Addictive Personality and Problematic Mobile Phone Use

Motoharu Takao, Ph.D.,1 Susumu Takahashi,1 and Masayoshi Kitamura2

Abstract

Mobile phone use is banned or regulated in some circumstances. Despite recognized safety concerns and legal regulations, some people do not refrain from using mobile phones. Such problematic mobile phone use can be considered to be an addiction-like behavior. To find the potential predictors, we examined the correlation between problematic mobile phone use and personality traits reported in addiction literature, which indicated that problematic mobile phone use was a function of gender, self-monitoring, and approval motivation but not of loneliness. These findings suggest that the measurements of these addictive personality traits would be helpful in the screening and intervention of potential problematic users of mobile phones.

Introduction

Mobile phone is one of the greatest inventions of today’s world. Because of its convenience, the majority of people in developed as well as developing countries use mobile phones. The research group estimates that at least 70% of the Japanese population and 62% of U.S. inhabitants used mobile phones in 2005.1 In Australia, 81% of people used mobile phones in the same year.2 While mobile phones are extremely attractive as a tool for communication and interpersonal interaction, there has been an increased risk in its problematic use.3 In many countries, governments ban mobile phone use while driving a vehicle because of the increased potential for accidents.4–6 Despite legal regulations and significant campaigns for traffic safety, a group of drivers remain reluctant to refrain from holding mobile phones while at the steering wheel. Other problems are caused by the considerable amount of debt incurred by the excessive use of mobile phones and the harassment of others through bullying or obscene calls.7 Addiction-like behavior to mobile phones is also a serious problem for an individual’s social life and work, although this type of addiction is not recognized as a diagnostic category at this time in DSM-IV.5,9 Addictive people tend to feel depressed, lost, and isolated without a mobile phone. Their work and lives are sometimes disturbed by frequent calls, text messaging, Web browsing, and online chats.

Defining addiction-like behavior is difficult because of the variety of symptoms associated with it.5,9 There is a wide variety of new mobile phone functions, including camera, computer, music player, GPS (global positioning system), and gaming features. The mobile phone is no longer only a tool of communication but an indispensable instrument of an individual’s social and work life. Improvements in the quality of display and sound have enabled users to customize their phones with wallpaper and preferred ringtones. Srivastava10 pointed out that the personalization of a mobile phone can reflect self-identity. Such technological advancements can augment the overattachment of users to their mobile phones. These technological alterations may complicate the symptoms in behaviors.

Despite the current lack of reliable diagnostic markers, similarities have been suggested between problematic mobile phone use and other sorts of addiction, such as smoking, drug, alcohol, Internet, and gambling.3,11 A multiregression model study demonstrated that the people who use mobile phones problematically exhibit a bias toward extraversion and low self-esteem, but not neuroticism.3,11 These personality traits are also well-known predictors for other types of addiction. Self-monitoring and loneliness also have been reported to be predictors of addictive behaviors. Approval motivation can be a new predictor for addictive tendencies, as indicated in the studies of self-esteem.

Sharp and Getz reported that individuals who score high on self-monitoring are prone to alcohol addiction.12 Self-monitoring is a trait related to the tendency to monitor and regulate the public self.13,14 High self-monitors are sensitive to social cues and tend to adapt behaviors to the public self that meet the demands and expectations of peers. A factor analysis yielded three factors: extraversion, acting, and other-directedness.15 Acting refers to competence and willingness to speak and entertain. Other-directedness is volition to change one’s behavior to suit other people. It is likely that addictive mobile phone users could also be high self-monitors.

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because they share with extraverts such properties as sociality and susceptibility to peer influences.

Self-esteem is the evaluation and the judgment of the worth of a person that one determines and maintains of himself or herself. Studies have demonstrated that low self-esteem is closely related to problematic mobile phone use and many other kinds of addictive behavior: alcoholism, drug abuse, smoking, addictive Internet use, addictive gambling, and addictive sexual behavior. Although it is unknown how low self-esteem is related to addictive behaviors, it is plausible that people with low self-esteem are disposed to seeking approval, assurance, and admiration from among their peers, thereby indulging in attractive things. It is seeking approval, assurance, and admiration from among their peers, thereby indulging in attractive things. It is possible, therefore, that people with a high level of approval motivation have addictive tendencies.

Loneliness has been reported in such addictive behavior as alcoholism, drug abuse, addictive Internet use, and addictive sexual behavior. It is conceivable that both addictive Internet use and problematic mobile phone use may share the same properties because they are addiction-like behaviors related to a tool for communication and interpersonal interaction.

