggesting that only harmonious passion for online gaming (but not obsessive passion) shows a unique positive relationship with positive affect when playing online games.

The second study (Lafrenière, Vallerand, Donahue, & Lavigne, 2009) investigated a mixed sample of players using an online survey that, among other questions, asked players about their positive and negative affect when playing. Data were analyzed using canonical correlation analysis which found two canonical factors: one representing harmonious passion, and one representing obsessive passion. As expected, negative affect when playing showed a significant positive loading only on the factor representing obsessive passion. Unexpectedly, however, positive affect when playing showed significant positive loadings on both factors. Moreover, the loadings were of comparable size, suggesting that obsessive passion contributed to positive affect in the same manner (and to the same degree) as did harmonious passion—which is clearly at odds with predictions from the Dualistic Model of Passion. Unfortunately, the study did not report the bivariate correlations of passion and affect, so we could not reanalyze the relationships.

### **The Present Study**

Against this background, the aim of the present study was threefold. First, the study aimed to further investigate the relationships between harmonious and obsessive passion for online gaming and positive and negative affect when playing to address the questions unanswered by the previous two studies (Lafrenière et al., 2009; C. K. J. Wang et al., 2008). Second, the study aimed to investigate the relationships between the two forms of passion and affect when *prevented* from playing. Passion has been shown to predict not only affect when people are engaging in the activity they are passionate about, but also affect when they are prevented from engaging in the activity (Vallerand et al., 2003). Consequently, we expected the two forms of passion to show different relationships also with affect when prevented from playing. Third, the study aimed to investigate whether harmonious and obsessive passion make a unique contribution to explaining variance in positive and negative affect in online gaming when controlling for the effects of general positive and negative affect and craving.

Numerous studies have shown that harmonious passions is positively associated with general positive affect whereas obsessive passion is associated with general negative affect (see Vallerand, 2008, 2010, for reviews). Consequently, it is important to control for general affect to show that the relationships with affect in online gaming (i.e., affect when playing and affect when prevented from playing) are not mere reflections of gamers' general affect.

In contrast, no study so far has investigated how passion is associated with craving. However, there is circumstantial evidence suggesting that passion should be positively related to craving for gaming, and that craving for gaming may play a role in affect when gaming. First, a large online survey (C.-C. Wang & Chu, 2007) found that both harmonious and obsessive passion for online gaming showed positive correlations with online game addiction. Because craving—the experience of an overwhelming, often irresistible, desire for a substance or

activity—plays an important role in any form of addiction, it can be expected that harmonious and obsessive passion for online gaming would also show positive correlations with craving for online gaming. Second, Young and Wohl (2009), investigating gambling, found that craving was associated with positive and negative affect. In particular, craving was associated with positive and negative affect when gambling, but only with negative affect when prevented from gambling. Consequently, it can be expected that craving for gaming would also be associated with positive and negative affect when gaming, and with negative affect when prevented from gaming, which would make craving an important variable to control for when investigating the unique relationships between passion and affect in online gaming.

To examine the relationships of passion, craving, and affect in online gaming, we investigated gamers involved in playing MMOs. There are three reasons why playing MMOs is an ideal activity to investigate passion, craving, and affect in online gaming. First, MMOs are different from single-player online games as they require gamers to engage in social interactions and cooperative play and to build social networks in cyberspace. This makes these virtual worlds “sticky” and enables game worlds to retain players long-term (Bartle, 2004). Second, MMOs require a substantial investment of time. In *World of Warcraft*, for example, it can take the equivalent of over 15 days of logged playtime to achieve the maximum level for a character, which is a pre-requisite for inclusion in a range of social activities (Ducheneaut, Yee, Nickell, & Moore, 2006). Finally, in MMOs there is often no quantifiable end to the game. In principle, one can play “forever” which can make MMO players excessively immersed in their game. Consequently, playing MMOs represents an activity in which harmonious and obsessive passion can be expected to show different relationships with affect when engaging—and when prevented from engaging—in the activity.



