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Passion and Intrinsic Motivation in Digital Gaming

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ABSTRACT

Digital gaming is fast becoming a favorite activity all over the world. Yet very few studies have examined the underlying motivational processes involved in digital gaming. One motivational force that receives little attention in psychology is passion, which could help us understand the motivation of gamers. The purpose of the present study was to identify subgroups of young people with distinctive passion profiles on self-determined regulations, flow dispositions, affect, and engagement time in gaming. One hundred fifty-five students from two secondary schools in Singapore participated in the survey. There were 134 males and 8 females (13 unspecified). The participants completed a questionnaire to measure harmonious passion (HP), obsessive passion (OP), perceived locus of causality, disposition flow, positive and negative affects, and engagement time in gaming. Cluster analysis found three clusters with distinct passion profiles. The first cluster had an average HP/OP profile, the second cluster had a low HP/OP profile, and the third cluster had a high HP/OP profile. The three clusters displayed different levels of cognitive, affective, and behavioral outcomes. Cluster analysis, as this study shows, is useful in identifying groups of gamers with different passion profiles. It has helped us gain a deeper understanding of motivation in digital gaming.

INTRODUCTION

The videogame industry has become a multibillion dollar industry that rivals that of the movies.[1] *World of Warcraft*, a popular massively multiplayer online role-playing game (MMORPG) has over 8 million players worldwide. The Korean game *Maple Story*, especially popular among younger children, has a loyal following of more than 30 million players. Because gaming attracts so many people and is considered the fastest growing form of recreation, understanding the motivation determinants of gamers is an important area of research.

Descriptive studies such as Yee's[2] have explored gamers' motivations in digital gaming. The factor analysis revealed three main reasons gamers play: relationships (deriving pleasure in interacting with other gamers), immersion (identifying with game characters and living in the fantasy world of the game), and achievement (overcoming challenges and becoming powerful). Yee also found that gamers derive deep emotional experiences from their activities in the games. However, very few studies have examined the underlying psychological processes involved in these motivations.

One motivational force that receives little attention in psychology is passion, which could help us understand the behaviors of gamers. In this study, we used the conceptualization of passion described by Vallerand et al.[3] to examine the underlying psychological processes in digital gaming.

Passion is defined as "a strong inclination toward an activity that one finds important, invests time in, and likes."[3(p757)] There are two types of passion: harmonious passion (HP) and obsessive passion (OP). HP is the pursuit of or engagement in an activity by

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choice and is in harmony with other activities in different domains. This type of passion is linked to positive outcomes during and after the activity engagement. In contrast, OP is characterized as an internal pressure that forces a person to engage in the chosen activity. This form of passion is in conflict with activities in other life domains and is linked to negative outcomes during and after the activity engagement.

The two types of passion are closely linked to self-determination theory (SDT).[4] SDT is an organismic theory of motivation that accounts for psychological needs and motives. Psychological needs include autonomy, competence, and relatedness. Autonomy is the ownership of one's behavior. Competence the ability to produce desired outcomes and to experience mastery and effectiveness.[5] Relatedness is the feeling of being connected with others and of caring for and be cared for by others.[6] These three needs are assumed to be innate in SDT and are essential for people's survival, growth, and integrity.[7] If these three needs are satisfied, growth and development results, and intrinsic motivation for the task increases. When the three needs are not met, negative emotions such as anxiety and anger may result, and intrinsic motivation for the task is undermined.

Within SDT, Deci, and Ryan[4] outlined the organismic integration theory (OIT) to explain a process of internalization through which individuals satisfy their needs. OIT proposes a taxonomy of types of behavioral regulations in the internalization process, each one reflecting a qualitatively different "reason" for acting out the behavior in question. They are external regulation, introjected regulation, identification, and intrinsic motivation. Externally regulated behavior is controlled by external means such as rewards or external authority. Introjected regulation is behavior that is internally controlled or self-imposed, such as acting out feelings of guilt avoidance, and is characterized by the feeling of ought. Identified behavior is self-determined according to one's choice or values. It is characterized by feelings of want rather than ought. Finally, intrinsically motivated behavior is behavior that is solely for its own sake or enjoyment. These four behavioral regulations can be assessed by the Perceived Locus of Causality (PLOC) scale.[8] Two other regulations are included in the OIT: amotivation, a state of lacking the intention to act, and integrated regulation, which refers to behaviors that are performed volitionally. Vallerand et al.[3] have excluded both in their proposal.

