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Advanced or Addicted? Exploring the Relationship of Recreation Specialization to Flow Experiences and Online Game Addiction

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The popularity of online games has generated research interest in the flow experiences they may induce and the possibility of game addiction. Our study focuses on the dynamics of progression within online games, a perspective largely overlooked in previous investigations. Recreation specialization is used for exploring progression among online gamers and clarifying relationships between flow experiences and addiction tendencies. Data from online questionnaires completed by 357 players of Massively Multiplayer Role-Playing Games showed that specialized players are more likely to experience flow and exhibit game addiction than inexperienced players. Additionally, recreation specialization intensifies the effect of flow experiences on addiction tendencies.

Keywords addiction, flow experience, online games, progression, recreation specialization

Introduction

Video and online games have flourished worldwide (Lenhart, Jones, & Macgill, 2008). According to a report by DFC Intelligence (2007), the global online game market was worth US$4.5 billion in 2006 and was forecasted to exceed US$13 billion by 2012. Woodcock (2008) reported there are more than 16 million people worldwide who subscribe to fantasy-type role online games. The Institute for Information Industry indicated that online games...
were the leading form of cyber entertainment in Taiwan (Liu, 2006). Online games have become big business and popular pastimes.

Online games incorporate challenges that compel players to continually hone their skills. As players strive to advance to higher game stages, they can become readily immersed in the action. For some players, immersion can result in their disregarding the outside world. The psychological arousal that players experience is akin to flow, which can be defined as a state of optimal experience that entails participants becoming totally immersed in the action (Csikszentmihalyi, 1975). Indeed, online games generate considerable pleasure for players, often causing them to lose track of time within the fantastical world of cyber games (Griffiths, Davies, & Chappell, 2004; Rau, Peng, & Yang, 2006). Some players become so immersed in online gaming that it affects them adversely. For example, players have been observed to drop out of school, quit jobs, and distance themselves from friends and family (Griffiths et al., 2004; Young, 2009).

A few studies have investigated the relationship between flow experiences and addiction inclinations of playing online games. Chou and Ting (2003) verified that higher rates of online gaming are positively related to addiction and flow experiences. Wan and Chiou (2006), however, reported that flow experiences did not significantly influence addiction inclinations among online gamers. Previous results have yielded inconclusive findings, suggesting that additional research is needed to understand the relationship between flow experiences and game addiction.

One fruitful line of inquiry to explore these relationships involves using the recreation specialization framework. A major premise underlying recreation specialization is participants in any leisure activity can be arranged along a continuum of involvement from casual to highly specialized. Also, people’s skills, equipment and activity preferences, motivations, and social networks change the longer they participate in an activity (Bryan, 1977; Scott & Shafer, 2001). A few studies have shown that flow experiences are positively related to degree of specialization among activity participants (e.g., Wöran & Arnberger, 2012). Experience and enhanced skills may result in participants seeking out new challenges to experience flow and other benefits. However, flow can have a potentially dark side in that participants such as online game players can develop addictive tendencies (Yee, 2002). Some players have become so absorbed by online games that they withdraw from family and friends, lose interest in other activities, and continue to participate despite negative consequences on work and health (Young, 2009).

Our study explores specialization among online gamers and its possible effects on two important online-game experiences—flow and addiction. Two questions guided our investigation. First, do flow experiences and game addiction vary by participants’ degree of recreation specialization? Second, does degree of specialization mediate the relationship between flow experience and inclination of game addiction? Results expand our understanding of how participation in online games changes over time and how participation is potentially linked to both positive and negative outcomes.

**Literature Review**

Online games share many characteristics of video games that make them appealing, including role-playing and character development, sociability and multiplayer capabilities, graphics and sounds, and various game dynamics such as exploring new areas and fulfilling quests (Holt & Kleiber, 2009; Wood, Griffiths, Chappell, & Davies, 2004; Young, 2009). One other characteristic of online games that makes them compelling and different from other pastimes is that success is rewarded in the form of advancement to a higher level of participation. Higher play levels include new challenges and novelty, and game advancement is a major motivation among online gamers (Yee, 2006). Success at advanced play
Recreation Specialization and Flow Experiences

requires extraordinary time and skill (Young, 2009). These characteristics of online games can yield unbroken pleasure but also make cessation problematic (Hsu, Wen, & Wu, 2009).

