

Cultural Dimensions in User Preferences and Behaviors of Mobile Phones and Interpretation of National Cultural Differences

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Abstract. The purpose of this study is to identify the differences in user behaviors and cultural tendencies which will develop a cultural evaluation framework for mobile phone design among countries in the mobile telecommunication market. Cultural taxonomy helps the understanding of cultural differences. To help understand the Asian market more clearly, a brief overview of Geert Hofstede's findings (Individualism, Uncertainty avoidance, Power distance, Masculinity, and Long-term orientation) and the K.P. Lee's Cultural Variables (Way of Task Handling, Temporal Perception, Conception of Nature, Adherence to rules, Relationship with Human, Nature of Human Activity, Message Contexting, and Expression of Emotion) for the index of different cultures was used in this study. This research is based on an online survey in three countries (Korea, China and Japan), summarizing the responses of questionnaire about user preferences, and behavioral perceptions of UI Design of mobile phones. The result of this research identified the differences and similarities among countries clearly, reorganized the cultural variables. After comparing values of author's value from online survey and two other variables, this study found that Hofstede's and KP Lee's are very meaningful to identify cultural-based national characteristics. This verifies that differences of usage behavior and preference for mobile phone reflect cultural perspectives. This cultural research is the key to understanding these needs and to providing the companies with advanced market positioning. This study should not stop at a simple cross-national comparison but be a cultural comparison framework for giving companies a clear future direction for globalization-based design development.

Keywords: Mobile Phone, Interaction Design, Cultural Comparison, Behavior, Preference, User Questionnaire.

1 Introduction

1.1 Background and Purpose

Many cognitive psychologists have studied differences in cognitive styles between Easterners and Westerners. Nisbett [10] compared Asians' and Westerners' points of view in his book. He proposed that the thought patterns of East Asians and Westerners

differ greatly and classified these differences as holistic and analytic. Holistically-minded people have a tendency to perceive a scene globally and to perceive the context and the field as a whole. They also tend to focus on the relationships between objects and the field. On the contrary, analytically-minded people such as Westerners have a tendency to perceive an object separately from the scene and tend to assign objects into categories. Therefore, analytically-minded people are more field-independent.

The research said that Westerners assume Asians' behaviors are similar because they, geographically, live close together and look similar and vice versa. However, Hofstede observed that Korea's value did not fit well with the Asian averages. Instead, South Korea displays similar to Latin American countries in Geert Hofstede Dimensions.¹ Like this, no people can be separated by only one line.

Cultural variables can be too abstract to explain the behaviors of mobile phone users which make the variables difficult to use directly in design practice. So, transformation from cultural variable to design specification is needed. The survey questions and responses will provide good guidelines to understand different cultural markets. Therefore, the purpose of this study is to determine the distinctive cultural inclinations of each country in user behaviors related to mobile phones. This study will help to provide companies with the necessary knowledge and framework in advance of their product launch abroad.

1.2 Method and Scope

This is part of a cross-national cultural research project. Previous research [7] from online surveys has been performed in Korea, China and Japan. Those were survey [5]. Many questions were asked. Only 22 questions were used in this study to be analyzed, however, because only they were relevant to cultural perspectives such as habitual behavior, and perception (See Table 4).

The survey was done on male and female internet users between 15-39 years of age with experience in mobile phone use. Age ratio of those surveyed was 2:4:4 (age of 15-19:20-29:30-39). Purposive Quota Random Sampling was used. The Online Surveys from three countries (Korea, China, and Japan) were collected through e-mail, combined and analyzed through full packaging software application. After researching various cultural variables, one standard cultural index was developed. Using this index, other research results and cultural dimensions were compared.

Table 1. Survey Scheme

Target for Survey	Korea	China	Japan
Number of sampling	1040	644	527
Sampling method	Purposive Quota random Sampling		
Survey Institute	Metrix Inc	Infoplant	Marcom-China
Method and Duration	Online survey through email for 2 weeks		

¹ South Korea's Index values are: PDI=60 IDV=18 MAS=39 UAI=85. South Korea's closest correlation to another country in the Hofstede survey is to El Salvador's values of PDI=66 IDV=19 MAS=40 UAI=94.