## Method

### Participants

Our initial sample comprised 168 participants (133 male, 35 female) involved in playing MMOs. The mean age of participants was 25.4 years ( $SD = 9.0$  years). On average, participants played their favorite MMO (81% World of Warcraft, 13% Ultima Online, 6% other) for 27.1 hours per week ( $SD = 20.2$  hours).

### Procedure

Participants were recruited via postings on servers and online forums dedicated to MMOs. Participants completed the questionnaire online via a link to the School of Psychology's Questionnaire Management System (QMS). Participation was voluntary. As an incentive, a raffle prize worth £50 (approximately US \$80) was offered to those who completed the questionnaire. Only completed questionnaires were included in the analyses.

### Measures

**Passion.** To measure harmonious and obsessive passion for playing MMOs, we used the abbreviated form of the Passion Scale (Vallerand et al., 2003) that Rousseau, Vallerand, Ratelle, Mageau, and Provencher (2002) used when investigating passion for gambling, with instructions and items adapted to measure passion for playing one's favorite MMO. The scale comprised 10 items of which 5 measured harmonious passion (e.g., "This MMO is in harmony with the other activities in my life") and 5 obsessive passion (e.g., "I have almost an obsessive feeling for this MMO"). Players responded on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

**Affect.** To measure positive and negative affect, we used the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). To keep the questionnaire brief, we consulted Table 5 of the Watson et al. article and used only the five items with the highest factor loadings

on the positive affect factor to measure positive affect (e.g., “excited”) and the five items with the highest factor loadings on the negative affect factor to measure negative affect (e.g., “distressed”). To measure (a) general affect, (b) affect when playing, and (c) affect when prevented from playing we used the same 10 items, but different instructions: for (a), instructions asked how participants felt in general; for (b), how they felt when playing MMOs; and for (c), how they felt when prevented from playing MMOs. To all items, participants responded on a 5-point scale from 1 (*not at all*) to 5 (*very much*).

**Craving.** To measure craving, we used the Gambling Craving Scale (Young & Wohl, 2009) with instruction and items adapted to measure craving for playing MMOs. The scale comprised 9 items (e.g., “I crave to play right now”) and participants responded on a 7-point scale from 1 (*disagree*) to 7 (*agree*).

### **Preliminary Analyses**

To control for careless responding (see Gosling, Vazire, Srivastava, & John, 2004) we looked for participants who did not show any variance in their item responses to the scales (i.e., participants who gave the same response to all items). Six participants gave the same response to all items and were excluded from the analyses. Furthermore, we excluded two participants who were multivariate outliers (Mahalanobis distance with  $p < .001$ ; see Tabachnick & Fidell, 2007) resulting in a final sample of  $N = 160$  participants. To examine the data for possible gender differences, we computed a MANOVA with gender as the between-participants factor and the nine study variables as dependent variables. The effect of gender was nonsignificant with  $F(9, 150) < 1, p > .64$ . Consequently, we collapsed the data across gender.

For all scales, mean scores were computed by averaging responses across items. Table 1 shows the descriptive statistics and internal consistencies (Cronbach’s alphas).

## Results

### Correlation Analyses

First, we inspected the bivariate correlations (Table 1). As expected, harmonious passion showed significant positive correlations with general positive affect and with positive affect when playing. In contrast, obsessive passion showed significant positive correlations with general negative affect, negative affect when playing, and negative affect when prevented from playing. Moreover, both forms of passion showed a significant positive correlation with craving (which, as expected, showed positive correlations with positive and negative affect when playing and negative affect when prevented from playing).

However, each form of passion also showed an unexpected correlation: Obsessive passion showed a positive correlation with positive affect when playing, and harmonious passion showed a positive correlation with negative affect when prevented from playing. Consequently, we examined whether the overlap between harmonious and obsessive passion ( $r = .34, p < .001$ ) was responsible for the unexpected correlations by calculating partial correlations to control for this overlap (Table 2). Results confirmed that, once the overlap was controlled for, obsessive passion ceased to show a significant correlation with positive affect when playing, and harmonious passion ceased to show a significant correlation with negative affect when prevented from playing. Consequently, both forms of passion now showed the expected pattern of correlations with positive and negative affect. In addition, both harmonious and obsessive passion still showed positive correlations with craving which suggests that, in online gaming, both forms of passion are associated with craving. Therefore, it was important to control for individual differences in craving to examine the unique relationships of harmonious and obsessive passion in online gaming.