While there is no investigation of the relationship between loneliness and problematic mobile phone use, Reid and Reid revealed that lonely people preferred calls and rated text messages such as short message service (SMS, or text messaging) as a less intimate method of contact; on the other hand, anxious people preferred text and rated it the superior medium for expressive and intimate contact. It is conceivable that lonely people are eager to maintain contact with their peers through frequent calls so as to fulfill their loneliness. We therefore would expect that higher or problematic phone use is predicted by loneliness.

In this study, we depicted other traits of personality concerning problematic mobile phone use. Approval motivation and self-monitoring are closely related with extraversion and self-esteem. Thus, approval motivation and self-monitoring are also conceivable as new predictors of problematic mobile phone use. Loneliness is a well-known predictor of addictive behavior; hence, it could be related to problematic mobile phone use. To investigate the correlation between these predictors and problematic mobile phone use, a multiregression analysis was performed in this study. The measurement of these predictors would be helpful in screening of and intervention for potential problematic users of mobile phones.

Materials and Methods

Participants

Five hundred seventy questionnaires were distributed to participants recruited from several university campuses. Of these, 488 were returned, giving a response rate of 82.61%. There were 444 usable questionnaires (324 males, 124 females). Ages ranged from 18 to 39 years ($M = 20.77; SD = 1.66$). All of the participants own and use a mobile phone regularly.

Materials

The Mobile Phone Problem Usage Scale, the Self-Monitoring Scale, the Martin-Larsen Approval Motivation Scale, and the UCLA Loneliness Scale were employed in this study.

Mobile Phone Problem Usage Scale. The Mobile Phone Problem Usage Scale was devised and validated as a reliable self-report by Phillips and Bianchi. This scale contains 27 items that cover tolerance, escape from other problems, withdrawal, craving, and negative life consequences in the areas of social, familial, work, and financial difficulties.

Reliability and validity of Japanese translation of Mobile Phone Problem Usage Scale. A test of internal reliability (Cronbach’s alpha) was calculated on the basis of the Japanese translation of the Mobile Phone Problem Usage Scale to determine the level of internal consistency among items. A Cronbach’s alpha was 0.89, showing the high level of internal consistency and suggesting that items are homogenous.

To assess the validity of this scale, relationships with other measures of mobile phone use were examined using the Pearson’s correlation coefficient. One measure is reported time per week spent using a mobile phone. There was a significant and positive correlation between the score and the reported time, $r = 0.30, p < 0.001$. Other measures include reported time per week spent writing and reading text messages, reported number of people with whom the participant talks regularly, and reported number of people with whom the participant regularly exchanges text messages using a mobile phone. All of these measures also showed a significant and positive correlation with the scale, $r = 0.16, p < 0.001$; $r = 0.15, p < 0.002$; and $r = 0.14, p < 0.003$, respectively.

Self-Monitoring Scale. The Self-Monitoring Scale, originally invented by Snyder, is used widely and has been translated into many languages. This scale is composed of three subscales: extraversion, acting, and other-directedness. Its Japanese translation, consisting of 25 items, is also available and was utilized for our present survey. Items are rated on a 5-point scale. Higher scores indicate higher self-monitors.

Martin-Larsen Approval Motivation Scale. Approval motivation can be measured using the Martin-Larsen Approval Motivation Scale. This scale was designed to assess the need for favorable evaluations from others. Items are rated on a 5-point scale. Higher scores indicate stronger needs for social approval. This scale, consisting of 20 items, was also translated and validated by Japanese psychologists.

UCLA Loneliness Scale. Loneliness can be estimated using the UCLA Loneliness Scale, which was developed to assess subjective feelings of loneliness or social isolation. The Japanese translation of this scale, which includes 20 items, has been adopted for many research articles. Higher scores indicate stronger feeling of loneliness.

### Table 1. Means and Standard Deviations, Minimum, Maximum, and Skew of the Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>479</td>
<td>0.28</td>
<td>0.45</td>
<td>0</td>
<td>1</td>
<td>0.98</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>488</td>
<td>75.29</td>
<td>9.99</td>
<td>51</td>
<td>109</td>
<td>0.34</td>
</tr>
<tr>
<td>Approval motivation</td>
<td>474</td>
<td>60.04</td>
<td>8.79</td>
<td>30</td>
<td>88</td>
<td>-0.60</td>
</tr>
<tr>
<td>Loneliness</td>
<td>487</td>
<td>40.77</td>
<td>9.37</td>
<td>20</td>
<td>80</td>
<td>0.25</td>
</tr>
</tbody>
</table>
Analysis of independent variables

The total score for each questionnaire was calculated by summing the scores of each item per participant. Separate multiple regressions were carried out for each dependent variable to determine whether they could be predicted from the independent variables. The predictor variables include (a) gender, (b) self-monitoring, (c) approval motivation, and (d) loneliness. The dependent variables include (a) problem mobile phone use scale, (b) reported time per week spent using a mobile phone, (c) reported number of people with whom participant talks regularly, (d) reported time per week spent writing and reading text messages, and (e) reported number of people with whom participant exchanges text messages regularly using a mobile phone. The data were analyzed using SPSS (version 14.0). The chosen level of significance was an alpha level of 0.05.