As a foundation for this research which is the comparison of mobile phone cultures in China, Japan and Korea, earlier research [7] focused on general usage patterns and user perceptions by placing greater emphasis on depth in marketing view. Thus, as part of an effort to develop a methodology and process promoting the application of cultural factors in design, cultural comparisons and interpretations were conducted to establish a framework for research in the area of mobile interface design. These identified a relationship between cultural characteristics and mobile handset usage and confirmed cultural discrepancies reflected in the usage of mobile phones. In this research, Cultural Dimension by Hofstede Geert and K.P. Lee's Cultural Variable have been the main focus. The reason why this research chose Hofstede's Cultural Dimension, it is widely accepted and used for cross-national research in organizational and managerial settings. KP Lee's Cultural Variables [8] used the research for cross-cultural comparison on microwaves usage in Korea and Japan. One of the procedures of my research will be to verify and compare the results of these two studies.

2 Cultural Models

2.1 Cultural Dimension by Hofstede

Geert Hofstede states that Culture is more often a source of conflict than of synergy. In addition, cultural differences are a nuisance at best and often a disaster for marketing pitfall. His research gives us insights into other cultures so that we can be more effective when interacting with people in other countries. If understood and applied properly, this information should reduce the level of frustration, anxiety, and concern. Cultural research will provide the 'edge of understanding' which translates to more successful results for marketing. Hofstede's Cultural Dimensions are explained as follows.

Table 2. Hofstede's Cultural Dimensions

Power Distance Index (PDI)	focuses on the degree of equality, or inequality, between people in the country's society. A High Power Distance ranking indicates that inequalities of power and wealth have been allowed to grow within the society. It is the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally.
Individualism (IDV)	focuses on the degree the society reinforces individual or collective achievement and interpersonal relationships. A High Individualism ranking indicates that individuality and individual rights are paramount within the society.
Masculinity (MAS)	focuses on the degree the society reinforces, or does not reinforce, the traditional masculine work role model of male achievement, control, and power. A High Masculinity ranking indicates the country experiences a high degree of gender differentiation.
Uncertainty Avoidance Index (UAI)	focuses on the level of tolerance for uncertainty and ambiguity within the society for unstructured situations; it ultimately refers to man's search for Truth. A High Uncertainty Avoidance ranking indicates the country has a low tolerance for uncertainty and ambiguity.
Long-Term Orientation (LTO)	focuses on the degree the society embraces, or does not embrace long-term devotion to traditional, forward thinking values. High Long-Term Orientation ranking indicates the country prescribes to the values of long-term commitments and respect for tradition.

2.2 KP Lee's Cultural Variables

KP Lee [8] researched this dimension when he compared microwave usage between Koreans and Japanese. In order to conduct to develop a research framework for a cultural user interface study, the cross-cultural comparative study evaluated the usage pattern of microwave ovens. KP Lee's Cultural variables were used for cross-cultural research. This Cultural dimension was the modification with Trompenarrs's and Parson's. Each pair of dimensions and their descriptions are as follows.

Table 3. KP Lee's Cultural Variables and Description

Cultural Variables	Dimension	Description
1. Way of Task Handling:	Sequential vs. Synchronous	The temporal preference in performing tasks; Do only one thing at a time: Do many things at once
2. Temporal Perception	Past vs. Future oriented	People's perception toward priority in time
3. Conception of Nature	Subjugate vs. Control	The extent of mastering environment; Follows nature : masters environment
4. Adhere to rule	Universalism vs. Particularism	The extent of keeping standards; Adhere to standards : Adhere to focus on the exceptional nature of present circumstances
5. Relationship with Human	Individualism vs. Collectivism	The relationship between people; put more values in individual responsibility : regard group consensus more important
6. Nature of Human Activity	Ascription vs. Achievement	Achievement oriented cultures accord status to people on the basis of their achievement; Ascription cultures ascribe it to them by virtue of age, class, gender, education and so on
7. Message Contexting	Specific vs. Diffuse	The degree to which people engage others in specific areas of life; diffusely in multiple areas of our lives: at several levels of personality at the same time
8. Expression of Emotion	Affective vs. Neutral	The degree of Control people's feeling and express one's feeling

3 Interpretation of National-Cultural Differences

First of all, the basis for the cross-cultural comparative study was established by defining the essence of culture and theoretical framework. In doing so, it was attempted to interpret the interrelationships among characteristics of usage patterns, subjective preference, and cultural values of users.