Although researchers have noted that computer and online gaming can be a form of serious leisure (Holt & Kleiber, 2009), to our knowledge nobody has sought to examine variability of gamers’ experiences using the recreation specialization perspective. Bryan (1977) defined recreation specialization as “a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preferences” (p. 175). He argued that participants vary in level of commitment and tended to progress the longer they participated in a given activity. Recreation specialization has been applied to a variety of outdoor recreation activities, including birdwatching (Scott, Ditton, Stoll, & Eubanks, 2005), scuba diving (Thapa, Graefe, & Meyer, 2006), fishing (Ditton et al., 1992), and hunting (Needham, Vaske, Donnelly, & Manfredo, 2007). In a few cases, it has been applied to indoor pursuits, including card playing (Scott & Godbey, 1994), dancing (Brown, 2007), and heritage tourism (Kerstetter, Confer, & Graefe, 2001).

McIntyre and Pigram (1992) argued that recreation specialization embodies cognitive (e.g., skill and knowledge), affective (enduring involvement), and behavioral characteristics (e.g., years of experience). Similarly, Scott and Shafer (2001) argued that specialization should be conceived and measured in terms of a focusing of behavior, level of skill, and commitment. To date, researchers have used the specialization concept as an analytical tool for segmenting recreation participants and identifying distinct styles of involvement (e.g., Brown, 2007). It has also been used as a heuristic device for exploring how participant involvement changes over time (e.g., Kuentzel & Heberlein, 2006). A third use has been to predict various facets of participation, including motives and expected rewards, substitutability decisions, setting and equipment preferences, and socialization influences (see Scott & Shafer, 2001, for a more complete summary of variables of interest among recreation specialization studies). Only a few studies have examined how recreation specialization is related to flow (e.g., Wöran & Arnberger, 2012) and negative consequences (e.g., Lee & Scott, 2006). We are not aware of any published studies that have examined how recreation specialization is related to addictive tendencies.

Although we are unaware of studies applying the recreation specialization framework to online gamers, a few studies have documented how level of expertise shapes participation. Schrader and McCreery (2008) reported that expert/master players were generally more knowledgeable about games, performed better and more expertly, and enjoyed higher status in the gaming community than inexperienced players. Song and Lee (2007) divided game players into novices and experts and tested their performance on new tasks, and found that expert players’ performance exceeded that of novice players. These investigations revealed that knowledge, skill, and playing behavior varied with level of expertise, which support the underlying tenets of recreation specialization. It appears that online gamers, like any other group of activity participants, can be arranged along a continuum of participation from the general to the particular and exhibit varying levels of commitment, skill, and intensity of involvement.

We are interested in the extent that degree of specialization among online gamers is related to flow and addiction tendencies. Flow is a psychological condition where the individual is fully immersed in an activity and “there is little distinction between self and environment” (Csikszentmihalyi, 1975, p. 43). Characteristics of flow include a distorted sense of time, a feeling of control, clear goals, and a loss of self-consciousness. Flow usually occurs when skills and challenges are in accord. A handful of studies have documented that flow experiences are positively related to degree of specialization and enduring involvement among hiker, anglers, and other activity participants (Havitz & Mannell, 2005; Vittersø, 1997; Wöran & Arnberger, 2012). Findings from studies of online gamers, however, suggest opposing results. Rau et al. (2006) reported that both novice and expert players experience
distortions of time. Wallace (1999) found that beginners in games experience flow faster than master players.

Existing research on flow among online gamers have overlooked two important points. First, many advanced participants continue to participate in leisure activities because of the enjoyment (i.e., flow) they experience when involved in chosen pastimes (Csikszentmihalyi, 1990). Mannell (1993) was emphatic in this regard: “The more you invest in the activities that you choose to participate in, the more you get out of them” (p. 127). A second and related point is that participant motives change over time. This is a cardinal assumption of the recreation specialization framework. Bryan (2000) argued that advanced participants do what they can to avoid a pastime becoming simple or boring. He hypothesized that participants seek new challenges and develop advanced skills and knowledge to meet those challenges. For many advanced participants, a feeling of mastery and achievement are primary goals for participation (McFarlane, 2004). These points lead us to hypothesize that flow experiences among online gamers will be higher as people progress along the specialization continuum:

**H1**: Highly specialized players will experience higher rates of flow than other players.

Although flow is considered by many to be a positive outcome of participation in leisure activities, some players become so absorbed they manifest addictive tendencies. The meaning of game addiction is contested—the term is colloquially used to describe extreme devotion or state of being absorbed in a game (Holt & Kleiber, 2009). Extreme devotion, however, can lead to single-mindedness such that participation has a negative impact on the individual and his or her loved ones (Partington, Partington, & Olivier, 2009). We follow Yee (2002) who provided a working definition of addiction pertaining to online gaming as “a recurring behavior that is unhealthy or self-destructive which the individual has difficulty ending” (p. 1). Characteristic signs of game addiction include psychological and/or social withdrawal, continued participation despite negative consequences (e.g., losing a job), lying or hiding game use, and loss of interest in other activities (Young, 2009). Cessation of online gaming has been linked to unpleasant emotions and physical discomfort, which are regarded as symptoms of addiction withdrawal (Charlton & Danforth, 2007).

Studies have linked game-addiction tendencies to socialization functions of the Internet (Young, 1998), gender (Morahan-Martin & Schumacher, 2000; Scherer, 1997), affection-seeking (Chou & Hsiao, 2000; Lin & Tsai, 2002), psychological needs (Wan & Chiou, 2006), and personality (Lin & Tsai, 2002; Morahan-Martin & Schumacher, 2000; Young & Rogers, 1998). Our study extends this literature by examining recreation specialization as an antecedent of game addiction. Our contention is that specialization sometimes results in participants foregoing other pastimes. The attraction of online games may “crowd out” other activities, and participants may become dependent on the activity for enjoyment (Kubey & Csikszentmihalyi, 2002). This is consistent with research showing that addiction is highest among players who regard online games as highly salient and important (Charlton & Danforth, 2007). Simultaneously, people are driven to specialize as they have a need to find meaning and identity in everyday life (Bryan, 1977). Online gaming provides one such niche for some individuals. Young (2009) noted that online environments “allow individuals to experiment with parts of their personality . . . [and] try out new identities” (p. 357). The gaming environment may be so appealing and rewarding for some participants (compared with other areas of life) that they become increasingly consumed by the cyber worlds to which they are drawn. This leads us to hypothesize that:
Recreation Specialization and Flow Experiences

H₂: Highly specialized players will have greater addiction tendencies than other players.

Csikszentmihalyi (1990) noted that “the flow experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it” (p. 4). This positive feeling of flow fuels participation (Hsu & Lu, 2004) and loyalty to online games (Choi & Kim, 2004). Flow may be so pleasurable that participants are driven to compulsively seek it out in ways that are harmful (Chou & Ting, 2003; Hsu et al., 2009; Ng & Hastings, 2005). This tendency occurs among some outdoor recreation participants. For example, Partington et al. (2009) observed symptoms of dependence among female surfers as reflected by their tendency to participate despite injury and upsetting significant others.

A few studies have attempted to examine the flow–addiction relationship, and these studies have yielded inconclusive results. Chou and Ting (2003) reported that repetitive behavior increased addiction tendencies, and flow experience facilitated this relationship. In contrast, Wan and Chiou (2006) found that flow was not predictive of addiction among adolescents who played online games. Likewise, as noted above, Rau et al. (2006) reported that flow was achieved faster among novice players than for expert players. A limitation of Rau et al.’s (2006) study is that they did not take into account the intensity of flow experienced by players along a continuum of involvement. The intensity of flow is likely to increase as players’ skills and challenges increase (Csikszentmihalyi, 1990). Novice players are likely to encounter challenges and flow at an earlier stage of the game because of its novelty. Flow, however, may be ephemeral as novices lack requisite skills to progress to advanced stages of play. Expert players, on the other hand, may encounter flow for longer durations and at higher levels of play, as they have the skills to negotiate challenges they inevitably confront. The intensity of flow that experts encounter may be so appealing that addictive tendencies may surface (Kubey & Csikszentmihalyi, 2002).

