



Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology[☆]



Jon D. Elhai^{a,b,*}, Robert D. Dvorak^c, Jason C. Levine^a, Brian J. Hall^{d,e}

^a Department of Psychology, University of Toledo, Toledo, OH, USA

^b Department of Psychiatry, University of Toledo, Toledo, OH, USA

^c Department of Psychology, University of Central Florida, USA

^d Department of Psychology, University of Macau, Taipa, Macau (SAR), People's Republic of China

^e Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

ARTICLE INFO

Keywords:

Psychopathology
Mental disorders
Information technology
Mobile phones
Addictions
Internet addiction

ABSTRACT

Background: Research literature on problematic smartphone use, or smartphone addiction, has proliferated. However, relationships with existing categories of psychopathology are not well defined. We discuss the concept of problematic smartphone use, including possible causal pathways to such use.

Method: We conducted a systematic review of the relationship between problematic use with psychopathology. Using scholarly bibliographic databases, we screened 117 total citations, resulting in 23 peer-reviewer papers examining statistical relations between standardized measures of problematic smartphone use/use severity and the severity of psychopathology.

Results: Most papers examined problematic use in relation to depression, anxiety, chronic stress and/or low self-esteem. Across this literature, without statistically adjusting for other relevant variables, depression severity was consistently related to problematic smartphone use, demonstrating at least medium effect sizes. Anxiety was also consistently related to problem use, but with small effect sizes. Stress was somewhat consistently related, with small to medium effects. Self-esteem was inconsistently related, with small to medium effects when found. Statistically adjusting for other relevant variables yielded similar but somewhat smaller effects.

Limitations: We only included correlational studies in our systematic review, but address the few relevant experimental studies also.

Conclusions: We discuss causal explanations for relationships between problem smartphone use and psychopathology.

1. Introduction

In recent years, mobile phones have become pervasively used globally (Pew Research Center, 2014, February 13). Despite the social networking advantages (Cho, 2015) and productivity enhancements from using mobile phones – smartphones in particular – a growing literature finds many people overuse their phones in ways that interfere with their daily lives (Cheever et al., 2014; Clayton et al., 2015). Problematic mobile phone use is associated with health hazards, such as texting while driving, leading to injury and death (reviewed in Cazzulino et al., 2014), and types of psychopathology, including anxiety and depression (e.g., Demirci et al., 2015; Kim et al., 2015a).

We present a conceptual review of problematic smartphone use. Next, to identify psychopathological correlates of problematic smart-

phone use, we conducted a systematic literature review and synthesis on relations between problem use – for smartphones, more specifically – and psychopathology. This review is aimed at synthesizing the diverse individual studies and their findings in this area, to derive overall conclusions on the problem smartphone use-psychopathology relationship. No such summary or synthesis has been available before in this area, leaving the reader to consider individual study findings, without a comprehensive snapshot of the literature as a whole. We make a point of going beyond a discussion of statistical significance, by focusing on effect sizes from these studies.

2. Background

The introduction of the iPhone to global markets in 2007 marked a

[☆] We thank David Medina, PhD, for providing feedback on an earlier draft of this paper.

* Corresponding author at: Department of Psychology, University of Toledo, Mail Stop #948, 2801 W. Bancroft St., Toledo, OH 43606-3390, USA.
E-mail address: contact@jon-elhai.com (J.D. Elhai).

substantial and radical change in the mobile industry, and in subsequent mobile phone products, because of numerous technological advancements that came with it (Frommer, 2011, June 6). Based on a typology of internet uses and applications (Song et al., 2004), smartphone uses can be similarly categorized as follows: productivity enhancement (e.g., calendar and email), information seeking (e.g., web browsing news stories), social information and interaction (e.g., social media), diversion and relaxation, entertainment, monetary compensation (e.g., locating consumer deals) and personal status (van Deursen et al., 2015). Importantly, smartphones are compact and light, fitting into one's pocket or purse for easy accessibility.

A national opinion poll study released in 2015 by the non-partisan Pew Research Center (Smith and Page, 2015, April 1) sampled more than 3000 American adult cellphone users, finding roughly two-thirds owned a smartphone. A subset of about 1000 participants was followed for one week in an experience sampling study of smartphone use. During the week of observation, the most prevalent (non-mutually exclusive) smartphone uses included texting (97%), voice or video calls (92%), internet browsing (89%), email (88%), and social network site use (75%).

Despite the many uses and advantages of smartphones, there are disadvantages. This review focuses on mental health correlates of problem smartphone use, but there are additional health hazards worth noting. Smartphones can distract drivers (especially young adults) who talk or text on the phone while driving, potentially leading to traffic accidents (reviewed in Cazzulino et al., 2014). Smartphone use is also a distractor among pedestrians while walking or crossing the street (Schwebel et al., 2012; Thompson et al., 2013). Smartphone use is associated with neck and shoulder pain because of one's posture while using a smartphone (Shan et al., 2013; Xie et al., in press), as well as hand dysfunction (İnal et al., 2015). Mobile phone use in students is associated with poor physical fitness (Lepp et al., 2013; Rebold et al., 2016), and worse academic performance (Jacobsen and Forste, 2011; Lepp et al., 2014; Prabu et al., 2015). Greater problem use can expose individuals to more hazards or negative effects.

