



## Understanding motivation in internet gaming among Singaporean youth: The role of passion

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### ABSTRACT

This study examined the motivation of young people in internet gaming using the dualistic model of passion. Path analysis was used to examine the relationships between the two types of passion: obsessive and harmonious passion, behavioral regulations, and flow. A total of 1074 male secondary school students from Singapore took part in the study. The results of the path analysis showed that external, introjected, and identified regulations positively predicted obsessive passion, while harmonious passion was predicted by identified and intrinsic regulations. Flow in digital gaming was predicted directly by harmonious passion, as well as indirectly through intrinsic regulation. This study supports the proposed dualistic model of passion in explaining young people's motivation in internet gaming.

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### 1. Introduction

Digital gaming has become immensely popular in recent years. Although players of online games come from all demographic groups and ages, Yee's (2006) online survey of Massively Multi-player Online (MMO) players revealed that a significant proportion of gamers (25% in his sample of over 30,000 gamers) all over the world are young people in their teens. In fact, some of the teenagers are spending more time playing games in cyber cafes than in schools or on school-related activities (Lo, Wang, & Fang, 2005). Clearly, the gaming environments have tremendous appeal and young people are highly motivated to engage in them. It is thus not surprising that a number of papers have been written on gamers' behavior and their motivation (e.g., Bartle, 1996; Ryan, Rigby & Przybylski, 2006; Wan & Chiou, 2006; Wang, Khoo, Liu & Divakaran, 2008; Yee, 2006). Nonetheless, a lot more can be done to help us understand the underlying psychological processes involved in teenage gamers' motivation, especially in terms of their passion and flow experience.

Vallerand and his colleagues (2003) proposed a dualistic model of passion that can help us understand players' motivation in digital gaming. In their conceptual framework, passion is defined as "a strong inclination towards an activity that one finds important, invests time in, and likes" (Vallerand et al., 2003, p. 757). One important characteristic of passion is that the activity can be so 'self-

defining' that it becomes part of or internalized into the person's identity. For example, those who are passionate about playing basketball do not merely play the game; they are 'basketballers'. Likewise, those who have a passion for gaming do not just game; they call themselves 'gamers' or the names of their avatars (game characters) in the real world.

According to the dualistic model, there are two types of passion have been identified. Harmonious passion (HP) refers to the pursuit or engagement in an activity by choice and is in harmony with other activities in different domains. The internalization is autonomous or more self-determined. This type of passion is linked to positive outcomes during and after activity engagement. In comparison, obsessive passion (OP) is characterized as an internal pressure that forces a person to engage in his or her passionate activity and leads to conflicts with activities in other life domains. This results in a more controlled internalization of the activity into one's identity. This form of passion is linked to negative outcomes during and after activity engagement.

The processes of internalization stem from the self-determination theory (SDT) (Deci & Ryan, 1985). Within this theory, Deci and Ryan (1985) outlined the Organismic Integration Theory (OIT) to explain a process of internalization through which individuals satisfy their three psychological needs: competence, autonomy, and relatedness. The need for autonomy is defined as the need to feel ownership over one's behavior. The need for competence refers to the need for being able to produce desired outcomes and experiencing mastery and effectiveness. The need for relatedness is the need to feel connected to others, to be able to care for and be cared for by others. To the extent to which the three psychological needs are being satisfied, a person may internalize an activity into HP or OP.

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In essence, the OIT assumes that as individuals try to rationalize the behavioral outcomes relevant to their need satisfaction, there is a shift from an external to internal locus of causality. The more internalized a behavioral regulation, the more it will be experienced as autonomous (Deci, Vallerand, Pelletier, & Ryan, 1991).

In SDT, there are at least four types of behavioral regulations, each one reflecting a qualitatively different 'reason' for acting out the behavior in question. They are external, introjected, identified and intrinsic regulations. External regulation refers to behavior that is controlled by external means such as rewards or external authority. Introjected regulation refers to behavior that is internally controlling or self-imposed, such as acting out feelings of guilt avoidance, and is characterized by feelings of 'ought'. Identified regulation refers to behavior that is more self-determined according to one's choice or values. Although identified regulation can be autonomous, it is still considered as a form of extrinsic motivation. It is characterized by feelings of 'want' rather than 'ought'. Finally, intrinsically motivated behavior is behavior that is carried out solely for its own sake or for enjoyment. These four behavioral regulations are typically assessed through the Perceived Locus of Causality scale (Ryan & Connell, 1989).

