



# Who overuses Smartphones? Roles of virtues and parenting style in Smartphone addiction among Chinese college students



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## ARTICLE INFO

### Article history:

Received 27 June 2016

Received in revised form

11 August 2016

Accepted 16 August 2016

### Keywords:

Parenting style

Virtues

Smartphone addiction

College students

## ABSTRACT

Several empirical studies have linked negative parenting style (i.e., parental rejection and overprotection) with a higher degree of Smartphone addiction. However, few studies have analyzed the potential protective factors (e.g., virtues) that may prevent addiction and promote effective Smartphone addiction interventions. Therefore, we examined if virtues (i.e., relationship, vitality, and conscientiousness) mediated the association between parenting style and Smartphone addiction among college students. Moreover, we examined whether these relationships were moderated by gender. Chinese college students ( $N = 742$ ) ages 16–25 years completed the: 1) short-Egna Minnen av Barndoms Uppfostran-Chinese measure of parenting style, 2) 96-item Chinese Virtues Questionnaire, and the 3) Mobile Phone Addiction Index of Smartphone addiction. The results showed that negative parenting style significantly influenced college students' Smartphone addiction. Furthermore, virtues acted as a cognitive mechanism that mediated the association between negative parenting style and Smartphone addiction. Moreover, male virtues may be more sensitive to negative parenting style than female virtues. Relevant suggestions for college administrators, educators, parents, and future researchers are offered.

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## 1. Introduction

Smartphone use has increased substantially over recent years in both developed and developing countries. According to the International Telecommunications Union, there were more than 7 billion mobile cellular subscriptions at the end of 2015, accounting for 97% of the world's population. In China, the total number of Smartphone users was estimated to be 1.306 billion by the end of 2015, with a net increase of 19.645 million in 2015. Particularly, more and more college students have reported that they were unable to separate themselves from their Smartphones (Mok et al., 2014).

The use of Smartphones is likely to be a double-edged sword. Smartphone use could improve not only interpersonal relationships (e.g., Possession of Smartphones can achieve a large number of friends or followers), but also the quality of daily life (e.g., Smartphones have become the most effective means of

entertainment, amusement, and pastime) (Aljomaa, AlQudah, Alburan, Bakhiet, & Abduljabbar, 2016). However, a growing number of studies have indicated that excessive or uncontrolled use of Smartphones could cause sleep disturbances, work intrusion, depression, anxiety, loneliness, dangerous behaviors (e.g., using the phone while driving), and pathologic symptoms (Billieux, Van der Linden, & Rochat, 2008; Kwon et al., 2013; Thomée, Härenstam, & Hagberg, 2011; White, Eiser, & Harris, 2004). Smartphone addiction has been regarded as a new mental health problem that occurs when people overindulge in Smartphone use (Yen et al., 2009). Smartphone addiction has generally been defined as an inability to control the craving to use a Smartphone (Walsh, White, & Young, 2010). Additionally, Smartphone addiction has attracted considerable research interest in the last decade. The prevalence rate of Smartphone addiction in college students was estimated to be approximately 10–48% in 2016 (Aljomaa et al., 2016; Lopez-Fernandez, Honrubia-Serrano, Freixa-Blanxart, & Gibson, 2014). For example, a recent Chinese study conducted with 4000 college students revealed an addiction rate of 37.9% (Wang & Zhang, 2015). This large proportion and rapid growth trend sparked the urgency to explore the causes and psychological mechanisms underlying Smartphone addiction.

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Most published papers have attempted to estimate the negative outcomes of behavioral and psychological symptoms of Smartphone addicts (Samaha & Hawi, 2016). However, only a few researches have analyzed what causes an individual to become dependent on his or her Smartphone. Past studies have focused primarily on Smartphone addiction symptoms to measure the risk factors (i.e., individual, family, and social environmental) (Billieux, Maurage, Lopez-Fernandez, Kuss, & Griffiths, 2015; Walsh, White, Cox, & Young, 2011). However, a paucity of research has investigated important protective factors such as virtues. Likewise, relatively few studies have explored the relationship between parenting style (an important environmental factor and intervening variable) and Smartphone addiction. In addition, little research has examined whether the direct and indirect effects depend on other factors such as gender. For example, would male students who experience a highly negative parenting style develop fewer virtues compared to their female counterparts? Therefore, this study examined college students' Smartphone addiction in several respects. First, we sought to confirm previous findings by investigating the relationship between parenting style and Smartphone addiction among Chinese college students. Second, we extended the existing literature by examining the role of protective virtue-related factors, which could explain the relationship between parenting style and Smartphone addiction. Finally, we examined the moderating role of gender in this relationship. To the best of our knowledge, this study was the first to analyze these concepts in this context.

