

# A Study on Sensibility Measurement Method

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## ABSTRACT

This study is about the human sensibility measurement method. Researches on human sensibility measurement have been performed in many aspects. However, due to the subtlety and intricacy of human sensibility, it has been difficult to exactly measure human sensibility.

At present, Semantic Differential(SD) method is most widely used to quantify human sensibility. In SD method, complicate human sensibility is represented on a scale with equal interval or equal ratio. However, this method has a critical problem in that human sensibility cannot be expressed with equal interval or equal ratio.

In order to complement SD method and represent human sensibilities appropriately, we proposed an alternative method using the chroma-scale with saturation that had not equal interval or ratio. In experiment, proposed method shown that subjects understood a new scale easily and they could express their sensibilities on a new scale without any limitation.

As a result, the chroma-scale can be used not only for measuring consumer's preference but also for evaluating or selecting sensibility words.

## 1. Introduction

Due to the increased living standard, human is now living in the age of high sensibility characterized with new and comfortable life. Also, in the market place, customers want to buy a product with comfort, enjoyment, and usability beyond the basic requirement for function[2]. In other words, it has been passed the age of showing off a product

and overawing customers with many switches, buttons, complicate structure, etc. The age of fitting the man to the product has been changed with the age of fitting the product to the man. No more customers are fascinated with a product that has complicate structure and inconvenient functions. In these days, customers want to buy a sensibility product that has good design and

convenience[1].

As the importance of developing sensibility product has been increased, we need to establish an effective system for developing sensibility products. For this purpose, it is required to develop a method to understand and measure human sensibility[3].

Among many methods, SD(Semantic Differential) method has been widely used for this purpose. SD method uses a scale with equal interval or equal ratio to represent human's subtle and complicate sensibility[4]. However, SD method makes subjects to express their sensibilities under the given restraints without considering each subject's will.

In this study, we tried to develop a new scale that can minimize the restraints and extract sensibility information objectively and effectively when representing human sensibility.

## 2. Research Background

Among many kinds of sensibility measurement methods, this study is about extracting sensibility image with a few adjectives. In this case, because a human sensibility is measured and evaluated through linguistic expression, it is very important how we reflect ambiguity and uncertainty existed in human sensibility in the evaluation process.

Table 1. A Questionnaire For Subjective Evaluation Of A-type and B-type Questionnaire.

1. A Type. Did you have difficulty in expressing your feeling on this questionnaire? (Yes, No)

If yes, write the reason for that?

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7. B Type. Did the type of color on the chroma-scale have effect you on expressing your feeling? (Yes, No)

If yes, in what aspect?

SD method and rating method have been widely used as sensibility measurement method. These methods give the equal interval on each degree of scale and require the subjects to evaluate their sensibilities numerically. However, considering the fact that the degree of sensibility perceived by the subjects is not uniform, measuring and evaluating human sensibility using the numerical scale with equal interval is unreasonable and also, it has a limit on expressing ambiguity and uncertainty. Finally, it is difficult for the subjects to express their feelings numerically.

In this study, in order to solve the problems mentioned above, we used the blank scale and gave saturation on the blank scale to complement the ambiguity of expressing sensibility numerically.

## 3. Research Method

This study was performed under a few basic assumptions as following.

- Human sensibility is a complicate secondary feeling for the external stimulus perceived by the sense organ.

- As a receptor for the external stimulus and the change of environment, a human is acute and he or she has a function that can selectively or synthetically perceive the necessary information among compound stimulus.

- It is recognized that the boundary of

Sample No. : 1							
	Very little		Middle			Very much	
elegant	①	②	③	④	⑤	⑥	⑦
practical	①	②	③	④	⑤	⑥	⑦
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
light	①	②	③	④	⑤	⑥	⑦
pretty	①	②	③	④	⑤	⑥	⑦

Figure 1. A-type Questionnaire With The Sd-scale

Sample No. : 1			
	Very little	Middle	Very much
elegant			
practical			
⋮			
⋮			
light			
pretty			

Figure 2. B-type Questionnaire With The Chroma-scale

each cell in the chroma-scale does not exist in the subjects.

### 3.1 Subject

We chose 17 subjects who had not the particular mental disease and were able to express their sensibilities appropriately. Also, we considered the subject's educational career because the subjects were required to fully understand the given scale.

### 3.2 Experiment Method

Through the preliminary experiment, we chose a few sensibilities vocabularies that were appropriate for expressing human sensibility for the mobile phone.

We performed the main experiment by evaluating the mobile phone on the market with those vocabularies. Three kinds of questionnaires are used in this experiment; A-type questionnaire with the sd-scale [Figure 1], B-type questionnaire with the chroma-scale [Figure 2] and a questionnaire for subjective evaluation for these two questionnaires [Table 1].

Each subject was asked to answer the same questionnaire three times. Also, in order to remove the learning effect, we presented two kinds of questionnaires, A-type and B-type, in the ABBA sequence and asked the subjects to answer the second questionnaire when a certain time was elapsed after the first one

#### 4. Result Analysis

Since there exist some kind of subtle differences in human sensibility, it could be a problem to analyze all subject's data together. So, in this study, we analyze the degree of the distribution for the results of questionnaires repeated three times for each subject. Another problem in this study is that two questionnaires use different scales so that it is difficult to compare the results of these questionnaires. To solve this problem, we compare these scales by corresponding the point on the chroma-scale with the one on the sd-scale by one to one [Figure 3]. As a result, 12 subjects of total 17 subjects shown the bigger distribution in the sd-scale than that in the chroma-scale and 3 subjects had the similar results in the two scales. The rest 2 subjects shown the bigger distribution in the chroma-scale than that in the sd-scale.

This result can be interpreted as that when the subjects expressed their sensibilities, they felt much ambiguity, inaccuracy, variation on the sd-scale than on the chroma-scale.

The results of the subjective evaluation for the two questionnaires are like the following.

- In the A-type questionnaire, 10 subjects answered 'yes' for the question, "Did you feel any difficulty in expressing your sensibility on this scale?" and they explained that expressing their various sensibilities on the equal interval scale was difficult

and the sd-scale was too stiff.

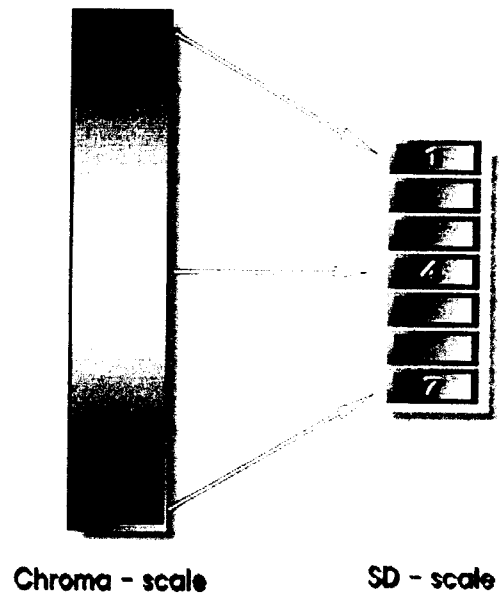


Figure 3. Transformation of the Chroma-Scale into the SD-Scale

- In the B-type questionnaire, 6 subjects answered 'yes' for the same question and most subjects said that the selection range was too wide and marking a point on the scale was not easy.

- For the convenience of expressing their sensibilities in the two questionnaires, 10 subjects said the B-type questionnaire was more convenient than the A-type one.

- In understanding the A-type questionnaire, 7 subjects said that they felt difficulty and they explained that the reason was the difficulty of realizing the differences among each scale.

- In understanding the B-type

questionnaire, 2 subjects said that they felt difficulty and that the range of expressing their sensibilities was too wide.

- For the question of understanding scales in the two questionnaires, 11 subjects said that the B-type questionnaire was easier than the A-type one.

- Also, they added some comments about the questionnaires like the followings.

- The degree of the brightness of red and green colours gave some help to the subjects in expressing their sensibilities.

- The B-type questionnaire was easier than the A-type one to mark.

- The B-type questionnaire was more convenient than the A-type one to see and to mark on the point they wanted.

## 5. Conclusion

Through the experiment, we could find the problem of the sd-scale and that the chroma-scale could be worth as a new scale in order to complement the problem of the sd-scale. If we continue to expand this study in the various aspects, it will contribute the development of human sensibility engineering.

## 6. References

[1] Kang., and Lee., "Sensibility Ergonomics and Product Development", A

Public Hearing Data for Sensibility Ergonomics Basis Skill Research Planning, 1995, pp.105-111.

[2] Ko, "About Sensibility Ergonomics", Engineering Technique, 1996, Vol. 3, No2., pp.134-138.

[3] Kim., C.J., "Development of Sensibility Ergonomics Technique", Measurement Standard, 1996, Vol. 19, No. 1, pp.2-10.

[4] Cho., A., Ergonomics Experimentation, 1991, pp.352-359.

[5] KRISS, "Development of Human Sensibility Measurement Technology", KISTEP., 1993.