Vallerand and his colleagues (Vallerand et al., 2003, 2008) proposed that HP results from the autonomous internalization of an activity, in which a person accepts that the activity is important for him or her and not is controlled by external rewards. Engagement in the activity is in full volition and not in conflict with other aspects of the person's life. With this type of passion, the person is free to choose to engage in the activity. There is no conflict between the passionate activity and his or her other life activities. Therefore, positive outcomes and emotion should result from HP. Studies have shown that HP leads to positive affect, concentration, satisfaction, and flow (Rip, Fortin, & Vallerand, 2006; Ryan & Connell, 1989; Ryan, Sheldon, Kasser, & Deci, 1996).

In contrast, OP results from controlled internalization. In the internalization of OP, an individual feels compelled to engage in the activity (Vallerand et al., 2008). There is an external force or internal contingency that controls the person. 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. Studies have found that OP is related to negative emotions, rigid persistence, self-destructive behavior, and conflict between activities and other life aspects (Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005; Ratelle, Vallerand, Mageau, Rousseau, & Provencher, 2004; Seguin-Levesque, Laliberte, Pelletier, Blanchard, & Vallerand, 2003; Vallerand et al., 2003).

The concept of flow or optimal experience has been applied in various domains including digital gaming (Wang et al., 2008). Csikszentmihalyi (1990) defines flow as the state in which people are so involved in an activity that nothing else seems to matter. It is a psychological state that is characterized by nine dimensions; a balance of challenge and skill, a merging of action and awareness, clear perceived goals, unambiguous feedback, total concentration on the task at hand, a sense of control, a loss of consciousness of self, a speeding up or slowing down of time, and autotelic experience. A state of flow is theorized to occur when these nine dimensions co-occur at high levels. At this state, people are totally unaware of their surroundings but are enjoying the task and having fun while doing the activity. Flow theory emphasises the importance of perceiving both the challenge and skills as balanced before flow can occur (Csikszentmihalyi, 1990). It occurs when a person perceives the challenge and his skill level are being balanced in an activity, the person enjoys the moment and experiences a sense of control, so there is an effortlessness of action resulting in a powerful intrinsic motivational force.

The links between flow and motivation have been well documented in psychological research. Flow has been closely linked to perceived competence (Csikszentmihalyi & Nakamura, 1989; Deci & Ryan, 1985). People with low perceived competence are likely to experience anxiety or boredom, depending on how much they value doing well in the activity. People with high perceived competence and efficacy are likely to report higher intrinsic motivation to perform in an activity (Ryan, 1982; Vallerand & Reid, 1984).

In a recent study, Wang and his colleagues (Wang et al., 2008) used cluster analysis to identify subgroups of young people with distinctive passion profiles on self-determined regulations, flow dispositions, affect and engagement time in gaming. It was found that gamers with high HP/OP profile had higher flow dispositions compared to gamers with average HP/OP and low HP/OP clusters. In addition, they found that the three clusters differed in terms of their behavioral regulations and other outcomes. Specifically, the high HP/OP cluster had more autonomous behavioral regulations, positive affect and engagement time compared to the other two clusters. The cluster analysis method used in the previous study focused on differences at an intra-individual level. That is, people were grouped together based on their responses to a group of variables with homogenous characteristics. It provided profiles of people with similar characteristics but not the relative contribution of each independent variable to a dependent variable. In order to extend the literature, the current study uses a variable-oriented approach which essentially groups variables on common underlying dimensions or factors, using structural equation modeling or path analysis. This approach allows the researchers to examine the relationships between one or more dependent variables and a set of independent variables.

