



Problematic smartphone use and relations with negative affect, fear of missing out, and fear of negative and positive evaluation

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ABSTRACT

For many individuals, excessive smartphone use interferes with everyday life. In the present study, we recruited a non-clinical sample of 296 participants for a cross-sectional survey of problematic smartphone use, social and non-social smartphone use, and psychopathology-related constructs including negative affect, fear of negative and positive evaluation, and fear of missing out (FoMO). Results demonstrated that FoMO was most strongly related to both problematic smartphone use and social smartphone use relative to negative affect and fears of negative and positive evaluation, and these relations held when controlling for age and gender. Furthermore, FoMO (cross-sectionally) mediated relations between both fear of negative and positive evaluation with both problematic and social smartphone use. Theoretical implications are considered with regard to developing problematic smartphone use.

1. Introduction

In modern society, many individuals engage in excessive use of their smartphones. Excessive smartphone use is associated with physical health symptoms (Shan et al., 2013; İnal et al., 2015; Xie et al., 2016), as well as mental health problems including depression and anxiety (reviewed in Elhai et al., 2017a). Excessive use is also associated with decreased productivity, and poor academic achievement (Samaha and Hawi, 2016; Duke and Montag, 2017). However, little is known about relations between excessive smartphone use and other contemporary psychopathology-related constructs.

Smartphone access and usage is prevalent in contemporary times. Recent data demonstrate that the average worldwide ownership rate of a smartphone is 43%, with 72% ownership in the United States (Poushter, 2016). Smartphones have the advantage of being used for multiple purposes, including productivity enhancement, information seeking, social interaction, relaxation and entertainment, among other motivations (van Deursen et al., 2015). However, excessive smartphone use is a problem among many individuals currently.

“Problematic smartphone use” (PSU) is a construct often defined by excessive use of one's smartphone with interference in work, school or socially (Billieux et al., 2015). PSU is also accompanied by symptoms found in addictive/substance use disorders, including dependence and

withdrawal when not using one's smartphone (Clayton et al., 2015). In recent years, PSU has been studied, with multiple personality-related pathways theorized and found to influence this construct, such as excessive reassurance seeking, impulsivity, and extraversion (Billieux et al., 2015). Models of PSU have often conceptualized psychopathology or personality variables as influencing increase smartphone use, with increased or habitual use influencing PSU (Oulasvirta et al., 2012; van Deursen et al., 2015).

PSU is related to the construct of problematic internet use (Kuss et al., 2014), and both constructs involve symptoms observed in substance use disorders. However, these constructs are statistically distinct (Király et al., 2014). The study of problematic internet use has revealed associations with demographic, psychosocial, psychopathological, and technology use variables (Kuss et al., 2014) that has informed the examination of risk factors for PSU (Elhai et al., 2017a). Importantly, because of the portability and ease of access of one's smartphone, PSU is different from and poses a unique hazard compared to problematic internet use.

Our focus is on PSU, and a particular type of use - social use. Whereas non-social (or “process”) smartphone use involves primarily non-social purposes (e.g., entertainment, relaxation), social use involves primarily social purposes (e.g., communication, social networking) (van Deursen et al., 2015).

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While extensive research finds associations between PSU and depression and anxiety (reviewed in Elhai et al., 2017a), little consistent support has been found for other mental health variables. We examined additional variables reasonably expected to relate to PSU, despite little empirical scrutiny. These variables include fear of positive and negative evaluation, negative affect, and fear of missing out (FoMO). While FoMO has been recently linked to PSU in a community sample (Elhai et al., 2016), these other three variables have not been examined.

1.1. Fears of positive and negative evaluation

The fear of positive evaluation involves feelings of apprehension about others' positive evaluations of oneself, and associated distress (Weeks and Howell, 2012). This construct emerged from the finding that socially anxious individuals worry about their social performance, and that attaining positive evaluation adds pressure to perform positively (Weeks and Howell, 2012). In contrast, fear of negative evaluation involves apprehension that others will negatively evaluate oneself, and associated distress (see Watson and Friend, 1969).

The fear of negative evaluation is a common factor of psychopathology, involving social anxiety and depression; fear of positive evaluation is unique to social anxiety (Wang et al., 2012; Weeks and Howell, 2012). PSU has been linked with depression (Elhai et al., 2017a) and social anxiety (Lu et al., 2011; Hong et al., 2012; Harwood et al., 2014), but has not been assessed in relation to fear of positive or negative evaluation.

1.2. Negative affect

Negative affect is an underlying dimension of a broad set of emotional states, including fear, anger, sadness, guilt, and disgust. Watson (2009) found evidence for negative affect as a factor underlying depression and anxiety disorders. Negative affect shares similar physiological correlates with depression and anxiety, including low heart rate variability (Bleil et al., 2008). Because depression and anxiety are related to PSU (Elhai et al., 2017a), negative affect is worth investigating.