3.1 Interpretation of National-Cultural Differences by Hofsted's Cultural Dimension

Here are the cultural implications by nation based on Cultural Dimension for Hofstede's view. Following are the results when the three individual nations (Korea, China, and Japan) are separated for comparison purposes. This should facilitate an understanding of the differences among them and compared with the Asian and World averages.

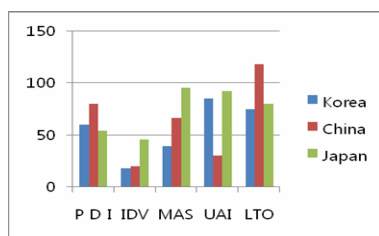


Fig. 1. Hofsteopde’s Value Graph²

Table 4. Questions and Results

Cultural	Variables	Questions
Way of Task Handling	Sequential-Synchronous Japan<China<Korea	-Do you prefer to use a menu’ vs. ‘Do you prefer to use hot keys’? -Do you want to make calls while walking? -Do you keep the phone at hand or keep in pocket while it’s not being used? -Are most of your calls out of necessity (not to chat or enjoy conversation)?
Temporal Perception	Past-Future Japan<China<Korea	-Do you prefer additional functions besides current functions? - Do you prefer sleek and futuristic design styles?
Conception of Nature	Subjugate-Control Korea<China<Japan	-Do you use service outlets shop rather than to trouble shoot yourself? - What do you do when the call doesn’t go through? Rather than just giving up, I would leave a voice message or use SMS.
Nature of Human Activity	Achievement-Ascription Japan<=China< Korea	-Is Function more important than the size of the phone? -Would you keep your current phone as long as it doesn’t break down?
Adhere to Rule	Universal-Particular Japan<Korea<China	-Do you like to use your mobile service to keep your ap- pointment times flexible? -Do you use functions besides phone calls & SMS very often? -Level of use of alarm function; Do you use the alarm function to awaken you up in the morning?
Relation-ship with Human	Collectivism-Individualism Korea <China<Japan	-Do you try to keep your voice down when using the phone in public places? -Do you turn off your mobile phone when you do not want to be bothered? -Do you Prefer standard design styles to Fashionable Design Styles?
Message Contexting	Specific-Diffuse China<Korea <Japan	-Do you use your home telephone when it is cheaper in cost at home instead of the mobile phone? -Do you lock your mobile phone with a secret code so that only you can access the phone? -Are you interested in mobile phone related sales events and discount benefits?
Expression of Emotion	Affective-Neutral China<Korea <Japan	-Do you keep conversations short without chatting? -Do you decorate your phone with stickers and accessories? -Do you prefer dynamic animated screens over static screens?

² www.geert-hofstede.com/ Using each Hofstede’s value of nation, the values for Korea, China, and Japan are selected and re-arranged for the purpose of this study.

(1) **Korea**³. South Korea's highest Hofstede Dimension is Uncertainty Avoidance (UAI) at 85, indicating the society's low level of tolerance for uncertainty. In an effort to minimize or reduce this level of uncertainty, strict rules, laws, policies, and regulations are adopted and implemented. The ultimate goal of this population is to control everything in order to eliminate or avoid the unexpected. As a result of this high Uncertainty Avoidance characteristic, the society does not readily accept change and is very risk-averse. South Korea has a low Individualism (IDV) rank of 18.

(2) **China**⁴. Geert Hofstede analysis for China has Long-term Orientation (LTO) the highest-ranking factor (118), which is true for all Asian cultures. This Dimension indicates a society's time perspective and an attitude of persevering; that is, overcoming obstacles with time, if not with will and strength. The Chinese rank lower than any other Asian country in the Individualism (IDV) ranking, at 20 compared to an average of 24. This may be attributed, in part, to the high level of emphasis on a Collectivist society by the Communist rule, as compared to one of Individualism.

(3) **Japan**⁵. The Buddhist-Shinto societies also have an additional Dimension, that of Long Term Orientation (LTO). Geert Hofstede added this Dimension after the original study, and it was applied to twenty-three of the fifty original countries in his study. The Buddhist/Shinto Countries of Taiwan and Japan have LTO as the most closely correlating Dimension.

3.2 Interpretation of National-Cultural Differences by Hofsted's Cultural Dimension

Relevant questions were extracted from more than 40 existing questions in online surveys. Fifteen people categorized the 22 questions into 8 cultural variables. Two or three questions were allocated to category of each cultural variable. Concept of Cultural dimension was used as a comparison tool of different cultures.