Vallerand et al.[3] proposed that the two types of passion are closely linked to the internalization process described previously. Autonomous internalization of an activity leads to HP in which the person accepts that the activity is important for him or her and is not controlled by external rewards. Engagement in the activity is in full volition and not in conflict with other aspects of the person's life. In comparison, controlled internalization leads to OP in which the individual feels compelled to be engaged in the activity. There is an external force or internal contingency that controls the person, and this might conflict with activities in his or her other life domains.

It is hypothesized that HP should lead to greater positive affect and less negative affect compared to OP in an activity. In addition, behavioral engagement is more flexible in HP. That is, if a person derives positive benefits from the activity, he or she will persist. However, if negative outcomes are experienced on a regular basis, the person may decide to reduce or cease activity engagement. In contrast, OP leads to negative affect and conflict with other aspects of one's life. In terms of activity engagement, OP would lead to persistence in the activity even in the absence of positive emotions or in the face of important personal costs such as poor academic results or damaged relationships.

In previous studies, HP was generally found to be related to positive emotions, concentration, and flow, while OP was related to negative emotions, rigid persistence, conflict between activities and other life aspects, and self-destructive behavior.[3,9,10,11] However, Ratelle et al.[10] found that HP was not related to positive outcomes in gambling behavior. It appears that HP and OP may be activity-specific. In addition, although the two types of passion were correlated in gambling behavior, OP had stronger correlations with heavy gambling than did HP. Thus, the conceptualization of the two types of passion as two separate constructs was supported.

Previous studies have examined the independent effects of the two types of passion. No studies have sought to study the notion of passion at an intraindividual level. That is, how different levels of HP and OP may affect the cognition, affect, and behavior of a person at an intraindividual level. The purpose of the present study was to identify subgroups of young people with distinctive passion profiles on self-determined regulations, flow dispositions, affect, and engagement time in gaming. As no studies have been conducted in this area, we did not specify any hypotheses for the study. We assumed that individuals vary in the two types of passion, which would result in different levels of behavioral regulation, flow disposition, affect, and time spent engaging in digital gaming.

METHODS

Participants and Procedure

One hundred fifty-five students (134 males, 8 females, 13 unspecified) from two secondary schools in Singapore participated in the survey. They ranged in age from 11 to 17 years ($M = 13.78$; $SD = 1.03$). Teachers from the two schools invited gamers in their classes to participate in the study. Permission for the study was sought through the principals. The students were told that participation in the survey was voluntary and they were free to withdraw at any time. No student refused to take part. Questionnaires were administered in quiet classroom conditions.

Measures

The passion scale. A short version of the passion scale[3] was used to measure young people's obsessive and harmonious passion toward computer gaming (five items for each of the two subscales). Participants were asked to name one of their favorite games and then to complete the items as they applied to this activity. The OP items focused on a passive perspective of passion in which there is an internal compulsion to engage in the activity, and conflict may be experienced within the person. HP items focused on the positive aspects of passion in which the person is in control and the activity is in harmony with the person's other activities. Items were rated on a 7-point scale (1, do not agree at all; 7, completely agree).

Dispositional Flow Scale (DFS-2). The DFS-2[12] was used to assess nine theorized dimensions of flow, as proposed by Csikszentmihalyi.[13] The nine dimensions are challenge–skill balance, action–awareness merging, clear goals, unambiguous feedback, concentration on the task, sense of control, loss of self-consciousness, transformation of time, and autotelic experience. The DFS-2 is a 36-item inventory designed to assess the propensity to experience flow in a particular situation. Referring to their favorite game, participants were asked to respond to the stem, "When playing this game. . . . " Answers were given on a 7-point scale (1, almost never; 7, almost always).

Perceived Locus of Causality (PLOC). The PLOC scale developed by Goudas, Biddle, and Fox[14] was adapted to assess four types of regulatory styles in computer gaming. The stem for all the items was "I play this game. . . . " Introjected regulation was assessed through four items. External, identified, and intrinsic regulations were measured through three items each. Responses were also made on a 7-point scale (1, strongly disagree; 7, strongly agree).

Positive and negative affect. Participants were asked to indicate the extent to which they experienced six emotions when engaging in the game from the positive and negative affect schedule.[15] The three positive emotions were excited, proud, and strong; and the three negative affects were guilty, nervous, and irritable. The responses to the six items were measured on a 7-point scale (1, almost never; 7, almost always).

