A CASE STUDY ON HOW CHINESE STUDENTS USE THEIR CELL PHONES IN SWEDEN COMPARED TO THAT IN CHINA

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Abstract
This study focuses on cell phone usage. By comparing how a group of students use their cell phones in Sweden with that in China, alternate cell phone usage behaviors will be concluded. The study includes a case study. In order to do the research, the author selects a specific group and holds interviews. Three theories are used in this thesis which are: 1) mobile context, 2) switching behavior of mobile users and 3) transaction utility and reference situation. After introducing these three theories, the author concludes six theoretical factors which are combined into one competent framework. Base on the new framework, the author analyzes the result from the case study. After presenting the interview and the results, the author finds that Chinese students use their cell phones less frequent in Sweden compared to that in China. In order to find out the reasons, the author creates goal, emotion, fee, location and habit as the five matching factors which result in those changes. The matching factors are the bridge between the theories and the case study. After generalizing how those factors affect people while using cell phones, future work is to raise up some thoughts of how cell phones will be like in the future which is relevant to how to adapt information technology to human lives.

Key words: cell phone use, mobile context, switching behavior of mobile users, transaction utility, reference situation.
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Content
1 Introduction ................................................................................................................................. 1
   1.1 Research questions ............................................................................................................. 2
   1.2 Limitations .......................................................................................................................... 2
2 Method .......................................................................................................................................... 3
   2.1 Case Study ............................................................................................................................ 3
   2.2 Apply to My Case .................................................................................................................. 6
   2.3 Building framework .............................................................................................................. 8
3 Theory .......................................................................................................................................... 9
   3.1 Mobile context ....................................................................................................................... 9
   3.2 Switching behavior of mobile users ...................................................................................... 10
   3.3 Transaction utility and reference situation ............................................................................ 12
   3.4 Apply to the framework ....................................................................................................... 13
4 Case Study .................................................................................................................................... 14
   4.1 Group presentation .............................................................................................................. 14
   4.2 Data collection ...................................................................................................................... 14
   4.3 Interview data ...................................................................................................................... 16
5 Analyze ........................................................................................................................................ 23
   5.1 Completion of framework ................................................................................................... 23
   5.2 Cause of the change ............................................................................................................. 24
      5.2.1 Causes of the change on text message ..................................................................... 24
      5.2.2 Causes of the change on phone calls .................................................................... 25
      5.2.3 Causes of the change on function use .................................................................... 26
   5.3 Compare to the theory ........................................................................................................ 27
   5.4 Summary of analysis .......................................................................................................... 29
6 Discussion and future work ....................................................................................................... 30
   6.1 Discussion ............................................................................................................................ 30
   6.2 Future work .......................................................................................................................... 30
List of Figures

Figure 1 Case study tactics for four design tests (Source: Yin, 2003) ........................................ 3
Figure 2 Convergence of multiple sources of evidence (Source: Yin, 2003) .................................... 5
Figure 3 Maintaining a chain of evidence (Source: Yin, 2003) ......................................................... 5
Figure 4 Relevant Situations for Different Research Strategies (Source: Yin, 2003) ....................... 6
Figure 5 Framework outline ........................................................................................................... 8
Figure 6 The structure of context of mobile context (Source: Hoyoung, K. et al. 2002) ................. 9
Figure 7 Research model of switching behavior (Source: Ranganathan C. et al. 2005) .................. 10
Figure 8 Framework with theoretical factors .................................................................................. 13
Figure 9 Framework with personal behaviors ............................................................................... 15
Figure 10 Complete framework ..................................................................................................... 23

List of Tables

Table 1 Types of evidence (Source: Yin, 2003) ........................................................................... 4
Table 2 The three packages of text messages .................................................................................. 25
Table 3 Different fees of text message on two packages ................................................................. 25

List of Graphs

Graph 1 Ratio of the interviewees on whether they perceive the changes on using cell phones ...... 16
Graph 2 The amount of text messages the interviewees averagely sent in China every month ....... 18
Graph 3 The amount of text messages the interviewees averagely send in Sweden every month .... 18
Graph 4 The amount of phone calls the interviewees averagely made in China every month ........ 20
Graph 5 The amount of phone calls the interviewees averagely made in Sweden every month ...... 20
1 Introduction

Can you imagine going to school without a cell phone? How inconvenient it would be! You would not be able to communicate with your classmates or family members at will. You would also have to carry a cumbersome old-fashioned notebook or dozens of business cards to keep track of your contact numbers. Today, a cell phone is not merely a tool which enables us to make phone calls and send text messages or pictures. It can process, store, and output/input complex and diverse information. If you do not believe that, just look at the functions the Apple iPhone has: Multimedia, Internet connectivity, Web accessibility, E-mail, etc. While the performance and cost of current new cell phone functionalities, or call services, are not yet completely satisfying no one can deny that a new age is coming – the age that belongs to the cell phone. In today’s world nearly everyone has a cell phone. How people use cell phones is an interesting topic. It is related to how cell phones will be designed in the future and how to apply information technology to our quality of life. Thus, the answers to these questions may inspire thoughts towards the development of cell phones.

Since we are exchange students in Sweden, I would like to focus on the group of exchange students from China to see if we have different usages of cell phones in Sweden other than that in China. Students are one rapid growing group of cell phone users, who use cell phones for various reasons which may not be confined to communicating and entertainment. In my thesis, I would like to focus on the university students since they are in the majority of student users. I, as an exchange student from China myself, have found many things change since I came to Sweden. The way of using cell phone definitely counts. For instance, I discover I have been sending fewer text messages and so it is with the phone calls I made. In general, I have been using my cell phone less frequently. I wonder am I the exception or all of the Chinese students feels the same. If this is a common phenomenon, why would it happen? I think it may due to the varying of time or environment. People use technology every day, so we may consider how to improve technology so that it could benefit us more. By focusing on people’s diverse usage of their cell phones, we would find some clues on how information technology benefits people.

