Sociable People Beware? Investigating Smartphone Versus Nonsmartphone Dependency Symptoms Among Young…

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SOCIABLE PEOPLE BEWARE? INVESTIGATING SMARTPHONE VERSUS NON-SMARTPHONE DEPENDENCY SYMPTOMS AMONG YOUNG SINGAPOREANS[1]

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The purpose in this web-based study was to relate smartphone and non-smartphone use to symptoms of mobile-phone dependency, and to examine sociability in this context. We used a stratified sampling method to recruit 551 Singaporean undergraduates. The results showed that young smartphone users tended to have greater mobile-phone dependency and more severe symptoms than non-smartphone users did. We found that utilizing mobile Internet and text messaging were both positively associated with smartphone users' dependency. Regardless of phone type used, the level of sociability of mobile phone users was positively associated with mobile dependency and symptoms of feeling anxious and lost, and withdrawal/escape.

Keywords: smartphone dependency, sociability, mobile Internet, text message, mobile instant message, short message service

Mobile phones have become the most prevalent communication devices with global mobile-cellular penetration at 96% of the population (International Telecommunications Union, 2014). People consciously use mobile phones with various levels of dependency (Carbonell, Oberst, & Beranuy, 2013), and heavily reliant users who make excessive and improper use of mobile phones show pathological symptoms of mobile addiction and maladaptive behavior (Leung, 2008b). Instead of presuming mobile addiction, in this study we investigated mobile dependency as a continuum and defined it as a relationship in which individuals attain

goals, such as social connectivity, through reliance on using mobile activities (Park, Kim, Shon, & Shim, 2013).

Sociability, in the context of information technology use, is defined as a human's desire to socialize with others through mediated technologies (Junglas, Goel, Abraham, & Ives, 2013). It is a crucial psychological trait associated with users' dependence on mobile technologies (Igarashi, Motoyoshi, Takai, & Yoshida, 2008). Rice and Hagen (2010) argue that young people use mobile communication to keep perpetual contact with social networks, thereby causingtheir mobile dependency. As smartphones with identifiable operating systems enable advanced capabilities and extend functionalities with third party applications (Theoharidou, Mylonas,& Gritzalis, 2012), their adoption is increasing worldwide (Danova, 2015). According to a multiscreen study conducted by Google (2012), smartphones with mobile Internet services enhance users' social connectivity and cross-screen interactions. Constant social connection via smartphones has become a norm for digital-savvy young users (Hyman, 2013).

Despite a climate of social alarm caused by the fact that young people are prone to losing self-control in using mobile phones (Igarashi et al., 2008; Leung, 2007), relatively little research regarding smartphone dependency has been conducted. As smartphones' advanced features are likely to increase users' attachment, it seemed worthwhile to us to compare smartphones with non-smartphones in regard to causing symptoms of mobile dependency. To fill the research gap, we examined differences between smartphone and non-smartphone dependency symptoms, and their relationships to sociability and mobile dependency.

Literature Review and Hypotheses

According to Chóliz (2010), the social and affective functions of mobile phones cause uncontrolled, inappropriate, or excessive phone use, resulting in negative outcomes (e.g., disruption to school work, costly phone bills, and conflicts with parents; Leung, 2008b). Heavy reliance on mobile phones, turning into addiction, led to college students' developing severe dependency symptoms (Rice & Hagen, 2010), including inability to control craving, feeling anxious and lost, withdrawal/escape, and productivity loss (Leung, 2008a).

Excessive messaging is the key determinant resulting in non-smartphone dependency among young people (Igarashi et al., 2008; Perry & Lee, 2007). In many prior studies the results show frequent use of texting was positively related to mobile addiction (e.g., Leung, 2007; Park, Hwang, & Huh, 2010; Perry & Lee, 2007). Popular smartphone activities like mobile Internet and mobile instant messages (MIM) raise recent concerns about

youths' problematic phone use among young people (Sultan, 2014). We considered it important to examine the relationship between mobile activities and dependency symptoms as well as to compare results for smartphone users and non-smartphone users. Hence, we proposed:

Hypothesis1: Mobile phone users who use mobile Internet or or text messages (i.e., SMS and MIM) more often will show a higher level of mobile dependency than will those who use these activities less.