Results

Analysis of independent variables

The totals, means, and standard deviations of age, gender, self-monitoring, approval motivation, and loneliness were calculated along with the minimum, maximum, and skew for each of the independent variables (Table 1). Self-monitoring and loneliness were positively skewed, and approval motivation was negatively skewed. Because approval motivation was negatively skewed, this scale was inverted by subtracting from a maximum value before transformations were applied. Square-root transformations were used on the approval motivation variable. Due to the transformation, the approval motivation variable was inverted, and this variable was named “low approval motivation” to assist in interpretability.

Table 2. Means and Standard Deviations, Minimum, Maximum, and Skew of Predictors

<table>
<thead>
<tr>
<th>Predictor</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile phone problem usage scale</td>
<td>464</td>
<td>82.93</td>
<td>34.20</td>
<td>25</td>
<td>193</td>
<td>0.65</td>
</tr>
<tr>
<td>Reported time per week spent using mobile phone</td>
<td>473</td>
<td>58.45</td>
<td>139.88</td>
<td>0</td>
<td>1680</td>
<td>6.56</td>
</tr>
<tr>
<td>Reported number of people with whom participant talks regularly</td>
<td>480</td>
<td>3.97</td>
<td>3.72</td>
<td>0</td>
<td>30</td>
<td>3.06</td>
</tr>
<tr>
<td>Reported time per week spent writing and reading text messages</td>
<td>422</td>
<td>101.97</td>
<td>130.30</td>
<td>2.87</td>
<td>840</td>
<td>2.87</td>
</tr>
<tr>
<td>Reported number of people with whom participant exchanges text messages regularly using mobile phone</td>
<td>475</td>
<td>6.36</td>
<td>6.54</td>
<td>0</td>
<td>80</td>
<td>4.72</td>
</tr>
</tbody>
</table>

The assumption of normality was achieved after the data were transformed. To screen for univariate outliers, a cutoff of $z > 3.29, p < 0.001$ was applied. To screen for multivariate outliers using Mahalanobis distances, cases with values greater than $18.47 (\chi^2, df=5, p < 0.001)$ were excluded.3,40

Pearson’s correlations were performed on all independent variables before and after transformation to test for multicollinearity. All of variables were below the selection criteria of 0.99.3,40 Therefore, there was no violation of this assumption.

Prediction of heavier and problematic mobile phone use

As shown in Table 2, the means, standard deviations, minimum, maximum, and skew were calculated for the dependent variables problem mobile phone use scale, reported time per week spent using a mobile phone, reported time per week spent writing and reading text messages, reported number of people with whom participant talks regularly, and reported number of people with whom participant exchanges text messages regularly using a mobile phone. All variables were positively skewed. The variables of problem mobile phone use scale and reported time per week spent using a mobile phone were transformed by logarithm, and the assumption of normality was achieved after this transformation.

The phone call

The multiple regression analysis was employed to reveal whether gender, self-monitoring, low approval motivation, and loneliness predict self-reported time spent using the mobile phone during the week. The independent variables could significantly account for 13.1%: $F(4, 451) = 11.89, p < 0.001$. Females, high self-monitors, and low lonely individuals converse more on mobile phones (Table 3).

Another aspect of the phone call is the number of people called regularly using a mobile phone. The independent variables could significantly predict 4.5% of this variable: $F(4, 472) = 5.60, p < 0.001$. It appears that males and low lonely individuals call more people (Table 4).