RESULTS

Descriptive statistics

Table 1 shows the internal reliability coefficients, means, and standard deviations of the variables used in this study. In general, all the measures had satisfactory internal consistency (alphas ranged from 0.70 to 0.87), except for negative affect ($\alpha = 0.47$). This subscale was deleted from further analysis. The gamers displayed moderately high scores in HP and all the nine dimensions of dispositional flow measures. They reported high scores in iden-

TABLE 1. DESCRIPTIVE STATISTICS AND INTERNAL CONSISTENCY COEFFICIENTS OF THE KEY VARIABLES

	α	*Mean*	*SD*
1. Harmonious passion	0.84	4.91	1.41
2. Obsessive passion	0.86	3.80	1.70
3. Skill—challenge balance	0.81	5.23	1.17
4. Action—awareness merging	0.77	4.95	1.20
5. Clear goals	0.82	5.44	1.12
6. Unambiguous feedback	0.84	5.37	1.14
7. Concentration	0.75	5.17	1.14
8. Sense of control	0.76	5.37	1.11
9. Loss of self-consciousness	0.72	4.43	1.37
10. Transformation of time	0.81	5.45	1.30
11. Autotelic	0.79	5.58	1.06
12. Flow	—	5.17	−0.91
13. External regulation	0.70	3.06	1.59
14. Introjected regulation	0.84	3.72	1.77
15. Identified regulation	0.72	4.75	1.57
16. Intrinsic regulation	0.78	5.72	1.33
17. Positive affect	0.75	4.92	1.57
18. Negative affect	0.47		
19. Weekday time	—	5.50	3.55
20. Weekend time	—	8.70	4.88

tified and intrinsic regulations but low scores in external regulation. In terms of hours spent playing computer games, the gamers reported 5.50 hours ($SD = 3.55$) during a typical weekday and 8.70 hours ($SD = 4.88$) during a typical weekend.

The correlation matrix of the main variables is shown in Table 2. HP was correlated with OP. However, each had different degrees of association with other variables. For example, HP was more positively related to flow, identified regulation, intrinsic regulation, and positive affect, while OP had higher correlations with external regulation, introjected regulation, and engagement time during weekdays and weekends. Flow was positively associated with more autonomous regulations and positive affect. More self-determined regulations (identified and intrinsic regulations) had higher correlations with positive affect. Engagement in gaming during weekdays was positively correlated with engagement during weekends.

Cluster analysis

In order to identify homogenous groups of students in passion, we used the two passion subscales as the clustering variables. We used a hierarchical clustering method to determine the number of clusters and initial cluster centers.[16] Dendrogram and agglomeration schedules were generated to provide basis for determining the number of clusters. Ward's method with squared Euclidean distance was used to determine the number of cluster groups.[17]

The agglomeration schedule showed that the merging of a three-cluster solution into a two-cluster solution created a bigger change in the coefficients (47.7%) than previous mergers (25.2% change). This indicated that two dissimilar clusters were being merged at this point. Therefore, a three-cluster solution was considered optimal for the cluster analysis. This is supported by the dendrogram. The cluster means and standard deviations of the three clusters are shown in Table 3.

Cluster 1 had an average HP/OP profile ($M = 4.72$ for HP; $M = 3.32$ for OP). It consisted of 64 gamers (41.3%). Cluster 2 had a low HP/OP profile ($n = 30$) and comprised 19.3% of the sample. Cluster 3 consisted of 61 (39.3%) participants with a high HP/OP profile (see Table 3).

Differences across clusters

A one-way analysis of variance (ANOVA) was conducted to determine differences in overall flow between the three clusters. The results indicated significant differences exist in the overall flow composite measure, $F(2, 152) = 18.21$, $p < 0.001$, $\eta^2 = 0.19$ (see Table 3). Post hoc tests revealed that the high HP/OP cluster had significantly higher flow disposition than the other two clusters (all ps < 0.001). The results of the MANOVA also showed significant differences between the three clusters in the four behavioral regulations (Wilks's $\Lambda = 0.599$, $F(8, 292) = 10.64$, $p < 0.01$, $\eta^2 = 0.23$). Followup ANOVAs revealed that the three clusters differed significantly in all four behavioral regulations (all ps < 0.05). Post hoc tests using Tukey's honestly significant difference (HSD) established that the high HP/OP cluster had significantly higher behavioral regulations than the other two clusters. The average HP/OP cluster also had significantly higher external, introjected, and identified regulations than the low HP/OP cluster. Therefore, the predictive validity of the cluster solution was supported.

