# Factors Affecting College Student's Mobile Phone Dependence and Anxiety

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***Abstract*—Mobile phone is not only as tools for communication, but also as tools for emotional contact among people. People are more relying on mobile phone than ever before. Therefore, this paper is to investigate the factors affecting the mobile phone dependence and anxiety. A valid questionnaire survey of 435 college students in Taiwan found strong support for the research model. In accordance with the research model, usage rate, habit, and dependence have an individually impacted on mobile phone communication anxiety. Usage rate had a direct influence on habit. Usage rate and habit had direct effect on mobile phone dependence, respectively. Implications of these findings are discussed for educators, researchers and telecommunication practitioners.**

**Keywords: communication anxiety, attachment theory, habit, mobile phone dependence**

## I. Introduction

Owing to the availability of telecommunication technology, mobile phone becomes more and more important in daily life. Mobile phone is not only as tools for communication, but also as tools for people working and emotional interaction. People are more relying on mobile phone than ever before. Most people in daily life, the average timing within a day "must" use mobile phones absolutely far beyond other consumer products. Under this highly dependent characteristic, mobile phone becomes one of mandatory items for modern people while out of home or office, especially juvenile are more and more relying on mobile phone. Digital Audience Research Group [1] found over 70 percents of students has anxiety while not bringing their mobile phone. Among these, 20 percents of students have extremely anxiety. College students are used to have their mobile phone to communicate with friends, even consider that no mobile phone no interpersonal relationship. Additionally, students use mobile phone to show they are not isolated from their peers or friends. Many people are dependent on mobile phone, if no mobile phone it is possible to lead to the symptom of anxiety [2]. Much research discussed about anxiety in various domains, but few evidences are aimed at mobile phone anxiety and communication dependence for further research. Therefore, this research is from attachment theory deeply investigating the effects of the users of mobile phone communication anxiety and communication dependence. The research framework is shown in Figure 1.

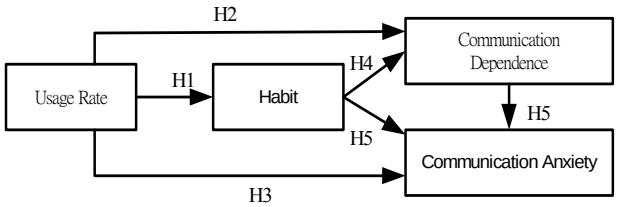


Fig. 1. Proposed Research Framework.

## II. A Conceptual Framework and Hypotheses Development

### A. Communication Anxiety

Anxiety is a vague, uncomfortable, and anxious feeling accompanying with headache, sweaty, palpitations, chest tightness, heartburn and restless situation [3]. Freud divided anxiety into three categories: 1) Objective anxiety is causes by outside world dangerous or threat. 2) Nervous anxiety is causes by self-impulse. 3) Moral anxiety is causes by individual real action or thought when it has a conflict with individual superego. Cattell and Scheier [4] divided anxiety into state anxiety and trait anxiety. Spielberger [5] also considered anxiety has state anxiety and trait anxiety. Spielberger defined state anxiety was an unique tendency for individual response to the stimulation and also a long-term threat of perceived physiology and psychology. State anxiety occurs when an individual get stimulation from situation pressure. State anxiety is a short-term feeling of nervous and worry. In this research, we treated communication anxiety as state anxiety and defined as an individual in a situation using the mobile phone to connect with others because of some external factors that make the individual has an uncomfortable mood or feeling.

### B. Attachment Theory, Dependence and Communication Anxiety

Attachment theory, proposed by Bowlby in 1973 [6], refers to the emotional linkage between infant and watcher. When attachment feels scared, tired or angry, the behavior of attachment will become very obvious. Bartholomew and Horowitz [7] applied Bowlby's attachment theory as a foundation to propose attachment theory including four-category modes which are secure, preoccupied, dismissing-avoidant and fearful-avoidant. Secure has a positive view about self and others, willing to share oneself and would not worry being isolated or unacceptable in

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interpersonal relationship. Preoccupied demonstrates a negative views about self, feels lower than others and always worries that others don't care about them and depend on interpersonal relationship a lot. Dismissing-avoidant means a positive view about self, enjoys independence, and doesn't like being dependent by others or depend on others. Fearful-avoidant refers having negative view of self and others and worries about getting hurt by others in interpersonal relationship. Licopp and Heurin [8] proposed that the use of mobile phone in interpersonal relationship has an immediate availability and the dependent level get higher in peers when using the mobile phone as many times as possible. Therefore, users would feel anxiety without mobile phone on hand. Preoccupied is a negative view about self and feels lower than others. This type of anxiety always worries about that others don't care about them and very depend on interpersonal relationship. Most of college students have preoccupied anxiety [9]. Searle and Meara [10] applied Bartholomew and Horowitz's [7] research concept and found preoccupied anxiety will be afraid of leaving their mobile phone. Based on aforesaid theoretical and empirical evidence, we assume that habit is one of factors to affect dependence of mobile phone. When habit becomes stronger, the dependence of mobile phone becomes higher which will also lead to the communication anxiety.