Table 3. Standardized Regression Coefficient ($\beta$), t-Value of $t$, and Significance Values for Predictors of Weekly Time Spent Using Mobile Phone

<table>
<thead>
<tr>
<th>Predictors</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.09</td>
<td>1.61</td>
<td>0.107</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>0.14</td>
<td>2.43</td>
<td>0.016</td>
</tr>
<tr>
<td>Low approval motivation</td>
<td>-0.02</td>
<td>-0.46</td>
<td>0.648</td>
</tr>
<tr>
<td>Loneliness</td>
<td>0.27</td>
<td>4.68</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 4. Results of Multiple Regression of Weekly Time Spent Using Mobile Phone

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$R^2$</th>
<th>$F$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.13</td>
<td>11.89</td>
<td>5</td>
<td>0.001</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>0.13</td>
<td>11.89</td>
<td>5</td>
<td>0.001</td>
</tr>
<tr>
<td>Low approval motivation</td>
<td>0.04</td>
<td>5.60</td>
<td>5</td>
<td>0.001</td>
</tr>
<tr>
<td>Loneliness</td>
<td>0.04</td>
<td>5.60</td>
<td>5</td>
<td>0.001</td>
</tr>
</tbody>
</table>
Table 4. Standardized Regression Coefficient (β), t-Value of β, and Significance Values for Predictors of Number of People Called Regularly Using the Mobile Phone

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>−0.15</td>
<td>−3.17</td>
<td>0.002</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>0.04</td>
<td>0.79</td>
<td>0.433</td>
</tr>
<tr>
<td>Low approval motivation</td>
<td>−0.03</td>
<td>−0.57</td>
<td>0.572</td>
</tr>
<tr>
<td>Loneliness</td>
<td>−0.17</td>
<td>−3.47</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 5. Standardized Regression Coefficient (β), t-Value of β, and Significance Values for Predictors of Scores of Mobile Phone Problem Usage Scale

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.10</td>
<td>2.23</td>
<td>0.022</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>0.22</td>
<td>4.61</td>
<td>0.001</td>
</tr>
<tr>
<td>Low approval motivation</td>
<td>−0.17</td>
<td>−3.68</td>
<td>0.001</td>
</tr>
<tr>
<td>Loneliness</td>
<td>−0.02</td>
<td>−0.35</td>
<td>0.724</td>
</tr>
</tbody>
</table>

Table 6. Standardized Regression Coefficient (β), t-Value of β, and Significance Values for Predictors of Weekly Time Spent Writing and Reading Text Messages

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.07</td>
<td>1.37</td>
<td>0.171</td>
</tr>
<tr>
<td>Self-monitoring</td>
<td>0.20</td>
<td>4.43</td>
<td>0.001</td>
</tr>
<tr>
<td>Low approval motivation</td>
<td>0.12</td>
<td>2.45</td>
<td>0.014</td>
</tr>
<tr>
<td>Loneliness</td>
<td>−0.15</td>
<td>−3.91</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Discussion

Our study aims to find the correlation between problematic mobile phone use and personality traits reported in addiction literature. Problematic mobile phone use was a function of gender, self-monitoring, and approval motivation but not of loneliness.

High self-monitoring

High self-monitoring has been linked to addictive behavior. High self-monitoring could explain both the problematic use of a mobile phone as measured by the Mobile Phone Problem Usage Scale and the overall use of a mobile phone: time spent during the week, number of people called regularly, time per week spent writing and reading text messages, and number of people with whom text messages are exchanged regularly using a mobile phone.

High self-monitors are fundamentally social in nature, sensitive to social cues, and susceptible to peer pressure. In fact, they are more prone to risk behavior, sensation seeking, and problematic behavior. They also have a larger number of people with whom they communicate regularly.

Text messaging

The independent variables could predict 9.6% of the time per week spent writing and reading text messages, \( F(4, 414) = 10.95, p < 0.001 \), and 3.3% of the number of people with whom the participant exchanges text messages regularly using a mobile phone, \( F(4, 467) = 4.04, p < 0.003 \). High self-monitors, low approval motivators, and low lonely individuals tend to spend time writing and reading text messages (Table 6). In addition, low lonely individuals are inclined to exchange text messages with others regularly (Table 7).

Table 7. Standardized Regression Coefficient (β), t-Value of β, and Significance Values for Predictors of Number of People with Whom Text Messages Are Exchanged Regularly Using Mobile Phone

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.07</td>
<td>1.37</td>
<td>0.171</td>
</tr>
<tr>
<td>Self-monitoring</td>
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<td>2.45</td>
<td>0.014</td>
</tr>
<tr>
<td>Loneliness</td>
<td>−0.15</td>
<td>−3.91</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Such features of personality and social relation make it difficult for them to refrain from violating laws concerning mobile phone use and using mobile phones inappropriately in public spaces.

High self-monitors are also extraverted. As pointed out by Bianchi and Phillips, extraversion is also closely related to addictive behaviors and problematic mobile phone use. Therefore, it is not surprising that high self-monitors are more likely to use phones inappropriately.

