A group-based modeling approach to estimating longitudinal trajectories of Korean adolescents' on-line game time

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A B S T R A C T

The purpose of this study was to identify the number and the pattern of latent classes based on online game time and to test the significant determinants of classes among the variables, such as sex, self-control, self-esteem, aggressiveness, emotion regulation, academic stress, academic motivation and social skills. In order to identify the latent classes, we applied Nagin's semiparametric, group-based approach to the four waves of longitudinal data from the Korean Youth Panel Study using SAS Macro. As a result, four latent classes emerged according to different patterns of change in game play time: the low group, the rising group, the declining group and the chronic group. As for the influential factors, the results of conducting a multinomial logit analysis indicated that all factors, except social skills, proved to be significant.

1. Introduction

According to the latest statistics from Korea Communications Commission (KCC) and the National Internet Development Agency of Korea (NIDA), Internet use in Korea has been steadily increasing on a yearly basis throughout the last decade. One of the main reasons as to why young people use the Internet is to play online games (NISA, 2007). The Korea Creative Content Agency (KOCCA) conducted a survey on online game addiction among adolescents in South Korea (2007. 12–2008. 2), and found that 12.1% of young people in their adolescence play online games for more than three hours per day. Among these players, 29.1% reported that they feel anxious and uneasy if they cannot play online games or if they suddenly reduce their game play time. 53.5% reported that they have attempted to stop playing, but failed to do so. This suggests that a considerable number of young people feel a strong need to play online games. For some adolescents, participating in online games extends beyond merely engaging in a leisure activity; it becomes an addiction.

Online game addiction is commonly classified under the category of Internet addiction (Young, 1999). Addiction is ordinarily

diagnosed when social or professional functioning is damaged in concert with physiological dependence, tolerance and/or withdrawal symptoms due to the abuse of substances such as alcohol, cocaine or marijuana or due to compulsive behaviors. Because Internet addiction causes similar results, it has been classified as a subcategory of addiction (Griffiths & Hunt, 1998). Researchers found that the more adolescents spend time playing games, the more they show low self-control, poor grades (Kim & Cho, 2002), low emotional intelligence, poor relationship with teachers and peers, poor school adjustment (Kim, 2010) and aggressive attitude (Lee, 2011). Online game addiction leads to obsessive playing, which may engender impaired daily life, difficulty in separating fantasy from reality and withdrawal symptoms.

Adolescence is an important period of human development (Baker, Yardley, & McCaul, 2001). Thus, a great deal of the time spent addicted to online games during this critical formative developmental stage can hinder young people's normal development (Young, 1999). It may disrupt one's physical and mental growth and negatively influence the formation of one's self-identity and academic performance. Due to the consequence that addiction can be a serious problem with far-reaching consequences for adolescents, examining the related factors is of great importance. A meta-analysis of related studies reported that some personal characteristics were found to possess a significant relation to online game addiction (Kang & Son, 2007). Thus, in order to improve our understanding of game addiction in adolescents, the current study aims to investigate how personal characteristics (e.g., sex, self-control, self-esteem, aggressiveness, emotion regulation,

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academic stress, academic motivation and social skills) influence the change pattern in Korean adolescents' online game addiction over time.

2. Overview of the literature

This paper discusses eight personal characteristics that have been identified as having connections with game addiction.

2.1. Sex

Many previous studies indicated that males play online games more frequently and show much higher levels of addiction compared to female players (Cole & Griffiths, 2007; Kim & Cho, 2002). However, a careful interpretation of these results is needed because there is a great possibility that the sex difference in online game play time results from the social expectations associated with sex. Males are often the main targets for marketing games because the society often views online games, especially violent games, as a leisure item for males more than for females. Such social expectation may lead male students to have a higher desire to be good at online games and spend more time playing them compared to female students. Therefore, being male or female itself may not have a direct relation with online game play time or addiction. Yet, a complex interaction between social expectations about being a male or female may influence adolescents' online game play tendency.

2.2. Self-control

Self-control is the ability to delay one's pleasure and satisfaction by regulating impulsive actions in order to achieve greater and longer-term goals (Logue, 1995), which is also noted as a factor that influences online game addiction. Adolescents with lower self-control have shown a greater possibility to become addicted to online games due to their inability to control their desire to play games (Kim & Cho, 2002; Lee, 2003). Not being able to regulate their own desires or impulses related to playing online games is problematic because adolescents cannot learn or set boundaries between playing games as leisure and playing games as a necessity.

2.3. Self-esteem

Another commonly reported characteristic is self-esteem, which is a person's overall estimation of his/her own value (Rosenberg, 1965). Many studies indicated that adolescents' self-esteem and game addiction have a negative correlation (Sanger, Willson, Davies, & Whittaker, 1997). Adolescents with lower self-esteem become more easily addicted to an imaginary space because there, they can experience the kind of life they have always desired in reality and therefore, recover their lost self-esteem (Lee, 1999). In the case of self-esteem, it is often the satisfaction of accomplishment that comes with being skilled in a particular arena that influences adolescents to continue playing to the point of excess.

2.4. Aggression

The General Aggression Model (GAM; Anderson & Bushman, 2002), one of the social learning theories of aggression, suggests that exposure to violent games leads players to develop cognitive scripts related to aggression. A meta-analysis on violent video game effects (Anderson et al., 2010) reported that exposure to violent video games is a causal risk factor for increased aggressive behavior, aggressive cognition and affect as well as for decreased empathy and prosocial behavior.

2.5. Emotion regulation

There is little significant research on the relation between emotion regulation and online game addiction, although a lack of the ability to regulate emotions was proved to have a relation to various mental problems, such as personality disorders and drug abuse (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Emotion regulation can be described as the awareness, understanding and acceptance of one's own feelings and the ability to control them in order to reach one's goals and meet the situational demands (Gratz & Roemer, 2004).

2.6. Academic stress and motivation

Academic stress and motivation are also worth noticing in relation to adolescents' online game addiction, because academic work is one of the most important tasks in their developmental stage. However, little study was found on the influence of these factors with regard to the addiction, whereas academic performance has been found to have a negative correlation with computer game addiction among adolescents (Yoon & Lee, 2005).

2.7. Social skills

Studies show contradictory results regarding social skills. There are several studies claiming that excessive game players possess poor social skills and are highly isolated (Huang, 2006). However, Cole and Griffiths (2007) have argued that playing online games can strengthen friendships in real life and even help make life-long friends.

3. Research questions

Online game addiction is a behavioral pattern that develops over a long period of time. However, although many studies have examined the relation between personal characteristics and online game addiction, most are based on cross-sectional data and thus, cannot adequately explain how the characteristics affect the change in the addiction level over time. Thus, our study examined the following research questions: (1) Are there distinct patterns of latent classes according to online game time? How many classes exist and what are the characteristics of each latent class? (2) Given that there are multiple class patterns, what are the effects of sex, self-control, self-esteem, aggressiveness, emotion regulation, academic stress, academic motivation and social skills on determining the probability that each student belongs to a specific latent class?

4. Method

4.1. Participants

The current study used the dataset of the Korean Youth Panel Study (KYPS). KYPS is a multi-wave, longitudinal study that focuses on adolescents' school experiences from the period of mid-junior high school to early high school. Students' self-report questionnaires were used in this study. The current study's sample included 1725 males and 1724 females (mean age: 14.78 years, SD: .41 years) from four waves of KYPS.