

**EFFECTS OF NINE WORKPLACE INTERIOR COLORS ON
THAI WORKER MOOD AND COLOR PREFERENCES**



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entitled
**EFFECTS OF NINE WORKPLACE INTERIOR COLORS ON
THAI WORKER MOOD AND COLOR PREFERENCES**

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ABSTRACT

The purpose of this research is to examine the effects of nine workplace interior colors such as red, orange, yellow, blue, green, purple, beige, gray, and white on Thai office worker moods including the association of colors and moods on genders difference. And explore the opinion on their color preferences, designate and distracting workplace interior color to recommend appropriate workplace interior colors for creating the healthier workplace environment in Thai organization. The quantitative approach is used in for the research. Total of 200 Thai office workers respondents was collected via online survey and analyzed by using descriptive statistics and compare mean. The results showed that the high negative moods such as anger, confusion, and tension were mainly found in red and orange room while the greatest vigor mood found in the yellow room. Furthermore, fatigue was the majority mood found in the neutral color room such as gray and white. In gender difference, the significant difference of the impact of the nine colors on moods found in red, orange, yellow, green, purple, gray and white room. Females indicated more all negative moods than males in the yellow room. Also, more anger, depression, and tension in the colorless room, more depression in the orange room, more confusion in purple, and more fatigue in the green and red room found in females, while males experienced higher vigor in the yellow room and more tension in the red room. Further, Thai office workers like the beige color the most and prefer to work in the beige office. Moreover, beige, white and green were considered as the least distracting color in their perception. The suggestion on management practice and recommendations for future research on Thai office worker moods and workplace interior colors are discussed.

KEY WORDS: Color / Color Mood/ Color Preference/ Workplace/ Interior Design

29 pages

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CHAPTER I

INTRODUCTION

Color is essential to our everyday life, and its presence is evident in everything that we perceive. It commonly recognizes in many past research studies such as Lang (1993), Hemphill (1996), and Mahnke (1996) that color also has a strong effect on human feeling and emotions. The new term 'color emotion' was recently used in this field by many researchers. Since many psychologists have opined that different colors will create different feelings in the human being, the investigation of the meaning of colors, i.e., the color emotion of people are focused and systematically studied.

In this research, it was considered beneficial to analyze the appropriate use of color in workplace interior design to convey proper meaning and create a positive working environment to increase Thai employee's mood. Traditionally, in Thailand, the selection of the color for the workplace to be designed is based on the judgment of the management in which their selection may be according to their preference or fortune, i.e., the lucky color.

This study involved the review of past research papers for the topic of the influence of color in moods and the relationship between colors and moods in the workplace. And additionally, working on a quantitative research to examine the effects of nine workplace interior colors such as red, orange, yellow, blue, green, purple, beige, gray, and white, on Thai office worker moods including testing a different perception in moods affected from the nine colors between genders. Furthermore, the research still collects some opinion data of color preference, designated office color and distracting color to provide some benefit idea of workplace interior development.

1.1 Research Objective

The objectives of research are;

- To examine the effect of nine workplace interior colors such as red, orange, yellow, blue, green, purple, beige, gray, and white on the moods of Thai office workers.
- To examine whether there is any difference in mood on the nine colors between genders.
- To explore Thai office color preference, designate workplace interior color, and distracting workplace color.

1.2 Research Question

- How the nine workplace interior colors impact to the moods of Thai office workers?
- Are there any differences in Thai office worker mood affected from the nine colors between genders?
- What are the colors that Thai office workers; prefer, like to work in, and distracting them?

Next, chapter 2 is a summary of the literature review on the physical and psychological aspects of colors in human and how it linked to the workplace. It introduces the nature of color and the evolution of color perception in human. Furthermore, for psychological aspect, it presents the examination and opinion among many researchers for the meaning of color to the human being, the association between colors and human moods, color preference, and the influence of gender effects on color emotions. Lastly, the importance of color in the workplace and its impact on office worker moods are discussed.

CHAPTER II

LITERATURE REVIEW

The workplace interior color can influence the worker moods. Also, their working moods can be varied by individual color perception and by many factors such as gender, age, environment screening ability and culture as demonstrated by many studies over the recent years. Therefore, finding the common color and moods association for Thai office workers will be defined the best solution to select the appropriate interior color to fit them and create a healthier workplace environment for Thai organization.

To study “Effects of nine workplace interior colors on Thai worker mood and their color preference” the researcher needs to obtain the overview and understanding of the concept, theory and related past research work for supporting this further research study.

2.1 Color

2.1.1 What is Color?

Color (American English) or Colour (Commonwealth English) is the psychological property of human visual experiences. It is a form of energy that influences the emotional and aesthetic associations. It derived from the human physical actions when they look at the objects together with the wavelength of the light that is reflected from them and describe through the color name such as red, orange, yellow, blue, green, purple, and so on as the process shown in Figure 2.1.

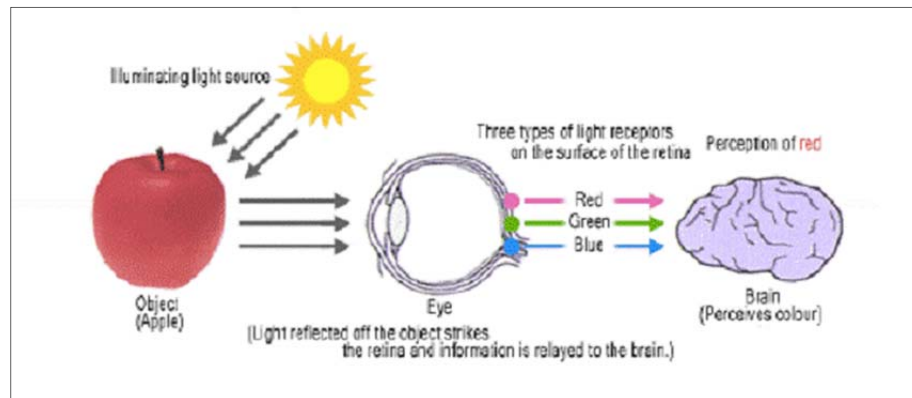


Figure 2.1 Color Perceptions (Robotic vision without camera team project, Dokuz Eylül University)

2.1.2 How can we perceive color?

In 1672, Sir Isaac Newton demonstrated a phenomenon of color by refracting white light with a glass prism and observed that the light was composed of all the rainbow color such as red, orange, yellow, green, blue, indigo, and violet (ROYGBIV color). The human can see all the rainbow color because the visible spectrum is the narrow portion of electromagnetic radiation that the cone cells in the human eye are sensitive to its wavelengths.

