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The role of stress and motivation in problematic smartphone use among college students

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ABSTRACT

Although numerous studies have examined factors that influence problematic smartphone use, few have investigated the interactions between different types of motivation and psychosocial well-being factors in facilitating problematic smartphone use. Thus, this study analyzed the moderating role of perceived stress on the relationship between entertainment or escapism motivation and problematic smartphone use. Using a sample of 600 typical smartphone users (Chinese college students) we found: (1) Perceived stress moderates the relationship between entertainment motivation and problematic smartphone use, and between escapism motivation and problematic smartphone use among users scoring high on problematic use; (2) perceived stress moderated the relationship between entertainment motivation and problematic use also among users scoring low on problematic smartphone use, but for these users stress did not moderate the relationship between escapism motivation and problematic use. Our study highlights the importance of unresolved real-life problems in facilitating problematic smartphone use, suggesting that the resolution of these problems might be a good starting point when researchers design interventions for people excessively relying on smartphones.

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1. Introduction

Smartphones, distinct from standard mobile phones in terms of the operating system and being equipped with advanced 3G or 4G features and capabilities (e.g., socializing on Facebook and viewing/posting videos on YouTube), have attracted a significant number of users (Bian & Leung, 2014). The Statista (2013a) reported a forecasted smartphone penetration rate of 37% worldwide; this number continues to grow. The smartphone user penetration rates are estimated to reach about 65.8% of the population in the United Kingdom (Statista, 2013b), 63.5% in the U.S. (Statista, 2013c), and 49% in China (Statista, 2013d) respectively by 2017. Smartphones have become a perceived necessity in personal and work lives. Not only are they used for social networking purposes, but also for features and functions like reading e-books, answering e-mails, sending short messages, and playing online games. Generally, people use smartphones for entertainment or to relieve stress (Lee, Chang, Lin, & Cheng, 2014) because they can yield immediate gratification. However, spending too much time on

smartphone can be problematic, which might be accompanied by a diminished sense of volitional control and induce persistent smartphone activity (Thomee, Harenstam, & Hagberg, 2011), leading to mental health symptoms such as sleep disturbances, depression, and psychological distress (Chesley, 2005; Thomee, Eklof, Gustafsson, Nilsson, & Hagberg, 2007; Thomee et al., 2011).

Amount of studies have been done focusing on addiction (Young, 2004), problematic use (Chen & Kim, 2013; Martinotti et al., 2011), or excessive use (Bener, Al-Mahdi, Vachhani, Al-Nufal, & Ali, 2010; Buckner, Castille, & Sheets, 2012) of the Internet and other technologies. Young (2004) has defined Internet addiction as an impulse-control disorder not involving an intoxicant, making it a 'behavioral addiction' akin to gambling addiction and unlike alcoholism. This type of addiction has since been extended to incorporate other forms of technology, such as social networking sites (Kuss & Griffiths, 2011) and smartphone addictions (Bian & Leung, 2014; Kwon et al., 2013). However, considering that debate exists in terms of behavioral addictions (Peters & Malesky, 2008), and that problematic use implies that a person uses their phone in such a way that it leads to problematic outcomes but without making a clinical judgment as to whether this person has the mental disorder of addiction or not, we chose to

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use the more conservative term “problematic use” rather than “addiction”.

Numerous studies on smartphone use have been conducted from the perspectives of predictive psychological factors (Beranuy, Oberst, Carbonell, & Chamarro, 2009; Bianchi & Phillips, 2005; Chiu, 2014; Ehrenberg, Juceks, & White, 2008; Ha, Chin, Park, Ryu, & Yu, 2008; Hong, Chiu, & Huang, 2012; Jenaro, Noelia, Maria, Francisca, & Cristina, 2007; Walsh, White, Cox, & Young, 2011), predictive social factors (Walsh et al., 2011), and family environmental factors (Toda et al., 2008). However, few have examined the role played by the interactions between motivation and psychosocial well-being factors in problematic smartphone use. Thus, the purpose of this study is to establish a model of interactive effect of perceived stress and motivation on problematic uses of smartphone. The reason for investigating the interactions between motivations and psychosocial well-being variables in problematic smartphone use is that a direct-effects only approach does not account for how relationships between predictors may impact problematic use (Kardefelt-Winther, 2014a). In other words, with a direct effects approach it remains unclear how a person's well-being and his/her motivations for using the smartphone together shape how the phone is being used (Katz, Blumler, & Gurevitch, 1974) and when this leads to problematic outcomes (Kardefelt-Winther, 2014b). As a consequence, direct effects models focusing only on psychosocial well-being as the sole predictor of problematic use, as has been the tendency in the field so far, may be inadequate in their elucidation of its underlying mechanisms. Additional research is therefore needed to accurately simulate the realistically more complex and interactive nature of the antecedents of problematic use.