High approval motivation

Our study demonstrated that approval motivation has a close relationship with problematic mobile phone use and a weak relationship with time spent writing and reading text messages. People with low self-esteem also have strong approval motivation because they are disposed to seeking approval, assurance, and admiration among their peers, thereby indulging in attractive things. Bianchi and Phillips’ study revealed that low self-esteem could predict not only overall use but also problematic mobile phone use. Low self-esteem has been reported to be closely related to many other kinds of addictive behavior: alcoholism, drug abuse, smoking, addictive Internet use, addictive gambling, and addictive sexual behavior. Therefore, it is not surprising that people with high approval motivation more frequently use mobile phones inappropriately, although former research could not be found that demonstrated the direct link between approval motivation and addictive behavior.

Loneliness

Unexpectedly, loneliness could not predict problematic mobile phone use but could predict overall use time spent during the week, number of people called regularly, time per week spent writing and reading text messages, and number of people with whom text messages are exchanged regularly using a mobile phone.
regularly using a mobile phone. A study of Japanese high school students implied that an active social network and frequent use of a mobile phone reduced students’ loneliness.46

Reid and Reid35 reported that lonely people in the United Kingdom and the United States preferred calls and rated text-like short messages as a less intimate method of contact. In our study on Japanese college students, a trait of loneliness is related with the frequent exchange of short messages. Japanese mobile phone companies supply relatively advanced services for short messages: highly emotional pictographs, free long texts, easy input methods, and other functions. These features could incite lonely people to communicate through text messaging.

Loneliness is associated with problematic or addictive Internet use,11,47 although not with mobile phones. Although the psychological differences among problematic Internet and mobile phone uses are not known, lonely people demonstrate dissimilar attitudes toward these two media. Lonely people are generally introverts,48 and introverts are shown to be less susceptible to problematic mobile phone use.3

Other addictive personality traits

Other personality traits are also shown to be related to addictive Internet use. Recently, two groups found high levels of anxiety in pupils who use the Internet frequently59 and in high school students who use mobile phones excessively.50 Depression and alexithymia were also reported to be important characteristics in excessive mobile phone users and addictive Internet users.50–52 Both sensation seeking and obsessive compulsive behavior are important predictors of Internet addiction.32,51,53,54 In order to fully understand the psychological aspects of problematic mobile phone use, future studies are needed to demonstrate the relationships among these addictive personality traits and problematic mobile phone use.

Gender

Gender appeared to be a weak predictor of problematic mobile phone use. Females are likely to experience more frequent problematic use of mobile phones, although an Australian study failed to find such a relationship.5 Although the factors affecting the results of two studies are not known, cultural or ethnical backgrounds might influence the addictive behaviors in females. In western countries, gender differentiation is not as severe as that in Asian countries, including Japan. In Japan, females are still expected inexplicitly to behave modestly. Such social pressure might actuate the problematic use of mobile phone.

Somewhat paradoxically, males tended to call more people in our study. Bianchi and Phillips3 reported the same result. This may be partly explained by a higher level of activity in the daily lives of males. In Japan, male students are more active in part-time jobs and in extracurricular activities; thus, they may need to talk with many people by mobile phone.

Intervention and management

This research suggests that problematic mobile phone use has a close relationship with high self-monitoring and high approval motivation. The management of problematic use could be assumed mainly in two ways. The first type of intervention could focus on the functions of the mobile phone. For example, mobile phone tools that require the user to manually input information (e.g., GPS tools) could be designed to display, when first initialized, a warning against using the phone while driving. Mobile phones could also be devised in a manner that would not stimulate or fascinate problematic users, although such recommendations may conflict with the marketing goals of mobile phone manufacturers.3

The second type of intervention could be practiced in the educational fields. Some personality traits as predictors of problematic mobile phone use have been found in our present and previous works. If young students with these personality traits are screened, they could be taught to be aware of their predisposition to problematic mobile phone use and to understand the self-control for appropriate mobile phone use. As the number of young mobile phone users increases, educational intervention will become more important.

Acknowledgments

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Disclosure Statement

No competing financial interests exist.

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AUTHOR QUERY FOR CPB-2009-0022-TAKAO_1P

AU1: please insert academic degree for Takahashi and Kitamura.
AU2: By “short mail” I believe you mean text messaging, the more common term for it. Correct?
AU3: Should problem be changed to problematic? Should “scale” be deleted?
AU4: Should problem be changed to problematic? Should “scale” be deleted?
AU5: Should problem be changed to problematic? Should “scale” be deleted?
AU6: Should problem be changed to problematic? Should “scale” be deleted?
AU7: Please verify disclosure statement is correct. If not, please revise.
AU8: should scale be deleted?
AU9: Should scale be deleted?