Research in the dualistic model of passion has generally supported the existence of the two types of passion. Although the correlations between the two types of passion are generally moderate to high, results from partial correlations provide support that the two types of passion are associated with different affective experiences and outcomes (Vallerand et al., 2006). No studies have tested the hypothesized relationships between the dualistic model of passion and behavioral regulations. To bridge this empirical gap, this study tested the hypothesized structural model as shown in Fig. 1. According to SDT, external, introjected and identified regulations are all controlled forms of regulation. Hence it was hypothesized that these three types of regulations would lead to OP. However, identified regulation can also be regarded as the most self-determined of the extrinsic regulations. Thus, it was hypothesized that identified regulation, together with intrinsic regulation, would result in HP. In addition, HP and intrinsic regulation would lead to flow.

## 2. Methods

### 2.1. Participants and procedures

A total of 1074 male students from six secondary schools in Singapore participated in the survey. There were 622 students from Secondary One and 452 students from Secondary Two. All the students ranged in age from 12 to 14 years. Permission for the study was sought through the principals. 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. When completing the questionnaire, participants were informed that there were no right or wrong answers. They were assured of the confidentiality of their responses, and were encouraged to ask questions if necessary.

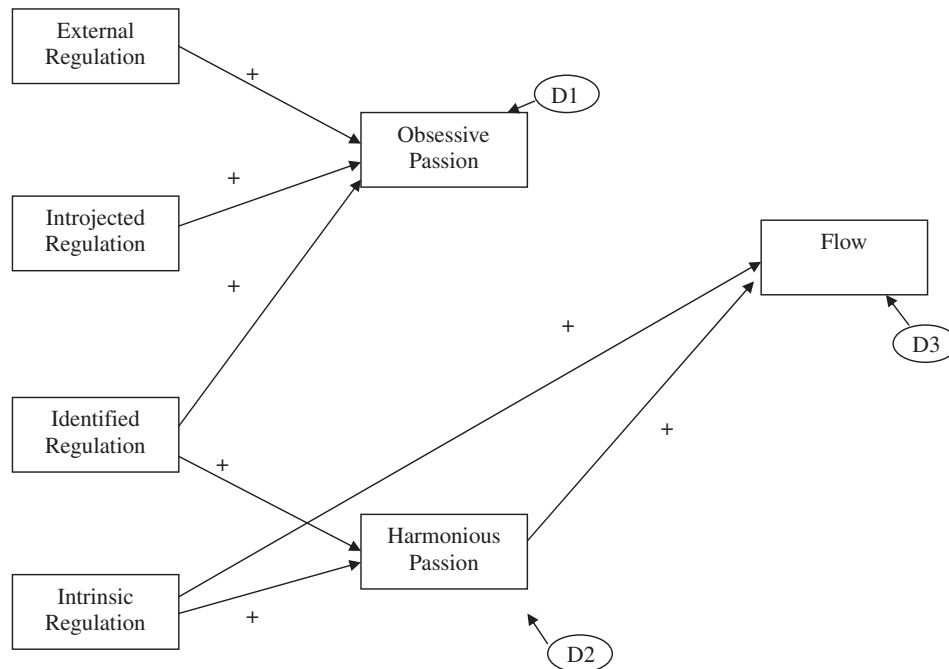


Fig. 1. Proposed model of the relationship between HP and OP, behavioral regulation, and flow.

## 2.2. Measures

### 2.2.1. The passion scale

Participants were asked to specify one of their favorite games and then asked to complete the items while referring to this activity. The short version of the passion scale with 10 items (5 items for each of the 2 subscales) was used (Vallerand et al., 2003). The OP items focused on a passive perspective of passion where there was an internal compulsion to engage in the activity, and conflict might be experienced within the person (e.g., ‘The urge is too strong; I cannot help myself from playing the game’). HP items focused on the positive aspects of passion where the person was in control and the activity was in harmony with the person’s other activities (e.g., ‘Gaming is in harmony with the other activities in my life’). Items were rated on a seven-point scale ranging from 1 (do not agree at all) to 7 (completely agree). A Confirmatory Factor Analysis (CFA) was conducted for the two-factor passion scale. The result showed acceptable fit for the measurement model (scaled  $\chi^2 = 185.52$ ,  $df = 34$ , NNFI = .962, CFI = .972, RMSEA = 0.072, 90% of CI of RMSEA = .062, .083). The internal reliability coefficients ( $\alpha$ ) were .90 for HP and .91 for OP.