Report shows in this year, every two people possess a cell phone, while the ratio is only 12% in 2000. It should be attributed to the rapid growth of cell phone use in developing countries. As for China now, the population of mobile phone users has reached 547.286 million. (Cciddcom, 2007). China has ranked the first all over the world as the largest telecommunications market. For the last four years, there have been a considerable rise of 20% of cell phone users each year and up till now the total number is still only 39.9% of the Chinese population, which shows the great potential of the market. (Sohu club, 2007). In order to cater to the needs of the customers, it is essential to grip customers’ usages of cell phones. Making phone calls and sending text messages are the two major functions people use. Report shows in 2007, there were 592.1 billion text messages sent all over China. That is over 1.6 billion per day. (Xinhuanet.com, 2008) A trend as it is, cell
phones are multi-functioned. But the number of their purchasers remains a question. Let’s take a look at Sweden, where mobile service is started six years ahead of China. According to a recent research, most of the Swedish only use the few simple functions of a cell phone such as making phone calls or sending text messages. Only 15% of customers, who buy cell phones with GPRS, use this function. (It024. com, 2007)

1.1 Research questions

- How do Chinese students’ usages of their cell phones in Sweden vary from those in China?

- What causes these changes?

1.2 Limitations

Here, in order to give the metaphor of cell phone usage in future China, I take the same group and study their behaviors of using cell phones in Sweden and in China respectively. Sweden is a developed country while China is a developing one. The status quo in Sweden is, to some extent, the future of China, especially on the technical development, such as the Internet accessing speed. Still, the geographic change is not effectively equal to the time change so there must be some deficiency. As we could find in the research, the drop of social contact in Sweden is a main reason for the decreasing use of cell phone (see Chapter 4 and Chapter 5). But it does not necessarily suggest the future situation in China, which, on the contrary, would be more likely the opposite. Besides, due to the limitation of the group, not all the factors can be considered. For instance, age is one factor in user demographics. However, the interviewees are almost in the same age level, which excluded the consideration of this factor. Similarly, factors such as relationship duration and service bundling could not be evaluated under these circumstances.
2 Method

2.1 Case Study

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. My case study followed Yin’s recommendation. There are four stages: 1 Design the case study, 2 Conduct the case study, 3 Analyze the case study evidence, and 4 Develop the conclusions, recommendations and implications. Designing the case study is the first stage in the case study methodology recommended by Yin (1994) and he also proposed five components of research design that are important for case studies:
- A study’s questions
- Its propositions, if any
- Its unit(s) of analysis
- The logic linking the data to the propositions
- The criteria for interpreting the findings.

After designing the case study, I would like to ensure the value of the study according to the criterion on judging the quality of research designs. According to Yin (2003), the empirical research can be evaluated by four tests, which are: construct validity, internal validity, external validity and reliability as shown in figure 1:

![Figure 1: Case study tactics for four design tests](Source: Yin, 2003)

Conducting the case study is the second stage of the methodology recommended by Yin (2003). Here, Yin suggests two tasks which will lead us to a successful project. First is preparing for data collection and the second one is collecting the evidence. Yin (1994) also suggested three principles of data collection for case studies: Use multiple sources of data, create a case study database and maintain a chain of evidence.
When it comes to collecting the evidence, Yin (1994) proposes six sources. They both have strengths and weaknesses as shown in table 1:

<table>
<thead>
<tr>
<th>Source of Evidence</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| Documentation      | • stable - repeated review  
• unobtrusive - exist prior to case study  
• exact - names etc.  
• broad coverage - extended time span | • retrievability - difficult  
• biased selectivity  
• reporting bias - reflects author bias  
• access - may be blocked |
| Archival Records   | • Same as above  
• precise and quantitative | • Same as above  
• privacy might inhibit access |
| Interviews         | • targeted - focuses on case study topic  
• insightful - provides perceived causal inferences | • bias due to poor questions  
• response bias  
• incomplete recollection  
• reflexivity - interviewee expresses what interviewer wants to hear |
| Direct Observation | • reality - covers events in real time  
• contextual - covers event context | • time-consuming  
• selectivity - might miss facts  
• reflexivity - observer's presence might cause change  
• cost - observers need time |
| Participant Observation | • Same as above  
• insightful into interpersonal behavior | • Same as above  
• bias due to investigator's actions |
| Physical Artifacts  | • insightful into cultural features  
• insightful into technical operations | • selectivity  
• availability |

Table 1 *Types of evidence (Source: Yin, 2003)*

After using multiple sources of evidence, I would like to converge them into one fact. There are convergence and non-convergence of multiple sources of evidence as shown in figure 2:
That is to say, all the multiple sources I choose should aim at corroborating the same fact. By using multiple sources could address the potential problems of construct validity. To increase the reliability of the information is to maintain a chain of evidence. Here is figure 3, which shows the process.

I would follow the steps given by the figure to conduct my case study. Not only from down to top but also, when looking back from top to down, we could also see the chain there. Yin (2003) states that data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study. He also presents some possible analytic techniques: pattern-matching, explanation-building, time-series analysis logic models and cross-case synthesis. The last stage is developing the conclusions, recommendations and implications. It is the contact point between the user and the researcher. In order to give my readers a clear view of my thesis, detailed description and results from the statistical tests will be included. And I will also provide explanations of those results.
2.2 Apply to My Case

There are many strategies while doing a research, such as experiment, survey, archival analysis, history and etc. The reason why I choose case study here based on my own situation and according to figure 4:

![Figure 4: Relevant Situations for Different Research Strategies (Source: Yin, 2003)](image)

1. Types of research question
   My question is “how do Chinese students’ usages of their cell phones in Sweden vary from those in China?” It is a “how” and “why” question and this kind of question are likely to lead to the use of case studies or histories.

2. Extent of control over behavioral events
   No requirement of controlling behavioral event in my case.

3. Degree of focus on contemporary as opposed to historical events
   It is obviously that I will focus on the contemporary events since the participants are now exchange students in Sweden. Hence, case study is preferred in examining contemporary events.

According to the five components mentioned above, here are the ones in my case:

- **A study’s questions**: Do the Chinese exchange students use their cell phones differently in Sweden compared to that in China?

- **Its propositions, if any**: According to my own personal experience, I guess the answer would be yes. The differences would be found in the number of text messages sent, the length and number of phone calls and maybe some other cell phone function use.

- **Its unit(s) of analysis**: In my case, the unit of the analysis is one of the Chinese exchange students study here in Sweden.

- **The logic linking the data to the propositions**: I would like to show the number of text messages sent, the length and number of phone calls made by interviewees in China and compare to that after they come to Sweden. After the comparison, we could see if there are any differences. I also take gender into consideration in both
units. All the participants have used cell phones in China and they are also using cell phones when they came to Sweden. This group is very suitable in this case study.