“..If the Sun’s Light consisted of but one sort of Rays, there would be but one Colour in the whole World” –Sir Isaac Newton.

In 1810, “Zür Farbenlehre or Theory of Colors” was published by Johann Wolfgang von Goethe. His color theory was human-oriented which mainly focused on the psychological and emotional aspect of human experience on color which opposite to Newton's studies which was scientifically based. The main ideas of this study were; the influence colors generated by the psychological mechanism of the human who gave its meaning and atmosphere of powerful, gentle and radiant within the beholder's eyes.

“Colours are light’s suffering and joy”–Johann Wolfgang von Goethe.

Furthermore, in 1990, Frank H. Mahrke suggested that the color perception is to ‘experience’ it in both conscious and unconscious way. This concept was used to create the “Colour Experience Pyramid” shown in Figure 2.2 that assumes six fundamental, interrelated factors influencing the human experience on color in a systematic way; first, biological reaction to a color stimulus is the psychological aspect where it covers

an inherent characteristic of nature and its environment. Second, the collective unconscious is a personal experience from the familiar archetypes or original pattern that is unconscious rational thought. Third, Conscious symbolism or association that human has learned responses at the conscious level such as green for nature, blue for sky or water. Fourth, Cultural influences and Mannerisms is the color association to the particulars of specific cultures and groups or regions and religions have experienced and belief. Fifth, Influence of trends, fashion, and styles that affect the change of color in a particular time associated with sales and market and the state of feeling bored of the human. The top of the pyramid is a Personal relationship to color which expresses the own color preference, like or dislike, individually.

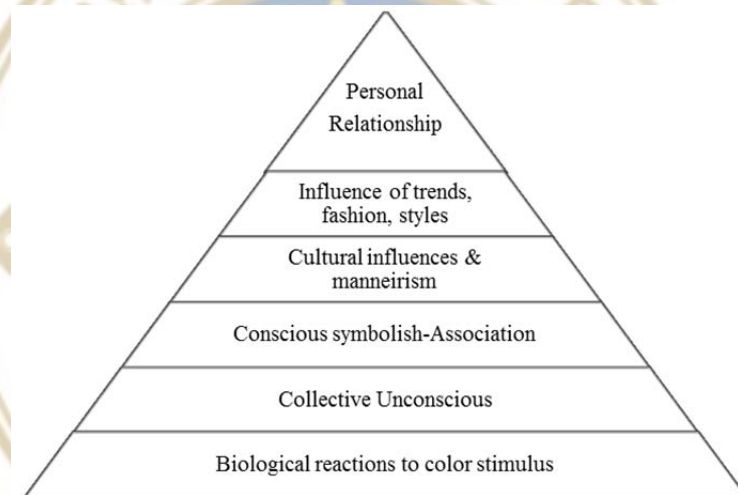


Figure 2.2 The ‘Colour Experience’ Pyramid by Frank H. Mahnke

2.1.3 Color Dimension

The color perception is commonly described into three dimensions of the color experience which are hue, saturation, and brightness as shown in Figure 2.3. Hue refers to the quality of color and corresponds to the color names that individual perceived in roughly the same way, such as red, orange, yellow, blue, green, purple, and so on. Saturation represents the hue-intensity or vividness of color. The more saturated the stimulus, the stronger or brighter the color experience and the less saturated, the more it appears white or gray or black. The brightness of a color refers to the amount of light present.

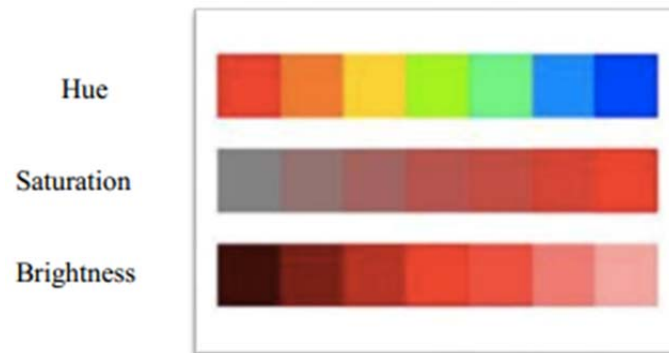


Figure 2.3 Hue, saturation, and brightness

Many of the first color-ordering systems presented color on two-dimensional charts until the 19th century, the first color theorist, Professor Albert Munsell hypothesized color on a three-dimensional model based on formal progressions of hue, value, and chroma or saturation. He noted that each color has a logical relationship to all other colors.

In Munsell's hue shown in Figure 2.4, there are five primary colors such as red (R), yellow (Y), green (G), blue (B) and purple (P). There are also five intermediary colors between the primaries such as yellow-red (YR), green-yellow (GY), blue-green (BG), purple-blue (PB) and red-purple (RP). The scale of Munsell's value ranges from 0 for pure black to 10 for pure white. Black, white and gray between them are called neutral colors.

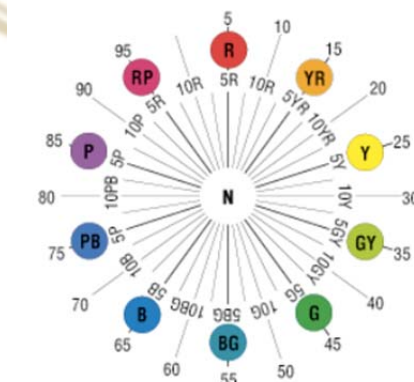


Figure 2.4 The Munsell's hue circle

2.1.4 Warm versus Cool Colors

Color can also be represented in temperature term such as ‘Warm’ and ‘Cool’ as related to the wavelength of the color presented in Figure 2.5. Warm colors include red, orange, and yellow are seen as active and arousal while the cool colors include blue, green, and violet are considered to be the piece and restful.

