

**The Mobile phone as an interpersonal Contact:  
From perspective of gender difference**

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## ABSTRACT

Since modern society changes rapidly, styles of interpersonal communication changes as well. Of all, the mobile phone plays a significant role in everyone's daily life, becoming as the most popular communication tools.

Thereby, from observing the once usage of mobile phone, we can get a better understand on the social contact between ego and alters. Therefore, it is interesting to know what kinds of interpersonal contact being maintained by the mobile phone. So this study attempts to discuss whether there exists gender difference on making use of mobile phone and the style of communication for purpose of maintaining relationships with family members and friends.

We categorized family members, closed friends, friends who are unable to see each other, all kinds of friends and acquaintances as our measurements on relationships

This study is based on quantitative data collected in 2003. Our data is based primarily on an analysis of the data from the "Taiwan Mobile Phone Survey", which was conducted nationwide in Taiwan under the auspices of the Center for Survey Research and Institute of Sociology in Academia Sinica in 2003. The same questionnaire was used in Japan and Korea survey in 2001 and 2002, and then it was translated into Chinese to conduct this research. So the questions are much more reasonable for Asian people, especially for the MP users.

Through SEM group comparison, results show that the usage of mobile phone technology can benefit female rather than male. Compared with male, women treat mobile phone as the best channel for contacting with all kinds of friends and friends who are unable to see each other. Women are more likely to maintain all kinds of friendships, keep in touch with acquaintances by mobile phone. This study concludes that it seems easy for female to expand their social networks by the usage of mobile phone.

## **1. Introduction**

As a basic need of human beings, communication has always been the most widely practiced activity in people's daily lives. The assumption is that human being is a kind of social animal, used to participate in community life. Within the community life, at each occasion of interaction, each person's status is organized by the location of time versus space, by the network of position versus distance and by the closeness of the relationships.

In other words, the interpersonal relationships and the reciprocal communication regularly constitute the social life of human beings. For example, the consequence of the development of industrial society has demonstrated that no matter how complicated the industrial society is, it still needs to run within the physical proximity of individuals under a concrete setting.

The most significant feature of a society transformed from a traditional one to a modern one is that people's geographical location is no longer limited to a particular place and their social relationship is no longer bonded to kinship only. However, such transitions did not happen in just one night. Unquestionably, behind these transitions, there are a series of social developments proceeding simultaneously, such as communication-technology, governmental regulation, market mechanism and social psychological transitions.

On the basis of these simultaneous transitions, people began to obtain power to shorten the spatial distance by way of transportation and communication. They even gain the power to overcome the constraint of time. Under these transitions, the original linkages of the fixed location in people's daily lives become fluctuant and movable. No matter what is going on, people are still inlaid with the needs of mutual linkages into the interpersonal relationship. Embedded in this circumstance, it is quite an urgent issue to investigate how to communicate with people who are constantly on the move and how these fluctuating mutual linkages spread out.

Nowadays, we can often see people talking on the Mobile Phone (MP) while walking down the street, or heading towards somewhere by bus, by car, by train or by subway and at the same time, reporting his or her location to someone else who is on the other end of the phone. These images seem to be able to answer the following questions: how can we maintain the constantly changing communication and interpersonal linkages and how can we utilize modern technology to reconstruct new forms of social relationships in modern days. In brief, it is the science-technology that helps advance the

transformation of interpersonal linkages. On the basis of the combination of the technical and societal evolutions, the science-technology could increase the spatial mobility and communication capacity. What consequence will emerge in everyone's life after the changes caused by usage of MP? Will interpersonal contacts be extended or be restrained? Will it cause a lot of changes in personal intimated relationships? Will it widen the range of interpersonal contacts in individual or not? Will the more and more personal communication framework empower someone or not? Taking the usage of MP as the focal point, this study intends to provide empirical evidences to clarify these research issues.

With the time to changing, there are having greatly advanced in the forms of interpersonal-communication. When there are more and more various forms of communication, it becomes more complicated to interpersonal contacts, relations and organizations. In the past, we can't observe the real-time contacts to whom directly. Until now, people have communicated with others through many forms of media, the situation makes it possible to realize what kinds of relations could be maintained and how people connect with others.

The place-to-place connection in the fixed telephone age would be substituted by individual-to-individual connection of the mobile age in the near future (Plant 2000 ; Wellman 2001 ) . Our study explores if this will foster new social contacts and interpersonal relationships. The change of the form of interpersonal-communication not only reflects on the usage of new media but also on the transition of the relationship. The geographical location evolves into the relationship location from the outside world to the inner mind, and it also reshapes the connection of social network.