### **Hierarchical Regression Analyses**

Because general affect and craving showed substantial correlations with affect when playing and when prevented from playing (see Table 1), we conducted two sets of hierarchical regression analyses investigating if passion for online gaming had unique effects beyond general affect and craving, first controlling only for general affect (Model 1) and then controlling for both general affect and craving (Model 2). Table 3 shows the results.

Regarding Model 1, results showed that (a) harmonious passion for gaming predicted higher positive affect when playing after general affect was controlled for, and (b) obsessive passion predicted negative affect when playing and when prevented from playing after general affect was controlled for. Surprisingly, harmonious passion also contributed to the prediction of negative affect when prevented from playing. However, this changed in Model 2 when craving was additionally controlled for. Now, as was expected, only obsessive passion predicted higher levels of negative affect when prevented from playing. In contrast, the results for positive and negative affect when playing remained unchanged: When craving was controlled for—in addition to general affect—harmonious passion still predicted higher levels of positive affect and obsessive passion higher levels of negative affect when playing.

### **Discussion**

The aim of the present research was to investigate the relationship between passion and affect in online gaming in a sample of gamers involved in playing massively multiplayer online role-playing games (MMOs) by examining how individual differences in harmonious and obsessive passion predict positive and negative affect when playing and when prevented from playing while controlling for the effects of general affect and craving. Results were as expected from the Dualistic Model of Passion (Vallerand et al., 2003) and in line previous studies on

passion and affect in other life domains and activities (Vallerand, 2008, 2010): Harmonious passion for online gaming predicted positive affect when playing, and obsessive passion predicted negative affect when playing and when prevented from playing. Moreover, regression analyses indicated that these effects were unique to harmonious and obsessive passion, and not just mere reflections of gamers' general positive and negative affect. The findings indicate that gamers high in harmonious passion experience more positive affect than gamers low in harmonious passion when playing online games. In contrast, gamers high in obsessive passion experience more negative affect compared to gamers low in obsessive passion both when playing and when prevented from playing online games. For gamers high in obsessive passion, online games seem to bear no joy, only distress.

The present findings are the first to replicate the pattern that previous research on the Dualistic Model of Passion established for other activities in the domain of online gaming, thus providing further support for the generalizability of the model. Furthermore, regarding the previous finding that playing MMOs has positive and negative effects (Smyth, 2007), the present findings suggest that individual differences in harmonious and obsessive passion for gaming may explain why MMOs have different effects for different people. Because positive and negative affect are closely related to psychological well-being (Watson et al., 1988) and the present findings showed that harmonious and obsessive passion had unique effects on positive and negative affect in online gaming, the present findings suggest that harmonious and obsessive passion are factors contributing to, or undermining, the psychological well-being of people involved in online gaming.

Moreover, the present findings are the first to provide empirical evidence suggesting that individual differences in craving should be taken into account when investigating the effects of

harmonious and obsessive passion for activities that have the potential to be addictive such as digital gaming (C.-C. Wang & Chu, 2007) or gambling (Mageau et al., 2005; Ratelle et al., 2004). Finally, the findings indicate that craving for online gaming shows the same emotional pattern as craving for gambling, that is, positive correlations with positive and negative affect when engaging in the activity and with negative affect when prevented from engaging in the activity (cf. Young & Wohl, 2009), suggesting that craving is a variable that research on excessive digital gaming and online game addiction may pay closer attention to.

It is important to note a number of limitations of the present study. First, the study focused on positive and negative affect. While positive and negative affect are important indicators of psychological well-being, future studies should include additional variables of well-being (e.g., overall health, sleep quality, social life; Smyth, 2007) to investigate the positive and negative effects of passion in online gaming. Second, the study was cross-sectional so the findings from the correlation and regression analyses should not be interpreted in a temporal or causal sense. Future studies should therefore employ longitudinal designs to establish the temporal and causal pathways between the variables (Taris, 2000). Finally, the study investigated gamers involved in playing MMOs. Future research needs to examine if the findings generalize to other types of online and offline digital gaming such as one-player action adventures, first-person shooters, and strategy games (cf. Przybylski, Weinstein, Ryan, & Rigby, 2009).

