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# Online gamer personality and weekday gaming tendency

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Online gaming emerged as a burgeoning Internet service that has many enthusiastic customers that enjoy this entertainment form. In addition to generating significant revenues for online game service providers, its increasing popularity provides more fun for other players. However, the correlates for individual tendency to play online games in weekdays (weekday gaming tendency) have seldom been investigated. Therefore, this study investigated how gamer personality and weekday gaming tendency are related based on weekday and weekend usage patterns. Data were obtained from 115 online gamers. Analytical results indicated that openness is positively related to weekday gaming tendency, while neuroticism is negatively related to weekday gaming tendency. Based on the results of this study, we recommend that online game service providers target prospective customers that are high in openness, but low in neuroticism when their objective is to increase weekday utilization of server capacity.

**Key words:** Personality trait, online game, weekday gaming tendency, openness, conscientiousness, extraversion, agreeableness, and neuroticism.

## INTRODUCTION

Online gaming is a burgeoning e-service sector, as evidenced by significant market revenues and the number of users (Hsu and Lu, 2004). Blizzard Entertainment, Incorporated (2008) reported on a single online game with 11,000,000 customers, while Jupiter Research (2005) stated that the online gaming market tripled its revenues from 2003 to 2004. DFC Intelligence (2006) indicated that online gaming generated \$US3.4 billion in global revenues in 2005, and it estimated to reach \$US 13 billion in 2011, demonstrating the necessity to elucidate further the nature of this growth sector. Moreover, online gaming is also one of the most notable systems in the current era and attracts researchers to understand satisfaction and loyalty of online game users (Yang et al., 2009). The sample of this study comprises students, because students are one of the major target

customers of online games (Jansz and Tanis, 2007). Since students are similar in their employment status, hours of employment may not bias the findings of this study. According to literature, personality heavily influences Internet usage (Landers and Lounsbury, 2006), indicating that personality may also heavily influence online game usage. However, Internet usage accumulates usage of multiple Internet services, warranting the need to extend the findings of Landers and Lounsbury (2006) to specific Internet contexts, for example, online gaming. Such an extension can shed further light on the findings of Landers and Lounsbury (2006).

Previous studies have frequently used weekly hours for assessing usage (Griffiths et al., 2004; Jansz and Martens, 2005). Usage includes that during weekdays and weekends. Distinguishing between weekday and weekend usage is relevant to online service managers. The present study thus created one construct weekday gaming tendency to represent the individual tendency to play more on weekdays but less on weekends.

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Knowledge about the link between gamer personality and weekday gaming tendency helps game providers not only to determine estimated capacity for weekdays and weekends, but also to identify what users will fill the weekday or weekend capacity of their servers. For instance, if openness is closely related to weekday gaming tendency, game providers can focus on attracting high-openness users to fill their unused weekday capacity. Such data on weekday gaming tendency can facilitate managerial decisions for customer targeting decisions and development of customer loyalty. Therefore, this study investigates how gamer personality influences weekday gaming tendency. In a closely related study, Teng (2008) identified how online game users and non-users differ in personality traits, indicating that online game users score higher than non-users in openness, conscientiousness and extraversion. This study extends the results of Teng (2008) by correlating personality with weekday gaming tendency.

## LITERATURE AND HYPOTHESES

As psychological patterns, personality traits profoundly impact individual psychology and behavior over time (Zimbardo and Weber, 1994). Among various typologies of personality traits, the Big Five personality traits are frequently adopted in service and online gaming research (Teng et al., 2007a, b; Teng, 2008) and, therefore, are used in this study. Big Five personality traits include five major domains. Openness indicates the tendency to be curious, creative and imaginative (McCrae and Costa, 1985; McCrae and John, 1992). Conscientiousness indicates the tendency to be systematic, careful and efficient (Barrick and Mount, 1991). Extraversion indicates the tendency to be social, active and talkative (McCrae and John, 1992). Agreeableness refers to the tendency to be kind, cooperative and empathetic (Barrick and Mount, 1991; McCrae and John, 1992). Neuroticism indicates the tendency to be anxious, depressed and emotional (McCrae and Costa, 1985; McCrae and John, 1992).

