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REHABILITATION AND THE MEANING OF COLOR

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts
In
Rehabilitation Counseling

By
Hazel Ganther

June 2000

REHABILITATION AND THE MEANING OF COLOR


A Project
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By

Hazel Ganther

June 2000

Approved by


Dr. Margaret Cooney


Mr. Joe Moran

June 1, 2000
Date

ABSTRACT

This study examined whether there is a positive relationship between emotional response and color. The methodology: consisted of using 8 bright color cards that were 11x17-inch cards matte surface. The cards were placed in front of the classroom in a selected order, so that the students would not draw color associations to particular colors. The participants were 49 college students at California State University San Bernardino. The participants were asked to identify their favorite color and write down adjectives that they felt explained the meaning of the colors. Information was recorded on anonymous response sheets. The results were compared within the groups and compared to studies conducted in a similar manner. The responses were only taken into consideration if the participant chose the correct adjective that have been studied in previous studies to represent that particular color. The collection was random selection of participants from rehabilitation classes, art classes and educational psychology classes. The results showed a positive and significant similarity to color and emotional response.

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CHAPTER ONE

INTRODUCTION

The purpose of this study is to explore the relationship of color to emotional response and the influence of color preference on rehabilitation modalities. This study also explores the preference of color. Why does a person like a certain color and dislike another color? Research has shown that colors can affect a person's mood and well being. Research has stated the notion that mood, affect, personality, and color are associated is rationally appealing. (Elaine P. Gelineau 1981) p.163

In rehabilitation therapy a client's moods, personality and well-being are important to the rehabilitation process. The client responses to created art productions such as art and media have been used as a reflection of an individual's development, abilities, personality, interests, concerns and conflicts. Color can be utilized in art therapy as a means to recognize a person's moods or personality. The Rorschach test has been used to interpret a subject's response to color as an indication of that person's emotional state.

Research has concluded that when it comes to personality and color people that are out going or extrovert preferred bright colors. People that were introverts preferred subdued, dull colors. Similarly a correlation

between preferred colors and emotional response to color can be used in rehabilitation therapy and art therapy to treat persons with disabilities which usually are in the developmentally, medically, educationally, socially or psychologically categories. These treatments have been used in mental health, rehabilitation, medical, educational, and forensic institutions, under the heading of art therapy. The spontaneous art expression of children and adults has represented both emotional and symbolic communications.

Studies have shown positive results that certain emotional responses to color are universally the same. If this is so the rehabilitation therapist can better understand what emotional feelings a client is expressing when applying these universal meaning to communication through art therapy. Color provides an avenue for communication and makes verbal expression more accessible. These emotional responses to color and their meanings can be used in managing behavior, reducing anxiety, aiding reality orientation, and increasing self-esteem.

Researchers have studied the effect of color on behavior. It has been concluded that certain colors have an emotional effect on an individual.

Studies show that warm colors cause an arousing effect on behavior and cool color cause a restful effect on

behavior. Some studies have used adjectives, feelings or mood-tones to describe the emotional response and meaning to color. This researcher agrees with this premise, but is extending it to say other factors need to be considered; such as age, difference in the preference of color, and populations that have disabilities. Future research should be done and should consider, but not be limited to, different groups of people, and the demographic area they live in, hues of color, and surface texture when conducting a study.

Is color culturally influenced? How old does one have to be to give a positive response to color? In a study designed by Chris J. Boyatzis, and Reenu Varghese (1994) p. 77, the methodology was as follows: children 5-years-old and 6 1/2 year-old were shown nine colors, one at a time and in a random order. The children were asked what was their favorite color and how did that color make them feel. The children were all able to orally express an emotional response to each color. The girls in particular showed a preference for brighter colors and dislike for the darker colors. The boys in both age groups had more positive responses to dark colors. The children's responses to certain colors were similar to the emotional responses within the tested groups and across other studies tested in

a similar manner. The results indicated that children age 5 and 6 with little cultural influence showed emotional feelings to color.

Results indicated a positive association to color and emotional responses. In a study done by Boyatzis and Varghese (1994) p. 78, for many years clinical psychologists have offered assumptions about the emotional significance of color and emotional association. The color red has been associated with anger, aggression excitement, while the color green was associated with quietness, serenity and withdrawal. The study concluded children did show an emotional association with color mostly positive ones.

Color has a powerful effect on people. The meaning of color is interpreted by the emotional responses it evokes in people. Research studies have been conducted to collect data that indicates similar emotional responses are associated with certain colors. Can an assumption be made about color and the effect it may have on a person's behavior? Research has indicated that, yes, color can have an effect on a person's behavior. For example, the warm colors, red, and yellow have an exciting and arousing effect on behavior causing an up mood effect on the individual. In contrast, the cool colors, blue and green have a serene and calming effect on behavior, causing a restful effect. Prison

walls are painted certain colors to have a certain effect on the inmate's behavior. The inmate's day room is painted blue, because blue has a serene and restful effect on the inmate's behavior. Why does a person prefer a particular color? A study done by Chris J. Boyatzis and Reenu Varghese (1965) p.77 suggests that children's emotional reactions to bright colors became increasingly positive with age. Girls in particular showed a preference for bright colors and a dislike for darker colors. To test this hypothesis this study will focus on college age students to examine if the female gender prefer bright colors to dark colors and examine if males prefer dark or light colors, as they grow older. Many questions have been asked about color and the emotional responses it evokes in people. There have been many research studies done that focus on color association and emotional responses as well as color preference. Nakshian (1964) designed a study using eleven groups of adjective to describe the meaning of color, and the emotional responses associated with a particular color. Results indicated a positive relationship similar to other studies that have tested this hypothesis.