- **The criteria for interpreting the findings:** We would see the changes of the number of text messages sent, the length and number of phone calls made by interviewees after interviewees came to Sweden. And they will also express some changes of their own feelings when using cell phones during the interview. These changes could support my propositions.

After designing the case study, I would like to ensure the value of the study according to the criteria for judging the quality of research designs. To meet the test of construct validity, I followed the two steps:

1. I select specific types to study and in this thesis they are what specific functions which Chinese students use in Sweden and the frequencies to use them compared with those while in China.
2. In order to provide a valid measurement, I used variety of sources of evidence gathered from articles, books and data from Internet and then compared them with empirical data collected by documentations, archival records, interviews, direct observations participant observation and physical artifacts.

Internal validity is establishing a causal relationship, where certain conditions are shown to lead to other conditions. As I am going to research the reasons that cause the changes of the way Chinese students using their cell phones, specifically speaking, the environment, this validity is included in this thesis. In this case study, I am using a group of Chinese students who come to Sweden to study. There are 18 people together.

After considering different types of evidence carefully, I decided to use documentation, interview, direct observation and participant observation as my sources of evidence.

*Documentation:* I collect some background information from the Internet so that I could provide comprehensive information to my readers and help them to understand my study better.

*Interviews:* It is a very essential to the source of case study as they can provide us more efficient and trustful data. In case of bias due to poor questions, I would design my interview questions more carefully.

*Direct observation:* As all the interviewees are my classmates, I could see them almost every day. It is easier for me to observe how they use their cell phones.

*Participant observation:* I am with the group and I am also one of them who use cell phones both in China and Sweden.

After using multiple sources of evidence, I would like to converge them into one fact to answer the questions proposed in my case. Among the possible analytic techniques Yin (2003) proposed, the best suited one for my case study would be explanation-building. *Explanation-building* is considered to be a special type of pattern matching, but a more difficult one. This strategic is to build an explanation first and analyze the case study data.
In my case, I hypothesize the change of the fee and the shrink of the social circle both lead the change of using cell phones. These would be compared to the information I get from the interviewees later. My conclusions, recommendations and implications will be based from this.

### 2.3 Building framework

In my case, I am going to use interview as my main approach of my case study. During the interviews, I can only acquire the information about personal behaviors which are concrete. In order to match them with theories which are very abstract, I will generalize some “matching factors” to connect them with each other. The other reason why I create those factors is that it will be easier to understand the narration. Theories are sometimes too conceptual to be adapted since the outcomes from case study are solid. When I try to match them, there may be too many overlaps or conflicts. What I am trying to do there is to create a framework so that the description would be easier to convey. Figure 5 shows the empty framework. The left column stands for theoretical factors which will come from theories. The right boxes are the personal behaviors that will be investigate in the interviews. Middle ones are the matching factors which could connect theories to my case.

![Framework outline](image)

Figure 5 *Framework outline*
3 Theory

In this chapter, I will introduce three theories that I use in this thesis. They are 1) mobile context, 2) switching behavior of mobile users and 3) transaction utility and reference situation. After introducing these three theories, I would build my own theory framework according to them. By using the new framework, I would easily build my own case study and make it more clearly.

3.1 Mobile context

According to Hoyoung et al. (2002), mobile context is defined as any personal and environmental information that may influence the person when he/she is using mobile.

The authors claim that this definition has two characteristics stated as follow:
1. The definition focuses on the contextual information from the users’ perspective even though information about context can be theoretically limitless.
2. The definition includes not only personal contexts but also environmental contexts.

We can see it clearly through the figure where the author divided contextual information into two categories as shown in figure 6. These are personal context and environmental context.

![Figure 6: The structure of context of mobile context (Source: Hoyoung, K. et al. 2002)](image)

Personal context is composed of internal and external context. The internal context has something to do with the intrinsic aspects such as what is the goal the users use mobile phone and how they feel while using it. The external context refers to the physical aspects of the users like how their hands and legs moving while use mobile phone.

The environmental context consists of physical and social environments parts. The physical context explains the distraction both on visual and auditory while the social context describes co-location and interaction.
3.2 Switching behavior of mobile users

Ranganathan et al. (2005) examined over 30,590 mobile users. Statistical analysis supports prominent associations between the service usage, service bundling and their switching behavior of users. They also found age and gender would influence mobile user switching. Figure 7 shows their research model.

![Research model of switching behavior](Source: Ranganathan C. et al. 2005)

In this figure, authors believe that relational investments and user demographics are the two main factors that affect switching behavior of mobile users.

*The relational investments*

The relational investments are closely related to the user-provider relationship in the sense of adding the switching costs. The switching costs include both economic costs and non-economic costs, the latter of which involves searching, learning, cognitive and emotional adjustments that are inevitable in the switching process. Thus, by adding switching costs which reduces the users’ desire to change providers, relational investments enhance customers’ loyalty. When it comes to relational investments, it can be further divided into the following three variations: service usage, relationship duration and service bundling. According to the author, service usage refers to the extent to which a user utilizes the services offered by a mobile service provider. Relationship duration refers to the tenure of the relationship between a service provider and a user. Service bundling refers to aggregation of multiple products or services as a single package.

*Service usage*

Service usage, plainly speaking, is how often and how many percentages of the services offered by the mobile service provider are used. According to the expectation-disconfirmation theory, the more frequency and percentage of the service is used by a customer, the fewer tendencies he shows to defect the current service and switch to another, regarding the switching costs in forms of searching for a provider, forming expectations and evaluating the service performance. Researches on users’ satisfactions also echo with this point. According to the study, there are close
connections between prior service usage, customer satisfaction and subsequent usage. Users who had positive perceptions of their prior usage enjoyed higher level of cumulative satisfaction; higher satisfaction, consequently leads to increased subsequent service usage. Evidence shows that users who had switched their Internet service providers had not make adequate usage of the provided service. Service usage contributes to prevent switching behavior of mobile users.

Relationship duration
Relationship duration is essential to the user-provider relationship because it affects users’ view of expectation of a relationship. As the Relationship duration extends, the customers gain considerable knowledge and expertise from the provider about competitive services, pricing practices and industry trends. They would build more confidence over the provider and the level of satisfaction and the expected value from a relationship changes until the relationship ends. In this sense, relationship duration increases the cumulative experience of satisfaction by the users, as well as increasing the switching cost regarding the time and energy customers invested in a provider, thus discouraging users to conduct switching behaviors. Duration of user-provider relationship contributes to prevent switching behavior of mobile users.