Highly open individuals are curious, creative and imaginative (McCrae and John, 1992). Online games create novel and surprising virtual worlds with unexpected events, thus satisfying the curiosity of highly open individuals and impelling them to use online games continuously. Also, openness is closely related to exploration and role-playing motivations (Jeng and Teng, 2008). Highly open individuals are thus likely to explore and role play in online gaming. Weekdays comprise regular activities such as schooling or working that is monotonous for highly open individuals, leaving their curiosity and need for imagination dissatisfied. Highly open individuals are thus likely to play online games during the weekdays to satisfy their curiosity and need for imagination, leading to a hypothetically positive relationship between openness and weekday usage of online

games. Conversely, weekends are generally free for individuals to explore the world, offering a substitute for online game play. Highly open individuals can thus satisfy their curiosity and need for imagination by exploring life on weekends, thus reducing their online game usage during weekends, leading to a hypothetically negative relation between openness and weekend usage of online games.

H<sub>1</sub>: Openness is positively related to weekday gaming tendency

Conscientiousness refers to the tendency to be systematic, careful, efficient, responsible and strongly motivated (Barrick and Mount, 1991). Online games involve achievement symbols and feedback signals such as a brilliant outfit, high-level avatar (user representation in online game), and possession of scarce and precious gems. Online games also involve simple rules and predictable outcomes that enable users to achieve attainable goals. Thus, highly conscientiousness individuals are likely to use online games continuously in order to achieve attainable goals. Highly conscientious individuals systematically plan their time academically or professionally to achieve success. Intuitively, excessively playing online games during the weekdays may reduce the time and energy devoted to academics or work, thus reducing related achievements. Thus, highly conscientious individuals are likely to play online games during weekends, thus reducing their weekday hours spent playing online games and increasing their weekend hours spent playing online games.

H<sub>2</sub>: Conscientiousness is negatively related to weekday gaming tendency

Highly extraverted individuals are talkative, social and interactive (McCrae and John, 1992). Griffiths et al. (2004) found that online game players enjoy societal aspects of online games. Restated, online games satisfy the social needs of highly extraverted individuals. In weekdays, students need to go to school and employees need to go to work, leaving little time and energy for social activities that can satisfy individual social needs. Online gaming does not require traveling time and efforts required to meet with friends, and thus is a convenient way for having social contacts with friends in weekdays. Thus highly extraverted gamers are likely to play online games more in weekdays. Conversely, during the weekends, more individuals have enough free time and efforts to meet with their friends, attracting highly extraverted gamers to take advantage of meeting with their friends in person, particularly those who are not accessible via online gaming. Thus highly extraverted individuals are motivated to play online games during the weekdays, rather than during the weekends, leading to a hypothetically positive relationship between extraversion and weekday gaming tendency.

H<sub>3</sub>: Extraversion is positively related to weekday gaming tendency

Highly agreeable individuals are congenial, cooperative and empathetic (Barrick and Mount, 1991; McCrae and John, 1992). Important others (spouses, parents, family members and good friends) may ask highly agreeable gamers to spend time with them, reducing their usage. During weekdays, people are busy in their schooling and/or working, and thus few persons ask highly agreeable gamers to spend time with them, leaving them more time spent on gaming. Contrarily, people have more free time in weekends, and thus may ask highly agreeable gamers to spend more time with them, and spend less in gaming. Since highly agreeable individuals are cooperative (Barrick and Mount, 1991; McCrae and John, 1992), they are likely to comply with such requests, reducing their online game usage during weekends, leading to a hypothetically positive relationship between agreeableness and weekday gaming tendency.

H<sub>4</sub>: Agreeableness is positively related to weekday gaming tendency

Highly neurotic individuals easily become nervous, depressed, anxious or emotional (McCrae and John, 1992). Restated, highly neurotic individuals may consistently have negative emotions. During weekdays, highly neurotic individuals suffer from their abundant negative emotions related to academics or work. Since negative emotions are uncomfortable to individuals, individuals are likely to have natural tendency to avoid them. The reinforcement theory of Skinner (1969) posits that if individuals have natural tendency to avoid something, they are likely to avoid behavior associated with it. Online games provide strong stimuli that also generate negative emotions of highly neurotic individuals. Thus, according to the reinforcement theory of Skinner (1969), highly neurotic individuals may avoid receiving additional stimuli from online gaming during weekdays, in which they receive much stimuli from their workplaces. However, during weekends, no stimuli come from workplaces, thus relieving neurotic individuals from negative emotions due to their work. Thus highly neurotic individuals may tend to play online games more during weekends than during weekdays.