As the result, it changes the basic framework of the interpersonal communication. The transformation make it possible to which not be able to in the past, for example stride across the line of private and public fields ; the changing of social roles, social relations and even the social rules ( Geser 2004 ; Geisler 2001 ; Rich and Brigitte 1999 ) .

## **2. The Research Question and The Assumption**

From the sociological perspective, the process of socially defining the MP is revealing in itself. The adoption and the usage of MP give us a chance to see how the innovation is accepted and how it causes the revision of existing values and practices. Based on the above statement, we considered that the distinguished characteristic of MP usage is the communicated with others in the unit of "individual" firstly. Then, the

characteristic comes out some chances for an “individual” to get decision-making power in rearranging relationships. Therefore, we set the social effect on the improved relationships, and distinguish the concept of usage between *intensity* and *breadth*. It could verify the causal relation more clear on the usage to the improved relationships.

In addition, we compare the improved relationships between male and female users, going a step further to answer using the same media of MP, the difference between usage and the improved relationships. In substance, gender is the important character as well as the distension of social roles. We attempt to find the answer: When the individual communication is possible, what kind of flexibility and potential will come out, especially on the interpersonal relationships (contacts). It will help us to realize the correlation between the MP usage and the changing of relationships, extending to the social effect.

The follow of this are our major research questions:

- What is the correlation between the MP usage and interpersonal relationships?
- What kinds of relationships can be improved by MP usage? How to improve the relationships (by the *usage intensity* or *usage breadth*)?
- What is the difference between the improved relationships after using MP?  
Comparing with the male and female users.

### **3. The review of Literature**

#### **3.1 The Approaches of technology and Society**

Until now, there are more and more researches discussing about the social effect of the MP, even the Internet. The researchers come from many kinds of fields, such as information and communications, information and technology and sociology...etc. In addition, the perspective of the impact after using the MP often rely on some theories for the approach, like the technical innovation, social adopting, the theory about social capital, the theory of information society and domestication of the ICT...etc.

The observation to the mobile phone could come from many approaches. We describe the brief of development about the approaches. At first, the technical deterministic view is inveterate for a long time. It suggests that it is technologies that form and mold society. Second, the opposite view is the social deterministic that stand for technologies are reinterpreted by user and given new, unexpected trajectories. Thus,

while a mobile phone is designed primarily as a communication device, it can conceivably function as a tool. We can see technology as a type of text that has an author (the designer) and is read and interpreted by the user.

Third, the affordances approach is a type of middle position of the idea above both. It suggests that the physical characteristic of an object interplay with the way in which we perceive and interpret the use of the object. The core idea is that “the properties of objects determine the possibilities for action. But the elaborated area of the approach is the difficult place to separate from the motivations clear. Fourthly, the domestication approach is a compromise between technical and social determinism, while at the same time it avoids the narrowness of the affordances approach. The approach was developed to examine the adoption of technologies in the home, but has been expanded to include mobile technologies.(Haddon 2001a,2001b) The adoption was view as a process. In addition, domestication approach is not only a mental process carried out by an individual but also a social interaction between individuals. This approach has several advantages over the alternatives noted earlier. It assumes we arrange our lives and define ourselves via technical objects and the technical devices have consequences for the arrangement of our everyday lives (Rich 2004).

Besides, Katz and Aakhus (2002a,2002b) try to build up a theory about mobile phone, drawing attention back to the technology without ignoring human will. This logic is grounded in broader ideologies that are rooted in historical, materialistic, religious and ideational, and that have dominated human attempts to contextualize and make meaningful their life experiences. They use the neologism “*Apparatgeist*” to suggest the spirit of the machine that influences both the designs of the technology as well as the initial and subsequent significant accorded them by users, non-users and anti-users. According to the neologism “*Apparatgeist*”, they try to tie together both the individual and the collective aspects of societal behavior, and reset the research core on people themselves and the relations between the users and their media.

No matter what technology force the development of society, or advancing society drive the development of technology. There must have the practice of human life to be the foundation, we are going to next step by the time. Therefore, we expand our observation on the usage and interpersonal contacts, when the mobile phone as a device of communication, not only support the bilateral, real-time contacts for two sides, but also make more capacity for individuals to rearrange social contacts and the relationships.

The MP just likes a role of bridge between individual and another person. While People use the devices such as phone, mobile phone and the email, not only for contact but also hand around the interpersonal affection. It is more and more convenient for people to communicate with others, the usage of MP could shorten the nature distance, saving time, money and physical strength, at the same time, that accelerate information exchange by interpersonal contacts. It could be empowered for individuals by the usage of MP, on the contrary they could meet another dilemma\_ **individualism flourishing** (Wellman 2001). The rise of individualism becomes unavoidable and necessary, meanwhile everyone will live as an individual and try to connect with and be connected with another person.