Service bundling
Service bundling means providing the customers multiple products or services within one time in one package so that they can choose from. When it comes to the mobile services, it could take in the forms of voice mail, multimedia messaging, online games, web access, email, and so on. Evidences have shown that this method of vendition has positive effects on users’ final buying decisions. Firstly, when enjoying the convenience of the Service bundling from one provider, the users may find it difficult to throw away the accumulated provider-specific skills and knowledge to switch to another one. Secondly, this kind of service would enhance the users’ loyalty to the provider. Service bundling contributes to prevent switching behavior of mobile users.

User demographics and switching behavior
Recently, various studies show that User demographics play a prominent role in people’s switching behavior. Mobile consumers with different characteristics make different decisions. Age and gender are the two classifications of the user demographics.

Age
Young mobile users regard mobile phones as a means to entertain, to seek for a sense of social belonging as well as self-value. They view mobile more as a medium to represent their life-style other than a functional, complex technology. Thus, they are more likely to change mobile services, comparing to the elder ones. Age contributes to prevent switching behavior of mobile users.
Gender
It is reported that female users experience higher level of anxiety when using technologies comparing to male users. So female may easily be content with and get used to a service and thus are not likely to change service providers. Female users show fewer tendencies to switch providers comparing to male users.

3.3 Transaction utility and reference situation

Blechar et al. (2006) researched in the acceptance and use of mobile technology. Their efforts indicate that when users choose mobile services, they will reflect on former experiences. They also suggest that users cognitive referencing is an influential factor. There come to the two factors: transaction utility and reference situation. The authors have taken steps to make up for the deficiency of the theories they adopted, such as trying to better capture mobile users behavior, understand the added value of mobile services and put emphasis on the ‘end-user context’. Unlike most existing researches which put mobile service in an isolated situation; they focus on the choice process in the context of various sources available to fulfill a service need. Early in the initial stage of their research, they have found that users tend to make references transversely, especially to the Internet, to help make their mobile service choices. This means their single focus on the adoption decision is no longer sufficient and they call for new theories and modules for research to make it a sounder system. They adopted behavioral economics and further the concept of referencing through transaction utility to study user’s decision-making process.

Transaction utility
Transaction utility is defined as ‘the difference between the amount paid and the ‘reference price’ for the goods. The reference price is the ‘regular price’ in a consumer’s mind based on his past experience of purchase. The reference price may increase or decrease the transaction utility thus to affect a consumer’s purchase decision. A customer may still buy something he does not need because of the idea of ‘bargain’ when he assumes the price to be higher than it currently is. On the contrary, if the actual price is higher than the reference price, he or she may consider it expensive and not buy it, thus produces a negative transaction utility. The idea of transaction utility has proved its existence in consumer goods market analysis and experimental economics research. Solow reference prices goes against user’s advanced mobile service usage.

Reference situation
A second essential concept the authors have to in draught is the reference situation -- the ‘reference state’ serving as a proof when users judge the good’s total value, make comparison and final purchase decision. It can affect user’s reference price and thus actual usage decision. It is the reason why on some special occasions, customers are willing to pay more than regular “reference price” to gain some services. During such special occasions, regular services can’t be obtained easily; the user’s assessment of value
of the services is thus changed and the reference price has increased, thus the transaction utility becomes positive. In this sense, the convenience of Internet is a threat to create the reference situation in favor of increasing reference price, which is during decision session whether to use a mobile service, the reference situation of the Internet lowers users’ reference prices.

### 3.4 Apply to the framework

Those three theories are the ones I use in my thesis. They describe six theoretical factors, which are: 1) personal context, 2) environmental context, 3) relational investment, 4) user demographics, 5) transaction utility and 6) reference situation. So now, I can fill in the framework with the six theoretical factors:

<table>
<thead>
<tr>
<th>Theoretical factors</th>
<th>Matching factors</th>
<th>Personal behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal context</td>
<td></td>
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<tr>
<td>Environmental context</td>
<td></td>
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<tr>
<td>Relational investment</td>
<td></td>
<td></td>
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<tr>
<td>User demographics</td>
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<td></td>
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<tr>
<td>Transaction utility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference situation</td>
<td></td>
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</tr>
</tbody>
</table>

Figure 8 Framework with theoretical factors
4 Case Study

In order to qualify the research with factual support, I chose an experimental group to interview. This chapter mainly presents the interview process and the results. There will also be some fundamental analysis based on the data to show how the behaviors changed.

4.1 Group presentation

The group I chose includes eighteen exchange students who are all studying in Sweden. They all had cell phones while they were studying in China. All of them have had a cell phone since they went to university or even earlier. That is to say they have been using cell phones for at least three years in China and they use cell phones frequently there. They continue to use their cell phones after they moved to Sweden. There are nine boys and nine girls in the group which I am going to analyze of. Looking back into the theories, gender is one factor which results in the behavior changes. In my case, I have the same boys and girls in number which I take the consideration of identical quantity of boys and girls to match the gender factor.

4.2 Data collection

In order to acquire information and data, I use interviews as the main method. During the interviews, I can only collect the information about personal behaviors, such as: the amount of SMS sent the length and amount of phone calls made and some other function use. According to this, I will focus on three main personal behaviors: 1) changes on text messages, 2) changes on phone calls and 3) changes on other function use. Therefore, I put the information in the framework as shown in figure 9.

I design my interview questions based on these three personal behaviors. The questions are only a framework and when I was doing interviews, sometimes I did not totally follow the questions listed below. That is to say, these questions are most likely to be a clue which guides the interview. As the interviews are more like a conversation, some interesting ideas will show up when the conversation goes on. Since I have been classmates with all the interviewees for three years, I know them well so some personal details are not included into my question list but I take them into consideration. Here is the question list:

✓ Do you feel that you use cell phones differently here comparing to that in China?
✓ How many text messages did you send in China every month? What were those messages sent for?
✓ How many text messages do you send now? What are those messages sent for?
✓ If it has changed, why?
✓ How many phone calls did you make in China every month? What are those phone calls made for?
✓ How long did every phone call last on average when you were in China?
How many phone calls do you make now? What are those phone calls made for?
How long did every phone call last on average now?
If there are some differences, can you give some reasons about them?
Does your cell phone have a camera?
If yes, how often did you use it in China and how about it here?
Are there any other changes you want to add?