1.3. FoMO

FoMO is a pervasive apprehension that others might be having rewarding experiences from which one is absent (Przybylski et al., 2013). Using a community sample, Elhai et al. (2016) discovered that FoMO was related to PSU. Additionally, FoMO was associated with increased social smartphone use in college and community participants (Przybylski et al., 2013; Alt, 2015).

2. Theory

Uses and Gratifications Theory (UGT) is relevant to electronic media consumption, such as smartphone use. UGT assumes that based on individual differences, people have specific needs that they desire to be fulfilled by mass media. Furthermore, a specific need would drive an individual to consume a very particular type of media to satisfy that need (Blumler and Katz, 1974; Blumler, 1979). In UGT, individual differences driving such media choices can include demographic characteristics, as well as psychological and psychopathological traits. Recent papers have supported individual differences in UGT in explaining PSU (Grellhesl and Punyanunt-Carter, 2012; Park et al., 2013; Elhai et al., 2017b). Individuals with high levels of FoMO should attempt to fulfill their social needs by increased use of social media (e.g., a smartphone).

An additional relevant theory is Compensatory Internet Use Theory (CIUT), developed by Kardefelt-Winther (2014). As with UGT, CIUT also attempts to explain media use – in particular, internet use. CIUT assumes that life stressors and negative events motivate some people to overuse technology as a means of alleviating their negative emotion.

Thus, this theory is grounded in the assumption that excessive internet use is not pathological in and of itself, but rather is a compensatory process for coping with psychopathology. Several studies thus far have found empirical support for this theory as related to the study of PSU (Wang et al., 2015; Long et al., 2016; Zhitomirsky-Geffet and Blau, 2016).

2.1. Purpose/aims

Our purpose was to examine psychopathology-related variables in relation to PSU, including social use in particular. Specifically, we examined fears of positive and negative evaluation, negative affect, and FoMO for associations with PSU and social smartphone use, of which only FoMO has been explored for relations with PSU (Elhai et al., 2016).

2.2. Hypotheses

- 1) *FoMO would relate positively to PSU, and particularly to social smartphone use.* Based on UGT (Blumler and Katz, 1974; Blumler, 1979) and CIUT (Kardefelt-Winther, 2014), FoMO should be associated with increased social smartphone use, as a means to fulfill and compensate for individuals' social needs. Recent research has found FoMO related to PSU (Elhai et al., 2016). Furthermore, Przybylski et al. (2013) and Alt (2015) found that FoMO related to increased social media use.
 - 2) *Fear of negative and positive evaluation should be positively related to PSU, and social use.* Based on UGT and CIUT, social smartphone use would be expected to relate positively to evaluative fears, because those individuals fearing evaluation should avoid real-life interaction, instead using their smartphones to compensate. Social anxiety is associated with PSU (Lu et al., 2011; Hong et al., 2012; Harwood et al., 2014), and social media use (Hargittai, 2007); and social anxiety is strongly related to fears of positive and negative evaluation (Weeks and Howell, 2012).
 - 3) *Negative affect should be positively related to PSU, including increased social use.* Negative affect should relate to social smartphone use based on UGT and CIUT, as such use would be a means to cope with and compensate for negative affect. Depression relates to increases in PSU (Elhai et al., 2017a), social smartphone use (Elhai et al., 2017b), and social media use in general (Rosen et al., 2013; Andreassen et al., 2016). And depression is similar to negative affect, an underlying part of depressive and anxiety disorders (Watson, 2009).
 - 4) *FoMO will have an additive effect on problematic and social smartphone use, above and beyond the other correlates.* Elhai et al. (2016) found FoMO to be the most potent predictor of PSU in a community sample. We expected to find similar support with the present college sample.
 - 5) *FoMO (cross-sectionally) mediate relations between fear of evaluation and both problematic and social smartphone use.* Fear of evaluation is related to social anxiety (Weeks and Howell, 2012). And social anxiety is associated with PSU (Lu et al., 2011; Hong et al., 2012; Harwood et al., 2014), and social media use (Hargittai, 2007). Social anxiety is thought to be associated with PSU because online (e.g., smartphone-based) socializing can be a means of compensating for one's real-world social fears (Hong et al., 2012; Kardefelt-Winther, 2014). We propose that FoMO may be a mechanism responsible for why some socially anxious/evaluative fearful individuals engage in increased smartphone use.
- An additional mechanism that can explain relations between psychopathology-related variables and PSU is the extent or type of smartphone use. Increased smartphone use was revealed to be a significant mediator between psychopathology-related variables and PSU in several papers (Oulasvirta et al., 2012; Kim et al., 2015; van Deursen et al., 2015). Furthermore, van Deursen et al. (2015)

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