### C. Usage Rate, Habit, Dependence and Communication Anxiety

The usage rate is defined as a measure of the quantity of a product consumed by a user in a given period and user may thus be subdivided as heavy, moderate and light in marketing domain [11]. The usage rate has been applied in various research domains such as network usage rate, mobile phone usage rate etc.. A real case posted on China net [12] describing a person with high frequency of mobile phone using and suddenly a sharp reduction of frequency in mobile phone. He would become very anxious and has a depressed mood. Based on the survey of FIND [13], the mobile phone use can be divided into browsing, shopping, entertaining and so on. Previous research indicated that the frequency of an object refers to the average call per day, numbers of receiving call, numbers of receiving phone text, the frequency of involvement, the frequency of assaults and so on [11][14][15][16]. Ram and Jung [17] proposed the scale of product use behavior. Dutton and Hemphill [18] follows Ram and Jung's concept and developed a scale to measure the usage rate including usage frequency and usage variety. Therefore, in this study we define the usage rate of mobile phone as the usage frequency and usage variety of mobile phone.

Habit refers to, from Wikipedia's definition, an acquired pattern of behavior that often occurs automatically [19]. Wolpe [21] demonstrated habit is an organism for certain stimulated situation having psychological response. Based on aforesaid concept, this study defined habit is through the accumulation of repeated use of mobile phone. For instance, if people have pressure, stress or anxiety, they may strengthen these habits to relieve pressure [22]. People are attracted by the mobile phone and having intention to use it, it will become a habit. Therefore, based on the aforesaid theoretical concept and empirical studies, we define habit as college students often use mobile phone to communicate with others and continue to keep this kind of behavior. Furthermore, previous research found students with mobile phone dependence usually have preoccupied anxiety [9][23]. Thus, we assume that students are used to use mobile phone as a communication tool, they are more dependent on mobile phone.

Based on the aforesaid theoretical bases and empirical studies, we suggest the following hypotheses:

H1: Mobile usage rate has a positive influence on communication habit.

H2: Mobile usage rate has a positive influence on mobile communication dependence.

H3: Mobile usage rate has a positive influence on mobile communication anxiety.

H4: Communication habit has a positive influence on communication dependence.

H5: Communication habit has a positive influence on mobile communication anxiety.

H6: Mobile dependence has a positive influence on mobile communication anxiety.

## III. RESEARCH DESIGN

### A. Sampling Process

Research has conducted at university students with questionnaire method. The data collection time was from August to December, 2010, lasting four months. The target samples were college students in Taiwan. Owing to the prevalence of mobile phone as a communication tool, a convenient sampling was applied to locate the target respondents. No specific criteria were proposed to locate the respondents. There were 453 questionnaire being distributed and finally generated 435 valid samples.

### B. Measurement Development

A seven-likert scale from most disagreement to most agreement was used to measure the respondent's feeling of each variable. Communication anxiety is adopted and modified from Brosnan & Thorpe [24] scale with 10 items. Mobile dependence is modified from scale of Simpson, Rholes & Phillips [25] with 9 items. Habit is modified from Theiler [26] and Foa & Kozak's [27] scales with 15 items. Usage rate is modified from Ram and Jung's（1990）scale with 7 items. Before distributing the formal questionnaire, a pretest was applied in 50 students majoring in information management to verify the contents of each variable. The unclear or ambiguity questions are revised for the following formal questionnaire.

## IV. DATA ANALYSIS AND RESULTS

### A. Demographic Information

435 valid respondents were collected. Over half of the respondents are male (52%). The average mobile phone bill is mostly from 300 to 500 NT dollar (38.9%). Most of the respondents have one mobile phone (61.3%). Some of the respondents have two mobile phone (35.9%). If there is a new type of mobile phone launching into market, most of the respondents will not change it (66.7%). This indicates that students still have economic consideration under new

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products launching into the market. As to the number of year using mobile phone, 28.8% is within 3 years and 28.4% is between 3 to 5 years. The communication time per time is less than 30 minutes (58.9 %) and from 30 minutes to one hour is 24.1%. Most of respondents use mobile phone as a communication tool (84.1%). 79.4% respondents like to use mobile phone to send text message.

### *B. Reliability and Validity*

The Cronbach's α was used to test the internal consistency. Nunnally [28] proposed 0.7 as indication of adequate reliability. Usage rate deleted one item and generated 6 items with α value 0.742. Habit has 15 items with s α values 0.837. Dependence deleted 3 items and generated 6 items with α value 0.752. Communication anxiety deleted one item and generated 9 items with α value 0.823. Overall, the value of each variable is over 0.7 indicating that each variable has high reliability and is trustworthy.