In order to obtain more information, open-mined questions are used to inspire the interviewees expressing. I would not only take the statistics, but also record the reasons which cause these changes. Both the statistics and the reasons will help me with the further analysis.

Figure 9 Framework with personal behaviors
4.3 Interview data

In this part, only the answers of close questions will be analyzed and more answer analysis will be in Chapter 5.

1. Perceiving the changes

When they were asked whether they could feel that they use their cell phones differently from what they did in China, girls showed more sensitivity than boys. More girls than boys agreed that they have used their cell phones differently. Here is a boy who shook his head immediately after my question: “Using my cell phone differently? No, I don’t think so. I still use it to make phone calls.” Another boy who thought twice before answering it: “Well, maybe. I am not sure. It feels like I use it not so often these days.” When I raised this question to girls, only one of them gave me a negative answer: “Change? What do you mean by change? Cell phone is a cell phone. Can it be used in other ways than communicating? Er…playing games? I never play games in my cell phone.” All of the rest girls agreed with the statement completely: “Sure, obviously. I seldom use it after I came here. I used to have too many text messages to send but here, who can I send to? Oh, I am starting to miss my friends in China.”—this is a typical answer from girls. After calculating the statistics, the result can be shown in graph 1:

![Graph 1: Ratio of the interviewees on whether they perceive the changes on using cell phones](image)

The ones who claimed that they used cell phones the same way as that in China because they thought they still used it as a tool of communication. What they meant is that they still used cell phones to make phone calls or sent text messages. But what I wanted to know was whether the amount of text messages or phone calls has changed. Some of them were not thinking the way I expected them to but still, we can see from the graph that 61% of the interviews could feel the differences. Those who claimed they use cell phones differently now sensed they use their cell phones much less frequent here.

2. Changes on text message

Changes on text massage are basically the changes on text message amount. When
asked whether they send different text messages in number comparing to that they did in China, most of the interviewees nodded their head. Here are some answers: “Yes, obviously. You know I used to send nearly a thousand messages per month. Well, yes, most to my boyfriend. We were not in the same school you know. I just loved to text message him whenever I am free. But here, I don’t know why he can’t receive my messages and yes of course, the cost is ten times more.” – from a girl. Some other interviewees also admitted the text messages are mostly sent to their boyfriend or girlfriend such as a boy said: “Yes it’s true. I sent much more text messages after I got a girlfriend. She was so into sending text messages and I have to reply all of them.” For those who were not in a relationship, they also had some text messages to send. Let’s take a look at the girl who missed her friends in China a lot: “I’d say yes. I send around 500 messages a month, basically to my friends. I like to chat when I feel bored. And I prefer text messages when I have something to inform others. It’s cheaper, so why not? But when I came here, well, I feel I have too many things to care about here. I have to learn more and take care of myself too. I don’t have so much time to chat and I don’t have people to chat with. I mean, everybody is busy now.”

Girls are keener on chatting with text messages while some boys have their own usage too. Here is a boy who sent a lot messages but he has a different reason: “Yes, you know I worked in the student union. Text message is the major way for me to inform something. You know, just group message all the members so you don’t have to call them respectively. But here, the only thing for me is study. No more work to do.” Despite of these reasons, boys are really reluctant to send messages. Here is a typical answer describing the reasons: “Text messages? I never use them here. I seldom send messages when I am in China. Making a phone call is much quicker and more direct right? But girls like it so I only used it to reply. Haha. Nobody sends my text messages here so I never send as well. Typing in English is not pleasant either I think.” – from a boy who dislikes text messages at all.

After gathering the information, I build the graph 2 to show the situation while the interviews were in China.

Among those boys who send more than 300 text messages per month, either they have a relationship with someone or they work for some organization like student union so they need to send group messages some time via their cell phones. Girls like to use text messages to chat when they are free and when they have something to inform someone, text messages will be their references. Then it comes to the statistics when they come to Sweden shown in graph 3. I use the same scales as the previous one to make them easier to compare.

Most of their text messages in Sweden are sent to Chinese friends. For boys, they use text messages to inform or ask their friends about non-emergent things while girls still use it for chatting and communicate with each other as long as the situations are not urgent enough.
By comparing the two graphs, we could see girls are likely to send more text messages than boys both at home and abroad. We can easily find out from the two graphs that the number of text messages per month has decreased and it is not only from the general view but also from the individuals. All of the interviewees believe that they had sent much fewer text messages in Sweden than in China. Sending text messages, the most popular way to use cell phones in China, is still the number one choice to communicate by girls but the amount has dramatically shrank especially on boys. There is even a boy who has never sent a text message in Sweden.
3. Changes on phone call
Changes on phone calls include two aspects: phone call amount and phone call length.

Changes on phone call amount
When it comes to how many phone calls they make per month, most interviewees found it hard to tell. After the discussion, I decide to calculate the rough number. Here are some quotes describing how often they made calls and why: “How many? Once a day at least, I think. Sometimes, you know, ask people to play basketball together. And yes, you see when we were playing online games at dorm; we were so reluctant to leave for dinner. So we can simply order it by calling. You know there is a restaurant near where we lived. Things have changed when we came here, we have to cook now. I can’t order Chinese food from my phone, can I? So, yes, I make fewer phone calls.” Ordering the food is not the only reason for them to make phone calls. Here is another reason coming from the boy who worked for the student union: “I used to make many calls. Well, as I told you I worked for the student union. I used to make many phone calls especially when there will be big activities. You know lots of work has to be assigned and so many people have to be contacted. Yes, again, I know much less people here, so I make fewer phone calls.” Knowing fewer people or having less work to do are not the only reasons. Let’s take a look at what a computer science student says about it: “I make less. I made calls to contact with my friends but here, I don’t have so many friends to contact with. Furthermore, I can always contact my friends on MSN. You see, I am a computer science student. We are always sitting in front of the computer and here, wireless Internet connection is everywhere. We are almost 24 hours online. Why do we need a cell phone?”

Compared to boys, some girls do not feel the changes so strongly. As this girl who claims she make phone calls as few as she did in China. “I don’t think there would be many changes. I seldom made phone calls unless it is a fixed phone so I can’t send a text message. Am I too thrifty? Haha. Well, I just don’t think things would be that emergent so I prefer text messages most of the time. When I am here, still, the thing is I really don’t need to call anybody.” But more girls are showing their agreement. “Yes, I think I make less. The ones I used to call are mostly my family I guess. But here, the cheapest package cost me 1 kroner per minute right? So I use Skype. It’s cheaper. And if they are online, it’s free and we could see each other through web cam.” And here is another quote from a girl who also believes she has made fewer phone calls: “Well, I feel I am not making as many as I did in China. When I was in China, well, I like to call friend when I feel lonely or bored. But here, I don’t know whom to call. I mean, my friends are not here. Maybe I will try to know some new people then.”