Obviously, relationships among flow, addiction, and specialization are complex. Degree of specialization may well moderate the relationship between flow and addiction. More specifically, it is reasonable to expect that the relationship between flow and addiction is strongest among specialized players. For novices and intermediate players, flow is unlikely to result in high degrees of addiction because players are unlikely to regard the activity as central to their identity and lifestyle. Balance in their lives may prevent addiction in any given sphere (Young, 2009). Some specialized players, in contrast, have invested themselves in the game to the exclusion of other pursuits. As their level of expertise and commitment to the game increase, they may come to depend on the game for experiencing flow. Stated differently, specialization may result in players concentrating their interests and attention on a limited field of action for enjoyment and satisfaction. This leads us to hypothesize:

H₃: Degree of recreation specialization of online game players will moderate the relationship between flow experiences and addiction tendencies.

Methods

Study Subjects and Data Collection Process

Our investigation used players of Massively Multiplayer Role-Playing Games (MMORPGs) as the study population. MMORPG are the most popular online games (Woodcock, 2008), primarily because players can choose roles to play during different stages of the game in response to various scenarios. During progressive stages, game characters must upgrade their abilities by acquiring new tools and knowledge. MMORPGs were selected because
advancement is a key aspect of their play. We posted an Internet-based questionnaire on the two largest online gaming websites in Taiwan (Gamer and Game Base) to collect data from players of varying expertise and experience. These two websites have discussion platforms for various gaming communities, including those for beginners seeking assistance, experts giving advice, and friends sharing information. Respondents voluntarily completed the online questionnaire. Before accessing the questionnaire, respondents were required to enter an identification number, which prevented people from completing two or more questionnaires. We sought to exclude players who were younger than 10 years old, as it felt they would not have the requisite reading skills to comprehend questions. This investigation gathered a total of 375 questionnaires during April and May 2008, of which 357 were completed and subjected to further analysis.

Measurement of Constructs

Flow experience emphasizes a fusing of the mind and activity, as individuals fully concentrate on the activity and disregard the outside world or rewards (Csikszentmihalyi, 1975). We measured flow using a six-item scale developed by Choi and Kim (2004): (a) “playing the online game was interesting in itself,” (b) “playing the online game was fun,” (c) “I thought of other things while exploring the online game,” (d) “I felt curious while playing the online game,” (e) “I was in control of the online game that I was playing,” and (f) “I was entirely absorbed in playing the online game.” Responses for each item were on a 7-point scale ranging from strongly disagree (1) to strongly agree (7). Responses for the six items were combined to create an overall flow score.

To measure addiction tendencies, we used four scales developed by Charlton and Danforth (2007) in their study of online gaming. These scales assessed addiction in terms of withdrawal symptoms, degree of conflict, relapse, and salience. The following four items measured withdrawal symptoms: (a) “I am addicted to online games,” (b) “I have made unsuccessful attempts to reduce the time spent playing online games,” (c) “when I am not playing often I feel agitated,” and (d) “arguments have sometimes arisen at home because of my interest in online games.” Three items were used for measuring conflict: (a) “I sometimes neglect important things because of my interest in online games,” (b) “online gaming has sometimes interfered with my work,” and (c) “my social life has sometimes suffered because of playing online games.” The following three items were used for measuring relapse: (a) I am sometimes late for engagements because I am playing online games,” (b) “I often fail to get enough sleep because of playing online games,” and (c) “I miss meals because of playing online games.” Finally, the following three items were used for measuring behavioral salience: (a) “I feel that I spend more money than I can afford on online games,” (b) “I feel a sense of power when playing online games,” and (c) “I use online games as an escape from socialization.” The same 7-point agreement scale was applied and responses were combined to create a single addiction score.

Following Scott and Shafer (2001), we measured specialization using two indicators of behavioral involvement (years of playing this game, attending game contests), two commitment items (“I choose this game over other leisure activities” and “I have continuously spent money and time on playing games”), and five skill items (“I will continuously seek challenges for more advanced play,” “I like to use the most recent equipment and share experiences with others,” “I spend time continuously to learn new knowledge about the game and apply them when I play,” “my skill level is better than other players,” and “I like to join game-related guilds or organizations”). Response categories for the commitment and skills items were on the same 7-point agreement scale. We combined all nine items to create a composite index. This procedure has its critics (e.g., Kuentzel & McDonald, 1992)
but has been used effectively by others to create a continuum of specialization from low to high (e.g., Donnelly, Vaske, & Graefe, 1986; Salz & Loomis, 2005).

