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Modeling habitual and addictive smartphone behavior
The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender

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ABSTRACT

The present study investigates the role of process and social oriented smartphone usage, emotional intelligence, social stress, self-regulation, gender, and age in relation to habitual and addictive smartphone behavior. We conducted an online survey among 386 respondents. The results revealed that habitual smartphone use is an important contributor to addictive smartphone behavior. Process related smartphone use is a strong determinant for both developing habitual and addictive smartphone behavior. People who extensively use their smartphones for social purposes develop smartphone habits faster, which in turn might lead to addictive smartphone behavior. We did not find an influence of emotional intelligence on habitual or addictive smartphone behavior, while social stress positively influences addictive smartphone behavior, and a failure of self-regulation seems to cause a higher risk of addictive smartphone behavior. Finally, men experience less social stress than women, and use their smartphones less for social purposes. The result is that women have a higher chance in developing habitual or addictive smartphone behavior. Age negatively affects process and social usage, and social stress. There is a positive effect on self-regulation. Older people are therefore less likely to develop habitual or addictive smartphone behaviors.

1. Introduction

The use of mobile Internet has reached figures over 50% in most Western countries (Donovan, 2013). In the Netherlands, 70% of the general population and over 90% of the adolescents own a smartphone (CBS Statistics, 2013). Often expressed concerns related to the increasing dependency on smartphones centers around the notion of addiction (Haverlag, 2013). While the need for research on Internet and smartphone addiction is acknowledged (Haverlag, 2013; LaRose & Eastin, 2004; LaRose, Lin, & Eastin, 2003), most of the investigations focus on describing behaviors and consequences (Yu, Kim & Hay, 2013). Factors that support smartphone addiction are to a large extent unknown (Haverlag, 2013). In the current contribution, first we focus on the type of smartphone use, or the gratifications that might play a role in habitual or addictive smartphone behavior. Second, we focus on personal traits that have been proposed as effective on addictive Internet and gaming behaviors: social stress, emotional intelligence, and self-regulation (Kwon et al., 2013). Third, we investigate the role of gender and age. Men and women are known to use smartphones in different ways, and younger people are the most profound users of mobile technologies.

1.1. Addictive smartphone behavior

Internet and smartphone addiction are different from addictions such as alcohol or drugs; the former are behavioral and not substance dependent. Behavioral addiction can be defined as a disorder characterized by (1) behavior that functions to produce pleasure and to relieve feelings of pain and stress, and (2) failure to control or limit the behavior despite significant harmful consequences (Shaffer, 1996). In behavioral addictions, the behavior itself – think of using smartphones, social media, or gambling – act as a reward. Whang, Lee, and Chang (2003) consider Internet addiction as "an impulse-control disorder with no involvement of an intoxicant; therefore, it is akin to pathological gambling" (p. 144). Internet and other digital addictions are often the result of habitual behavior used to relieve pain or escape from reality (Huisman, Garretsen, & Van Den Eijnden, 2000). When the use of the Internet or smartphones becomes addictive, this might result in negative effects on financial, physical, psychological, and social

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aspects of life (Young, 1999). Although the Internet in general, and the mobile Internet on smartphones in particular have similar features making the type of addiction similar (Kwon et al., 2013), smartphones have unique factors, such as (screen) size, applications, ubiquity, and flexibility in both time and space (Nielsen & Fjuk, 2010). The large variety of available applications promotes the intensive use of smartphones and the need of being online (Okazaki & Hirose, 2009).

1.2. Habitual smartphone behavior

Excessive and impulsive smartphone behavior can be explained by problematic habitual evolvement (Oulasvirta, Rattenbury, Ma, & Raita, 2011). Habits are formed through repeated acts in certain circumstances (Oulasvirta et al., 2011). In cognitive research, habits are defined as "an automatic behavior triggered by situational cues, such as places, people, and preceding actions" (Oulasvirta et al., 2011, p. 2). Habits are behavioral acts without self-instruction or conscious thinking (LaRose & Eastin, 2004), and can have both positive and negative effects (Wood & Neal, 2007). Habits enable multitasking and accomplishing complex tasks, and provide control over behavior in novel situations (Wood & Neal, 2007). Habits furthermore have a positive social feature, because habits characterize a person and predict that person's actions (Oulasvirta et al., 2011; Wood & Neal, 2007). On the other hand, maladaptive habits can cause unintended behavior activated by internal or external cues interfering with other acts, for example when people experience excessive urges such as unintended smartphone checking. This could interfere with daily life if it is not limited by regulations or social norms (Rush, 2011). Smartphones have the potential to produce new habits related to Internet use, for example, automatic actions in which the smartphone is unlocked to check the start screen for notifications (Oulasvirta et al., 2011). Such automatic actions can be triggered by external (ringtone) and internal cues (emotional state, urge). When previous actions resulted in desirable outcomes, those actions are likely to reoccur. The frequency of these actions and the salience of the reward determine the strength of the habit (Rush, 2011). Strong habits are repeated more often and are easier provoked by cues compared to habit that are less automatic (LaRose & Eastin, 2004). This can reach the level where they become annoying, such as inappropriate use of a smartphone at restaurants, concerts, and/or family gatherings. When the smartphone is removed, panic attacks or feelings of discomfort might emerge (Young, 1999; Shaffer, 1996). We hypothesize that:

H1: Habitual smartphone use positively influences addictive smartphone behavior.

1.3. Type of smartphone usage

Testing the relationship between types of smartphone use and addictive behavior requires a classification of usage types. Song, Larose, Eastin, and Lin (2004) proposed a twofold classification based on process and content gratifications. Process-related gratifications are acquired during consuming or prosuming media (Song et al., 2004) and are most interesting in relation to addictive smartphone behavior. Pleasurable experiences function as rewards and increase the chance to develop habitual or addictive behaviors (Yang & Tung, 2007). Besides process related use, previous studies showed that social usage affects addictive Internet behavior (Chou & Hsiao, 2000; Yang & Tung, 2007). Li and Chung (2006) concluded that if people depend on the Internet for social reasons, the risk to get addicted is the highest. People who are highly dependent on the Internet for interaction act impulsively, avoid emotions, and fail to keep up a proper planning or time management (Li & Chung, 2006). Lopez-Fernandez, Honrubia-Serrano, Freixa-Blanxart, and Gibson (2014) concluded that smartphone addicts spend most of their time on their smartphone for social purposes. Bandura (1991) explains with operant conditioning that actions are reinforced by rewards and punishments. Using the smartphone for pleasurable or social experiences is rewarding. The result is that we are more likely to repeat those actions as an escape from real life (Chou & Hsiao, 2000). We hypothesize that:

H2a: Process usage positively influences habitual smartphone use.
H2b: Process usage positively influences addictive smartphone behavior.
H3a: Social usage positively influences habitual smartphone use.
H3b: Social usage positively influences addictive smartphone behavior.

1.4. Personal traits

In the current study, we consider three traits that have shown to affect Internet and gaming addictions: emotional intelligence, social stress, and self-regulation (Kwon et al., 2013). Emotional intelligence is especially popular in its relation to physical and mental well-being (Engelberg & Sjoberg, 2004; Grisham, Steketee, & Frost, 2007; Kun & Demetrovics, 2010; Parker, Taylor, Eastabrook, Schell, & Wood, 2008; Rozin, Taylor, Ross, Bennett, & Hejmadi, 2003). It involves the ability to monitor and discriminate one's own and others' emotions, and subsequently use this information to guide one's thinking and actions (Kun & Demetrovics, 2010). Poor emotional regulation by adolescents is associated with problem behaviors (Wills, Pokhrel, Morehouse, & Fenster, 2011). In addictive behavior, decoding and differentiation of emotions as well as the regulation of emotions play an important role (Kun & Demetrovics, 2010). Internet addicts are more likely to have problems with decoding facial expressions and emotions (Engelberg & Sjoberg, 2004). Furthermore, individuals that have difficulties in coping with negative emotions easily turn to the Internet (Kun & Demetrovics, 2010). Overall, individuals with lower levels of emotional intelligence show less physical and mental well-being and possess a higher risk of developing Internet addictions (Beranuy, Oberst, Carbonell, & Chamarro, 2009; Engelberg & Sjoberg, 2004; Parker et al., 2008). This also applies to smartphone addictions (Beranuy et al., 2009; Kun & Demetrovics, 2010). We hypothesize that:

H4a: Emotional Intelligence negatively influences habitual smartphone use.
H4b: Emotional intelligence negatively influences addictive smartphone behavior.

The second personal trait we focus on is social stress. In general, stress is a nonspecific response of the body to a demand placed upon it to adapt, whether that demand produces pleasure or pain (Goeders, 2003). Smartphones are designed to be carried 24/7 and support their owners in different ways. The result is that many people are strongly attached to their smartphone (Rush, 2011) and increasingly also expect others to be available at any time. This can cause stress or anxiety when the device is not at immediate reach (Carbonell, Oberst, & Beranuy, 2013): one cannot be reached by others, cannot contact friends, or fails in being up-to-date (Lee, Chang, Lin, & Cheng, 2014; Sayrs, 2013). Because the smartphone has become so visible in daily life, it is becoming a critical tool in impression management. Not being able to be reached, for example, might cause symptoms of stress because this unavailability