### **3.2 The Interpersonal Contacts, Relationships and Social Capital**

As the result, we find that there is a tight relation between the usage of MP and the interpersonal contacts. And it is our major concern in this research. Whether or not it could contribute to interpersonal contacts after using the MP? If the empirical evidences are positive, the next question is what kinds of relationships could be improved through the interpersonal contacts after using the MP? When we already find the answers above both, we can advance to compare with which groups of users getting more benefit from the interpersonal contacts and relationships.

The original relationships of the users are the beginning of usage on MP, such as families, intimacy relationship and friendships. Then, the users could extend to contact with whom just see one time, know each other in any social situations, even to never see each other. Those contacts come into being one relationship in the future, even if we cannot see it directly. The communication of mobile phone can be seen as ego-central network. The scope of social network means the accessibility of one's interpersonal network, even to an indicator of social resources ( Marsden 1987 ) .

In addition, social capital refers to the amount and quality of an individual's social relations (Rich, 2001). Besides, there is abundant literature pointing out how important social relations are with respect to issues such as children's achievement in school (Parcel and Dufur 2001), individuals' psychological well-being(Umberson et al 1996) , individuals' ability to find a job(Granovetter 1973) , and individuals' ability to build a career(Burt 1999).

In the recent time, there are some sociological studies discussing the correlation between the mobile phone technology and the networking relations, even to social capital, such as Berry Wellman (2000,2001), Ling Rich (2004), Leslie Haddon (2001) and Hans Geser(2004). It was proved by empirical research in Finland, the usage of mobile phone contribute to the interpersonal contacts. Besides, the usage of mobile phone not only strengthens the original relations to families or classmates, but also extends the new relations to someone having met only once ( Rich 2004 ; Rich and Brigitte 2003 ) .

From the interpersonal contacts to the relationships, it was a dynamic and bilateral process. Through the contacts, talking and understanding, we build up some relationships. And then, we are continued repeatedly contacting with each other to show the relationship existing, meanwhile maintain the relationship by many ways. In other words, what kinds of media, how the number of times to contact with, how much time to spend for and how many people to connect are the indicators to represent the reality of relationship. Therefore, in spite of the traditional forms of communication (ex. face to face, by telephone), new devices could give us more opportunities and channels to increase the interpersonal contacts, and then improve the relationships.

#### **4. DATA**

Our research is based primarily on an analysis of the data from the ‘Taiwan Mobile Phone Survey’, which was conducted nationwide in Taiwan under the auspices of the Center for Survey Research and Institute of Sociology in Academia Sinica in 2003.

The same questionnaire was used in Japan and Korea survey in 2001 and 2002, and then it was translated into Chinese to conduct this research. So the questions are much more reasonable for Asian people, especially the MP users. The respondents were chosen from a probability sample whose ages ranged between 12 and 69 years. The total number of respondents was 1002, which forms a response rate of 40.3%.

#### **5. Measurement**

##### **5.1 Independent variables: MP usage behavior**

According to the study of usage of technology (Ram and Jung 1990), there are three types of usage, usage intensity, usage breadth and usage variety. Our study focuses on the usage behavior and the social impact. Hence, to develop our research, it is critical to distinct from the usage intensity and usage breadth.

### **5.1.1 Usage Intensity: the frequency of using the MP to communicate to others.**

It is about the relation of user and MP. A scale of *usage intensity* was derived from respondents' reports on the frequency of using MP, the time spent on MP and the cost of usage on MP.

- **The frequencies of using MP:** The question is 'How many times do you use MP to call-out and call-in every day?' The higher the value is, the more the using times is. The variable could describe the situation of the users use the phone to connect and be connected to others.
- **Time spent on MP:** The question is 'How long do you spent on talking on MP everyday?'
- **The cost of MP:** The question is 'How much money do you pay for the MP communication every month?' The rate of mobile communication is according to month-basic fee and pay for calling side. Hence, the total fee of MP conversation in Taiwan is almost equal to the ability of users to call-out. The ability means the users could afford to the bill and they really call-out so many times.

The above three questions all are answered by respondents themselves. In order to show the meaning of primary data, we never recode the three variables. Maintain the original value could make us observing the actual behaviors. The three questions are the measure of *usage intensity*. High scores indicate more strong usage. There could be a coincidence between the collection of behaviors and inner attitude of individuals to the MP.