H<sub>5</sub>: Neuroticism is negatively related to weekday gaming tendency

## METHODS

This study adopts a cross-sectional design. One hundred and fifteen online game users from business schools (school A, B and C) in three universities in northern Taiwan enrolled in this study. Among them, 39.1% were from school A, 36.5% were from school B, and 24.3% were from school C, indicating balanced sampling. Among the participants, males comprised 67.8 and 45.2% were aged >19 years and 77.0% had a monthly income <\$200 US. The

user profile of male and >19-year-old is consistent with that of Griffiths et al. (2004). The participants were asked to provide their average weekday hours spent playing online games and average weekend hours spent playing online games. The weekday gaming tendency was defined as the ratio of weekday hours to weekend hours. Participants played online games for 2.31 h per weekday (S.D.=1.97) and for 4.03 h per weekend day (S.D.=2.83). Twenty items measuring Big Five personality traits were adopted from Teng et al. (2007a), in which the items possessed good reliability and validity. The response options ranged from 1 (very disagreeable) to 5 (very agreeable). Participants were also asked to provide their sex, age and income. Their confounding effects on the study findings were minimized by using these demographics as the control variables in this study. Confirmatory factor analysis was conducted for assessing the reliability and validity of study measurements.

Items measuring each trait had a Cronbach's  $\alpha$  ranged from .72 to .86, satisfying the criterion of Nunnally and Beinstein (1994). Moreover, items measuring each construct had a composite reliability (CR) >.79 and average variance extracted (AVE) >.55, complying with the criteria of Bagozzi and Yi (1988), thus indicating adequate reliability. Each item had an indicator loading >.66 and a  $t$  value >7.09, satisfying the criterion of Anderson and Gerbing (1988), thus indicating adequate convergent validity. The maximum squared correlation (.37) was below the minimum AVE (.55), indicating sufficient discriminant validity (Fornell and Larcker, 1981). Table 1 summarizes the confirmatory factor analysis. Furthermore, the fit indices indicate that the data adequately fit the measurement model ( $\chi^2=211.01$ ,  $df=80$ , CFI=.88, IFI=.88, GFI=.80 and RMSEA=.12). The normed chi-square value ( $\chi^2/df$ ) equaled 2.64, thus satisfying the criterion of Bagozzi and Baumgartner (1994). The CFI and IFI values roughly reached the criteria of Bollen (1989). The RMSEA is an inadequate indicator when the sample size is relatively small (Bentler and Yuan, 1999). RMSEA was thus not used as a critical indicator in this study. Average scores for measuring each trait were only lowly to moderately correlated (from -0.22 to 0.62), implying sufficient construct validity. Table 2 lists the correlations.

## RESULTS

The hypotheses were tested based on regression analysis. Sex, age and monthly income were utilized as the control variables for minimizing their potential confounding of the study findings. Five personality traits, that is, openness, conscientiousness, extraversion, agreeableness and neuroticism, were utilized as independent variables in this study, while weekday and weekend hours were utilized as the dependent variables. Table 3 summarizes the regression analytical results. Openness is positively related to weekday gaming tendency ( $\beta=.22$ ,  $t=1.76$ ,  $p<.05$ ), supporting H<sub>1</sub>. Highly open individuals are likely to play online games more hours during weekdays than during weekends. Conscientiousness is not related to weekday gaming tendency ( $\beta=-.10$ ,  $t=-0.90$ ,  $p=.19$ ), not supporting H<sub>2</sub>. This may be owing that highly conscientious individuals have strong work drives (Barrick and Mount, 1991), thus decreasing their weekday and weekend online game usage. Extraversion is not correlated to weekday gaming tendency ( $\beta=.07$ ,  $t=0.67$ ,  $p=.25$ ), not supporting H<sub>3</sub>. A potential explanation is that highly extraverted individuals love interactions with individuals in the real world as well as those in game worlds, leading