In addition, the results of the MANOVA showed significant differences between the clusters on time spent playing games during a typical weekday and

TABLE 2. ZERO-ORDER CORRELATIONS OF THE KEY VARIABLES

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1. Harmonious passion	1.00									
2. Obsessive passion	−0.61**	1.00								
3. Flow	−0.56**	−0.35**	1.00							
4. External regulation	−0.41**	−0.61**	−0.25**	1.00						
5. Introjected regulation	−0.54**	−0.56**	−0.40**	−0.71**	1.00					
6. Identified regulation	−0.66**	−0.49**	−0.51**	−0.55**	−0.71**	1.00				
7. Intrinsic regulation	−0.61**	−0.31**	−0.55**	−0.21**	−0.42**	−0.67**	1.00			
8. Positive affect	−0.44**	−0.26**	−0.53**	−0.26**	−0.48**	−0.56**	−0.52**	1.00		
9. Weekday time	−0.22**	−0.30**	−0.26**	−0.23**	−0.26**	−0.25**	−0.06	−0.10	1.00	
10. Weekend time	−0.28**	−0.38**	−0.23**	−0.26**	−0.24**	0.30	−0.16	−0.19*	−0.59**	1.00

*$p < 0.05$; **$p < 0.01$.

TABLE 3. CLUSTER MEANS AND STANDARD DEVIATIONS FOR THE THREE CLUSTERS

	Cluster 1 (N = 64)		*Cluster 2 (N = 30)*		*Cluster 3 (N = 61)*	
	M	*SD*	*M*	*SD*	*M*	*SD*
1. Harmonious passion	4.72	0.96	3.20	1.29	5.95	0.87
2. Obsessive passion	3.32	0.69	1.45	0.55	5.47	0.97
3. Flow	4.93^{a}	0.79	4.70^{a}	0.94	5.64^{b}	0.81
4. External regulation	2.80^{a}	1.32	1.84^{b}	1.01	3.91^{c}	1.59
5. Introjected regulation	3.38^{a}	1.47	2.13^{b}	1.19	4.82^{c}	1.57
6. Identified regulation	4.37^{a}	1.36	3.46^{b}	1.45	5.75^{c}	1.18
7. Intrinsic regulation	5.38^{a}	1.40	5.09^{a}	1.41	6.37^{b}	0.90
8. Positive affect	4.70^{a}	1.42	4.14^{a}	1.74	5.54^{b}	1.42
9. Weekday time	4.36^{a}	3.06	4.70^{a}	3.37	7.02^{b}	3.57
10. Weekend time	8.02^{a}	4.70	5.93^{a}	3.69	10.72^{b}	4.77

Note: Means in the same row with different subscripts differ significantly at $p < 0.01$ in the Tukey's HSD comparison.

weekend, Wilks's $\Lambda = 0.813$, $F(4, 284) = 7.73$, $p < 0.01$, $\eta^2 = 0.10$. The results of the followup tests established significant differences between the three clusters for both weekday and weekend. Post hoc tests indicated that the high HP/OP cluster had significantly more engagement time on both weekdays and weekends (all ps < 0.01) than the other two clusters (see Table 3). Finally, the three clusters also differed significantly in positive affect, $F(2, 150) = 9.91$, $p < 0.001$, $\eta^2 = 0.12$. Specifically, the high HP/OP cluster reported significantly higher positive affect compared to the two other clusters (ps < 0.01).

DISCUSSION

The purpose of the present study was to identify subgroups of young people with distinctive passion profiles on self-determined regulations, flow dispositions, affect, and engagement time in gaming. In general, the results showed that gamers in Singapore displayed moderately high scores in HP and high scores for all the nine dimensions of dispositional flow measures. Their motivation in playing computer games tended to be regulated by more autonomous regulations and less regulated by controlled regulations. They also reported high positive affect and spent many hours playing computer games during a typical school day ($M = 5.50$ hours, $SD = 3.55$) and during a typical weekend day ($M = 8.70$ hours, $SD = 4.88$). Although the overall means portray a relatively positive picture, the intraindividual differences may be masked by drawing conclusions from the means and standard deviations.[18]

The results revealed that HP had higher associations with flow, identified regulation, intrinsic regulation, and positive affect, while OP had higher correlations with external and introjected regulations and engagement time during weekdays and weekends. The findings are consistent with earlier studies.[3,10] Although the two types of passion correlate positively, they are related to various cognitive and behavioral measures differently, with HP to more positive outcomes and OP to more negative outcomes.