### **5.1.2 Usage Breadth: The numbers of people that you (the user) connect by MP.**

- **Numbers of people contacted:** It is the important indicator of the usage breadth. We ask the question 'How many people do you phone via MP to discuss personal matters only?' to describe the actual scale of communication network and personal relationship. The *usage breadth* refers to the number of partners to whom calls are directed and from whom calls are received.

When you talk to many people, it means whom you call-out and call-in are different. And there are many kinds of people talk to you by MP, at the same time, you can connect various people by the MP. In other words, *usage breadth* means the range of networking that connect by MP. The range of networking by MP is a direct indicator to measure *usage breadth*.

Therefore, we use the only one indicator to measure *usage breadth*. High scores indicate more wider-ranging people contacts. It can be seen that *usage intensity* and *usage breadth* are different from each other, they are different concepts.

## **5.2 Dependent variables: The improvement of relationship**

We use a set of fourteen questions in a 4-point Likert scale to ask what the changes are after using MP. Among them, five questions are about relationship. According to the closeness of the relationships, we classify five types of relationships: ‘interpersonal contacts advance’, ‘many kinds of friends contacts advance’, ‘friends hard to see can be advance’, ‘family contacts advance’, and ‘intimacy relationship advance’. We regard these five items as indicators of the changes of their relationship although some may argue that contact is not necessarily the same as relationship.

When it gets higher score, means that there are much more changes in the relationship after using MP. Contacts could be considered as a very important part of the relational performance because the relationship could be judged according to the two-way and real-time communications. And the communication of MP is the definitely one kind of the two-way and real-time communications.

## **5.3 Method**

At the beginning, we make a simple description between MP users and non-users. Then, we focus on the usage of users and the improved of relationship. We use the SEM model to test the causal relation between the usage of MP and the improved of relationship. In the end, we use multi-group structural equation model to analyze the effect of difference between gendered groups. We use the LISREAL to analyze the data and fit the models.

# **6. Results**

## **6.1 The differences between MP users and non-users.**

In Table 1 the difference is quite clear. About 53% of MP users are male, but only 41% of non-users are male. In other words, there are almost 60% of non-users are female. This is an interesting point to be marked.

Unfortunately, it is impossible to talk about the MP application of nonusers, we choose to other media, such as internet as indicators to see if there is any difference between MP users and non-users. About 60% of MP users use the internet, but only 29%

of non-users use it. Depend on that, we find those who use MP would probably use the internet, too. Comparing the differences for MP users to those of non-users, the major concerning is on the personal characters of users like age, gender and education, rather than the social impact.

**TABLE 1**

|                  | MP user |        | Non-MP user |        |
|------------------|---------|--------|-------------|--------|
|                  | N       | %      | N           | %      |
| <b>Gender</b>    |         |        |             |        |
| Male             | 389     | 53     | 110         | 41     |
| Female           | 346     | 47     | 157         | 59     |
| Total            | 735     | 73     | 267         | 27     |
| PC Internet      | 445     | 60     | 78          | 29     |
| <b>Age</b>       |         |        |             |        |
| 13-19            | 106     | 14.4   | 67          | 25.1   |
| 20-29            | 165     | 22.4   | 9           | 3.4    |
| 30-39            | 174     | 23.7   | 19          | 7.1    |
| 40-49            | 163     | 22.2   | 39          | 14.6   |
| 50-59            | 95      | 12.9   | 50          | 18.7   |
| 60-69            | 31      | 4.2    | 76          | 31.1   |
|                  | Mean    | SD     | Mean        | SD     |
| Age              | 35.5    | 13.4   | 44.1        | 20.2   |
| Education(Years) | 11.5    | 3.4    | 8.1         | 3.0    |
| Family members   | 4.6     | 1.9    | 4.7         | 2.3    |
| Income(NT\$)     | 75,901  | 70,463 | 37,765      | 29,171 |

Source: Taiwan Mobile Phone Survey (2003)

