

# Relationship Between Mobile Phone Addiction and State Anxiety of College Students: The Mediating Effect of Psychological Craving for Mobile Phones

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**Abstract:** With the widespread use of mobile phones, college students addicted to mobile phones cause anxiety. In order to explore the relationship between mobile phone addiction and state anxiety among college students, whether there is a mediating role in mobile phone psychological desire. The questionnaire method was used to investigate the state anxiety, mobile phone addiction and mobile phone psychological desire of 589 students from 3 universities in Hebei Province. The result shows that State of anxiety and mobile phone craving were positively correlated with mobile phone addiction ( $r = 0.25, P < 0.01$ ;  $r = 0.74, P < 0.01$ ). State of anxiety was positively correlated with phone craving ( $r = 0.16, P < 0.01$ ), and the mediating effect was 0.28. We can see that State of anxiety can promote mobile phone addiction directly or indirectly by increasing psychological craving for mobile phone.

**Keywords:** College students; State of anxiety; Psychological craving for mobile phones; Mobile phone addiction

Studies have shown that the advantages of convenient and fast mobile Internet access aggravate the risk of mobile phone addiction<sup>[1]</sup>. Mobile phone addiction refers to the behavior of the psychological dependence and obsession state caused by the frequent use of mobile phone, and their own thoughts cannot be pulled away from the mobile phone<sup>[2]</sup>. In recent years, mobile phone addiction for college students has become an increasingly common problem at home and abroad<sup>[3-4]</sup>. The influencing factors of mobile phone addiction show diversified characteristics, among them, the Psychological Rational demand is one of the important factors affecting individual mobile phone addiction. For example, some previous studies have pointed out that individuals with negative emotions expect to use mobile phones to relieve their bad emotions to compensate for their psychological needs<sup>[5]</sup>. This Severe dependence on mobile phones has a significant negative impact on college students: one is, that mobile phone addiction affects the physical health of college students., For example, individuals looking at mobile phones for long time while standing or walking are more likely to lead to knee, ankle, waist or plantar injuries<sup>[7]</sup>, excessive use of mobile phones leads to lower vision level and sleep quality<sup>[8]</sup>; other is that it will also infringe on the mental health of college students.

The State of anxiety is caused by external conditions at a specific time and place<sup>[10]</sup>. Usually, mobile phone addicts will show an inability to leave their phones, often touch them, and feel anxious when they are not around<sup>[11]</sup>. The psychological desire for a mobile phone refers to the strong subjective desire to use a mobile phone. Studies have found that mobile phone psychological craving is positively associated with mobile phone addiction, for example, Franken<sup>[12]</sup> pointed out that the psychological desire of individuals with the tendency of mobile phone addiction is more intense than that of individuals without mobile phone addiction, but the level of mobile phone psychological desire is only different, and even normal users also have the sense of mobile phone psychological desire.

It can be seen that both state anxiety and mobile phone psychological desire can positively predict mobile phone addiction, and there is a certain relationship between the three. Apart from this, there is a positive relationship between anxiety and psychological desire for mobile phone<sup>[13]</sup>. This study takes college students to explore the mediation effect of mobile phone psychological craving between state anxiety and mobile phone addiction. Suppose1: state anxiety, mobile phone craving and mobile phone addiction are significant; and Suppose2: mobile phone craving plays a mediating role in the process of state anxiety affecting mobile phone addiction.

## 1. Objects and methods.

### 1.1 Study subjects

In this study, subjects were selected from universities in Hebei Province and were surveyed anonymously by random sampling, and three college students in Hebei Province were determined to carry out online questionnaire survey. With the cooperation of the counselor and the head teacher, the "questionnaire star" was used to distribute questionnaires to the students, and the subjects completed the questionnaire inde-

pendently. A total of 643 questionnaires were collected, and 589 valid questionnaires were finally obtained, with an effective recovery rate of 91.6%. Among them, 257 (43.6%) were male and 332 (56.3%); 160 freshmen (27.1%), 157 sophomore (26.6%), 145 junior (24.6%), and 127 senior (21.5%).