One theory of problematic technology use suggests that problematic smartphone use occurs when users repeatedly go online as a means to cope with life problems (Kardefelt-Winther, 2014a, 2014b, 2014c). According to the Compensatory Internet Use theory (see Kardefelt-Winther, 2014b for a detailed account), a user's needs and motivation to cope with life problems via Internet use is determined by the degree of life problems experienced, which implies that the relationship between motivations and problematic smartphone use should be moderated by life problems. Specifically, people may use smartphones for entertainment or escapism purposes, as this can help them cope with low psychosocial well-being such as stress. Therefore, as compared to people with high psychosocial well-being, those with low psychosocial well-being should be more likely to use smartphones to counteract their negative feelings which might lead to a higher degree of problematic outcomes. Following this line of thought, this study examines whether perceived stress moderates the association between two types of motivation (i.e., entertainment and escapism) and problematic smartphone use.

2. Literature review

2.1. Compensatory Internet Use theory

Based on the Compensatory Internet Use theory, low psychosocial well-being may be regarded as underlying causes of some of the motivations for Internet use, and in certain cases, this interplay may lead some people to spend so much time with their smartphone that it eventually results in problematic consequences for their life. This theory can be used to explain why some people persist in using the Internet or smartphones despite experiencing problematic outcomes, which is by some scholars referred to as addictive behaviors (Kardefelt-Winther, 2014b). Kardefelt-Winther (2014c) investigated the interaction effects of psychosocial well-being variables (i.e., stress and

self-esteem) and motivation (i.e., escapism) on problematic online gaming and found that both stress and self-esteem moderated the association between escapism and problematic online gaming. His study showed that people who were more stressed or had lower self-esteem and played primarily for escapism purposes, tended to experience more problematic outcomes than those who were less stressed or had high self-esteem. Crucially, the direct effects of escapism or stress alone did not have a significant impact on problematic outcomes when the interaction effect between the two variables was controlled for, which suggests that it is the combination of stress and escapism that leads to more problems.

2.2. Gratification from smartphone usage

Users might derive pleasurable and rewarding feelings from media usage. As proposed by the uses and gratification perspective, individuals' excessive use of media may be way of satisfying their psychological needs (Song, 2004). Specifically, individuals tend to actively select particular media and consume content to satisfy their psychological needs (Katz et al., 1974). Previous studies have found that people use new media to satisfy their needs for information, convenience, entertainment, self-expression, social status, and social interaction (Hawi, 2012; Ko, Cho, & Roberts, 2005; Papacharissi & Rubin, 2000). In relation to this, previous studies have identified various motives influencing problematic Internet use, such as the need for information, interpersonal relationships, entertainment, as well as the need to kill time and find an escape outlet (Khang, Kim, & Kim, 2013; Lowry, Gaskin, & Moody, *in press*). Regarding mobile phone use, users' needs for entertainment, stress relief, instantaneousness, mobility, interest, information, and social status serve as primary motives for using the medium; this could lead to excessive reliance on mobile phones (Lee et al., 2014). In other studies, it has been revealed that relaxing, relieving stress (Ho & Syu, 2010), strengthening users' family bonds, expanding their psychological neighborhoods, facilitating symbolic proximity to the people they call (Wei & Lo, 2006), as well as pass time (Wei, 2008), are motives for using mobile phone. Furthermore, according to a more recent study, problematic media use may occur when individuals use media to alleviate psychological distress arising from social and interpersonal confrontation (Khang et al., 2013).

2.3. Perceived stress and problematic smartphone use

Perceived stress is defined as a situation that is appraised as threatening or otherwise demanding, with no sufficient resources to enable one to cope with the situation (Cohen, Kamarck, & Mermelstein, 1983). Stressful environments and life events could provoke interacting somatic and psychological states that transform stress responsiveness and, thus, render individuals vulnerable to addiction (Hawkins, Catalano, & Miller, 1992; Rhodes & Jason, 1990). In terms of the association between stress and problematic new media usage, Jie et al. (2014) reported that stressors stemming from interpersonal and school-related problems and anxiety symptoms were significantly associated with Internet addiction, after controlling for demographic characteristics. In addition, family and general emotional stress, respectively, have been found to have a positive predictive power for smartphone addiction (Chiu, 2014). When confronted with excessive life stress, young people are inclined to increase their Internet use to manage moods, compensate for social interaction, and escape from reality (Leung, 2007). Therefore, researchers have argued that some individuals may use the new media (e.g. Internet and smartphone) primarily to cope with stress (Anderson & Collin, 1996). This notion has been corroborated in a study by Whang, Lee, and Chang (2003), which found that work-related stress is positively related to Internet

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