The relationships for HP and OP seem to parallel those reported by Clark[19] on gamers' addiction. The study found that gamers who are involved in the game without being "addicted" (a parallel to HP gamers) tend to be members of guilds (groups of MMORPG player formed for the purpose of mutual cooperation to achieve common goals such as game missions or "quests" or to fight in battles or raids) that focused more on social interaction (more likely to be a self-chosen activity). In contrast, gamers who score higher on addictive tendencies (a parallel to OP gamers) tend to belong to "raid" guilds in which game goals are not self-determined but are decided by the guild leader or senior members. It is possible that HP gamers derive their sense of achievement from self-determined game goals, as opposed to OP gamers, who have game goals decided for them by others. Certainly, more studies involving game structures and in-game behavior must be conducted to find out why the experience of flow, behavioral regulations, and affect differ among gamers. The relationship between

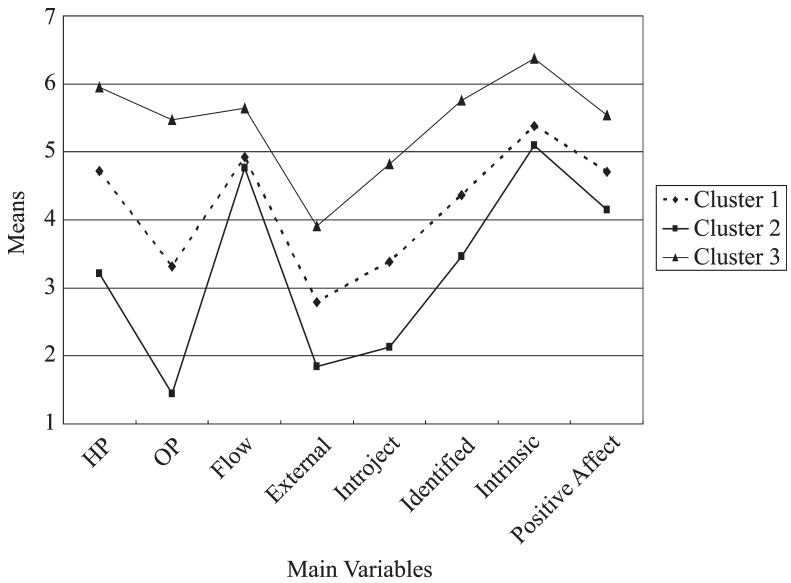

FIG. 1. Graphical presentation of the cluster profiles.

HP and OP, with that of "engagement" and "addiction" in the videogame literature,[20,21] is another area that warrants further study.

The cluster analysis found three groups of gamers with distinct passion profiles. The first cluster had an average HP/OP profile, the second cluster had a low HP/OP profile, and the third cluster had a high HP/OP profile. The three clusters displayed different levels of cognitive, affective, and behavioral outcomes.

The high HP/OP cluster (Cluster 3) had significantly higher flow disposition, behavioral regulations, positive affect, and engagement time than the other two clusters. Further correlational analyses revealed that the two types of passion were positively correlated in the high HP/OP cluster ($r = 0.36$, $p < 0.05$). However, the correlations were negative between the two types of passion in Cluster 1 ($r = -0.40$, $p < 0.05$) and Cluster 2 ($r = -0.27$, $p = 0.15$). This is an important finding. The result suggests that when HP and OP are negatively correlated (as in Clusters 1 and 2), HP is correlated with flow and positive affect and OP has a negative relationship with flow and positive affect. However, when HP and OP are positively correlated (as in Cluster 3), the association between both types of passion and flow is positive.

Previous studies[3,9,10] reported high positive relationship between the two types of passion (e.g., Mageau[9] reported $r = 0.44$). The results of the current study show that this may not be the case at an intraindividual level. The relationship between the two types of passion can vary significantly.

In terms of positive affect and gaming time, the results showed that the high HP/OP cluster had significantly higher positive affect and engagement time than the two other clusters. However, if we look at their average engagement time in games during weekdays ($M = 7.02$ hours, $SD = 3.57$) and weekends ($M = 10.72$, $SD = 4.77$), it is a worrisome situation because the gamers are secondary school students who should be spending time on other activities, such as homework and exercise.

Taken together, the present findings suggest that the two types of passion can help in our understanding of motivation in digital gaming. The findings support the predictions that HP is related to more positive outcomes, while OP is associated with negative outcomes. However, there are homogenous subgroups of gamers who have distinct passion profiles and display different levels of cognitive, affective, and behavioral outcomes.

In conclusion, the use of cluster analysis in this study shows that it is useful in identifying groups of gamers with different passion profiles. It has helped us gain a deeper understanding of motivation in digital gaming. Figure 1 shows a graphical representation of the cluster profiles.

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