## 7.2 The Rate of MP Users by Gender and Age.

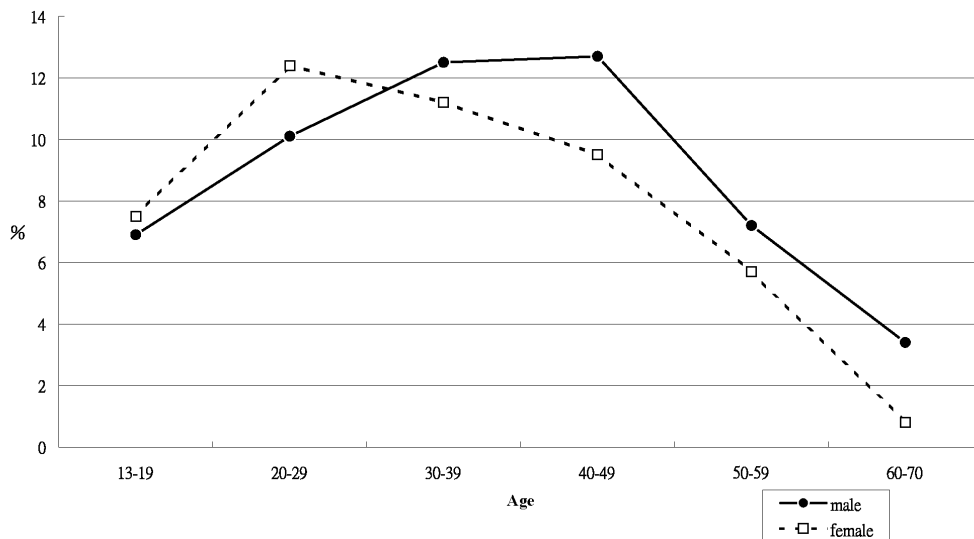
Age and gender are both important personal characters to dominate the penetration rate of MP, we should consider how people conduct their media usage with different age, or different gender as the context.

In Figure1, we can see the difference of rate by age and gender. It is significant that grouped by gender and age, the rate of MP users shows something interesting. Below the age of 29, the percentage of female users is more than male ones. But accompany with

the age increasing, the rate of male users are more than female ones. In addition, the biggest rate-gap between male and female is 40-49. According to the Figure1, we can find the personal character of age and gender both effect the usage of MP. Besides, it is necessary to distinguish more detailed, then we could realize the effect of age and gender.

In this study, we group by gender to compete against the effect of MP usage on the interpersonal contacts increasing. At the same time, the effect of age and education will be control. In order to consider the all effect of variables, we use the SEM model to estimate the effect of causal relation.

Figure1.MP users Rate by Age and Gender



### 7.3 The Analysis of Structure Equation Model

#### 7.3.1 Total sample

We first estimate a model that incorporates both concepts of MP usage. And there are five types of relationships to be improved after using the MP. In figure3, we estimate the causal relation between MP usage and the improved-relations. After using the MP, there are four types of relationships improved through the *usage intensity*, such as interpersonal contacts( $\gamma_{11}$ ), many kinds of friends( $\gamma_{21}$ ), friends hard to see( $\gamma_{31}$ ) and intimacy relation( $\gamma_{41}$ ). Only the family contacts are not improved. The situation shows that no matter how often using the MP, it does not increase the contacts of family apparently. But

the result does not match that in Finland (Haddon 2001 ; Rich 2004). The reason is the users thought subjectively the family contacts are increasing in spite of great or low usage intensity.

In the other way, it is significant that there are two types of relationships improved through the usage breadth, such as many kinds of friends( $\gamma_{22}$ ) and friends hard to see ( $\gamma_{23}$ ). In other words, the usage breadth has the direct and positive effect on the relations of friends, no matter they are hard to see or various kinds of. But, it is interesting that the effect of interpersonal contacts is not significant. The situation may show that the usage breadth of MP is not so wide to increase contacts for all persons. It will depend on the users on the threshold of beginning to communicated with. But from the whole model, we can find the effect from MP usage to the improved-relations is positive.

