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Mobile phone dependency and its impacts on adolescents' social and academic behaviors

Dong Gi Seo^a, Yujeong Park^{b,*}, Min Kyung Kim^c, Jaekook Park^d^a Dept. of Psychology, Hallym University, Chuncheon-si, Gangwon-do, South Korea^b Special Education Program, Dept. of Theory and Practice in Teacher Education, The University of Tennessee, USA^c Department of Teaching and Learning, East Tennessee State University, Johnson City, TN, USA^d Dept. of Special Education, Pusan National University, Pusan, South Korea

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ABSTRACT

This study aimed to examine the possible intrapersonal (i.e., attention, depression) and interpersonal (i.e., social relationships with friends, social relationships with teachers) problems related to mobile phone dependency and their impacts on academic achievement in adolescents in South Korea using a national sample of 2159 middle and high school students (1074 male and 1085 female). A structural equation modeling approach with mediation analysis was employed to test the seven hypotheses drawn from conceptual and empirical bases. Results showed that mobile phone dependency negatively predicted attention and positively predicted depression, which in turn, affect social relationships with friends and both Korean language arts and mathematics achievement. Also, the mediating roles of attention, depression, and relationships with friends were found between mobile phone dependency and the academic achievement of middle and high school students in S. Korea. Based on the findings, implications of the current study and future directions for research were discussed.

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1. Introduction

South Korea is one of the countries where information and technology (IT) has become a major driver of the economy in recent years and where most people have access to high-speed Internet (Campbell & Choudhury, 2012). According to the 2015 Mobile Phones Usage Statistics released by the Korean Ministry of Science, ICT and Future Planning (MSIP), approximately 57.77 million (112% of the total population in South Korea) were registered for mobile subscriptions in South Korea, meaning that there are more mobile phones in use than the total population in the country (MSIP, 2015). Such a high rate of mobile phone use is also reflected in the school-aged population; a report from the Korean Ministry of Gender Equality and Family (MOGEF, 2013) said that mobile phone ownership among adolescents aged 12–19 years has exceeded 90%, accompanied with high exposure to mobile media and technologies in various ways (The Neilsen Company, 2013).

While several studies have found advantages of using mobile media and technologies for school-aged adolescents such as

vocabulary learning (Lu, 2008), second language learning (Thornton & House, 2005), and classroom engagement (Wang, Shen, Novak, & Pan, 2009), much research has discussed the potentially negative, problematic use of mobile phones (Bianchi & Phillips, 2005; Billieux, 2012; Ha, Chin, Park, Ryu, & Yu, 2008). When it comes to the “dark side” of mobile phones for younger people (Lee, Chang, Lin, & Cheng, 2014), the research findings have revealed concerns about problematic use of mobile phones such as behavioral or technological addiction and its influences on intra-personal (e.g., attention, depression etc.) and interpersonal characteristics (Block, 2008). In particular, there are indications that younger people have an even higher likelihood of using the short message service (SMS) function and other features on mobile phones and being influenced by such features, resulting in increased exposure to emotional and social problems (Bianchi & Phillips, 2005; Charness & Bosman, 1992).

Regarding the potential risks of mobile phones, several medical experts and psychologists have revealed concerns about serious public health issues such as electromagnetic radiation, hearing impairments, and psychological distress/disorders (e.g., compulsive–impulsive spectrum) in S. Korea where the most saturated mobile market is established (Block, 2008; Young, 2007). In

* Corresponding author.

E-mail address: ypark@utk.edu (Y. Park).

particular, excessive or addictive use of the mobile phone and its impact on psychological disorders has received more attention in the fields of human health and psychology; relatively less evidence has been provided regarding how psychological problems impact on other aspects of adolescents' social relationships and academic development. Recognizing that the majority of school-aged children and adolescents in S. Korea put a mobile device into their hands and use it as communication device for their social relations inside and outside of school (Campbell & Choudhury, 2012; The Neilsen Company, 2013), it seems logical to assume that such dependency may produce psychological problems as well as other developmental problems, which could potentially impede students' success at school and beyond. In an effort to examine the broader impact of mobile phone use on adolescents' development, this study was designed to investigate the intertwined relationships between adolescents' emotional, social, and academic development. Thus, the primary goal of this study is to delineate the various factors that can be influenced by the mobile phone dependency of middle and high school students in S. Korea.

2. Conceptual framework underlying hypotheses

There has been a lack of studies that systematically articulate the theories and conceptual frameworks that underlie recent studies of problematic mobile use and its impacts on youth development (Moreno, Jelenchick, & Christakis, 2013; Moreno, Jelenchick, Cox, Young, & Christakis, 2011). Moreover, the clinical characteristics of problematic or excessive use of up-to-date technology and media have been described in various ways, such as problematic internet use, internet overuse, mobile phone overuse, etc. (Lepp, Barkley, & Karpinski, 2014; Thomee, Harenstam, & Hagberg, 2011), and there are currently no specific terms or criteria to define and conceptualize such phenomena related to internet and phone use, particularly with regards to adolescents' learning (Ko, Yen, Yen, Lin, & Yang, 2007). Therefore, the authors constructed research questions and hypotheses for the current study based on one conceptual approach (the environmental psychology model and behavioral addiction) and empirical studies, which can provide a framework for how to investigate mobile phone overuse in adolescents.