After estimating the number, the condition in China is shown as graph 4 while that in Sweden is shown in graph 5:
Most of the calls by boys were ordering take-away food or calling friends to play outside games together. Girls only make calls to fixed telephone or their parents. Sometimes, they just want to hear some voices when they feel lonely.

Boys tend to make more phone calls than girls both in China and in Sweden. Both of boys and girls are using phone calls just to tell or ask for information. More girls use it as a tool of chatting than boys.
Changes on the length of each phone call
When asked how long a phone call would last on average, nobody could give a certain statistic. Both boys and girls consider it unchanged since they directly end up the call as long as they’ve got desired information, wherever in China or Sweden. Boys will not talk about unnecessary stuff via cell phones while it happens on some girls. This feeling has reached a widely identification as this boy said: “I don’t think it has changed. Why should it change? I call somebody just to inform something and I hang off after things are done.” Girls were always more sensitive so some of the girls gave out some different phenomena as this girl: “Well, I guess it would be longer. I mean when I made calls in China, I will try to speak faster to save money since every minute charges. But here, we only have the opening charge so I won’t care about the minutes any more. I will talk about other things too after the main discussion.” Being enlightened by the girls, some boys also discovered changes: “Yes, sometimes. I just can’t believe one day I call my friend for nothing. I was bored. You know we lived together but here, we live alone. Sometimes I really feel lonely in my little room so I just call for chatting and thanks to the opening charge. It’s affordable.”

We can see that some of them begin to chat over phones for sometime which they seldom do in China. Due to the cheap opening charge, boys also admit that they start to call some friends for nothing just because they feel bored. Thus, the number of phone calls has also decreased but not so obviously as that of text messages especially on girls. Some people are more willing to make phone calls than they were in China.

4. Changes on other function use
After analyzing the changes on the text messages and phone calls, I asked them about whether they use the camera on the cell phone and if they had more feelings to add. I generalize the answers into three aspects: general feelings, camera using and other function using feelings.

General feelings
Seven of the interviewees mentioned that they obviously used their cell phones less than in China and when I asked the rest of the interviewees if this happened to them too, eight of the rest eleven interviewees agreed. I took two typical answers, one from a boy and one from a girl. “When I was in China, I took my cell phone everywhere in case that someone will call me, but now, I just simply put it somewhere since it seems that I can expect no more than one call each day.” – from a boy. “One day, I left my cell phone in my dorm when I went to class. I would be nervous if I did it in China since I would worry about if somebody would be looking for me or I would lose the contact with my friends. But here, when I arrive at the classroom that day, I simply got my laptop logged into the Internet via the wireless connection and found most of my friends online so that would not be a problem anymore.” – from a girl. The rest answers were similar to these two. Most of the interviewees felt they use their cell phones less.
Camera using
16 of the interviewees have a cell phone with a camera but only 3 of them claim that they use it differently. One of them believes he use it more while the other two claim less. All of them have given their reasons as follows. First, let’s see two responses which disagree with the changes: “Change? I don’t think so. I used to use the cam in China a lot. I like to take pictures of myself anywhere I want to. So when I came here, maybe, more? But if I really want to take some pictures, I will bring my real camera with me. The camera in the cell phone is just for fun.” – from a girl who likes self-pictured. “No, no. I seldom use the camera. It’s low pixel. I mean the photos will be of low quality. I prefer a real camera. Yes. both in China and here. I seldom use it.” – from a boy. Now here is a boy who believes he uses less: “For me, in China, I liked to take photos with my cell phones whenever I found something interesting and sometimes I sent them right away to my friends though multimedia message. I thought I would use them more here so I bought a new cell phone with a larger pixels camera but now, I use a real camera which I take in my bag every day.”

Other function use feelings
Five of the interviewees mention that they do not use so many functions as they did in China. Some of the rest interviewees also give some examples to support this idea. The quote as following is typical: “I used to change my ringtones a lot when I was in China so that I can catch up with the fashion by having the coolest songs in my cell phone. Now, I have not changed it for two months since I never surf on the Internet via my phone here and of course, I do not have so much time to waste.” From the responding we could find that all of the interviewees still take cell phones as a tool of communication just as they did in China. After they came to Sweden, cell phones are likely to be used only in communication. Almost all the interviewees use their cell phones only to make phone calls or send text messages while other functions of the cell phone have been ignored.
5 Analyze

This chapter is going to analyze the data given by Chapter 4, and the analysis follows the theories mentioned in Chapter 3. In this chapter, I will introduce the five empirical factors, and explain how they change cell phone users’ behaviors. In the second part of the chapter, the connection between my research and theories will be described.

5.1 Completion of framework

First of all, I would like to complete the framework in order to analyze the result from previous chapters.

![Figure 10 Complete framework](image)

Five empirical factors are generalized from the personal behaviors to simplify the connection between the theories and my case. (See Figure 10) They are: 1) goal, 2) emotion, 3) fee, 4) location and 5) habit. I hypothesize that all three personal behaviors (changes on text messages, phone calls, and other function use) can be explained by the changes of the five empirical factors. That is to say, any of the five empirical factors variation will lead to the change of personal behavior on cell phone using. **Goal** is the purpose of using cell phones. It affects the internal personal context. **Emotion** is the feelings while people use technology. With emotion changing, people will change their
ways of using cell phones. Fee is the change on the price of sending text messages or making phone calls. It is related to the social aspect of environmental context and transaction utility. Location is different environment in where people are surrounded while using technology. It belongs to the environmental context and reference situation. Habit is the tendency about how people use cell phones. It has influence with the service usage aspect of relational investment. Different genders have different habits too. Gender is one aspect of user demographics.

5.2 Cause of the change

Now, I will try to explain the three main changes by the five matching factors. There are three types of changes: 1) change on the text messages, 2) change on phone calls and 3) change on other function use. Those five matching factors will be analyzed respectively in this part. Among those five factors, fee and location change are assumed as two main factors affecting to the change on text messages and phones. So they will be discussed independently under each change. The other three, which are goal, emotion and habit, will be described as followed:

Goal – As we learn from Chapter 4, all of the people still consider cell phones as communication tools, and sending text messages and making phone calls are still the most popular function of cell phones. That is to say, goal remains the same so the main usage of cell phones stays.