## 1.2 Study method

### 1.2.1 Measures of state anxiety

The State Anxiety Scale (Questionnaire I) from the State Trait Anxiety Scale (STAI) was used<sup>[14]</sup>, which includes 20 items measuring how people feel about "this moment".

### 1.2.2 Measurement of mobile phone psychological craving

The mobile phone thirst feeling scale was used<sup>[15]</sup>. There are 10 questions in the scale, with Likert 7 level score, 1="strongly opposed", 2="against", 3="a little against" and so on, all for positive score, the higher the score represents the stronger their mobile phone psychological desire.

### 1.2.3 A measure of mobile phone addiction

Using the scale of mobile phone addiction of college students<sup>[16]</sup>, the scale was included in 16 items, which were divided into four dimensions: withdrawal symptoms, highlighted behavior, social comfort and mood change. The 5-point scoring method is adopted, 1="very inconsistent", 2="not quite consistent", 3="general", 4="more consistent", 5="very consistent", both are positive scoring, the higher the score, mobile phone addiction is obvious.

## 1.3 Statistical treatment

Use the SPSS of 26.0, The normal distribution test of the data showed that the three variables of state anxiety, mobile phone addiction and mobile phone psychological craving all matched the normal distribution. At the same time, conduct the same method deviation test; explore the gender and grade differences of college students' mobile phone addiction using independent sample t-test and one-way variance analysis; use Pearson product difference related to explore the correlation between state anxiety, mobile phone psychological desire and mobile phone addiction.

## 2. Results

### 2.1 Common method deviation test

Harman single factor test shows that the special value of 6 factors With a characteristic root value > 1, the explained variation of the first factor is 38.44%, <40% critical standard<sup>[17]</sup>, There is no significant common methodological bias.

### 2.2 Differences of mobile phone addiction between gender and grade of college students

Using independent sample t-test on the gender difference of mobile phone addiction among college students, the results showed that the difference of college students was statistically significant ( $t = -10.03$ ,  $P < 0.001$ ), and the addiction score of boys was lower than that of mobile phone addiction in girls.

One-way variance analysis of the scores between college students showed that the scores were different between grades ( $F = 21.13$ ,  $P < 0.001$ ). After the post-test, the third and fourth grade students mobile phone addiction total score [(50±16); (45±16)] higher than that of [(35±18); (42±17)] as shown in Table 1.

**Table 1. Analysis of differences in mobile phone addiction between gender and grades ( $\bar{X} \pm S$ )**

| sex          | number of people | Cell phone addiction |
|--------------|------------------|----------------------|
| the male sex | 257              | 36±18                |
| femininity   | 332              | 51±12                |
| t            |                  | -10.03               |
| P            |                  | < 0.01               |
| grade        | number of people | Cell phone addiction |
| freshman     | 160              | 35±18                |
| sophomore    | 157              | 42±17 <sup>a</sup>   |
| junior       | 145              | 50±16 <sup>ab</sup>  |
| senior       | 127              | 45±16 <sup>ab</sup>  |
| F            |                  | 21.13                |

*pour:* <sup>a</sup>  $p < 0.01$  when compared with the freshman year, <sup>b</sup>  $P < 0.01$  for comparison with the sophomore year.

### 2.3 Mobile phone addiction in different states of anxiety levels

The state anxiety scores of college students were ranked according from high to low. The top 27% of the students were taken as high groups, and the bottom 27% of the students were classified as low groups. The difference of mobile phone craving scores between the groups of state anxiety was statistically significant ( $t = -4.32, P < 0.001$ ), the craving score in the higher anxiety group ( $43 \pm 18$ ) was significantly higher than that in the low anxiety group ( $36 \pm 15$ ); the difference in college students was statistically significant ( $t = -5.41, P < 0.001$ ), and the high anxiety group ( $45 \pm 16$ ) was higher than the score in the low anxiety group ( $38 \pm 14$ ).

