

RELATIVE IMPORTANCE OF DESIGN AND USABILITY OF CELL PHONE IN TERMS OF AGE AND GENDER

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ABSTRACT

Generally, it is believed that high-tech devices such as the cell phone are not used frequently by the senior people. But actually, the number of the senior people who use the cell phone is not so small. The fact is that they don't use it effectively and efficiently. In this paper, authors focused on the process of purchasing and using the cell phone in detail. The result of the questionnaire research showed that there is a difference between the young people and the senior people in the relative importance of the cell phone when they purchase it. More specifically, when choosing the cell phone, the young people tend to focus on the Kansei or the design aspects of the cell phone while the senior people tend to focus on the usability. In addition, interview research revealed that there are social factors including the family structure, the residence type, and the relationship with children and mental factors including the sense of weakness and the general lack of activeness as well as the physical change due to their age as the background factors for the characteristic behavioral pattern of the senior people to emphasize the usability. But there were also positive opinions among senior people that they would put emphasis on the design if there is a sufficient level of usability.

Keywords: *senior people, cell phone, usability, design, qualitative approach*

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1. INTRODUCTION

With the progress and the diffusion of information and communication technology, devices applying this technology have begun to be used in various scenes by various users. Japan is regarded to be advanced in terms of the use of the cell phone, but there still exists a gap between high end users and low end users depending on the demographic traits. One of those traits is the generation or the age group. According to Ministry of Internal Affairs and Communications, only about 70% of people of their late 60's and about 40% of their 70's are using the cell phone, although more than 90% of people of their 20's through 40's are using it [1]. In other words, senior people do not use the cell phone actively compared to young people.

In our previous studies, it was found that the senior people do not use many functions of the cell phone effectively [2] [3]. It was also found that there is a generation gap between the senior people and the young people regarding the use of the cell phone. This study focuses on the reason of such differences in relation to the value criteria of those people, in other words, how the design (appearance) and the usability are affecting the purchase of the cell phone by adopting the research.

2. QUESTIONNAIRE RESEARCH

We conducted the questionnaire research for the purpose of getting the information on the purchase of the cell phone in detail.

2.1. Method

Informants were 750 people ranging from 15 to 65 who live in the metropolitan areas of Japan within their 30 km environs. Table 1 shows the number of informants in terms of age and gender. The statistics shows that there were total of 127,771,000 people living in Japan, and the population of Tokyo was 12,758,000 in 2007.

The research was conducted in June 2009. Answers to the questionnaire were obtained by visiting informants to request answering the questionnaire and then mailing it back to us. In order to submit a camera-ready paper with proper layout, please follow the instruction of this document.

Table 1: Informants

	15-19	20's	30's	40's	50's	60-65	Total
Male	23	76	101	79	71	36	386
Female	23	70	94	72	68	37	364
Total	46	146	195	151	139	73	750

2.2. Content of Questionnaire

Although the questionnaire included many questions related consumption lifestyle and demographic characteristics (gender, age, family structure, job, annual income, etc.), only the result for the question about the value criterion will be described here.

Q: Which aspect of the cell phone is the most important to you when you purchase it?

- a. Performance (battery duration, speed of interactive response),
- b. Functionality (number of functions, availability of expected functions),
- c. Weight and Size (weight not too heavy and size not too large),
- d. Brand (favorite brand, the same brand of which used previously),
- e. User Conformity (fitting to user category including female/male, kids and seniors),
- f. Design (good-looking, Kansei impression in general),
- g. Ease of operation (not so difficult operation, easy operation),
- h. Display Size (display size not too large and not too small),
- i. Price (not too expensive and not too cheap),
- j. Other

2.3. Result

Answers to above questions are shown in Fig. 1 where the data is shown not as the original frequency but as a percentage because the number of informants was different from question item to question item.

There was a significant difference for the choice of the new cell phone between various generations. Result of the chi-square test and the residual analysis that was significant at 5% level are shown as follows.

- (a) **Performance** – Adopted by male of their 10-20's. Male of their 60's and female of their 50's seldom put emphasis on this criterion.
- (b) **Functionality** – Adopted by both of male and female of their 10-20's. Male and female of their 60's and female of their 50's seldom put emphasis on this criterion.
- (c) **Weight and Size** – Adopted by male of their 40's. Female of their 60's seldom put emphasis on this criterion.
- (d) **Brand** – Female of their 60's seldom put emphasis on this criterion.
- (e) **User Conformity** – Adopted by female of their 50-60's. Male and female of their 20's and male of their 30's and 40's seldom put emphasis on this criterion.
- (f) **Design** – Adopted by female of their 10-20's. Male and female of their 50's and 60's seldom put emphasis on this criterion.
- (g) **Ease of operation** – Adopted by male and female of their 50's and 60's. Male and female of their 10's and 20's and male of their 30's and 40's seldom put emphasis on this criterion.
- (h) **Display Size** – Adopted by male and female of their 60's and female of their 50's. Male of their 20's and 30's seldom put emphasis on this criterion.
- (i) **Price** – Adopted by female of their 40's. Male of their 10's seldom put emphasis on this criterion.

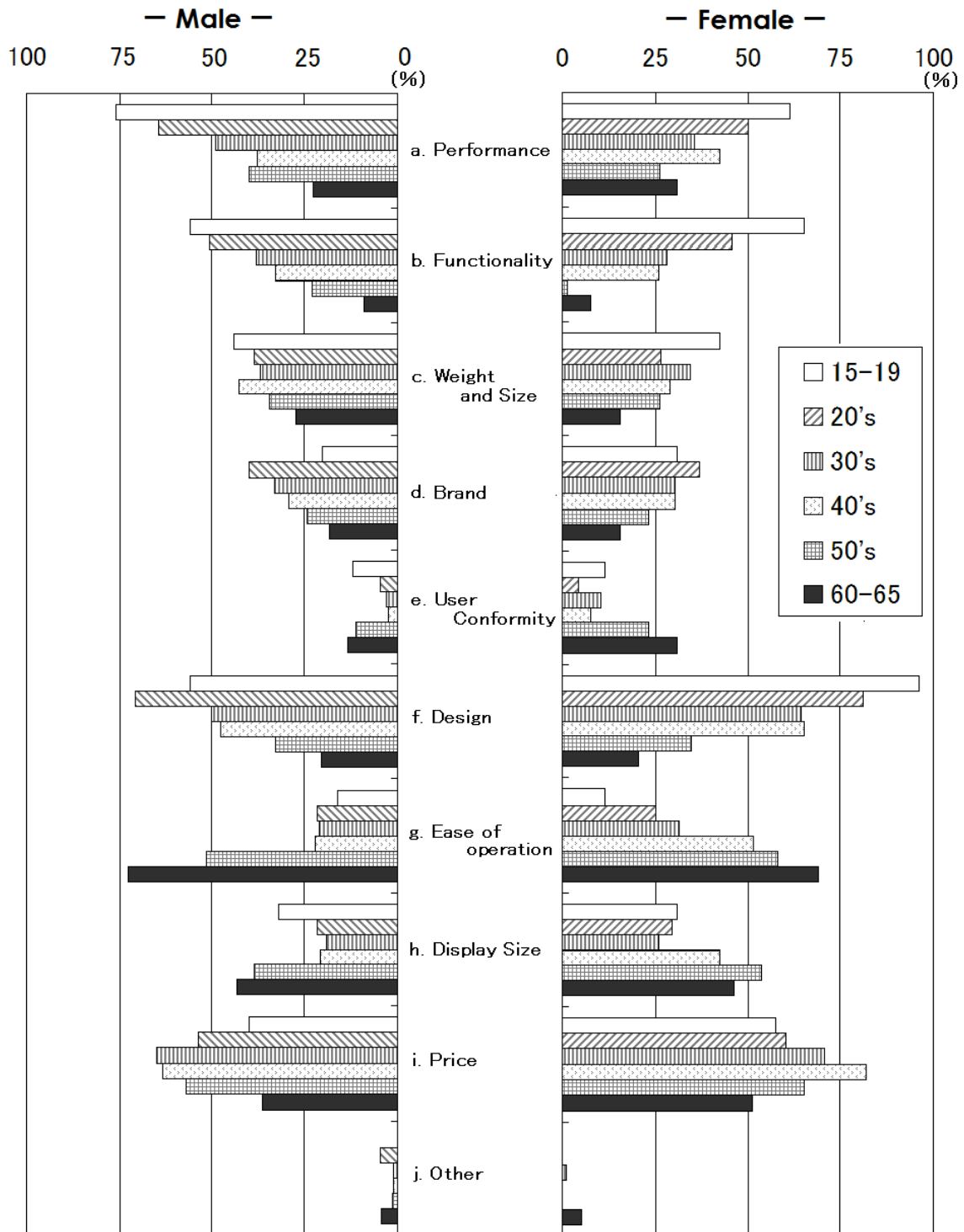


Figure 1: Percentage of selection of each value criterion by age and gender for purchasing the cell phone

3. INTERVIEW RESEARCH

Although the result of the questionnaire showed that there are differences in the use of value criteria regarding the age and the gender, it was not clear why and how there was such a difference of value criteria between the young people and the senior people. Hence we conducted the interview research for scrutinizing the reason why senior people put more

emphasis not on design and other criteria but on such value criteria as the user conformity, the ease of operation (usability), and the display size rather than the design (Kansei characteristics).

3.1. Method

Informants were 8 senior people of their 60's and 70's and 8 young people of their 20's who live in Tokyo. They were an equal number of men and women in each group. The average age of the senior people was 68.8 with the SD (standard deviation) of 5.54, and the average age of the young users was 25.4 with the SD of 2.45. All 16 informants had their own cell phones.

Regarding the definition of the senior people, we defined them as those who are over 60, whereas WHO (World Health Organization) defines them as those over 65. It is because the senior people usually retire from their job at around 60 and their life environment changes drastically after the retirement.

We conducted 4 hours (2 hours x 2) interview for the senior people and 2 hours interview for the young people. The reason why we allocated 4 hours for the senior people is that they took much time for reminding of their past events and experiences, that they had a long history and it takes more time than the young people to get their life story that is related to the focus of the research, and that it was necessary to let them take the rest frequently considering their fatigue. The research method was the individual interview, more specifically the contextual inquiry (Bayer and Holtzblatt [4]). We conducted the interview at their home.

3.2. Instruction and Questions

First we explained about the research that it is for the academic purpose and does not have anything with the sales activity. Then we explained about the expected time of the research, about the free stance of the informant that they can refuse to answer to any questions of which the informant may feel unpleasant, about our treatment of the individual information, and about the purpose of audio recording. After obtaining their consent, we started the interview.

Next, we asked about the rough information on the use of the cell phone and the individual information (life history, current life, social relationship, family membership, etc.) as the background information. Research questions of the interview were as follows. Because we adopted the semi-structured interview technique, the order of topics varied from session to session.

< About the informant >

- Life history,
- Their daily job,
- Avocation,
- Value attitude,
- Their view on their own quality of life,
- Their personal relationship with friends and other people,
- Family membership....etc.

< About the use of the cell phone >

- History of use,
- Actual use,
- Functions that they use,
- Differentiation of the use among various functions and other devices,
- Contexts and situations of the use of the cell phone,
- How would they do when they face with problems while using the cell phone.

3.3. Result

We transcribed the text from the recorded conversation. Then we analyzed how the informant will behave when, for example, they face with problems. The results of the interview research for senior people are summarized in Figure 2.

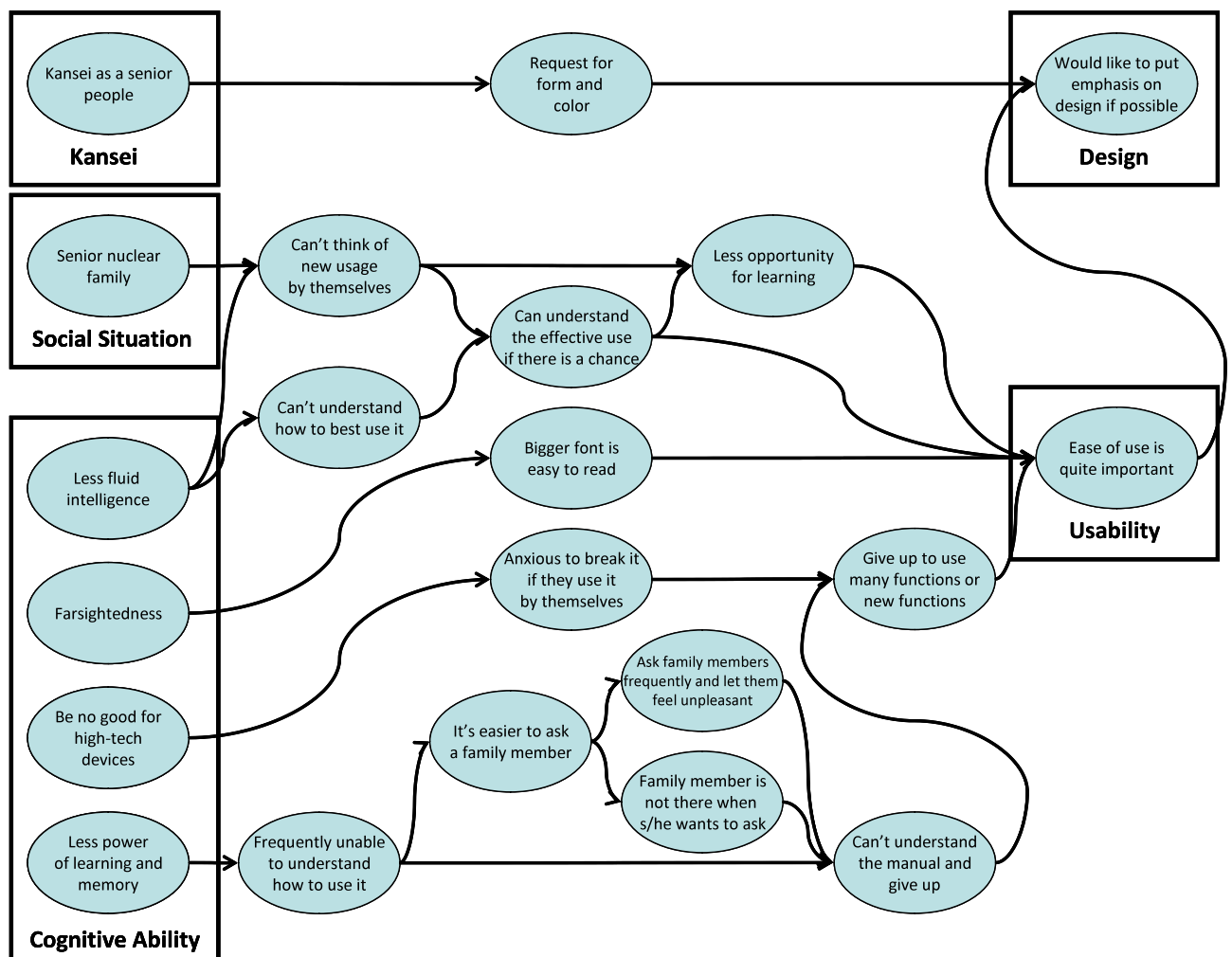


Figure 2: Percentage of selection of each value criterion by age and gender for purchasing the cell phone

Regarding the usability, young people tend to solve the problem by themselves when they face with any problems. If they can't find the solution, they try to search the relevant information in the manual. But it is generally infrequent for them to use the manual. On the contrary, senior people tend to ask their family member if there is a one. It was because they

think they might break the cell phone if they try something new. It was also true that they think it is far easier to ask the solution to somebody else who are living near themselves. But because of the recent tendency of nuclear family, some of them do not have the opportunity to ask to the family member. If they don't get the relevant information from the family member or they are living by themselves, they try to read the manual. But, in many cases, they don't get the solution in the manual and will finally give up using that function of the cell phone. As a result, they regard the ease of use or the usability of the cell phone quite important. This does not necessarily mean that the senior people are neglecting the design or the Kansei aspect of the cell phone. The usability is important for them at first hand, but if there are no usability problems they tend to put emphasis and be attracted to the design of the cell phone. In other words, they can be influenced and be fascinated by the design depending on the level of ease of use or the difficulty of use.

4. CONCLUSION

Researches were conducted in terms of the key aspects of the cell phone when senior people and young people would like to purchase the one using the quantitative approach (questionnaire) and the qualitative approach (interview). In the first study using the questionnaire, it was found that there are differences in the relative importance of the value criteria depending on age and gender. The second study using the interview focused on the difference between the young people and the senior people. Based on this result, it was found that the senior people are not simply neglecting the design (Kansei aspect) but are putting more emphasis on the ease of use (usability) and that they will regard the design as important if there are no usability problems.

From the result of this study, it could be said that the improvement of the usability of the cell phone is quite important especially for the senior users. But because there is an individual difference regarding the literacy to use the cell phone among the senior people, the user interface of the cell phone should be optimal for both levels of people. In addition to the deliberate consideration on the usability, the design or the Kansei aspect should also be considered based on the fact that the senior people are not simply denying the Kansei aspect. In Japan, there have been developed many cell phones that target to the senior people with the intention expecting for them to use the cell phone effectively and efficiently [5]. These cell phones were developed considering the physical characteristics of the senior people, but the usability as a whole has not yet fully been matured.

It was found that it is difficult to answer to "why" questions by just applying the quantitative method such as the questionnaire. By applying the qualitative approach such as the contextual inquiry, it is possible to understand the situational structure of the user behavior and to give a better understanding to the result of the quantitative approach. This approach will surely give the insight to the total design of the high-tech device such as the cell phone.

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