2.1. Approaches to problematic mobile use: behavioral addiction

One perspective that provided insight into the research questions of this study can be found in recent studies investigating behavioral and technological addictions (Orford, 2001). The term 'addiction' originated from a medical model, and this term was traditionally used for referring to a condition where a person is heavily dependent on a substance (e.g., alcohol, drugs) for pleasure or relaxation (Bianchi & Phillips, 2005). Recently, researchers have suggested that a broad range of conditions define 'addiction' by involving not only the ingestion of such substances but also the continuous and excessive engagement in a behavior (e.g., gaming, gambling, shopping) resulting in unawareness of one's life responsibilities (e.g., work, homework, relationships) (Lemon, 2002; Shaffer, 1996). According to research showing strong associations between behavioral addiction and its influences on adolescents' emotions and behaviors (e.g., Griffiths & Hunt, 1998; Ko et al., 2007), the more dependent adolescents are on games or the internet, the more negative consequences they likely to have (e.g., stealing, aggressiveness). In addition, such behavioral addiction and psychiatric problems are not unidirectional; adolescents who are addicted to media might have problems such as attention-deficit hyperactivity disorder (ADHD), depression, and hostility (Yen, Yen, Chen, Tang, & Ko, 2009), and adolescents with ADHD and

depression might be more dependent on media or technology use (Ko et al., 2007). The concepts of behavioral addiction or technological addiction are still under-developed, and the impact of the excessive use of mobile phones or computers on youth development and its consequences may require stronger empirical foundations to be established as a theoretical framework. Thus, the current study might add more knowledge to the existing literature to provide evidence to support a developing concept related to media and technology dependency and/or overuse.

2.2. Factors likely influenced by mobile phone dependency

Several studies have investigated the relationship between mobile use and mental health and development related outcomes. First, frequent mobile phone use was associated with symptoms of depression and anxiety (Lepp et al., 2014; Thomee et al., 2011). It was found that high mobile phone use was a risk factor for adverse mental health outcomes; the risk for reporting adverse mental health symptoms was significant among those individuals perceiving accessibility (i.e., the possibility to be disturbed at all hours) via mobile phones to be stressful (Thomee et al., 2011) and perceiving an obligation to stay connected through mobile phones (Lepp et al., 2014). Second, the symptom of depression (i.e., emotional instability), in turn, had a direct relationship with high mobile phone use (Roberts, Pullig, & Manolis, 2015). That is, individuals who were depressed were more prone to mobile addiction than individuals with emotional stability. Lastly, after examining the relationship between mobile dependence (i.e., cell phone addiction) and impulsiveness of 346 college students who completed an online survey, Roberts et al. also found a direct and positive association between the trait of attention impulsiveness and mobile addiction; incessant use of mobile phones (e.g., texting, sending emails) may act as a source of distraction from worries and concerns.

One of the reasons behind the frequent use of mobile phones is known as social interaction anxiety (Lee et al., 2014). For those who are prone to addictive use of mobile phones, the mobile phone may be a pacifier to reduce their feelings of discomfort from social interactions. On the other hand, several studies (e.g., Cobb, Heaney, Corcoran, & Henderson-Begg, 2010; Huang, Jeng, & Huang, 2009; Kim, Lee, & Kim, 2014) suggest mobile use may enhance social interaction and collaborative environments. For example, Kim et al. found that a mobile instant messaging group was superior to personal computer-based instant messaging and bulletin board systems in facilitating students' teamwork in a regular classroom activity. Although no direct benefits of mobile use in the classroom were found in the study by Cobb et al., they found that those who are more likely to fear initiating social interaction reported the most satisfaction with mobile use in the classroom. Furthermore, Huang et al. (2009) suggest that a mobile blogging system in a collaborative learning model provides unlimited discussion space without time limitations in an easy manner.

However, until recently, not much has been known about (a) how the variable of mobile use plays in the interaction between personal traits and relationships with others and (b) the contextual relationships among mobile use, personal traits, and social relationships. In addition, the majority of studies were conducted with young adults such as college students (e.g., Billieux, Van der Linden, D'Acremont, Ceschi, & Zermatten, 2007; Roberts et al., 2015). Further research is needed to investigate the interaction of these variables among younger students. There have been several attempts to examine excessive and/or problematic mobile phone use and its impact on psychological aspects of users (Billieux et al., 2007; Lepp et al., 2014; Thomee et al., 2011). In such studies, topics included the emotional and social features of excessive mobile

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