3. The addiction construct in relation to smartphone use

In the Pew Research study, 46% of smartphone owners indicated that they “couldn't live without” their phone (Smith and Page, 2015, April 1). When separated from their smartphones, many individuals evidence mounting anxiety (Cheever et al., 2014) and physiological withdrawal-like symptoms (Clayton et al., 2015). In fact, many individuals experience phantom cell phone vibrations even in the absence of incoming phone notifications (Kruger and Djerf, 2016). In addition to “problematic smartphone use,” other terms that have been used to describe this construct regarding a smartphone include “addiction,” “excessive use,” “compulsive use,” and “compensatory use” (Kardefelt-Winther, 2014; Widyanto and Griffiths, 2006). “Compensatory use” may not be exactly the same as problematic use, but clarifies the motivation of such use – that is, to escape real-world problems and duties, and/or avoid negative emotion and affect (Kardefelt-Winther, 2014).

Problematic smartphone use has some communalities, but also differences, with other related constructs, such as internet addiction (reviewed in Kuss et al., 2014) and internet gaming addiction (reviewed in Kuss and Griffiths, 2012). These constructs have similar symptoms in common, typically measured using substance-related items with functional impairment. However, problematic smartphone use is different primarily because of the platform and interface of a smartphone. The internet addiction literature burgeoned before smartphones became prevalent – i.e., during times when it was not possible to use the internet, games or other web services on one's phone. The portability and accessibility of such smartphone uses and applications, discussed above, make the nature of problem smartphone use different from these other constructs. (And in fact, these constructs are

statistically distinct from one another, Kiraly et al., 2014).

To understand the newer construct of problem smartphone use, it is helpful to first review addiction in the context of the more established behavior of substance use. Most prominent psychological models of addiction posit that compulsory use, or what might be termed “addiction,” develops out of a process of positive and/or negative reinforcement (Robinson and Berridge, 2003). Negative reinforcement models, often referred to as “self-medication” or “affect regulation,” suggest that addiction develops as a way to cope with negative emotion (Baker et al., 2004). Although negative reinforcement seems like an intuitive mechanism for addiction, supporting research has been inconsistent (Shiffman et al., 2002). Negative reinforcement may result in subconscious associations that prompt automatic motivation to engage in the behaviors (Baker et al., 2004) (e.g., through automatic “checking” for smartphone notifications). However, the inability to engage in this automatized behavior results in heightened levels of negative mood (Baker et al., 2004). Thus, negative reinforcement models offer a possible mechanism for use maintenance, but may not explain how one may progress from use initiation to pathological use.

More accepted in explaining how use progresses to pathological use are positive reinforcement models of addiction (primarily for substance use), such as incentive sensitization theory (Robinson and Berridge, 2001). This theory posits that addiction initially develops as a process of mood enhancement, where individuals enjoy, and eventually crave, the positive aspects of the compulsory behavior (Robinson and Berridge, 1993), such as notification checking. At the initial stages, this results in strong associative or Pavlovian learning, making individuals increasingly attuned to small cues that come to signal the reward received from the compulsive behavior. Eventually this produces a disconnect between “liking” engagement in the behavior and “wanting” engagement in the behavior (Robinson and Berridge, 2000). Consequently, individuals develop an attention bias to environmental cues that prompt them to engage in the compulsory behavior, producing an urge to chase the positive feelings that occurred in the initial stages of use.

Thus, pathological use, as in the case of problematic smartphone use, may begin as a process of positive reinforcement. As the behavior becomes more compulsory, the individual begins to experience negative mood when not engaging in the behavior (i.e., withdrawal). Consequently, the only way to relieve the withdrawal is by engaging in the behavior (Wise and Koob, 2014). Alternatively, another way to view positive and negative reinforcement in smartphone addiction is that both types of reinforcement similarly involve the craving of positive emotion to alleviate negative emotion. However, it is also important not to overpathologize smartphone use (Billieux et al., 2015b). Indeed, even within the drug use literature there is evidence that some levels of use are not detrimental, and in fact can be adaptive (Schulenberg et al., 2000; Shedler and Block, 1990).

Causal theories of problem smartphone use draw from models of internet addiction. Several important pathways that are broad in focus and most discussed in the literature are discussed below, though not necessarily an exhaustive list. Several pathways are related to negative reinforcement models: a) habitual use and checking behaviors (Oulasvirta et al., 2012); b) seeking excessive reassurance (Billieux et al., 2015a); and c) reluctance to miss important information or content (Przybylski et al., 2013). These pathways are relevant to negative reinforcement because they involve behaviors intended to alleviate negative emotion. Two additional pathways are relevant to both negative and positive reinforcement models because they involve hedonic behaviors intended to boost positive emotion, but also warding off negative emotion: d) extraversion and e) impulsivity (Billieux et al., 2015a). As previously noted (Billieux et al., 2015a) note, these pathways are not mutually exclusive.

The development of problematic smartphone use through habit involves the tendency for smartphone features such as notifications and alerts to serve as cues for automatic checking behavior of one's phone

Download English Version:

<https://daneshyari.com/en/article/6229520>

Download Persian Version:

<https://daneshyari.com/article/6229520>

[Daneshyari.com](https://daneshyari.com)