**Table 1.** Summary of confirmatory factor analysis.

Variable	<i>M</i>	<i>SD</i>	$\lambda$	<i>t</i>	$\alpha$	CR	AVE
<b>Openness</b>							
Creative	3.51	0.84	0.83		0.72	0.79	0.55
Imaginative	3.92	0.85	0.73	7.96			
Intelligent	3.43	0.92	0.66	7.09			
<b>Conscientiousness</b>							
Systematic	3.33	0.81	0.96		0.82	0.89	0.80
Organized	3.48	0.73	0.82	7.85			
<b>Extraversion</b>							
Extraverted	3.37	1.00	0.76		0.86	0.90	0.74
Energetic	3.64	0.93	0.93	10.33			
Active	3.47	0.96	0.89	9.99			
<b>Agreeableness</b>							
Empathetic	3.82	0.88	0.74		0.81	0.85	0.60
Kind	3.69	0.81	0.75	7.59			
Sympathetic	3.66	0.82	0.88	8.60			
Warm	3.68	0.85	0.71	7.21			
<b>Neuroticism</b>							
Emotional	3.21	0.97	0.89		0.85	0.89	0.72
Irritable	2.70	1.03	0.85	10.75			
Moody	2.94	0.93	0.81	10.17			

**Table 2.** Correlations among study variables.

	1	2	3	4	5	6	7
Weekday hours	--						
Weekend hours	0.62*	--					
Openness	0.13	-0.07	--				
Conscientiousness	-0.07	-0.22*	0.46*	--			
Extraversion	-0.01	-0.15	0.61*	0.32*	--		
Agreeableness	-0.10	-0.20*	0.34*	0.22*	0.24*	--	
Neuroticism	-0.14	0.08	-0.08	-0.20*	0.01	-0.22*	--

\*  $p < .05$ .

them to spend time being with real-world friends in weekdays as well as in weekends. Thus highly extraverted individuals do not prefer massively playing online games in weekdays. Agreeableness is not related to weekday gaming tendency ( $\beta = -.01$ ,  $t = -0.08$ ,  $p = .47$ ), not supporting  $H_4$ . A potential explanation is that highly agreeable individuals are likely affected by others, including both online game users and significant others (family members and good friends). During weekdays, gamers keenly invite highly agreeable individuals to spend time with them, thus increasing the online game usage of highly agreeable individuals in weekdays.

Neuroticism is negatively related to weekday gaming tendency ( $\beta = -.30$ ,  $t = -3.02$ ,  $p < .01$ ), supporting  $H_5$ . Regression analysis in this study had variance inflation factors  $< 1.93$ , indicating a minimized multicollinearity. The Durbin-Watson statistic was 2.19, indicating the absence of autocorrelations among residuals. All the statistics indicated the adequacy of performing regression analysis in this study.

## DISCUSSION

This study is, to our knowledge, the first to investigate

**Table 3.** Role of personality traits in weekday gaming tendency.

	Weekday gaming tendency		
	$\beta$	t	p
Sex	0.21	2.18	0.03*
Age	0.05	0.56	0.58
Monthly Income	-0.07	-0.70	0.48
Openness	0.22	1.76	0.04*
Conscientiousness	-0.10	-0.90	0.19
Extraversion	0.07	0.67	0.25
Agreeableness	-0.01	-0.08	0.47
Neuroticism	-0.30	-3.02	0.00*
Model R <sup>2</sup>		0.15	

\*  $p < .05$ , †  $p < .10$ . Numbers under the third decimals were omitted for brevity. One-tailed tests were conducted for examining directional hypotheses.

how personality traits impact individual tendency to play online games in weekdays, in terms of the ratio of weekday hours to weekend hours spent playing online games. According to our results, openness is positively related to weekday usage, while neuroticism is negatively related to weekday gaming tendency. Theoretically, this study contributes to the user psychology literature by linking user personality to weekday use tendency. The user psychology literature has identified usability as a critical predictor for electronic customer relationship performance in a mobile communication technology context (Wahab et al., 2011). Moreover, price and quality fuel loyalty of online degree programs (Kim and Lee, 2011).

The literature has obtained interesting and useful findings. However, the literature has not established the link between user personality and weekday use tendency. The present study advances the user psychology by addressing this issue and identifying openness and neuroticism as two prominent personality predictors for weekday use tendency. The literature of gamer psychology has identified customization and immersion satisfaction as predictors for gamer loyalty (Teng, 2010). Such predictors are novel but do not cover gamer personality. The present study advances the gamer psychology by identifying certain personality traits as predictors for weekday and weekend game playing. Moreover, this study uses a novel measure, weekday gaming tendency, which summarizes the weekday and weekend game playing behavior and breaks a new path for the subsequent studies.