### 2.2.2. Dispositional flow scale (DFS-2)

The DFS-2 (Jackson & Eklund, 2004) was used to assess the optimal psychological state of flow, as proposed by Csikszentmihalyi (1990). The 36-item inventory was designed to assess nine dimensions of the propensity to experience flow in a particular situation. Referring to the game that they listed in the survey, participants were asked to respond to the stem, ‘‘When playing this game...’’. The nine dimensions assessed were: challenge-skill balance (e.g., ‘My abilities match the high challenge of the situation’), action-awareness merging (e.g., ‘I perform automatically, without thinking too much’), clear goals (e.g., ‘I know what I want to achieve’), unambiguous feedback (e.g., ‘I can tell by the way I am performing how well I am doing’), concentration on the task (e.g., ‘I have total concentration’), sense of control (e.g., ‘I have a feeling of total control’), loss of self-consciousness (e.g., ‘I am not concerned with how I am presenting myself’), transformation of time (e.g., ‘Time seems

to alter (either slows down or speeds up)’), and autotelic experience (e.g., ‘I really enjoy the experience’). Answers were given on a seven-point scale ranging from 1 (almost never) to 7 (almost always). A global flow factor was obtained by taking the mean scores of the nine dimensions. A CFA was conducted for a hierarchical measurement model for the DFS-2 with nine first-order factors and one higher order factor. The result showed acceptable fit for the measurement model (scaled  $\chi^2 = 1522.58$ ,  $df = 548$ , NNFI = .947, CFI = .954, RMSEA = .040, 90% of CI of RMSEA = .038, .042). The internal reliability coefficients ( $\alpha$ ) for all the nine subscales ranged from .82 to .90 (challenge-skill balance = .88, action-awareness merging = .82, clear goals = .88, unambiguous feedback = .90, concentration on the task = .85, sense of control = .86, loss of self-consciousness = .82, transformation of time = .85, and autotelic experience = .87).

### 2.2.3. Behavioral regulation

The Perceived Locus of Causality (PLOC) scale developed by Goudas, Biddle, and Fox (1994) was adapted to assess four types of regulatory style or behavioral regulation in computer gaming. The stem for all the items was ‘I play this game...’. Introjected regulation (e.g., ‘because I want others to think I’m a good gamer’) was assessed through four items. External regulation (e.g., ‘because that’s what I am supposed to do’), identified regulation (e.g., ‘because I want to improve in my game’) and intrinsic regulation (e.g., ‘because gaming is fun’) were measured through three items each. Responses were also made on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The CFA for the PLOC showed acceptable fit (Scaled  $\chi^2 = 532.51$ ,  $df = 55$ , NNFI = .935, CFI = .967, RMSEA = .082, 90% of CI of RMSEA = .056, .118).

## 3. Results

### 3.1. Descriptive statistics

Table 1 shows the descriptive statistics for the scales used in the structural equation model. An inspection of the mean scores sug-

**Table 1**  
Descriptive statistics and internal consistency coefficients, of the key variables.

	$\alpha$	Mean	SD	1	2	3	4	5	6	7
1. Harmonious passion	.90	4.32	1.46	1.00						
2. Obsessive passion	.91	3.42	1.58	.73**	1.00					
3. External regulation	.80	2.77	1.50	.43**	.63**	1.00				
4. Introjected regulation	.85	3.38	1.57	.56**	.68**	.79**	1.00			
5. Identified regulation	.80	4.24	1.57	.65**	.56**	.60**	.77**	1.00		
6. Intrinsic regulation	.84	5.09	1.48	.59**	.36**	.33**	.52**	.75**	1.00	
7. Flow	–	5.05	1.10	.58**	.34**	.21**	.33**	.47**	.53**	1.00

\*\*  $p < .01$ .

gests that the participants were relative high in HP, identified and intrinsic regulations, and flow. They reported low scores in OP, introjected and external regulations (less than 3.5 on a seven-point scale). All the measures had satisfactory internal consistency (alphas ranged from .80 to .91). The average alpha for the overall flow was .84 (alphas ranged from .81 to .87).