Each dimension has several questions for surveys related to these subjects. Questions were asked to three nations. Following are result of the comparisons

- **Way of Task Handling: Sequential vs. Synchronous.** Koreans have the most Synchronous ability in terms of the temporal simultaneously in performing tasks. Koreans do many things at once or do only one thing at a time such as carrying their cell phones close to them and are fanatical about them using them most frequently and in the greatest variety of ways. Most Japan users keep their handsets in carry bags or purses and use them mostly when a need arises. Meanwhile, they appear to be the most considerate of others: most people make phone calls from home rather than the workplace or school for reasons of privacy.
- **Temporal Perception: Past vs. Future oriented.** Koreans always pursuit the future as people's perceptions has priority in time. They like new and innovative functions and designs. Koreans prefer phones with a luxurious, advanced and high-tech image, which appears to be closely tied to the new product policies of phone manufacturers, which emphasize new technologies. Japanese have relatively low demand for additional features such as games, audio or video recording due to prevalence of diverse electronic devices on the market.

³ http://www.geert-hofstede.com/hofstede_south_korea.shtml

⁴ http://www.geert-hofstede.com/hofstede_china.shtml

⁵ http://www.geert-hofstede.com/hofstede_japan.shtml

- **Conception of Nature: Subjugate vs. Control.** Japanese has strong will to control environment. For example Japanese tend to fix problem by themselves and most of them tried not to give up but to leave a voice message. Korea and China are very similar characteristics of this concept of nature. Most of Korean tends to go to service outlet to get be fixed.
- **Adhere to rule: Universalism vs. Particularism.** For Chinese, flexibility is important: the replacement cycle is the shortest, brands and advertising are key factors influencing purchase decisions, and contract periods are flexible. On the contrary, Japanese reluctantly change meeting times and usually use main functions on mobile phones. Characteristics of Koreans are middle of one of Chinese and Japanese. Even though Korean seems to flexible, they most keep the alarm clock and is also familiar to additional mobile phone function
- **Relationship with Human: Individualism vs. Collectivism.** Koreans try to strictly keep their voice down when they use a mobile phone in public places according to survey. And Koreans tend to always connect to others. They also prefer moderate design because Koreans have a consciousness about others. Koreans like to be a member of their group. However, Chinese tend to go for familiarity and aesthetic designs: they appreciate variety in the colors of phones, such as pink, blue, red and green, and design is a larger factor than brand when it comes to purchase decisions. Japanese turn off my mobile phone when they do not want to be bothered and respect their privacy. They like both moderate and distinct and fashionable design.
- **Nature of Human Activity: Ascription vs. Achievement.** Koreans judge things by achievement, according to survey. Koreans tend to pursue stability rather than change, contradictory to the bias. Korean mobile phone users agreed on the importance of the size and thickness of handsets compared to function. Chinese are in the middle. Chinese think of function as more important than the size of phone. Chinese have the strongest willingness to buy premium phones, prefer a unique design image, and are easily influenced by peers or family members. In Japan, there is a broad range of brands consumers can choose from. Mobile phone users prefer a brand image that is best suited to their own lifestyle. They suit trend of mobile phone and willingly to change phones. They are concerned over the size of their mobile phones.
- **Message Contexting: Specific vs. Diffuse.** Japanese are most diffuse and Chinese are most specific. Japanese have low rate of preference to icon based screen. Japanese use practically cheap wired phone at home instead of mobile phone. Japanese consumers tend to choose what they personally prefer rather than following the opinions of others. Koreans have preferable icon based display to text based display. Koreans frequently use mobile phone for convenience and privacy despite of high cost. However, they rarely set up password to call. They are focused on benefit and event of Point of sale. There are some contradictory. Chinese prefer icon based GUI screen. Chinese keep privacy using password lock and frequently use mobile phone at home. They are not interested in sale event.
- **Expression of Emotion: Affective vs. Neutral.** Japanese are so neutral and logical in terms of the degree of Control people's feeling and express one's feeling. They showed noticeably low rate of call for killing time and chatting. They also prefer phones with simple designs that are likely to be enduring, and text-oriented, static designs for backgrounds. Koreans' characteristics are between the Chinese and

Japanese. They call for chatting with their acquaintances. They like simple and modern design without decoration. China also demonstrate a clear preference for dynamic background screens, enjoy chatting on mobile phones and sending text messages, and access wireless Internet content such as online chatting/ dating/ communities relatively frequently. All in all, the Chinese wireless population appears to place emphasis on dynamic and pleasurable features.