Other variables of interest included players’ (a) socio-demographic characteristics, including their gender, age, education, and discretionary monthly income; and (b) online game behavior, including frequency of participation, average length of playing, monthly spending, and motivations. Other researchers have used a few of the behavioral items in their measurement of recreation specialization. The behavioral items that we used for measuring recreation specialization focused on past history of participation (e.g., years of playing).

Results
Profiles of Respondents and Descriptive Statistics
Among the 357 respondents, 70% were male and 56% were between 21 and 30 years old. Thirty-two percent of respondents were under 21 years of age. More than half (55%) of respondents were students. Twenty-eight percent of all respondents reported they were in high school; 14% said they attended college. The rest (8%) attended junior high or primary school. Nearly two-thirds (65%) reported average monthly income below NT$10,000 (US$314). This amount is low, but indicative of the fact that the vast majority of respondents were school-aged.

Table 1 provides a summary of descriptive statistics for the variables measuring each construct. Respondents, on average, reported a relatively high degree of agreement with each of the six items we used for measuring flow. The highest level of agreement was for the item, “playing the online game was interesting in itself” (M = 5.9). The item-total correlations ranged from .60 to .81, indicating reasonable inter-item reliability. The Cronbach’s alpha for the six flow items was .72, which suggests an adequate level of reliability.

We used 13 items for measuring game addiction. In general, respondents reported moderate to low agreement on all items (Table 1). The highest level of agreement was for the item “I sometimes neglect important things because of an interest in online games” (M = 4.5). The lowest agreement was given for the item “I often feel that I spend more money than I can afford on online games” (M = 2.5). Item-total correlations were all high (.90 to .91), as was the Cronbach’s alpha (.91). These scores indicate that the game addiction construct had a high level of internal reliability.

The nine variables that we used for measuring specialization are also summarized in Table 1. Players, on average, had more than five years of playing experience. A large proportion of respondents reported they had joined game-related guilds or organizations (M = 5.5), continuously sought challenges for more advanced play (M = 5.2), and spent time continuously learning new knowledge (M = 5.1). Far fewer respondents agreed that they had continuously spent money and time playing games (M = 3.2). Most of the items had reasonably high item-total correlation values. The one exception was years of playing this game; the item-total correlation score for this item was only .15. Despite its low value, we retained this item in our analysis given that experience is integral to understanding specialization (Scott & Shafer, 2001). The nine items had a reasonable reliability, as measured by Cronbach’s alpha (.77).

Recreation Specialization Among Online Gamers
To explore differences among players based on specialization, we classified respondents into one of three groups. First, we standardized variables to minimize possible effects
### TABLE 1 Descriptive Statistics for Study Variables

<table>
<thead>
<tr>
<th>Indicators of Flow</th>
<th>M</th>
<th>Item–Total correlation</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Playing the online game was interesting in itself</td>
<td>5.9</td>
<td>.61</td>
<td>.72</td>
</tr>
<tr>
<td>Playing the online game was fun</td>
<td>5.7</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>I felt curious while playing the online game</td>
<td>5.4</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>I was in control of the online game that I was playing</td>
<td>5.3</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>I was entirely absorbed in playing the online game</td>
<td>5.3</td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>I thought of other things while exploring the online game*</td>
<td>4.1</td>
<td>.81</td>
<td></td>
</tr>
<tr>
<td><strong>Indicators of Addiction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I sometimes neglect important things because of an interest in online games</td>
<td>4.5</td>
<td>.90</td>
<td>.91</td>
</tr>
<tr>
<td>Playing online games has sometimes interfered with my work</td>
<td>4.4</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>My social life has sometimes suffered because of me playing online games</td>
<td>4.4</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>I think that I am addicted to online games</td>
<td>4.0</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>I often fail to get enough sleep because of playing online games</td>
<td>3.8</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>Arguments have sometimes arisen at home because of the time I spend on online games</td>
<td>3.6</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>I have made unsuccessful attempts to reduce the time I spend playing online games</td>
<td>3.5</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>I feel a sense of power when I am playing online games</td>
<td>3.5</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>I miss meals because of playing online games</td>
<td>3.4</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>When I am not playing online games often I feel agitated</td>
<td>3.3</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>I used online games as an escape from socializing</td>
<td>3.1</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>I am sometimes late for engagements because I am playing online games</td>
<td>2.9</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>I often feel that I spend more money than I can afford on online games</td>
<td>2.5</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td><strong>Indicators of Recreation Specialization</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to join game-related guilds or organizations</td>
<td>5.5</td>
<td>.46</td>
<td>.77</td>
</tr>
<tr>
<td>Years of playing this game**</td>
<td>5.4</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>I will continuously seek challenges for more advanced play</td>
<td>5.2</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>I spend time continuously to learn new knowledge about the game and apply them when I play</td>
<td>5.1</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>I like to use the most recent equipment and share experiences with others</td>
<td>5.0</td>
<td>.61</td>
<td></td>
</tr>
<tr>
<td>My skill level is better than other players</td>
<td>4.2</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>I have attended game contests</td>
<td>4.0</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>I choose this game over other leisure activities</td>
<td>3.9</td>
<td>.39</td>
<td></td>
</tr>
<tr>
<td>I have continuously spent money and time on playing game</td>
<td>3.2</td>
<td>.41</td>
<td></td>
</tr>
</tbody>
</table>