The intercorrelations among the variables used in the model (see Table 1) revealed that OP was positively and significantly correlated with HP. In addition, OP had stronger relationships with external, introjected and identified regulations than with intrinsic regulation and flow. In contrast, HP had stronger relationships with flow, intrinsic and identified regulations than with external and introjected regulations.

### 3.2. Structural equation analysis

The network of relationships between the dualistic model of passion, behavioral regulations, and flow was examined through the use of path analysis (see Fig. 1). In the initial analysis, there was no evidence of multivariate non-normality in the distribution (skewness and kurtosis  $< \pm 1$ , Mardia's coefficient = 31.99, normalised estimate = 46.69). Therefore, maximum likelihood method was used as the estimation method (Holve & Panter, 1995).

The indices of fit provided by EQS were examined to evaluate the adequacy of the models: chi-square statistic, Bentler-Bonett Nonnormed Fit Index (NNFI), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), Root Mean Squared Residual (RMSR), and Root Mean Squared Error of Approximation (RMSEA). The NNFI compares the lack of fit of a target model to the lack of fit of a baseline model. CFI assesses the lack of fit as estimated by the non-central chi-square distribution of a target model compared to a baseline model. GFI is an index of absolute fit, that is, the relative amount of the observed variances and covariances accounted for by a model (Holve & Panter, 1995). Typically, for these fit indices, there is a general agreement that an index close to .95 should be an indicator of a good fit to the data (Hu & Bentler, 1999). The RMSR is the square root of the mean of the squared discrepancies between the implied and the observed covariance matrices. The RMSEA is also based on the analysis of residuals and compensates for the effects of model complexity. For these two indices, values below .10 indicate a good fit to the data. Hu and Bentler (1999) now recommend a cut-off value close to .06 for RMSEA.

The fit statistics provided by EQS showed that the data fit the hypothesized model well ( $\chi^2 = 39.04$ ,  $df = 7$ , NNFI = .982, CFI = .994, GFI = .990, RMSR = .027, RMSEA = .065; 90% CI of RMSEA = .046, .086).

It is noteworthy that the variance in flow explained by the model was as high as 36.9%. The Wald Test did not suggest any parameters be dropped for the model but the LM Test revealed that if a path linking introjected regulation to HP is added, a marginally significant improvement in the model's fit would result. The standardized residuals indicated a positive correlation between HP and introjected regulation. No modification of the model was done.

The standardized loadings of the hypothesized model are shown in Fig. 2.

## 4. Discussion

The main purpose of this study was to investigate the relationships between the dualistic model of passion, behavioral regulations and flow with a sample of gamers from Singapore secondary schools. Very few studies have tested the framework proposed by Vallerand and his colleagues (Vallerand et al., 2003). The descriptive statistics showed that teenage gamers in Singapore reported moderately high scores in HP, identified and intrinsic regulations, and flow. In comparison, they reported lower scores in OP, and introjected and external regulations. These results are consistent with those documented by Wang et al. (2008). In the previous study, however, an intra-individual approach was used and the relative contribution or prediction of each variable was not known.

It is interesting to note that the teenage gamers in Singapore tended to have rather high autonomous regulations and largely harmonious passion for gaming. Parents and educators can take heart at the findings since it suggest that for many of the teenagers, gaming occupies a key space in their life but they are not compelled to engage in it and are not overpowered by it. Their passion does not control them and is in harmony with other aspects of their lives.

In examining the relationships between the key variables used in this study, the correlation showed that OP was positively correlated with HP. The finding is consistent with that of Wang et al.'s (2008) study. The correlation coefficient was .73. With such a high correlation, there is a need to examine the relative contribution of HP and OP. Hence, the use of structural equation modeling was appropriate for this study.

The results of the structural equation modeling supported the hypothesized relationships between the dualistic model of passion and behavioral regulations. External, introjected, and identified regulations are all controlled forms of regulation and they all predicted OP positively. Identified regulation, is the most self-determined form of extrinsic motivation. Apart from predicting OP, it also predicted HP alongside intrinsic regulation. Flow was predicted by intrinsic regulation directly and indirectly through HP. The results support the postulation that autonomous versus controlled internalizations would lead to two distinct types of passion.