4 Results and Discussion

Thus, as part of an effort to develop a methodology and process promoting the application of cultural factors in design, this research was conducted establishing a framework for cultural research in the area of mobile interface design, identifying a relationship between cultural characteristics and mobile phone usage, and distinguishing cultural discrepancies reflected in the usage of mobile phones in the target market. As a foundation for this research into and comparison of mobile phone cultures in Korea, China, Japan. This study focused on general usage pattern and user perception by placing greater emphasis on cultural view. Common characteristics as well as discrepancies among the three neighboring countries will not only prove to be useful data in attempting to understand each nation, but also valuable for businesses making inroads into one of these countries. The questionnaire helped to give us an overview of mobile phone usage patterns, design preferences, awareness of next-generation mobile phones, and cultural characteristics reflected in the usage of mobile phones in Korea, China and Japan. It led us to reach the following conclusions.

Table 5. Results by cultural variables

	1. Way of Task Handling:	2. Temporal Perception	3. Conception of Nature	5. Relationship with Human	6. Nature of Human Activity	4. Adhere to Rule	7. Message Contexting	8. Expression of Emotion
Korea	Synchronous	Future	Subjugate	Collectivism	Achievement			
China						Particular	Specific	Affective
Japan	Sequential	Past	Control	Individualism	Ascription	Universal	Diffuse	Neutral

These cultural value systems affect human thinking, feeling, and acting, and the behavior of using mobile phones in predictable ways. Common characteristics as well as discrepancies among the three neighboring countries will not only prove to be useful data in attempting to understand each nation, but also valuable for businesses making inroads into one of these countries. The findings could be more significant if they were to be applied in formulating new technology-related design development strategies, moving beyond a simple comparison of cultures. Meanwhile, designers need to be involved in creating products with well-grounded cultural knowledge and a systematic methodology. I.S. Lee [6] has provided knowledge about cross-country and cross-product cultural characteristics that will enhance our understanding of the intricate interaction between the culture and the user experience, a small but important step toward the development of culture-centered systems.

Table 6. Framework of Cultural Comparison for mobile phone UI design

Categories	Cultural Variables	Questions
Attitude of Time	1. Way of Task Handling 5. Long-Term Orientation (LTO)	-Do you prefer to use a menu' vs. 'Do you prefer to use hot keys? -Do you want to make calls while walking? -Do you keep the phone at hand or keep in pocket while it's not being used? -Are most of your calls out of necessity (not to chat or enjoy conversation)?
	2. Temporal Perception 5. Long-Term Orientation (LTO)	- Do you prefer additional functions besides current functions? - Do you prefer sleek and futuristic design styles?
Nature of Motivation	3. Conception of Nature 3. Masculinity (MAS)	-Do you use service outlets shop rather than to trouble shoot yourself? - What do you do when the call doesn't go through? Rather than just giving up, I would leave a voice message or use SMS.
	6. Nature of Human Activity 1. Power Distance Index (PDI)	-Is Function more important than the size of the phone? -Would you keep your current phone as long as it doesn't break down?
Related to Human	4. Adhere to Rule 2. Individualism (IDV)	-Do you like to use your mobile service to keep your appointment times flexible? -Do you use functions besides phone calls & SMS very often? -Level of use of alarm function; Do you use the alarm function to awaken you up in the morning?
	5. Relationship with Human 2. Individualism (IDV)	-Do you try to keep your voice down when using the phone in public places? -Do you turn off your mobile phone when you do not want to be bothered? -Do you Prefer standard design styles to Fashionable Design Styles?
Communication matters	7. Message Contexting 4. Uncertainty Avoidance Index (UAI)	-Do you use your home telephone when it is cheaper in cost at home instead of the mobile phone? -Do you lock your mobile phone with a secret code so that only you can access the phone? -Are you interested in mobile phone related sales events and discount benefits?
	8. Expression of Emotion 4. Uncertainty Avoidance Index (UAI)	-Do you keep conversations short without chatting? -Do you decorate your phone with stickers and accessories? -Do you prefer dynamic animated screens over static screens?

Therefore, Cultural variables are useful to compare because it is possible to formulate a parameter, a good index measurement. Three parameters between author's value, and Hofstede's were not 1:1 matched. However, grouping these values provided a meaningful analysis of user behaviors and preferences.

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