Except for “years of playing this game,” all items had seven response categories, ranging from strongly disagree (1) to strongly agree (7).

*This item was reverse coded.

**Responses for this variable were coded as 1 = 1 year or less, 2 = 2 years, 3 = 3 years, 4 = 4 years, 5 = 5 years, 6 = 6 years, 7 = 7 years or more.
of measurement units and then summed scores to generate a total score. Specialization index scores ranged from −20.9 to 13.28. We then divided respondents into roughly three equal groups of low, medium, and high based on their scores. This method of classifying respondents is often used in studies of recreation specialization (e.g., Donnelly et al., 1986; Salz & Loomis, 2005).

Chi-square analysis indicated that the behavioral patterns of online game players differed significantly by degree of specialization (Table 2). A high percentage of high-specialization participants played games several times a day (40%), for at least three hours per session (57%), and spent more than NT$400 monthly on gaming (50%), which was significantly higher than the totals reported by low-specialization players. Additionally, low-specialization players were more likely to play to kill time whereas high-specialization players were more likely to play to practice their skills (such as winning game-treasure) and socialize with comrades. Cramer’s V effect sizes ranged from .12 to .25, suggesting the reported differences were “small” to “medium” in size (Cohen, 1988). These results lend support to our assumption that the specialization framework can be applied to online gaming.

### Relationship Between Recreation Specialization and Flow Experience

One-way ANOVA and post-hoc tests revealed that players perceived flow experience differently across various degrees of recreation specialization, and these differences were statistically significant \( p < .001 \); Table 3). Highly specialized players reported significantly stronger flow experiences \( M = 5.69 \) than moderately specialized players \( M = 5.32 \) and low specialization players \( M = 4.83 \). Moreover, moderately specialized players reported significantly stronger flow experience than low-specialization players. The
TABLE 3 Flow Experiences and Game Addiction by Degree of Specialization

<table>
<thead>
<tr>
<th>Degree of specialization¹</th>
<th>Flow experience</th>
<th>Game addiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (1)</td>
<td>4.83ᵃ</td>
<td>2.86ᵇ</td>
</tr>
<tr>
<td>Medium (2)</td>
<td>5.32ᵇ</td>
<td>3.55ᵇ</td>
</tr>
<tr>
<td>High (3)</td>
<td>5.69ᶜ</td>
<td>4.41ᶜ</td>
</tr>
</tbody>
</table>

¹Means on 7-point scale from strongly disagree (1) to strongly agree (7). Means with different letter superscripts across each row differ at p < .05 using Sidak post-hoc tests.

teta effect size was .42, indicating that the differences were “large” (Cohen, 1988). Consistent with Hypothesis 1, player perceptions of flow increased with degree of specialization.

Relationship Between Recreation Specialization and Game-Addiction Tendency

One-way ANOVA and post-hoc tests also showed that players along the recreation specialization continuum reported varying levels of addiction tendencies (p < .001). Table 3 shows that highly specialized players (M = 4.41) reported significantly higher addiction tendencies than moderately specialized players (M = 3.55), and moderately specialized players had significantly higher addiction tendencies than players at the low end of the specialization continuum (M = 2.86). The teta of .51 suggests that the differences were “large” in effect size (Cohen, 1988). These results support Hypothesis 2.