### 2.4 Correlation analysis of each variable

After the correlation analysis of state anxiety, mobile phone craving and mobile phone addiction, the results showed that state anxiety and mobile phone craving were positively associated with mobile phone addiction ( $r = 0.25, P < 0.01$ ;  $r = 0.74, P < 0.01$ ); state anxiety was positively associated with mobile phone psychological craving, but the correlation coefficient was 0.16, which was a weak correlation ( $r = 0.16, p < 0.01$ ).

### 2.5 Mediation effect of mobile phone psychological craving between state anxiety and mobile phone addiction

With state anxiety as the independent variable, mobile phone addiction and state anxiety as the dependent variable, the structural equation model was constructed to test the mediation effect. The evaluation results of the structural equation model showed that the indicators of the model reached good  $\chi^2 = 37.12$ , fitting criteria: degree (DF=6),  $P < 0.001$ , Tucker-Lewis index (TLI)=0.96, goodness of fit index (GFI)=0.96, approximate root mean squared error (RMSEA) = 0.073. The mediation effect of mobile phone craving between state anxiety and addiction, and we sampled 4000 times to calculate the 95% CI. The results showed that the direct and indirect effects of state anxiety on mobile phone addiction were statistically significant, with Bootstrap 95% CI of (0.06, 0.31) and (0.18, 0.35), respectively, and the mediation effect was 0.28, accounting for 62.79% of the total effect. It indicates that state anxiety has a positive predictive effect on mobile phone addiction, and that mobile phone psychological craving plays a partial mediating role between state anxiety and mobile phone addiction.

## 3. The discussion

Mobile phone addiction was statistically significant between sex and grade level differences. First, female college students have higher mobile phone addiction scores than male college students. Studies have shown that women need more emotional comfort and more emotional swings<sup>[18]</sup>. They may also spend a long time on online shopping, prone to mobile phone addiction<sup>[19]</sup>. Secondly, the study showed that the total score of mobile phone addiction of junior and seniors was higher than that of freshmen and sophomores. Liu Zhiqiang<sup>[20]</sup> Found out in its investigation Freshman and sophomore students have just entered the college life, full of Surprisingly, they are more willing to spend time participating in various school activities. Junior and fourth year students have more disposable time, but the boring life and lack of learning motivation will increase individual bad emotions and the multifunctional, convenient and virtual characteristics of mobile phones become the carrier to release bad emotions<sup>[19-21]</sup>.

Related analysis shows that state anxiety and mobile phone psychological craving are positively associated with mobile phone addiction, and hypothesis 1 is true. The higher state anxiety score was significantly higher than that of the low state anxiety users, and the higher the level of state anxiety, the greater the risk of mobile phone addiction. The mood of highly anxious individuals is more unstable, which urges them to seek emotional sustenance to alleviate their bad emotions, and mobile phone is a small cost but very helpful for individuals to escape reality and express emotion, using mobile phone has become a way to reduce anxiety, individuals are more likely to spend their extra energy on mobile phone, the frequency of mobile phone increase will lead to mobile phone addiction.

Mobile phone psychological desire plays a partial intermediary role between state anxiety and mobile phone addiction. Hypothesis 2 is true. This study found that the score of high state anxiety was significantly higher than that of low state anxiety, and the higher the level of state anxiety, the greater the possibility of individuals to form a sense of mobile phone desire. Baker class<sup>[24]</sup> In the study, it is found that negative emotional experience is one of the important factors that affect the psychological desire of mobile phones. Mobile phone can well satisfy the individual's psychological desire for mobile phone, resulting in the use of mobile phone behavior. The subjective experience of this strong desire for mobile phones will prompt individuals to use mobile phones.

To sum up, state anxiety not only directly affects mobile phone addiction, but also indirectly affects mobile phone addiction through the "bridge" of mobile phone psychological desire. State anxiety is one of the influencing factors of mobile phone addiction among college students. For example, reducing non-essential academic stress can reduce the anxiety related to study, so they can actively plan their study and life process, control and adjust the resulting anxiety, spend more time doing what they like, and reduce the frequency and time of mobile phone use. Schools can help college students expand their social circle through social media and other ways, find friends with common interests and values, help them establish good social relations in real life, consciously control the use of mobile phones, and reduce individuals' psychological desire for mobile phones.

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