Emotion – As it mentioned in Chapter 4, interviewees claim that they are not used to send text messages in English. They feel uncomfortable when they type in English while they are used to type in Chinese. This phenomenon shows their emotion has changed after they came to Sweden. They feel no longer free enough to type a text message. The change of emotion results that they prefer a phone call to a text message.

Habit - Habit also plays an important role in the change of cell phone usage. According to Chapter 4, interviews, especially girls, are more likely to cling on the old habit. For example, girls love text messages so when they came to Sweden, they still prefer text messages to phone calls. Therefore, habit negatively interferes with the changes.

5.2.1 Causes of the change on text message

In Chapter 4, we can find out from graph 2 and graph 3 that the number of text messages sent per month has decreased. This trend is apparent not only on the graph as a whole, but on each individual as well. All of the interviewees believe that they had sent much fewer text messages in Sweden than in China.

1. Change of the fee
In china, the most popular mobile phone operator is China Mobile and all of the interviewees chose it when they were in China. It provides several packages of text messages as in table 2:
<table>
<thead>
<tr>
<th>Package</th>
<th>Fees of the packages/RMB</th>
<th>Number of the text messages can be sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10(≈8.7SEK)</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>20(≈17.4SEK)</td>
<td>400</td>
</tr>
<tr>
<td>3</td>
<td>25(≈21.7SEK)</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 2 The three packages of text messages (source: own creation)

In Sweden, all of the interviewees received a SIM card from Tele2, a mobile phone operator company in Sweden. It also provides several packages. Most of the interviews choose two of the packages which are shown below:

<table>
<thead>
<tr>
<th>Package</th>
<th>Fees per month/SEK</th>
<th>Charge on each text message/SEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kompis</td>
<td>75/150</td>
<td>Free</td>
</tr>
<tr>
<td>Amigos</td>
<td>100/200</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Table 3 Different fees of text message on two packages

Seven of the interviewees, which are all female, use the package called ‘Kompis’ which allows them to send text messages for free. It is attributed to their habit. The rest of interviewees use ‘Amigos’ which cost 0.49SEK each. For those who can send text messages for free use text messages as a main function of communicating. Those who pay for text messages admit that they prefer to simply making a phone call since the calling fee is just a little more than sending a text message (see also on next section 5.1.2 cause of the change on phone calls) which they feel acceptable.

2. Change of the location
The general environment is that one is China and one is Sweden. When in China, the most common contactors are classmates, co-workers and boyfriend or girlfriend as they have claimed in Chapter 4. All the interviewees have to keep in touch with Chinese students as well as students from other countries who speak English. Most interviewees state that they find that writing text messages in English is quite time consuming, so they prefer making a phone call even if sending a text message is free. Moreover, all the interviews pointed out that they had much fewer people to contact with than in China hence that is the direct reason of the decreasing number of text message amount.

5.2.2 Causes of the change on phone calls

From the graph 4 and graph 5 in Chapter 4, we could see that the phone call amount has reduced not so obviously than text messages amount. However, we can still perceive the decrease from the general view. It is interesting that not all of the interviewees make fewer phone calls, while some perform even more. As interviewees said in Chapter 4, some of them prefer a phone call since it costs them just a little bit more than text messages, which is acceptable. The convenience and rapidness of making a call seem more attractive to the interviewees. The following analysis is according to the two factors: fee and location.
1. Change of the fee

In China, the calling prices vary from each package and all the interviewees use the same one which cost 0.25RMB (=0.22SEK) per minute per call. In Sweden, it costs 0.69SEK every call in one network for at most two hours. After that, it will automatically disconnect and a new call can be made. Since all the interviewees are in the same network as well as most of their contactors, we can simply consider that the call fee here is 0.69SEK each. We can find that the calling fee is 0.25SEK higher than each text message and it is usual that one single text message cannot make things very clear, so most of the interviewees who use ‘Amigos’ will first turn to a phone call but not a text message when they have something to communicate with others. The reason why they choose ‘Amigos’ is that they can call overseas friends cheaper. Although they can use Internet phone such as Skype to make the calling much cheaper, some of them insist that they can have better feelings if they make the calls directly on the phone and they could hear each other more clearly through cell phones. Even for those who use ‘Kompis’, which enables them to send text messages free, they sometime will put calling in the first place since it is clear and direct.

2. Change of the location

It is similar to the environment change which the obvious environment change is that the country changed. Since group members are all new in Sweden, they do not have so many people to contact with as they were in China, the amount of phone calls every month has reduced. This situation is more obvious for boys than girls. When girls come to Sweden, it seems that their behavior has polarized. One group is hardly or never making phone calls while the other never sends a text message. Those who like to make phone calls believe that everything can be explained more clearly than from the text message but they also admit that sometimes they might have a little trouble with talking to non-Chinese through the phone in English. Maybe they cannot understand each other very well through the phone so they turn to text message again to make things clearer.

5.2.3 Causes of the change on function use

1. Camera using

Here, the cameras refer to the ones built in cell phones. Before the interview, I thought that they would use the camera more here, but to my surprise, among sixteen of the interviewees, only one uses his camera more and here is his reason: “It is quite a new place and I can easily find something new and interesting that I want to record. As I carry my cell phone every day, it is so convenient for me to take some photos.” Other interviewees gave several different reasons why they are not using their camera on cell phones more. Another quote: “I know that a real camera can always be better than that on cell phone. For me, I usually take a big bag with me. Carrying a real camera is not a big deal so I use my real camera when I want to take photos.” And: “My cell phone has a lot of pictures of my hometown, my family and my friends in China that I am so reluctant to delete. I want to show my hometown to my new friends here anytime and I need to see my family and friends when I miss them. My cell phone doesn’t have a very large memory
so it is not so impossible for me to use it a lot here.” A digital camera, nowadays, is so easy-taking and it performs better that a cell phone. When people come to a new place, they know they would come across many amazing scenes so they would like to carry a real camera.