Validity was used to measure the accuracy of measurement. A factor analysis with principal component combining with varimax rotation was used to test the convergent validity. Four factors were generated with Eigenvalue equal 1 and factor loading over 0.5 [29], which displayed that the each variable has convergent validity. Furthermore, Pearson correlation coefficient was used to test the discriminant validity, shown in Table 1. According to the degree of correlation coefficient explained by Hinkle, William & Stemphen [30], the range of correlation coefficient is over 0.9 indicating there is the highest correlation. The range of correlation coefficient is between 0.7 and 0.9 indicating high correlation, between 0.5 and 0.7 indicating middle correlation, between .0.3 and 0.5 indicating low correlation and between 0.0 and 0.3 indicating very least correlation. All variables had significant correlations (P<0.01) with low and least correlations that displayed each variable had discriminant validity.

TABLE 1: CORRELATION ANALYSIS OF EACH VARIABLE

| Variables | Usage rate | Habit | Depend | Anxiety |
|---|---|---|---|---|
| Usage rate | 1 | | | |
| Habit | .266** | 1 | | |
| Depend | .384** | .308** | 1 | |
| Anxiety | .348** | .165** | .406** | 1 |

**P<0.01; * P< 0.05

### *C. Hypotheses Testing*

The regression analysis was used to test the hypotheses. The results of each hypothesis are shown in Table 2. Usage rate has a positive influence on habit (beta= 0.480, p<0.001) and is consistent with hypothesis 1. Consistent with hypothesis 2 and hypothesis 3, usage rate (beta= 0.200, p<0.001) and habit (beta= 0.137, p<0.05) have a significant influence on mobile communication dependence, respectively. Among these, usage rate has the most significant influence on mobile communication dependence. As to hypotheses 4 to 6, usage rate (beta= 0.195, p<0.001, habit (beta= 0.376, p<0.001) and mobile communication dependence (beta= 0.314, p<0.001) are separately affecting the mobile communication anxiety. Among these, habit has the most significant power, mobile communication is coming next, and the usage rate is the least.

TABLE 2: RESULTS OF EACH HYPOTHESIS

| Dependent Variables | Independent Variables | Beta | t value | Sig. |
|---|---|---|---|---|
| Habit R=.480; $R^2$=.231 F=159.944, Sig.=.000 | Usage Rate | 0.480 | 12.647 | .000*** |
| Dependence R=.180; $R^2$=.032 F=8.883, Sig.=.000 | Usage Rate | 0.200 | 4.106 | .000*** |
| | Habit | 0.137 | 2.809 | .005** |
| Anxiety R=.586; $R^2$=.356 F=97.696, Sig.=.000 | Usage rate | 0.195 | 4.840 | .000*** |
| | Habit | 0.376 | 9.394 | .000*** |
| | Dependence | 0.314 | 8.879 | .000*** |

** : P<0.05 ; *** : P<0.001

## V. DISCUSSION AND CONCLUSION

### *A. Discussion*

Through 435 valid questionnaire survey, a regression analysis was applied to investigate dependence, habit and usage rate on mobile phone communication anxiety. All hypotheses are supported in this study. Usage rate has a positive influence on mobile communication anxiety, which indicates that the higher the usage rate is, the higher the communication anxiety is. The result is consistent with the real case of Chinese net [12]. A person with higher communication usage rate in mobile phone and suddenly reducing the usage rate, his/her motion will become extremely anxiety. Dependence has a positive impact on mobile communication anxiety. This result is consistent with previous studies [7][9][10][31], which indicate that the application of mobile dependence is similar with the other kind of electronic product anxiety. Habit is one of the factors affecting mobile communication anxiety and dependence, which are correspondence with the previous studies [9][23]. This result displays that when consumers are used to use a specific product, his/her psychological mind is more relying on that product and will worry about the availability of that product. Furthermore, usage rate has a positive impact on dependence, which is consistent with the previous studies [11][14][15][16]. This result is the same as the marketing research, that is, the heavy users have a higher loyalty on product and are more relying on the product [11].

### *B. Conclusion and Implications*

The aim of this study was to analyze the factors affecting the mobile phone dependence and anxiety. We have examined the factors among usage rate, habit and dependence on the mobile phone communication anxiety. The empirical findings suggest that usage rate, habit, dependence and communication anxiety have a causal relationship among them. Specifically, the higher the usage rate is, the more the habit becomes. Usage rate and habit have a significant impact on dependence, respectively. Additionally, usage rate, habit, dependence are separately affected the communication anxiety.

There are some implications of mobile communication anxiety and dependence, which will be addressed in this study. For communication industry, owing to the competition of mobile communication industry, how to retain the customers becomes a critical factor for communication

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business owners. So understanding the factors affecting college students' mobile phone communication anxiety could help business owners keep or increase customers. For educational domain, the prevalence of mobile phone would have more problems for students. For instance, usage rate, life or economic pressure or psychological factors are all the possible factors affecting student's mobile communication anxiety. Thus, the counselor can take some precautions program to reduce student's communication anxiety and guide students correctly using the mobile phone. The coping strategies are through family, school and society creating better environment to help student's correct mobile phone usage behavior. For academic research, little evidence applied dependence and habit in mobile phone communication anxiety. This study applied these factors to broad the research scope. Further study can apply this study as a reference to expand the domain of mobile phone communication anxiety, such as age, familiarity, loss and so on.

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