Hypothesis 2: Smartphone users who use mobile Internet or or text messages (i.e., SMS and MIM) will show higher levels of mobile dependency and more symptoms than will non-smartphone users.

Mobile phone usage is significantly related to many forms of sociability (Fortunati & Taipale, 2012). As mobile phones allow young people to be constantly connected without time and space constraints, they experience social dependency on their devices (Rice & Hagen, 2010). Adolescents who frequently use non-smartphones for conducting personal relationships show a high level of mobile dependency (Leung, 2008b). Disruption of constant connectivity with one's social network causes negative affective responses (Licoppe & Smoreda, 2005).

As social interactions are positively associated with mobile dependency symptoms (Shih, Chen, Chiang, & Shih, 2012), sociable users tend to be more susceptible to problematic mobile phone use (Park, Hwang, & Huh, 2010) than are less sociable users. Extraversion is positively associated with mobile addiction (Hong, Chiu, & Huang, 2012). Extraverted young students spend more time than less extraverted young students do on texting for social interactions (Hong et al., 2012) and feel susceptible to problematic phone use (Bianchi & Phillips, 2005). According to Sultan (2014), extraverts with high social anxiety tend to be addicted to MIM applications. Thus, in this study we proposed:

*Hypothesis 3:*Highly sociablemobile phone users will be likely to have a higher level of mobile dependency than will less sociable users.

Hypothesis 4: The sociability level of smartphone users will be associated with more mobile dependency symptoms than will that of non-smartphone users.

Method

Procedure and Participants

To investigate young people's smartphone dependency, a random stratified sampling method was used to select 2,000 undergraduate students at a comprehensive Singapore university. Young people aged between 16 to 24 years have a high smartphone ownership rate in Singapore (Blackbox Research, 2012). In April 2012 we emailed an online survey to the selected respondents. Using a US$7.90 voucher as an

incentive, we recruited 551 mobile phone users aged between 19 and 25 years, comprising 47% males and 53% females.

Measures

All measures were adapted from prior studies and validated by a pilot test in which the English-language survey was tested by 35 students to clarify unclear items. A 17-item Mobile Phone Problem Use Scale (MPPUS; Leung, 2008a) was used to assess mobile dependency with responses rated on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*always*). It generates a composite mobile phone dependency index (MPDI) and has a four-factor structure: inability to control craving,, feeling anxious and lost,, withdrawal/escape,, and productivity loss. Sociability (Zywica & Danowski, 2008) was measured by a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Five items were dropped after the exploratory factor analysis (Cronbach's alpha was .748). Mobile phone activities were measured by average daily time spent on mobile Internet, the average daily frequency of using SMS, and the average daily frequency of using MIM. The composite reliability (CR) value of constructs above 0.70 and average variance extracted (AVE) above 0.50 were acceptable. Mobile phone dependency and sociability constructs satisfied the requirements. Bivariate correlation and *t*-test were used for data analysis.

Results

Based on correlation results, using voice calls, mobile Internet, and text messaging were positively associated with MPDI among all mobile phone users. When we examined mobile dependency symptoms, the results showed that using mobile Internet had highly positive correlations with all four symptoms: productivity loss ($r = .34$, $p < .01$), inability to control craving ($r = .34$, $p < .01$), feeling anxious and lost ($r = .13$, $p < .01$), and withdrawal/escape ($r = .13$, $p < .01$). However, text messaging was related to three symptoms except feeling anxious and lost. Hence, Hypothesis 1 was supported.

The results also showed that the more smartphone users used mobile Internet and text messages (SMS and MIM), the more positive were the correlations with the MPDI ($r = .22$, $p < .01$; $r = .09$, $p < .05$), whereas there was no significant correlation for non-smartphone users. For smartphone users, mobile Internet use was positively related to the four mobile dependency symptoms ($r = .26$, $p < .01$; $r = .09$, $p < .05$; $r = .11$, $p < .01$; $r = .27$, $p < .01$). Text messaging (SMS and MIM) was associated with inability to control craving ($r = .12$, $p < .01$) and productivity loss ($r = .09$, $p < .05$) for smartphone users, but for non-smartphones users SMS use was

slightly positively associated only with withdrawal/escape ($r = .31$, $p< .05$).