Figure2: The Framework of Structure Equation Model

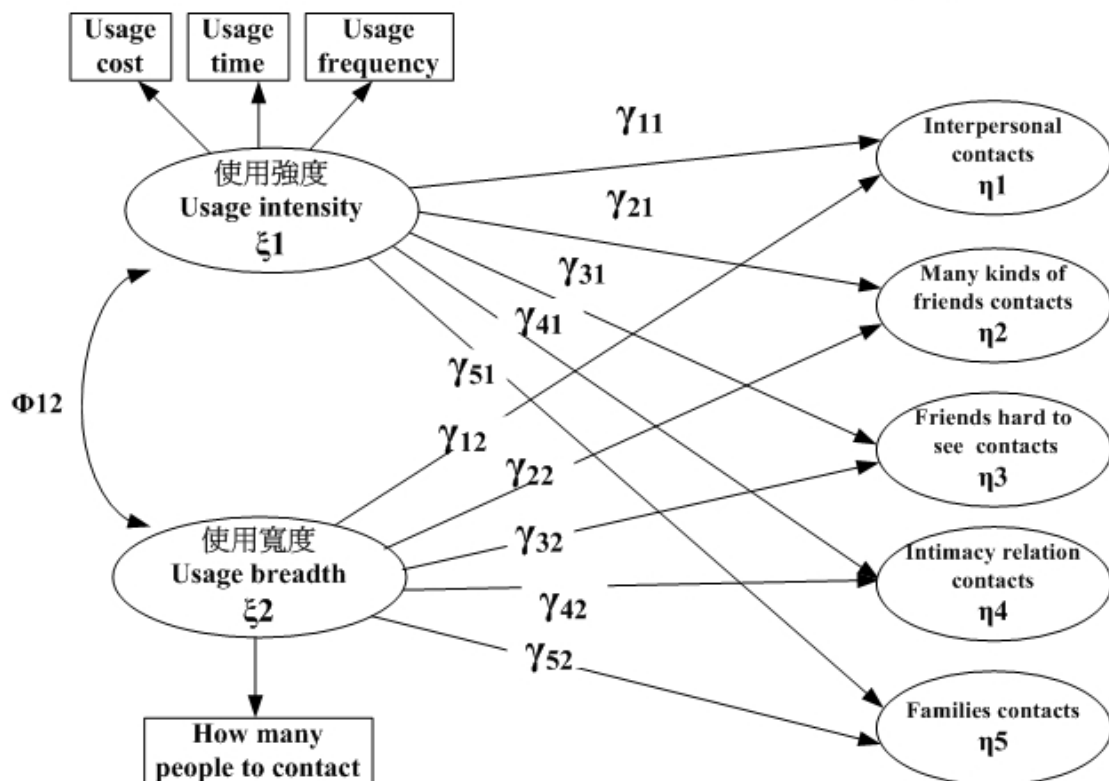
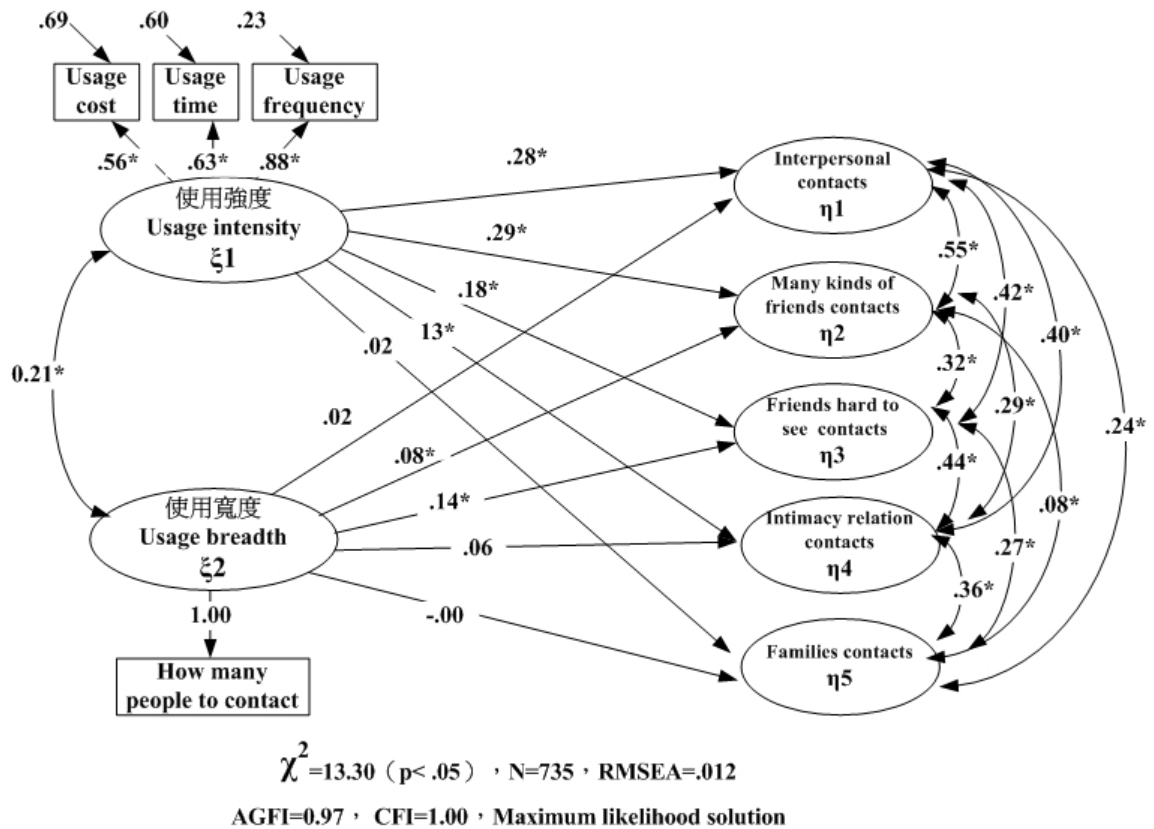


Figure 3: Estimated Model of the effects of MP usage on the Five Types of Interpersonal Contacts



### 7.3.2 The Users of Gender-Grouped

For a long time, there is clear limit of gender roles in our society, especially in the rule of interpersonal contacts. According to this, it is interesting to realize, for gender-grouped users, what could be improved to the interpersonal contacts? It is equal to answer if the individual communication is possible, what kind of flexibility and potential will come out on the contacts?