The rationale for the link between personality and use may be the tendency to experience flow, an experience of total concentration and intrinsic enjoyment. Teng (2011) found that temperament and character dimensions are related to individual tendency to experience flow, supporting that flow may mediate the personality influences on gaming behavior. However, Teng (2011) did not cover weekday gaming tendency, indicating the newness of the present study. The results are consistent

with those of Griffiths et al. (2004), in which most online gamers are male. While that study indicated that some gamers play online games excessively, this study contributes to literature by demonstrating that high openness and low neuroticism can determine individual tendency to play online games in weekdays, thus helping to identify excessive online game behavior.

Also similar in scope as that of this study, Landers and Lounsbury (2006) identified agreeableness, conscientiousness, extraversion, optimism and work drive as negatively related to Internet usage. Owing to the extremely diverse nature of Internet applications, more studies are needed for understanding users of specific internet application. The present study contributes to the literature by identifying that openness and neuroticism may influence individual tendency to play online games in weekdays. This study is, to our knowledge, the first to investigate how personality and weekday gaming tendency are related. According to our results, personality is closely related to weekday online gaming tendency.

Teng (2008) found that online game users and non-users differ in openness, conscientiousness and extraversion. This study concentrates more heavily on online game users, indicating that openness may help estimate weekday and weekend usage patterns. Moreover, neuroticism was negatively related to weekday gaming tendency. Results of this study extend those of Teng (2008) by shedding light on how online game users can be characterized in terms of personality and usage.

This study investigated how gamer personality and online game usage are related in order to understand gamers more comprehensively and within the framework of previous studies. Jeng and Teng (2008) found that openness is related to role-playing and discovery motivations. According to our results, openness is positively related to weekday hours spent playing online games, thus providing a potential behavioral outcome for role-playing and discovery motivations. This study demonstrated that personality traits are related to hours spent

during weekdays compared to during weekends. Individuals with a high openness and low neuroticism currently use online games heavily in weekdays compared to in weekends.

This study thus recommends that online game providers encourage individuals with such a personality profile to play online, thus filling their weekday capacity. In sum, results of this study can help managers select which customers they need for filling their weekday capacity. While establishing a link between personality traits and weekday gaming tendency, this study demonstrates the usefulness of personality traits for marketing purposes. Thus, game providers can incorporate user personality traits when designing various versions of games and preparing promotional materials in order to attract new customers and retain loyal ones. Such finding is also important in network economies. The literature has identified the issue of network effect (the phenomenon that user utility is positively related to the number of equivalent users) (Teng et al., 2006), which can provide competitive edge to online businesses.

Findings of the present study provide insights for online game businesses to attract new customers that can be momentum for creating network effects. Despite its contributions, this study has certain limitations. A cross-sectional design is utilized, limiting this study in terms of examining the causal relationships between personality and weekday gaming tendency. Restated, based on the study findings, we cannot infer that certain personality traits motivate individuals to play online games, because online game usage may also alter personality traits when users play for several years. Future studies may adopt a longitudinal design to determine whether playing online games for more than one year can alter user personality traits. Additionally, personality traits are utilized in this study as correlates for the ratio of weekday to weekend usage. Although providing reasons for doing so in the Hypotheses Development Section, this study does not provide direct evidence for such reasons.

This study has thus laid the foundation for future studies to examine such reasons directly. Future studies may focus on situational factors, such as hours of employment, by considering the personality influences identified in this study. Moreover, this study recommend using qualitative research methods (such as in-depth interviews) since they are widely recognized their ability to elucidate underlying mechanisms. Since students are one of the main target customer groups (Jansz and Tanis, 2007), the present study has a sample of students. Online game section is expanding rapidly (Whang and Chang, 2004) and includes customers more than students (Griffiths et al., 2004). Thus future studies are suggested to investigate if customer occupation, lifestyle, and stage in their life affects customer tendency to play online games in weekdays. This study investigated how the ratio of weekday to weekend online game usage is related to the Big Five personality traits. Since each trait contains several facets, as described by McCrae and

Costa (1985), this study recommends that future studies utilize personality facets to replicate the results of this study. Utilization of personality facets is a current trend, as demonstrated in Soto and John (2009).

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