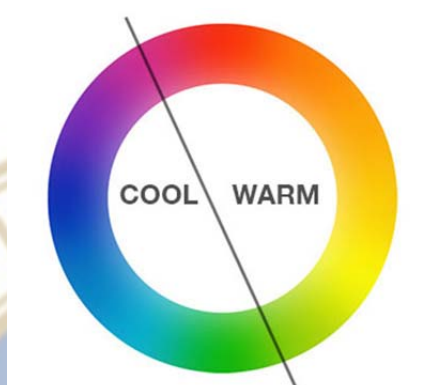


Figure 2.5 Warm and cool colors on the color wheel

2.2 The influence of Colors

2.2.1 Color and emotion association

The color emotions of people are when a human sees a color, and his/her mental perception includes memories, e.g., soft and hard, warm and cool, gaudy and plain etc. It is widely accepted that the color has a strong impact on human emotions and feeling and the different colors will induce different the feelings and emotions to them. The below are some examples the meaning of color to the human being from the past research works.

Red is the stimulated color that raises human blood pressure. (Clifton, D., 2006). It symbolizes warmth, love, adventurous, brave, arousing, passion. On the other hand, it is sometimes seen as aggressive, threatening and dangerous.

Orange is a highly universal color. It considered being warmth, jovial, lively, motivated and energetic. However, from the study of the psychologist Lois Wexner in 1954, orange was only moderately connected with distress.

Yellow is an energetic color and cheerful for creating the spirits and a positive outlook (Wexner, L., 1954; Murray, D., & Deabler, H 1957; Thompson, S., 2009).

Blue is the most comfortable color that is great to wear in stressful situations that relieve the nerves. The color consistently linked to feeling secure, tender and calms (Murray, D., & Deabler, H., 1957; Wexner, L., 1954).

Green represents perfect balance, and it is at the center of the spectrum. It is peaceful, calm, quiet, natural and restful (Cheng Ka-Min, 2001). In 2004 the study of the relationship between color and emotion by Kaya et al., using ten chromatic and three achromatic colors from the Munsell Color System saw that green is most positive emotional responses and linked it with relaxation and calmness.

Purple symbolizes royalty, dignity, elegant, mysticism, sensitive and magic, yet soft and lonely. It is an unquiet color, and it is least frequently selected color (Murray, D., & Deabler, H., 1957).

Beige offers some warmth of brown color with some coolness of white color; however, it often perceives as a dull and boring color.

Gray is the color between white (light) and black (dark) as it says it is unclear in any direction in the gray zone. The color associated with tired, quiet, conservative, and without life.

White is achromatic color or no hue and it represents spiritual, purity, innocence and birth

Also, the studies in the relationship between color preferences and arousal by Walters et al. (1982) found that red, yellow, and orange were rated as the highest arousal color. They associated with adjectives excited and anxious, whereas blue, indigo, and violet were rated for the lowest arousal color that linked to adjectives bored and relaxed.

However, Cheng Ka-Min work (2001) pointed that the meaning of color in emotion association may deviate and change when the hue, lightness, and saturation of the colors are changed to some extent and also varied by individual color perception.

2.2.2 Color preference

In early color studies such as Jastrow (1897), Dashiell (1917), Eysenck (1941), Garth (1924), and Birren (1952) found that blue and red were the most favorable colors,

following by green and purple, respectively. And yellow and orange were found to be the least preferred.

Figure 2.6 presents the summary preference of color hues among 1,097 office workers in 21 locations, collected by the Buffalo Organization for Social and Technological Innovation (BOSTI) in 1980. The survey showed some of the hues ranked highest; blue and green and the least one was gray (Eric & Mary, 1986).

Color scheme	Preference (%)
Cool colors (blues and greens)	72
Pastel colors (e.g., light blue or pale yellow)	67
Warm colors (yellows and reds)	59
Subdued colors with intense color accents	53
Neutral colors (e.g., beige, putty, or tan)	50
White	26
Intense colors (e.g., fire engine red or Kelly green)	20
Grays	10

Source: BOSTI (1980a), p. 25.

Figure 2.6 Preferences for color schemes among 1,097 office workers by BOSTI (1980a)

2.2.3 Color and Genders

Many color research demonstrations, for example; Guilford (1934), Eysenck (1941), and so on have shown that there were differences in response, both of emotion association and preference between genders.

Guilford (1934) was one of the earliest researchers to study the differences in color preference based on gender. In his works, found that female had seen significant variances in color hues chosen as compared to male.

A study conducted by Docus (1926) indicated that males had a higher effective value for yellow color than females. Besides, McInnis J. H., Shearer J. K. (1964) also said that women had greater flavored in cool color such as blue and green than men whereas men preferred bright color and stronger chromatic color such as red, yellow, orange, etc. than women. As same support, the research work of Radeloff (1990) that also presented the women had highly preferring in soft colors while men preferred bright ones. Whereas the studies from Jastrow (1897), George (1938), Silver and Ferranted's (1995) and Ellis, & Ficek, C. (2001) saw that men than women more prefer blue.

Guilford and Smith (1959) found that males were more prefer colorless such as white, black and gray, than females. And they proposed that females had a higher color sensitive and their color tastes more flexible and diverse than males. Moreover, the study of Khouw (2002) also supports that men were more tolerant in the dull colors; black, white, and gray than women and more women got more confused and distracted reacted to the combination of red and blue more frequently than males. In the opposite, Kuller (1976) indicated that men showed the higher bored and stressful than did the women in the gray room.

McGuinness and Lewis (1976) and Hoyenga and Wallace (1979) found women were more sensitive to red and yellow whereas men appeared to be more sensitive to colors in the blue-green light.

The Illustration of the difference in moods and taste for colors between genders have been still unclear due from some limitation areas. And other research works have shown that color preference and emotion association can influence by other factors, not only gender such as culture, age, education level, experience, and individual character, also the brightness and saturation of color.

2.3 Color and Workplace

In developing workplace today the concept of 'meaning of place' is a desired in the build its environment as other places. The meaning of place is described in three broad categories which are place identity, sense of place, and place attachment. Proshansky, Fabian, & Kaminoff (1983) introduced place identity as a place attribute to person's self-identity in which consists of knowledge and feelings developed through our daily life experiences of physical space. Steele (1981) stated that sense of place is drawn up by feeling and perceptions of people when its environment surrounds them. Lastly, Altman & Low (1992) presented place attachment occurred when people create emotional bonds between themselves and their surroundings. Therefore the meaning of place purposes in the creation of positive experience the office users, given that employee and employers feel a sense of belonging and meaning where they work.

Nowadays color is a significant element to be taken into consideration when designing visual comfort for a working office; creating the meaning of place, as

human perceived color as a fundamental quality of their visual experience and there is a common belief from research works about the relationship between color and moods or feeling. Becker (1981) found that environmental colors do serve for indirect effects on the office workers. It may induce a series of the behavioral reaction related to mood, performance, employee satisfaction and absenteeism.

Jacob and Sues (1975) indicated that red and yellow room provided major higher anxiety than blue and green condition as well as a work of Kwallek, N., Lewis, C. M., & Robbins, A. S. (1988) in which investigated the impact of red and blue office environment on worker moods and productivity and presented that red room was associated with anxiety and stress while the blue room related to depression.

Kwallek, N., & Lewis, C. M (1990) investigate the office workers mood and performance on three office colors such as red, green, and white between males and females. The significant result found that the office workers had lower confusion in the red room than in the green room. With gender differences, females had more tension and less vigor than males in the three color rooms. The white office was rated the least distracting and highest preference office to work; however many task errors were found in the white environment more than the other two colors as Mahnke (1987) said: "People have been conditioned to white by its over-abundant use." Also, more males than females felt that color of environmental distracting in red and white office whereas more females than males found the distracting in the green room.

Kwallek, N., Lewis, C. M., Lin Hsiao, J. W. D., & Woodson, H. (1996) demonstrated the effect of nine monochromatic office interior colors on workers task performance and mood, regarding hue, saturation, and value. They reported that males were more depression, confusion, and anger in highly saturated colors (red, yellow, orange, purple, green, and blue) while females tended to have higher depression, confusion, and anger in low saturated colors (white, beige, and gray). Moreover, warm colors (red, yellow, orange and beige) were more arousing than cool colors (blue, green, purple, and gray). In terms of color preference, orange and purple office showed the least preference working, while most preferred working was in beige and white rooms. White office showed the least distracting room color whereas purple, yellow, and red conditions were rated the most distracting.

Another important variable in the work of Kwallek, N., Woodson, H., Lewis, C. M., & Sales, C. (1997) was the ability of individual environment screener (high or low) that may interact with how different color schemes impact their mood and performance in red, blue-green and white office. The research presented that low screeners had more depression than high screeners in the red room and also were more anger and depression than high screeners in the white room. For the color preference, the blue-green office was reported to be the most favorite colors as found in BOSTI survey in Figure 2.6.

In summary, differences in the methodology and controlled environment used in each color and workplace association studies may also account for the variations in their findings as well. However, the conclusion that we draw from these studies is that there are pieces of evidence to support the idea that color does influence preferences, mood, and performance of people in the workplace.

Hence, we can reach the following hypothesis:

H1: There is the effect of color in workplace interior on office worker moods

H2: Color and mood association in workplace differs with gender

Next, chapter 3 presents the research design, data collection, and instrument and data analysis method using in this research work and summarizing the result of work.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

This research uses a quantitative approach propose to identify the level of both negative such as anger, confusion, depression, fatigue, tension and positive moods such as vigor affected from the nine workplace interior colors; red, orange, yellow, blue, purple, green, beige, gray, white. Additionally, examine whether there is any difference in genders. Furthermore, the research also explores the opinion in the office workers color preferences, designate workplace colors, and distracting workplace colors to develop some suggestions to management for designing workplace interior color.

3.2 Data Collection

A purposive or non-probability sampling method will be used to select the participants, total two-hundred sample sizes. The questionnaire will be distributed to the participants who are working in office environment via the online channel such as survey monkey.

3.3 Instrument

The online questionnaire divided into three parts; the effect of nine workplace interior colors on Thai office worker mood, the opinion in color preference, designated office color, and color distracting. And the last topic is demographic information.

The researcher created the projected images of nine workplace interior colors such as red, orange, yellow, blue, green, purple, beige, gray, and white, by using the software program. The pictures have enclosed in the online survey to examine the effects of those colors on their moods as shown in Figure 3.1.

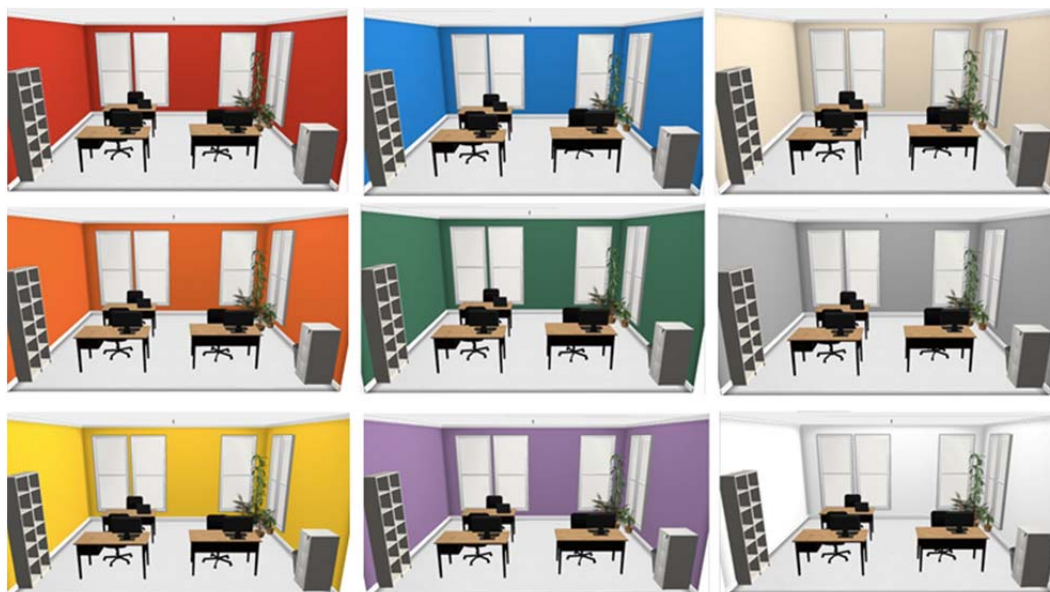


Figure 3.1 Projected images of nine office colors testing

Table 3.1 shows the mood scales index which consisted of twelve mood states such as grouchy, annoyed, confused, unable to concentrated, unhappy, miserable, fatigue, weary, tenses, nervous, lively, and active. Then the twelve moods will be categorized into six moods such as anger, confusion, depression, fatigue, tension, and vigor for analyzing. The selected mood items are certain part of the Profile of mood states, 65-rating scale (POMS; McNair et al., 1971). The researcher specifically selected only the significant items that related to working moods and using unipolar scales or 5-point scale (0 = not at all, 4 =extremely) to measure levels of moods experience.

Table 3.1 Mood index for testing the effects of nine workplace interior colors on Thai office workers

Mood	Sub mood	Positive/ Negative mood
Anger	Grouchy Annoyed	Negative
Confusion	Confused Unable to concentrate	Negative
Depression	Unhappy Miserable	Negative
Fatigue	Fatigue Weary	Negative

Table 3.1 Mood index for testing the effects of nine workplace interior colors on Thai office workers (cont.)

Mood	Sub mood	Positive/ Negative mood
Tension	Tense Nervous	Negative
Vigor	Lively Active	Positive

Furthermore, to determine the color preferences, designated workplace colors and distracting colors, the following questions will be asked.

- What is your favorite color?
- What is the designated color that you would like to work at?
- What is the color that can distract you when you are working?

Lastly, the demographic information included gender, age, position levels, and functional unit of working.

3.4 Data Analysis

After complete collecting data, the research performed the statistical analysis by using SPSS statistics. The frequency table will be used for analyzing the demographic data and compare mean function used for measure the means of moods level affected from each color and examining the impact of colors on moods of gender differences. The result of statistic will be translated and concluded in simple language for real management practice.

Next, chapter 4 summarizes the demographics of the respondents and the results from the quantitative examination of; the effect of nine workplace interior color on Thai office worker moods, the differential impact of the nine colors on moods between genders, and the opinion of their color preference.

CHAPTER IV

RESEARCH FINDING

The results of the studies were divided into four parts; first, it was a demographic profile of respondents. Second, it showed the results of effects of the nine workplace interior colors such as blue, green, purple, red, orange, yellow, beige, gray, and white on Thai worker moods. Third, the study presented the result from the comparison test on the effect of the nine workplace interior colors on moods between genders, and the last one was the analyzing in color preference, designate office colors and the distracting office colors in the viewpoint of the respondents.

4.1 Demographic profile of respondents

The population profile included gender, age, functional units and position levels were analyzed by using the descriptive statistics—frequency and percentage. The researcher distributed the questionnaire to two hundred people who are working in office environment. The summary profile showed in Table 4.1.

Table 4.1 Demographics Profile of Respondents

Variable	Sample (n=200)	Percentage (%)
Gender		
1 Male	83	42%
2 Female	117	58%
Total	200	100%
Age		
1 23-30 years old	116	58%
2 31-45 years old	74	37%
3 > 45 years old	10	5%
Total	200	100%

Table 4.1 Demographics Profile of Respondents (cont.)

Variable		Sample (n=200)	Percentage (%)
Functional Unit			
1	Accounting & Finance	37	20%
2	Marketing	29	10%
3	Sales	24	10%
4	Purchasing/logistic	13	10%
5	HR	20	10%
6	IT	7	0%
7	CustService	11	10%
8	Secretary	11	10%
9	Production	12	10%
10	Internal Auditor	13	10%
11	Other functional units	23	10%
Total		200	110%
Position Levels			
1	Staff Level	83	42%
2	Senior/Middle management Level	100	50%
3	Upper to Top management Level	17	9%
Total		200	100%

The majority genders of total respondents were female, which represented 58% of the total respondents. The highest proportion of the respondents' age was between 23 and 30 years old, which was 58% of the total respondents, following by aged group between 31 and 45 years old or 37% of total respondents. Most of the respondents were working in an accounting and financing unit, which represented 20% of the total respondents following by marketing, sales, others functional units, and human and resource units. For position levels, the primary respondents were senior/middle management level and staff level, which showed 50% and 42% of total the respondents, respectively. In addition, from total 23 other functional units respondents, the majority population was the designer that represented 26% of total the respondents.

4.2 Effect of nine workplace interior colors on Thai office workers' mood

From the examination, the hypothesis H1: There is the effect of color in workplace interior on office worker moods is accepted. To consider the overall of office workers' mood state per each nine color, Figure 4.1 below indicated the high level of negative moods mainly anger, confusion, and tension was shown in the red, orange and

yellow room. However, the respondents also experience the high-level vigor among other colors in these three rooms, especially the highest in the yellow room.

Green and purple room were attractive because showed that most of the respondents had higher positive mood such as vigor than other negative moods when they were working in them whereas there was no difference in the positive and negative moods while they stayed in the blue room.

In neutral office color room, such as beige, gray, and white, the overall moods in both of negative and positive were less found than the other colors. Fatigue mainly experienced by the respondents, following by depression in the gray and white room. And the high vigor found in the beige room.

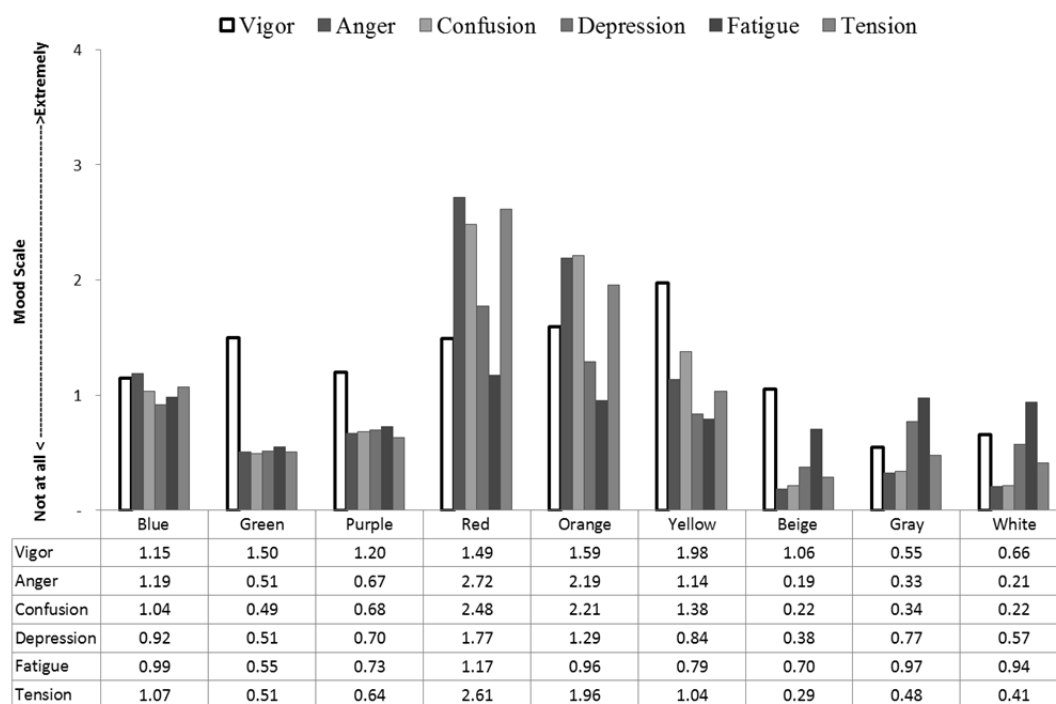


Figure 4.1 Mean of Thai office worker moods affected by each nine workplace interior colors

4.3 Effect of nine workplace interior colors on Thai office workers' moods between genders

From data analysis, the hypothesis H2: Color and mood association in workplace differs with gender was accepted in seven room colors such as green, purple, red, yellow, orange, gray and white whereas there were some rejected the hypothesis in blue and beige room

Table 4.2 represented the significant difference in moods affected from the nine workplace interior colors between genders. The major significant difference in all mood states between males and females was found in yellow office color. In the yellow room, males had lower negative moods such as anger ($F=12.399$), confusion ($F=8.289$), depression ($F=8.661$), fatigue ($F=6.388$), and tension ($F=10.861$) and higher vigor ($F=5.754$) than females. Besides, in the red room, females reported experiencing greater fatigue ($F=9.422$) but less tension ($F=10.471$) than males. And working in the orange room, higher depression was higher found in females than males ($F=4.390$).

For the green and purple room, there was significant difference in mood states between genders in fatigue and confusion. Females reported having greater fatigue than males in the green room ($F=5.147$) and higher confusion than males in the purple room ($F=5.085$).

In neutral colors room, the gender difference in negative moods such as anger, depression, and tension was significantly found in the gray room and white room. Females reported having higher anger ($F=4.638$), depression ($F=8.672$), and tension ($F=3.946$) than males as same as the anger ($F=5.791$), depression ($F=8.057$), and tension ($F=4.805$) the white room. Only the gender difference in vigor moods showed in the gray room in which females experienced higher vigor than males ($F=6.245$).

However, there are no significant differences in color and mood association between genders in the blue and beige room.

Table 4.2 Mean comparison of Thai office worker moods between male and female affected by each nine workplace interior colors

Moods / Colors	Blue		Green		Purple	
	Male	Female	Male	Female	Male	Female
Anger	1.30	1.11	0.43	0.56	0.52	0.78
Confusion	1.17	0.94	0.39	0.56	0.51	0.80 *
Depression	0.96	0.88	0.45	0.56	0.55	0.80
Fatigue	1.04	0.95	0.40	0.65 *	0.60	0.82
Tension	1.11	1.03	0.45	0.54	0.49	0.74
Vigor	1.16	1.14	1.54	1.47	1.10	1.27

Moods / Colors	Red		Orange		Yellow	
	Male	Female	Male	Female	Male	Female
Anger	2.93	2.57	2.17	2.20	0.77	1.39 *
Confusion	2.61	2.39	2.26	2.18	1.10	1.57 *
Depression	1.81	1.74	1.10	1.43 *	0.58	1.02 *
Fatigue	0.84	1.40 *	0.83	1.05	0.57	0.94 *
Tension	2.96	2.36 *	1.96	1.96	0.72	1.26 *
Vigor	1.62	1.40	1.71	1.51	2.17	1.83 *

Moods / Colors	Beige		Gray		White	
	Male	Female	Male	Female	Male	Female
Anger	0.18	0.19	0.20	0.41 *	0.10	0.28 *
Confusion	0.30	0.16	0.26	0.40	0.17	0.25
Depression	0.35	0.39	0.54	0.94 *	0.37	0.71 *
Fatigue	0.66	0.74	0.98	0.97	0.89	0.97
Tension	0.37	0.23	0.35	0.57 *	0.28	0.50 *
Vigor	1.21	0.94	0.39	0.67 *	0.54	0.74

* Significant main effect for gender ($p < 0.05$)

4.4 The color preference, prefer color to work with and distracting color

Table 4.3 represents the percentage of the respondents for colors in three aspects; their favorite color, color likely to work in and distracting color in the workplace.

Beige reported as the most favorite color among other colors which represented 62% of the total respondents. Males had higher preferred in beige color than females as it represented by 71% of their positive respondents while females showed only 55% of their group. On the contrary, red and orange were the color that both of males and females dislike the most, shown 99% and 91% of the total respondents respectively.

For the designate office color, Beige is the most chosen color that the total respondents like to work with, indicated by 71% of the total respondents for both males and females.

Red was the most distracting color from the perception of the total office workers (87%), following by orange (60%). On the contrary, beige, green, and white were the least distracting color in their perception, represented by 98%, 97%, and 95%, respectively of the total respondents who said positively for these colors. There was no significant difference in the perceptions of men and women.

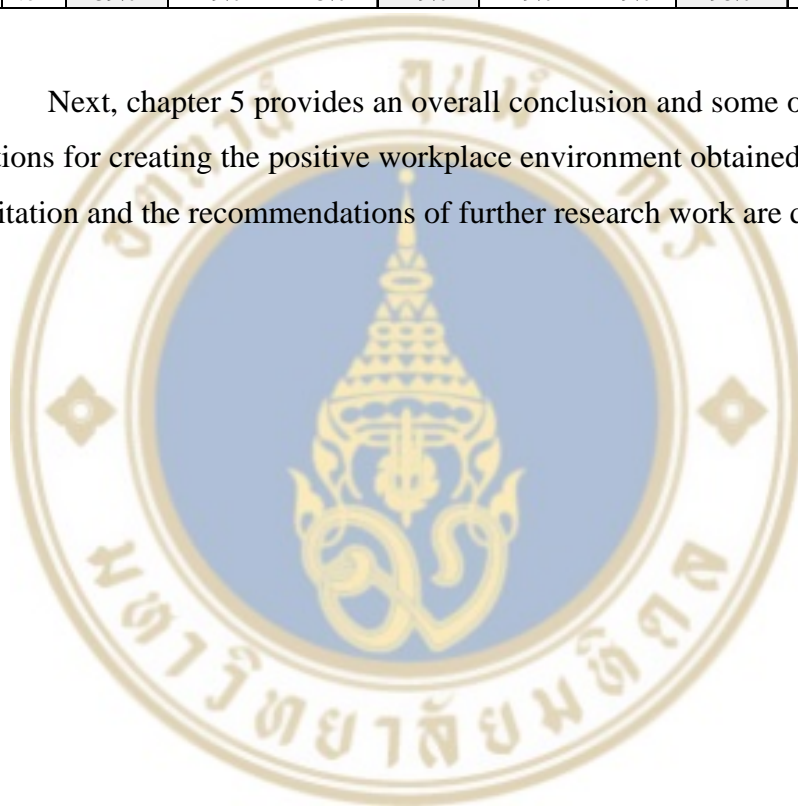
Table 4.3 Percentage of Thai office workers color preference, designated workplace color, and distracting workplace color

Office color		Like the Color			Like to Work in			Find Distracting		
		Total (n=200)	Male (n=83)	Female (n=117)	Total (n=200)	Male (n=83)	Female (n=117)	Total (n=200)	Male (n=83)	Female (n=117)
Red	Yes	2%	2%	1%	1%	0%	1%	87%	84%	88%
	No	99%	98%	99%	100%	100%	99%	14%	16%	12%
Orange	Yes	9%	7%	10%	4%	1%	5%	60%	59%	60%
	No	91%	93%	90%	97%	99%	95%	41%	41%	40%
Yellow	Yes	16%	6%	22%	11%	5%	15%	35%	28%	39%
	No	85%	94%	78%	90%	95%	85%	66%	72%	61%
Green	Yes	45%	59%	35%	31%	34%	28%	4%	1%	5%
	No	55%	41%	65%	70%	66%	72%	97%	99%	95%
Blue	Yes	33%	37%	29%	16%	16%	16%	18%	18%	18%
	No	68%	63%	71%	84%	84%	84%	82%	82%	82%
Purple	Yes	20%	8%	28%	16%	7%	22%	11%	12%	10%
	No	80%	92%	72%	84%	93%	78%	89%	88%	90%
White	Yes	34%	25%	40%	43%	49%	38%	6%	2%	8%
	No	66%	75%	60%	57%	51%	62%	95%	98%	92%

Table 4.3 Percentage of Thai office workers color preference, designated workplace color, and distracting workplace color (cont.)

<i>Office color</i>		Like the Color			Like to Work in			Find Distracting		
		Total (n=200)	Male (n=83)	Female (n=117)	Total (n=200)	Male (n=83)	Female (n=117)	Total (n=200)	Male (n=83)	Female (n=117)
Gray	Yes	29%	14%	38%	28%	19%	34%	12%	11%	13%
	No	72%	86%	62%	72%	81%	66%	88%	89%	87%
Beige	Yes	62%	71%	55%	71%	71%	71%	2%	1%	3%
	No	39%	29%	45%	29%	29%	29%	98%	99%	97%

Next, chapter 5 provides an overall conclusion and some of the managerial implications for creating the positive workplace environment obtained in this research. The limitation and the recommendations of further research work are discussed.



CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This research has studied and examined to understand how the selected colors such as red, yellow, orange, blue, green, purple, white, beige, and gray are associated with the moods of Thai workers when they are used in workplace interior, including the difference affected to their moods between genders. The purpose of this study is to provide insights into the utilization of appropriate colors to decorate the workplace for creating the positive workplace environment as it significantly impacts the success of the organizations within them

5.1.1 Effect of nine workplace interior colors on Thai office workers' mood

Overall, the present study showed the high level of negative moods such as anger, confusion, and tension was majority found in red and orange room while the highest positive mood such as vigor found in the yellow room when comparing to the other colors in this research. The finding somewhat agreed with the examination of Kwallek, N., Lewis, C.M., & Robbins, A.S. (1988) that showed the red office associated with anxiety and stress emotions. Also, it supported Kwallek, N., Lewis C.M., Lin Hsiao, J. W. D., & Woodson, H. (1996) that warm colors (red, orange, yellow) commonly provided the higher mood stimulation in both of negative and positive way than cool colors (blue, green, purple).