Vallerand and his colleagues (Vallerand et al., 2008) suggest that passion functions as a catalyst "to provide the energy for persistent and strategic engagement in highly demanding activities" (p. 387). Both types of passion could provide a motivational force. However, only HP positively predicts flow, while OP is not related to flow. This finding is very important to researchers who are interested in motivated behaviors.

From the self-determination theory perspective, controlled forms of internalization will not fulfil the needs for competence, autonomy, and relatedness. Therefore, OP is not the type of passion that should be encouraged. Ryan et al. (2006) found that multi-



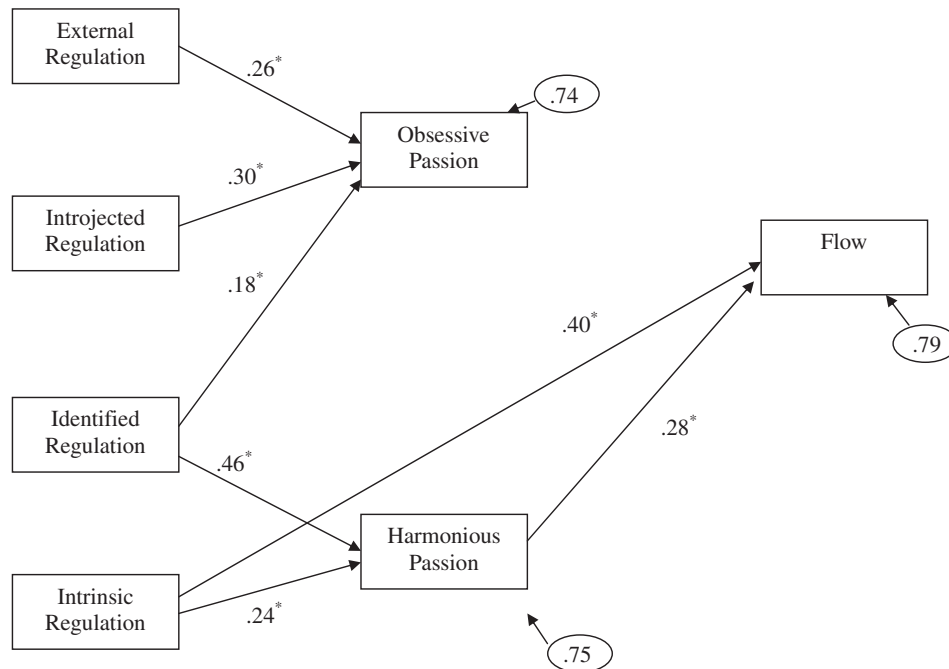


Fig. 2. Standardised solution for the proposed model.

player computer games could satisfy all the three psychological needs. This study adds to the literature that only gamers with HP are more likely to have their three needs fulfilled in the virtual world. The dualistic model of passion proposed by Vallerand et al. (2003) adds to our understanding of the motivational processes in digital gaming.

One important implication of the present findings is that if educators want to increase the motivation of their students in any given subject or topic, cultivating harmonious passion will lead to a more adaptive achievement motivation characterized by effort exertion and flow during task engagement. How can teachers promote HP in the classroom? Vallerand and Houliort (2003) suggest that activity valuation and autonomous internalization of the activity are the two key ingredients for nurturing HP. First, teachers need to let the students feel that the subjects or specific topics they are teaching are important to them such that students place high intrinsic value on the tasks. Second, teachers can promote autonomous internalization through providing an autonomy-supportive classroom environment in which students feel a sense of ownership in decision making (see Liu, Wang, Tan, Ee, & Koh, 2009).

The present study has a few limitations. First, the design is cross-sectional and thus causal relationships can not be determined. Second, this study only tested the relationships between behavioral regulations and passion in one direction. We cannot preclude the possibility that the dualistic model of passion can have a reciprocal effect on behavioral regulations. Third, the present study did not measure needs satisfaction to validate the two types of passion.

In sum, the present findings support the conceptual framework of the dualistic model of passion for understanding the motivational processes in digital gaming. More research is needed to replicate these findings and examine the consequences arising from the two types of passion.

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