Our study contributes to deepening the theoretical research about Smartphone addiction, expanding the application of virtues within the field of Smartphone addiction, and suggesting strategies that college administrators and parents can use to identify, screen, and intervene for Smartphone addicts. Therefore, our results may not only provide insight into future research in this field, but also provide an effective, practical way for preventing or reducing college students' Smartphone addiction.

### 1.1. Parenting style and Smartphone addiction

Parenting style has been reported to be an important family environmental factor that could reflect the essence of the parent-child interaction (Brofenbrenner & Ceci, 1994; Matejevic, Jovanovic, & Lazarevic, 2014). Parenting style has been used to refer to the kind of physical and emotional care parents or caretakers provide to their children (Darling & Steinberg, 1993). Researchers have separately assessed both parents' and children's views of parenting style (Aluja, Del Barrio, & García, 2006). In the current study, we focused on children's perceived parenting style and tested individuals' perceptions of their parents' childrearing behavior. Based on Perris, Jacobsson, Linndström, von Knorring, and Perris's (1980) description of perceived parenting style, positive parenting style is characterized by parental warmth (e.g., emotional support and acceptance). In contrast, negative parenting style is characterized by parental rejection (e.g., parent hostility, harsh and punitive parenting) and overprotection (e.g., strict regulation and monitoring, high degree of intrusiveness toward children) (Vera, Granero, & Ezpeleta, 2012).

Several empirical studies have revealed that family environmental factors play a significant predictive role in Smartphone addiction (Bae, 2015; Chiu, 2014). Specifically, negative parenting style could increase the degree of Smartphone dependence, while positive parenting style could reduce Smartphone dependence (Bae, 2015). According to problem-behavior theory (Jessor, 1987), the perceived environment system is one of the psychosocial systems (i.e., the perceived environment system, the personality system, and the behavior system) that specifies the likelihood of

occurrence of problem behavior. The majority of the variables in this system are parent- and family-oriented. In particular, the more parental rejection and overprotection experienced, the more likely the occurrence of problem behaviors.

Thus, Smartphone addiction might be induced through individuals' negative memories of their upbringing. Consistently, previous studies have supported the view that parenting style could be a target for Smartphone addiction prevention and intervention. However, only a few researchers have examined how parenting style was related to Smartphone addiction. For example, Deng, Huang, Gui, Niu, and Zhou (2015) found that positive and negative parenting style indirectly influenced the level of Smartphone addiction through subjective well-being.

### 1.2. Virtues as a mediator

With the flourishing of positive psychology during the last decade, the virtues system has emerged as a topic of research interest. Peterson and Seligman (2004) regarded virtues as positive psychological resources, and defined them as "a property of the whole person and the life that person leads" (p. 87). This virtues system involved organization of 6 universal virtues and 24 character strengths (Dahlsgaard, Peterson, & Seligman, 2005). Although abundant studies have consistently shown that these positive traits were significant to mental and behavioral health in different cultures, relatively few studies have investigated these traits at the virtue level. One reason for this is because the virtue structure was not sufficiently clear in different cultures, and previous studies have found various virtue structures (i.e., one-, three-, four-, five- and six-factor structures) (Toner, Haslam, Robinson, & Williams, 2012). Subsequently, Duan, Ho, et al. (2012) applied the combined etic-emic approach to reduce culturally inappropriate items and developed a 96-item Chinese Virtues Questionnaire (CVQ-96). Exploratory and confirmatory factor analysis suggested three well-established and culturally meaningful virtues: relationship, vitality, and conscientiousness. In terms of these virtues, relationships manifested as the positive cognitions, emotions, and behaviors associated with interactions with others; vitality reflected positive qualities such as curiosity and zest for creating a fulfilling life; and conscientiousness was related to intrapersonal virtues that exhibited willpower and self-control (Duan, Ho, Bai, & Tang, 2013).

Previous theoretical work has emphasized the importance of parenting style as a determinant of the development of personal virtues, and existing cross-national research has provided some indirect evidence by reporting associations between parenting style and personality traits that are conceptually related to certain virtues (Roberts, 2007; Robinson, Wright, & Kendall, 2011). For instance, parental rejection was consistently associated with higher trait-neuroticism and lower self-esteem. Punishment and excessive parental control could lead to the development of a pattern of hostility and a lack of socialization (García, Aluja, & del Barrio, 2006). In contrast, parental emotional warmth was related to high femininity and humility (Arrindell et al., 2005). To date, there appears to be no direct research into the effect of negative and positive parenting styles at the personal virtues level, which we examined in this study.

We also predicted that virtues would be negatively associated with Smartphone addiction characterized by the inability to control cravings and decreased productivity. According to problem-behavior theory (Jessor, 1987), personality traits (i.e., personal beliefs, expectations, values, attitudes, and orientations toward self and others) may be used to explain the instigation of problem behaviors or act as a control against them. Consistently, virtues manifest positive personality traits in interactions with others as well as qualities such as curiosity, zest for life, and willpower; consequently,

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