In figure 4, we can see the model of female users. Contrast with the total samples model, the effect of *usage intensity* is the same, but the effect of *usage breadth* is something different. The effect of many kinds of friends ( $\gamma_{22} = .17$ ) is larger than that in total samples model ( $\gamma_{22} = .08$ ), and the effect of interpersonal contacts ( $\gamma_{12} = .09$ ) is also larger than that in total samples model ( $\gamma_{12} = .02$ ). Depend on the female users, we find that when the *usage breadth* is higher, there are more improved relationships on the many kinds of friends, friends hard to see and interpersonal contacts.

In figure 5, we can see the model of male users. Contrast with the total samples model, the effect of *usage intensity* is the same, but on the *usage breadth*, there is no significant effect on many kinds of friends ( $\gamma_{22} = .03$ ). Moreover, for the male users, the improved relationships are many kinds of friends and friends hard to see. The result is different from that in female users.

Figure 4 : The MP Users of Gender-grouped \_Female

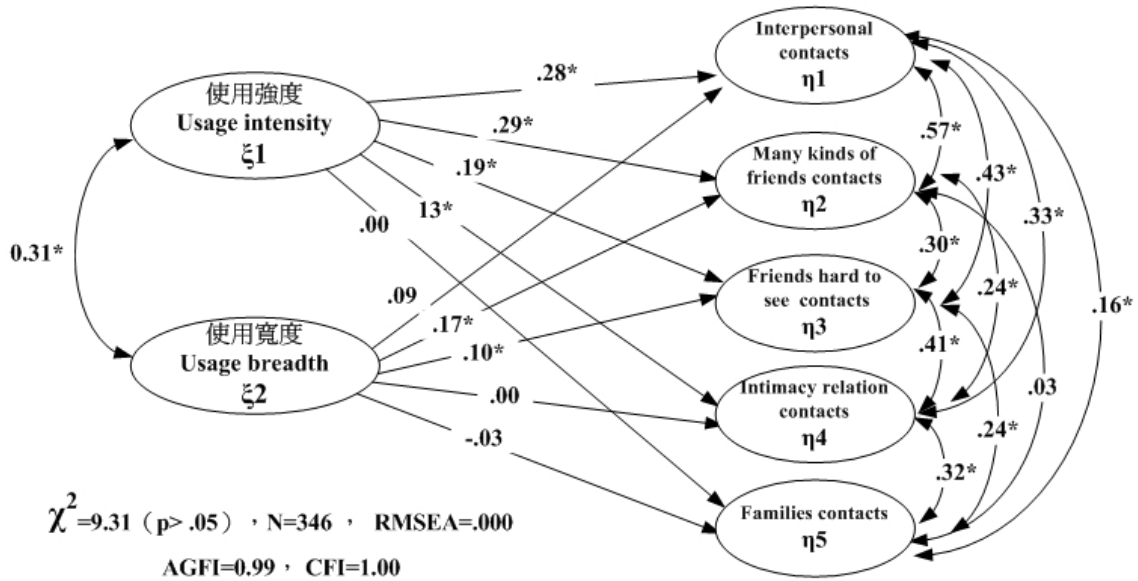
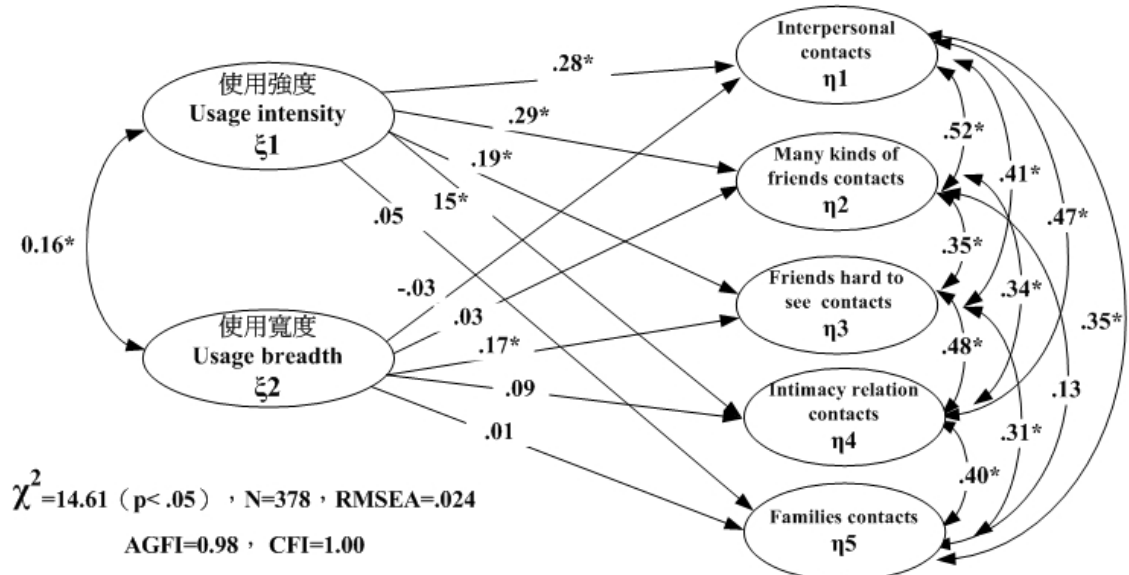