Moderating Effect of Recreation Specialization on Flow–Addiction Relation

As suggested by Baron and Kenny (1986), the interaction between a predictor variable (flow) and moderator variable (recreation specialization) is calculated and included in regression analyses to examine the relationship change as a function of third variable (game addiction). Table 4 summarizes results of hierarchical regression analysis. The results of the first step revealed a significant and positive effect of addiction tendency regressed on flow experience (Adj. R² = .15; p < .001). In the second step of the regression analysis, a significant effect of addiction tendency regressed on flow experience and recreation specialization

TABLE 4 Effect of Recreation Specialization on the Flow–Addiction Relationship

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>ΔR²</th>
<th>Adj R²</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow experience</td>
<td>1.25</td>
<td>.16</td>
<td>.39**</td>
<td>.15</td>
<td>63.96***</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow experience</td>
<td>.22</td>
<td>.08</td>
<td>.15**</td>
<td>.16***</td>
<td>.31</td>
<td>78.78***</td>
</tr>
<tr>
<td>Degree of specialization</td>
<td>.60</td>
<td>.07</td>
<td>.46***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow experience (A)</td>
<td>−.17</td>
<td>.19</td>
<td>−.11</td>
<td>.01*</td>
<td>.32</td>
<td>54.90***</td>
</tr>
<tr>
<td>Degree of specialization (B)</td>
<td>.07</td>
<td>.24</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A × B</td>
<td>.10</td>
<td>.04</td>
<td>.60*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < .05. ** p < .01. *** p < .001. Dependent variable is game addiction.
Recreation Specialization and Flow Experiences

FIGURE 1 Moderating effect of specialization on flow experience to addiction.

(Adj. $R^2 = .31; p < .001$) was found, and the level of model change was statistically significant ($\Delta R^2 = .16; p < .001$). Flow experience significantly influenced addiction tendency ($\beta = .15; p < .001$), as did recreation specialization ($\beta = .46; p < .001$). In the third step of the regression analysis, the level of model change was statistically significant ($\Delta R^2 = .01; p < .05$). This stage of regression analysis revealed that the interaction effect of flow-recreation specialization was the only significant predictor ($\beta = .60; p < .05$). This means that as we take into account the interaction effect, the individual influences of flow experience and recreation specialization on addiction become insignificant; the relationship between flow and game addiction varies by degree of recreation specialization. Consistent with Hypothesis 3, degree of recreation specialization moderates the relationship between flow experience and addiction tendency.

Revealing the Moderating Effect of Recreation Specialization

Given that the interaction effect of flow and specialization was significant, we further examined the flow-addiction relationship under low, medium, and high degrees of recreation specialization, which is illustrated in Figure 1. Three regression models were generated as: $Y = .533 + .681X$ for highly specialized players, $Y = 1.934 + .304X$ for moderately specialized players, and $Y = 1.894 + .200X$ for low-specialization players. All three models were significant at the .05 level. Trend analysis was employed to check variations among three regression lines, and a significant linear trend was observed ($F = 126.11; p < .001$). This indicated that the three estimated slopes significantly varied in order (.68 for highly specialized, .30 for moderately specialized, and .20 for low-specialization) and reveals that a unit change in flow experience most strongly impacted addiction tendencies among highly specialized players; its impact was weakest for low-specialization players.

Discussion

These findings support the application of the recreation specialization concept to online gaming and shed insight into what happens as players become more experienced and
progress over time. Consistent with assumptions of the recreation specialization framework, online gamers displayed a wide range of commitment, skill, and behavioral involvement. Players at the high end of the specialization continuum had played more years than others and reported greater skill and commitment compared with other players. They also played more frequently and for greater duration and spent more money on gaming. These same patterns are evident in studies of various outdoor recreation activities and indoor pastimes (Scott & Shafer, 2001). Our findings are also consistent with previous studies of online gamers that suggest player skill, knowledge, and tactics increase as they become more experienced and familiar with a game (Schrader & McCreery, 2008; Song & Lee, 2007). Taken together, the specialization framework appears to be highly useful in characterizing diversity of experiences and orientations among online gamers.