Despite these limitations, the present findings make an important contribution to our understanding of how passion for online gaming is related to craving and affect. In particular, they show that harmonious and obsessive passion explain variance in gaming-related affect beyond variance explained by general affect or craving. With this, individual differences harmonious and obsessive passion are an important factor to help explain why online gaming has

positive effects in some people and negative effects in others.

### Footnotes

<sup>1</sup>All correlations reported in C. K. J. Wang et al. (2008, Table 2) should be positive, not negative as they appear in the printed article (C. K. J. Wang, personal communication, August 26th, 2010).

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Table 1  
*Correlations and Descriptive Statistics*

Variable	1	2	3	4	5	6	7	8	9
Passion									
1. Harmonious passion									
2. Obsessive passion	.34***								
General affect									
3. Positive affect	.32***	.12							
4. Negative affect	.12	.44***	.23**						
Affect when playing									
5. Positive affect	.44***	.17*	.73***	.19*					
6. Negative affect	.15	.45***	.27***	.76***	.23**				
Affect when prevented from playing									
7. Positive affect	.04	-.06	.35***	.09	.23**	.21*			
8. Negative affect	.29***	.51***	.25**	.69***	.25**	.61***	.11		
9. Craving	.40***	.47***	.32***	.39***	.39***	.37***	.09	.47***	
<i>M</i>	3.19	1.83	3.43	1.84	3.53	1.67	2.59	1.87	3.21
<i>SD</i>	0.76	0.80	0.72	0.62	0.81	0.60	0.97	0.85	1.12
Cronbach's alpha	.67	.82	.77	.75	.83	.72	.86	.84	.85

Note.  $N = 160$ . All scores are mean scores (see Method section).

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 2  
*Partial Correlations of Passion with Affect and Craving*

Variable	Harmonious passion <sup>a</sup>	Obsessive passion <sup>b</sup>
General affect		
Positive affect	.30***	.01
Negative affect	-.04	.42***
Affect when playing		
Positive affect	.42***	.03
Negative affect	.00	.43***
Affect when prevented from playing		
Positive affect	.06	-.08
Negative affect	.15	.46***
Craving	.28***	.39***

*Note.*  $N = 160$ .

<sup>a</sup>Harmonious passion controlling for obsessive passion. <sup>b</sup>Obsessive passion controlling for harmonious passion.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 3

*Regression Analyses: Passion and Playing-Related Affect When Controlling for General Affect*

Variable	Affect when playing				Affect when prevented from playing			
	Positive affect		Negative affect		Positive affect		Negative affect	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
<i>Model 1</i>								
Step 1: General affect	.53***		.59***		.12***		.49***	
Positive affect		.72***		.10		.34***		.10
Negative affect		.03		.74***		.01		.67***
Step 2: Passion	.05***		.02*		.01		.07***	
Positive affect		.65***		.10		.36***		.05
Negative affect		.01		.67***		.06		.58***
Harmonious passion		.23***		-.01		-.05		.14*
Obsessive passion		.02		.15*		-.11		.21**

[Table 3, continued]

*Model 2*

Step 1: General affect and craving	.56***	.59***	.12***	.53***
Positive affect	.68***	.08	.35***	.04
Negative affect	-.03	.72***	.02	.60***
Craving	.18**	.06	-.03	.22***
Step 2: Passion	.03**	.01	.01	.04**
Positive affect	.63***	.10	.35***	.03
Negative affect	-.01	.67***	.06	.55***
Craving	.11	.01	.03	.12
Harmonious passion	.20***	-.01	-.05	.11
Obsessive passion	-.02	.15*	-.12	.17*

*Note.*  $N = 160$ .  $\Delta R^2 =$  change in  $R^2$ .  $\beta =$  standardized regression coefficient.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .