CHAPTER 3

EXPERIMENT

3.1 Materials

3.1.1 The polyester color samples are 20 hues, 12 tones and 6 achromatic colors, as follows;

20 hues	:	5R, 10R, 5YR, 10YR, 5Y, 10Y, 5GY, 10GY, 5G, 10G, 5BG, 10BG, 5B, 10B, 5PB, 10PB, 5P, 10P, 5RP and 10RP.
12 tones	:	Pale Grayish, Pale, Light Grayish, Light Moderate, Light, Grayish, Moderate, Bright, Dark Grayish, Dark, Deep and Strong.
6 achromatic colors	:	N1, N2, N4, N6, N8 and N9.5.

In some tone regions, textile dyeing colors were not available because of the non-existence of dyestuffs with acceptable fastness. Therefore, the totals of color samples used in the experiment were 218. (see data in Appendix A) The size of the color sample was 1 cm. X 1.5 cm.

3.2 Apparatus

3.2.1 Gretag SPM 50 spectrophotometer.

3.2.2 Light cabinet with illuminant D65.

3.3 Observers

3.3.1 With regard to selection of the observers, who are source of terms of color perception among the Thais, 30 of them at the age between 19-45 years old were chosen. Among them, 15 are male and the other 15 are female. They were asked to questionnaire with two different approaches. Dependence of on those with normal eyesight and not being color blind are imminent to ascertain it. The list of the observers was drown out of those who are tailors, architects, and students on arts programs, because they are known to perceive the colors better than the others.

3.4 Selecting Thai words for color perception

In order to choose the word for color perception test, total 69 words (see the data in Appendix A) were collected from 2 sources: as studied sample.

1. Dictionary by published the Royal Acedemy

2. People whose vocations are associated with color, e.g. dress tailors, architects, printers.

The terms collected are characterized to be modifications of the terms as those compiled in Dr. Supamas Engchuen (2000)*(25)*'s research entitled The Color Terms And the Concept of Color of the this in the Sukothai Period and at the Present time. Obviously those color terms were brought under study because they are most commonly used in modifying the color terms. White secondary modifying words such as "jual" ("จ๊ิว"), applicable to yellow; "aoy" ("อ๋อย"), modifying white, etc, were deleted out, Those principal color perceiving words came under research. The modifications are scientifically regarded as combinations of saturation and lightness which, in linguistics; light, dark, pale, etc are used. This is one of the perception processes which can be distinguished and evaluated scientifically of how much saturation and lightness of a non-based color. Generally, in. perceiving colors, however, humans cannot distinguish a color saturation and lightness; consequently it drives them to employ the color terms as discussed. Therefore, this research attempts to link the gap between the physical and psychological variables. In this case, it involves the perceiving terms of the Thais that are systematically charted out numerically i.e. they represent the physical variables. In this study, they are the Munsell and CIE L* C* h which are intended to used for the people in color industry.

3.5 Procedure

3.5.1 Preparation of color samples

Perception of Munsell color samples are 218 colors, divided into two sets for two experiments

3.5.1.1 Set I consist of 20 set of color samples, and 20 color codes. Each set were shown on 12 colors tone on the same paper, where one color tone was on one paper. The special color sample were used for testing in set one; they are achromatic colors e.g. N_1 N_2 N_4 N_6 N_8 $N_{9.5}$ (see the data in Appendix B)

3.5.1.2 Set II consists of 20 color sample sets. Each set is classified into 20 color chip numbers, and 12 color tones on the same paper. They are shown on color codes from 5R1 color to 5R12 color (see the data in Appendix B)

3.5.2 Preparation of questionaire

Two types of questionaire were prepared for the two data collection.

3.5.2.1 Questionaire type I: The observer will choose the Thai words for color perception matching with the color chip numbers by arranging color chips on the left and put the word for color perception on the top. (see the data in Appendix D)

3.5.2.2 Questionaire type II The observer will choose the color chip numbers perceived to be the same meaning with Thai words for color perception by arranging 69 words for color perception on the left and put the color chips on the top.(see the data in Appendix D)

3.5.3 Thai words for color perception test was separated into two types. (groups).

In the process, the observers were asked to choose color perception when looking at the color samples under illuminant standard D65 in the light cabinet.

3.5.3.1 Utilizing color sample set I and questionaire type I

The process will ask the observer chooses the word for color perception that he/she believes to be the same meaning with each color chip numbers. Number of word for color perception placed in each color chip number will depend on the sense of the observer to color perception.

3.5.3.2 Utilizing color sample Set II and questionaire type II

The observer will choose the color chip numbers that he/she believes to be the same meaning with each word for color perception. Number of color chips placed in each words for color perception will depend on to the sense of observer to color perception

3.5.4 Measurement of the colorimetric values from 218 color samples

These colors were measured by the Gretag SPM 50 spectrophotometer under the illuminant D65 with 10 degree standard observer condition in terms of the colorimetric values, L*,a*,b*,C* and h. (see the data in Appendix C)

3.5.5 The visual assessment experiment of the Munsell color space.

Data Analysis to make an analysis and ranking into color semi-quantitatives, which it's mean to the Munsell color space and CIE L* C* h color diagram.

Data Analysis to color specification show the significant at 50% level. It implies that the word for color perception and color chips were correctly chosen by the observers more than 50% or 15 observers up from 30 observers. For made the establish table of the result of experiment I and II of the Munsell color space.

3.5.6 Collecting and organizing the established result charts in the Munsell hue plane.

Get the data from the tables I and II, the charts of the result of the experiment I and II could be shown in the Munsell hue plane.

3.5.7 Plot color perception data of the color from experiment II on CIE L* C* h (CIE L* a* b*) diagram

The data out come, with 50% significance from experiment II on defining terms and selecting the color codes, are employed to designate positions in CIE L* C* h color system. The setting of the data has to conform with the color chart. The graph is plotted with L* a* b* values indicating the color codes and pointing the same positions as the by the CIE L* C* h color system, differing only the value system.

3.5.8 Comparing the data obtained from experiment I and experiment II

Data of experiment I and experiment II were used to compare their result and the comparative table was establish.