Consistent with other studies (e.g., Wöran & Aramberger, 2012), flow experiences increased with degree of specialization. Many people progress in leisure activities because of the enjoyment and intrinsic rewards they derive from participation (Csikszentmihalyi, 1990). As participants develop skills and experience, they inevitably encounter new challenges and opportunities for flow. Experience also brings with it the skills to manipulate the leisure environment to induce flow (Bryan, 2000). Our findings clarify those reported by Rau et al. (2006), who found that novice players experienced flow quicker than expert players. The novelty of online games may be sufficient to produce flow. Sustained flow, however, requires commitment, experience, and skill. As players progress, the difficulty of gaming challenges increase, and players must spend additional time and effort to meet these challenges. Thus, flow becomes an integral facet of participation as players advance to higher stages of participation.

The positive relationship between recreation specialization and addiction tendencies was also confirmed by our results. As players progress, they simultaneously become highly immersed and committed. The downside is that their participation can spill over and negatively affect their health, jobs, school, and relationships with significant others. An investigation of female surfers by Partington et al. (2009) suggested a similar tendency where surfers confessed they enjoyed surfing so much that they participated despite physical injury and impaired social relationships. Findings from this study and our results suggest that specialization and flow, when taken to an extreme, can have potentially harmful outcomes for participants.

Our study results also demonstrate a moderating effect of recreation specialization on the flow-addiction relationship. The effect of flow experience on addiction tendency was stronger among highly specialized online game players than it was for other players. As online players become specialized, their level of enduring involvement and personal commitment increases to the point where the activity becomes all consuming. Some of these individuals become so specialized (or serious) they lack the skills and personal resources to experience enjoyment outside the game environment. Indeed, they may well come to depend on flow for enjoyment because they lack other viable outlets for enjoyment. Researchers have discussed potential costs associated with specialization (Lee & Scott, 2006) and serious leisure (Stebbins, 2007). Our results suggest that addictive tendencies are one of those costs and may occur as specialized participants experience intense levels of flow.

Conclusions and Suggestions for Future Research

Findings from our study demonstrate that recreation specialization can be readily applied to online gaming. On the one hand, players can be arranged along a continuum of involvement from casual to highly committed. More importantly, degree of specialization was highly
related to players’ experience of flow and addiction tendencies. Flow is often regarded as an ideal outcome of recreation participation, but the lure of flow experiences brings the possibility of addiction. Studies have raised concerns regarding addiction of online gaming (Griffiths et al., 2004; Rau et al., 2006; Young, 2009). Researchers have also attempted to investigate the flow-addiction relationship (Chou & Ting, 2003; Wan & Chiou, 2006). Our findings reveal that the interaction between recreation specialization and the flow experience, not the flow experience alone, is effective in predicting addiction tendencies. The effect of flow on addiction tendency was strongest among highly specialized online game players. A high degree of specialization contributes to deeper levels of flow and resistance to foregoing the game environment. Our results suggest that online gaming can have deleterious effects and potentially diminish players’ ability to seek enjoyment in other pursuits and to relate to peers outside the game culture. Future research is needed to confirm the extent that these findings are applicable to contexts outside of online gaming.

Our study focused on the combined relationship of flow and specialization on addiction tendencies among online game players. Other studies have linked game addiction to other factors, including players’ psychological needs and personality characteristics (Lin & Tsai, 2002; Morahan-Martin & Schumacher, 2000; Wan & Chiou, 2006; Young & Rogers, 1998). Future studies should investigate the relative importance of flow and degree of specialization on addiction relative to these and other effects. Research should also seek to tease out the impacts of different dimensions of specialization (e.g., commitment, skill, behavior) to the study variables. A possible limitation of our study is that we used a composite index in our measurement of specialization, whereas other researchers have noted that dimensions of specialization do not always co-vary (Kuentzel & McDonald, 1992). It could be that individual indicators that we used for measuring specialization were more or less related to flow and game addiction. Finally, this study was limited to only one popular type of online gaming. Numerous other online games exist that involve different challenges and require different skills for advancement. Future research should examine relationships among flow, specialization, and addiction in these other games.

It is not clear if our findings generalize to other leisure activities. Online games, and electronic games more generally, are designed to encourage players to succeed and advance to a higher and often more difficult level of play. Advancement requires a commitment in time, effort, and skill development. Although the same processes exist in most complex forms of leisure (Stebbins, 2007), many participants choose to participate at the same level of intensity for years (Kuentzel & Heberlein, 2006; Scott & Godbey, 1994). Pressure for advancement and skill development do not appear to be as salient in other pastimes. Future studies are needed to understand better the nature of relationships among specialization, flow, and addiction across different games and leisure contexts.

References


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