Surprisingly, Thai office workers had more negative moods such as anger, depression, fatigue, and tension in the blue room than the yellow room which opposed to Jacob and Sues (1975). It may be because the yellow is the interior color providing the best lively and active mood states to them.

Green was another interesting color to use in office painting because it provided a high vigor mood state while maintaining the low score in all negative moods as found in work of Kaya et al. (2004) that green room shown the most positive emotional responses and associated with relaxation and calmness.

Additionally, the fatigue mood state was the majority found in the neutral color office, especially in gray and white.

5.1.2 Effect of nine workplace interior colors on Thai office workers' moods between genders

In this study, the significant difference in the effects of the colors on moods between genders was varied and found only in seven color rooms such as red, orange, yellow, green, purple, gray and white room.

The difference between males and females in all moods was found only in the yellow room. More enjoyment and less all negative moods such as anger, confusion, depression, fatigue, and tension were experience by Thai male office workers than females as supported by Docus (1926) that males had a higher emotional value for yellow color than females.

A similarity to the work of Kwallek, N., Lewis, C. M., Lin Hsiao, J. W. D., & Woodson, H. (1996), more anger, depression, and tension experienced by females than males in white and gray office. It was because males had more prefer and tolerant in the dull office colors such as black, white and gray that females as found from the mood and gender association studied by Guilford and Smith (1959) and Khouw (2002). However, only the higher vigor found in female than male in the gray room that was different from the past studies.

However, there were some opposite results in gender difference in moods affected from workplace interior colors from the Kwallek works. The current study found that more females experienced anger and confusion in the yellow room, depression in the orange room, confusion in the purple room than males while having lower tension in the red room. On the contrary, the findings in Kwallek works presented these three negative moods such as anger, confusion, and depression affected from yellow, orange, and the purple room was found higher in females than males and females also had

more tension than males in the red room. Additionally, more fatigue in the green and red room was experiencing by females than males.

5.1.3 Color preference, designate workplace interior color and color distracting in the workplace.

The present study found that the most favorite color and chosen workplace interior color in Thai office workers was beige while the least selected color was red and orange. Moreover, beige, green, and white color were rated as the least distracting room color whereas red and orange color were the most distracting from their perception. There was no significant difference in selecting between genders. The finding somewhat agreed with the research results of Kwallek, N., Lewis, C. M., Lin Hsiao, J. W. D., & Woodson, H. (1996) for beige, white, red and orange color.

5.2 Managerial Implication

The results of this study present that within one color can create the varieties of moods in the office workers while they are working and there are differences in colors and moods association between males and females in some colors.,

The neutral color such as beige and white are commonly accepted and particularly used in Thai workplace; however, they sometimes provided negative mood such as fatigue. So, to reduce some negative and increasing positive moods, the management should consider for the color combinations that are appropriate to the type of work and genders for creating the diversity in their workers feeling such as add up the yellow or green color into some areas to create the optimism, comfortable and calmness. Although, red and orange may create some distracting, properly using them to help to stimulate the working passion is another interesting idea.

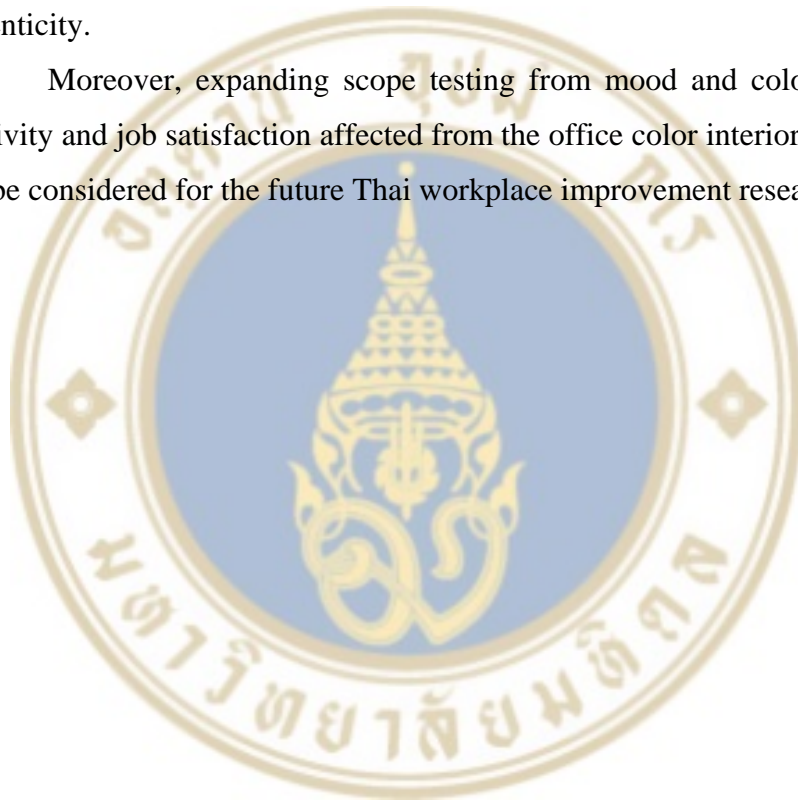
5.3 Limitation and Recommendation for future research work

The research design used in this study provided a means of the effect of colors on Thai office worker mood and their preference. Each color offers the varieties of moods and some of the findings differ from the past studies. It is probably due to

other factors which are environment, culture, and age that should be some of the variables considering in moods and colors association testing.

Moreover, there are some limitation of times, sample size and research method in the study. So the researcher would like to suggest for the future research to collect a larger sample size to have more realistic population proportion. Also, it should implement a room color setting and interview session including for conducting the demonstration for obtaining more accurate results because the use of photo editing in this study to create the effect of color using a projected image may limit the experience of authenticity.

Moreover, expanding scope testing from mood and color association to productivity and job satisfaction affected from the office color interior in Thai workers should be considered for the future Thai workplace improvement research topic.



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