According to t-test results, there was a significant variation between smartphone users and non-smartphone users in use of mobile Internet ($t = 6.58$, $p< .001$) and text messaging (MIM and SMS) ($t = 2.06$, $p< .05$). Smartphone users had a higher degree of mobile dependency ($M = 43.2$) than did non-smartphone users ($M = 34.1$) and scored higher on all dependency symptoms than did the latter. The t-test results indicated that there were significant differences between the two groups in levels of mobile dependency symptoms: productivity loss ($t = 5.54$, $p< .001$), inability to control craving ($t = 5.30$, $p< .001$), feeling anxious and lost ($t = 3.33$, $p< .001$), and withdrawal/escape ($t = 2.41$, $p< .05$). Thus, Hypothesis 2 was supported.

The correlation analyses showed that sociability was positively associated with all respondents' MPDI score ($r = .13$, $p< .01$) and with three symptoms: productivity loss ($r = .08$, $p< .01$), feeling anxious and lost ($r = .07$, $p< .01$), and withdrawal/escape ($r = .16$, $p< .01$), indicating Hypothesis 3 was supported. When examining two sets of correlation coefficients, smartphone users' sociability was associated with the MPDI ($r = .11$, $p< .01$) and the symptoms of productivity loss, feeling anxious and lost, and withdrawal/escape ($r = .04$, $p< .01$; $r = .13$, $p< .01$; $r = .07$, $p< .01$, respectively); however, non-smartphone users' sociability was significantly related to the MPDI ($r = .30$, $p< .01$) and the symptoms of feeling anxious and lost ($r = .25$, $p< .01$) and withdrawal/escape ($r = .43$, $p< .01$). Therefore, Hypothesis 4 was supported.

Discussion and Conclusion

In this study, the results showed that young Singaporean smartphone users tended to have a higher degree of mobile dependency and more severe symptoms than did young non-smartphone users. This indicates an urgent need to increase young people's awareness of overdependence on smartphone activities. The results showed that mobile dependency symptoms were associated with phone activities. Regardless of phone type, using mobile Internet was positively related to all four mobile dependency symptoms (i.e., inability to control craving, feeling anxious and lost, withdrawal/escape, and productivity loss.). Addiction to SMS (Igarashi et al., 2008; Perry & Lee, 2007) and MIM (Hong et al., 2012; Sultan, 2014) among young people resulted from excessive use of these cheap or free connectivity features. Our results also revealed that smartphone users who used SMS and mobile Internet more tended to have higher mobile dependency, yet non-smartphone activities had no

significant impact on mobile dependency among non-smartphone users. Hence, we recommend that parents and education authorities should set time limits for use of text messaging and mobile Internet by young smartphone users to prevent their becoming overdependent.

Similar to findings in prior mobile addiction research (Hong et al., 2012; Park et al., 2010), in this study a positive association was found between sociability and mobile dependency among both smartphone and non-smartphone users. Regardless of phone type, the more sociable mobile phone users were more likely to have higher mobile dependency, and to display symptoms of feeling anxious and lost and withdrawal/escape.When examining all mobile phone users and smartphone users, sociability was significantly related to three dependency symptoms (i.e., feeling anxious and lost, withdrawal/escape, and productivity loss); however, there was no relationship between non-smartphone users' sociability and productivity loss. The practical implication is that extraverts who use the compelling activities available on smartphones tend to experience productivity loss in study or work, but the use of non-smartphones is unlikely to result in such negative outcomes. Hence, sociable young mobile phone users should be wary of mobile addiction, and, in particular, extravert smartphone users should realize that they have a high risk of overdependence.

The findings in this study enhance the understanding of differences between smartphone and non-smartphone dependency and the impact of phone activities on dependency symptoms. The findings provide directions for parents, educators, and health authorities to look out for specific smartphone activities and dependency symptoms. Sociable smartphone users who frequently engage in using mobile Internet, SMS and MIM are at high risk of mobile overdependence. Campaigns about healthy smartphone usage are crucial to creating awareness among young users, especially emphasizing the significance of self-control in using the "sticky" phone activities, that is, the activities on which young people tend to spend more time and on which they feel more dependent. Future researchis advised to investigate how personal traits affect symptoms of smartphone dependency and to investigate how these symptoms may cause various effects on study, work, and well-being.

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