2. Other function using
As it is mentioned before, some of the interviewees spent lots of time on their cell phones by changing the ringtones or downloading some wallpapers when they were in china. This situation has also changed when they came to Sweden. At first, I thought there may be two reasons: 1) the cost on surfing on the Internet through cell phones is higher in Sweden; 2) the instructions and WebPages are all in Swedish therefore they could not understand. But I am wrong again since none of them has ever thought of it. There are two typical reasons stated as following. A quote: “I have a laptop and I think everyone has one here. The wireless connection is so wonderful that I can connect to the Internet wherever and whenever I want. It’s not like I was in China, the electricity will be off to make sure we all rest early so I can only go on surfing on the Internet through my cell phone after 11pm.” And: “I find I have so many things to do here so I have fewer time to deal with my cell phone. Ringtones? No, never. I have not changed it for a long time. I have so many assignments or projects every day. I should handle my school things first.”

To sum up, there are two reasons. Most Chinese students find school life in Sweden is busier. In China, they only have exams at the end of each semester but here, projects, papers and assignments are keeping them busy every day. Meanwhile, free and fast-speed Internet also leads to the decreasing usage of cell phones.

5.3 Compare to the theory
According to the analysis above and if we compare them back with the theory, we can discuss it from the six factors: personal context, environmental context, relational investments, user demographics, transaction utility and reference situation.

1. Personal context
Personal context, as mentioned in Chapter 3, has divided into internal context and external context and this research is more about the internal one. Internal context contains the goal and emotion of the users while using cell phones. In this case study, the goal has not changed much as all the interviewees still consider cell phones as communication tools. Emotion has changed when they use cell phones. As they have to send some of the text messages in English sometime and they have not get used to that, some of them may feel frustrated when writing.

2. Environmental context
This context contains physical context and social context as discussed before and this case concerns more about the social one. We see from the analysis above, their location changed so the amount of people they contact changed and it directly results in the decrease of cell phone usages. Higher charges and free Internet connection also lead to
the less frequency. People using telephone differently on account of the price plan, such as prefer making a phone call to sending a text message. Another environment change is that it is more convenient to access to Internet in Sweden. So we can see that interviewees are reluctant to use cell phones to surf on the Internet. The last example on environment context is also about function use. Interviewees found that they have more work to do in Sweden. Due to this, they seldom play games in their cell phones – like changing the ringtones – as they did in China.

3. Relational investments
The relational investments can be further divided into following three factors: service usage, relationship duration and service bundling. Here, service usage is more relevant to my case. Service usage factor shows customers are not likely to change when they are used to one service. As in the case, girls are fond of sending text messages. So when they come to Sweden, seven of the nine girls choose the package ‘Kompis’ which allows them to send text messages for free. Also, the result shows that girls still mainly use text message to communicate as they did in China while boys insist on calls.

4. User demographics
Age and gender are the two classifications of the user demographics while in my case, I only take gender into consideration. Reports show female users are not like to change service providers comparing to male users. Female users experience higher level of anxiety when using technologies so they are more sensitive when service providers changed. In my case, it is shown that at the beginning of the interview, girls agree they use their cell phones differently more than boys. In other word, girls showed more sensitivity than boys which proves the factor.

5. Transaction utility
Transaction utility describes what will influence customers’ purchasing decision when they choose services. This factor shows the customers will make up their minds basing on their past experience of purchasing. Simply speaking, a customer will not buy a product if the actual price is higher than he or she thought it to be. As in my case, price on phone calls in Sweden is higher. What the interviewees referred is the price in China which is lower therefore they cannot get used to the prices in a short period of time. As a result, they turn to text messages instead.

6. Reference situation
This factor describes reason why on some special occasions, customers are willing to pay more. During such special occasions, regular services cannot be obtained easily; the user’s assessment of value of the services is thus changed and the reference price has increased. In this sense, the convenience of Internet would decrease the use of mobile phone to some extent. In my case, interviewees believe that they can access to Internet more conveniently in Sweden. This is also one of the reasons why they use their cell phone less.
5.4 Summary of analysis

After analyzing, conclusions are given as follows. Fees are higher both on calling and sending text messages in Sweden but that is not the main reason of the decreasing use of cell phone. Fewer people need to contact via cell phones. Busy school life also keeps them away from playing with their cell phones. What is more, comparing between calling and sending text messages in Sweden, we could find that even if some people could send a message for free, they still prefer to calling when they have something to say. That is to say that people tend to make things more comfortable with an acceptable sacrifice of money. Most of the interviewees have a cell phone with variety of functions but they only keep it for simple use. Like the camera, interviewees prefer a real camera since it is more professional. When it comes to other functions like multimedia messages, they will turn to Internet since they spend more time in front of computers and Internet is free.
6 Discussion and future work

6.1 Discussion

After this research, we could answer the research questions raised in chapter 1:

- How do Chinese students’ usages of their cell phones in Sweden vary from those in China?

The Chinese exchange students use their cell phones differently in Sweden compared to that in China. They make fewer phone calls, send less text messages. In general, they use their phone less frequently.

- What causes these changes?

Goal, emotion, fee, location and habit are the five matching factors. As shown in my theory framework, the three personal behaviors can be explained by those five matching factors after analyzing all the information. The goal of people using cell phones stays the same as they communicate with cell phones so they still use cell phones to send text messages and make phone calls. Emotion change as they feel inconvenient to type in English so they send less text messages. Raise of fee cause less frequent usage while knowing fewer people -- due to the different locations – also reduce the usage. Habit remains the same so boys still prefer phone calls as they were in China even if they are much more expensive. All in all, those five matching factors cause the alterant usages of cell phones.

Back to the six factors from the three theories, they are well matched with the five matching factors. Goal and emotion are the internal personal context while fee and location are the aspects from social environmental context. Fee is also related to transaction utility while location belongs to environmental context as well. Usage service in relational investment can explain why habit plays an important role. Gender issue in user demographics, saying female are likely to cling on the same also be confirmed by the habit analysis.

6.2 Future work

Cell phone is still used as a simple communication tool in Sweden where Internet connection is inexpensive. Most people only use cell phone making phone calls or sending text messages. As we can see, due to the development of the information technology, the cost of accessing the Internet will decrease. The background information, which has been stated in chapter 1, shows that only 15% of Swedish use other cell phone functions besides calling and sending messages. Some advanced cell phones have been so developed that designers try to convince customers that these cell phones can replace laptop to some extent. We may wonder how cell phone technology will be developed if no one uses new functions. Cell phones have their own advantages like convenient carrying. The new question for developers is how to design cell phones that satisfy users’ capricious preference. Just adding more functions will not be enough.
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