Figure 5 : The MP Users of Gender-grouped \_Male



In order to compare with the variation of  $\gamma_{22}$  and  $\gamma_{32}$  in the *usage breadth*, we use multi-group structural equation modeling to analyze the covariation. In table 2, the result

of group comparison is the statistic significant on the path effect( $\gamma_{22}$ ), but the other path( $\gamma_{32}$ ) does not show the significant difference. The former means the path effect( $\gamma_{22}$ ) of two groups have the significant difference, and the latter means not.

Table2:Group Comparison on the Difference of the Path Effect

| The Path of Effect | 女性    | 男性    | $\chi^2$ | DF | $\Delta\chi^2$ | P-value |
|--------------------|-------|-------|----------|----|----------------|---------|
| $\gamma_{22}$      | 0.03  | 0.03  | 33.67    | 25 | 9.75*          | <.05    |
|                    | 0.17* | 0.03  | 23.92    | 24 |                |         |
| $\gamma_{32}$      | 0.14  | 0.14  | 27.57    | 25 | 3.66           | >.05    |
|                    | 0.10* | 0.17* | 23.92    | 24 |                |         |

## 7. Discussion

Overall, our study finds empirical support for the social effect after using the MP. When the users have higher degree of the usage intensity, they would have more contributed to the relationships, especially to the interpersonal contacts, many kinds of friends, friends hard to see and intimacy relation. Another side, when the users have higher degree of the usage breadth, they would have more contributed to the relationships, especially to many kinds of friends and friends hard to see and intimacy relation. In short, after using the MP, it actually is positive effect to the interpersonal contacts, even to the relationships.

Our study tries to classify two dimensions of the usage. Two dimensions of the usage help us to realize the influence of interpersonal contacts via mobile phone. Among this, we are very interesting in the correlation between usage and relationships, especially in the expanding relationships (ex. Many kinds of friends) .

Thus, our findings suggest that there are all the same effect to the usage intensity, include total sample, female-users model and male-users model. But, in usage breadth, we find the female-users would be more important than male-users, because they can increase many contacts with many kinds of friends. On the contrary, the male-users cannot. While the multi-group structural equation model try to analyze the variation between two groups, female and male. We actually observe significant gender difference. The only significant group difference observed is a greater usage breadth effect on improved many kinds of friends for female than for male. If we see the relationship as

one kind of social capital, the effects of using MP may empower the female than male from the increasing interpersonal contacts. But this is a possibility, not the social fact.

In brief, we have three main findings. First, the effect of improved relationships is positive after using the mobile phone. Second, in figure3, we can realize what kinds of relationships were improved. Third, the result of multi-group comparison, we find significant gender difference. The female-users could get more interpersonal contacts than male users, especially for many kinds of friends. Therefore, using the same device of MP, female-users might own more flexibility and potential chances to contact with other person.

Finally, given several limitations in our data, future research should consider the following. First, based on some theories to set the hypothesis with respect to the relationships or contacts might receive strong empirical support to the effect of the relationships. Second, it is important to determine if our finding for the MP generally can be replicated for more specific devices usage, such as the e-mail, internet phone and the internet. Last, a developmental perspective should be applied to test whether the effect of technology and the interaction between devices and social life. The users subjectively report their feelings and the researchers objectively observe the real fact, these will be necessary components to one study.

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