There are connotative meanings that are associated with certain colors. A study done by John E. Williams and Jackson Foley (1968) p.499 suggests that the meaning that is

associated with the colors black, white, and red. "Black was found to be bad" passive, and strong. The color white was associated with good, and weak. The color red was associated with to be active, and happy. The meaning was stationary across both racial and regional lines in all studies researched by the author.

CHAPTER TWO

LITERATURE REVIEW

This literature review focused on the following content areas: 1) Mood Association and Color 2) Effects of color on behavior. 3) Connotative meaning of color. 4) Preference for color and 5) Perceptions about color.

MOOD ASSOCIATION AND COLOR

The investigation conducted by the following two studies was different but shows similarities in their results. Lawler & Lawler (1965) study was conducted to determine, if a method of testing color association, was appropriate to the level of nursery-school children then could children associate color with mood? The study designed by Lawler & Lawler (1965) had 2 color choices, yellow and brown. Their study methodology investigated nursery school children.

They conducted their study using one group of 27 girls and one group of 21 boys in a nursery school. The children were told two moods story a "happy girl" story and "sad girl story." The males were told the "happy girl" story and the females were told the "sad girl" story. The participants were given the choice of two crayons; yellow and brown, to color the girls dress either happy or sad. The study design could have either used a girl or boy story for

identification purposes. Both groups were told the same sad and happy girl story. The Lawler & Lawler studies did not have a control group.

The study did not test racial or socioeconomic variables. The study done by Bourgeois, Bailetti, & G. Cerbus (1977) expanded the study done by Lawler & Lawler (1965). Bourgeois Bailetti & G. Cerbus (1977) wanted to investigate first grade boys instead of nursery school children. Their participants consisted of 180 boys with 60 subjects in three groups. Thirty 30 participants who were black and 30 participants who were white were in each group. Group one was told the "happy boy" story and group two was told the "sad boy" story. The control group three was told the "angry boy story." The boys were given 6 colors' choices (red, yellow, brown, green, blue, and purple) to color a picture according to the mood each story represented. In the control group the boys were told the "angry boy" story to investigate if there were any differences or similarities to the "sad boy" story. In addition, the study tested two variables racial and socioeconomic background. The variable tests were conducted to determine if the variables would have a significant effect on color choices. A preliminary test showed no significance in the preference of color choice association to mood stories.

These researchers also changed the story design from the girl story to the boy story, so the boys could identify with the stories. The study tested only boys to avoid sex differences. They used the same "happy and sad" story design used and designed by Lawler & Lawler.

Both studies had similar results. The Bourgeois & Cerbus study results showed that both the yellow and brown was chosen most often when representing the happy and sad story in each study. The color yellow was chosen to represent the happy story and the brown to represent the sad story. The Lawler and Lawler studies' results indicated that children were able to respond to color mood association using mood stories. Even though red was chosen to represent the happy boy story in the study done by Bourgeois & Cerbus as well, the color yellow was chosen most often. The Lawler & Lawler study did not have a control group, nor did they have the color red, so there were no results indicated. In Bourgeois Bailetti & G. Cerbus study the results however showed significant relationships in the treatment of inter-groups. The study indicated a significant difference between the "angry and sad boy stories." Red was chosen to represent the "angry boy" story and brown was chosen most often to represent the "sad boy" story. The results of the investigations agreed across both studies.

These studies were done to test color associations with mood stories. The results were compared and were similar for both studies. Data indicates that red, yellow, blue, green, black, white, and brown are colors frequently associated with the same adjectives or mood-tones to express emotional responses to color. Good, purity, and weak are adjectives or mood-tones that describe the color white. Bad, sad, powerful, and strong are adjectives or mood-tones used most often to describe the color black.

EFFECTS OF COLOR ON BEHAVIOR

In the study done by Jacob S. Nakshian's (1964) explaining the effects of Red and Green surroundings on behavior, it was suggested that certain color could have an effect on how a person responds to activities. Nakshian's general viewpoint states, the colors red and, other warm colors, such as orange and yellow are positive. For example the color red causes an arousing or exciting effect on people's behavior. The color red is arousing or exciting and speeds up motor reactions arousing drive and inducing bright moods. In contrast, the cool colors blue and green has a restful effect, on people's behaviors. The studies suggest that the "restful" effect of blue and green can impair the efficiency of performing activities requiring judgment precision and relatively fine psychomotor coordination.

In another study done by Glenn D. Wilson (1966) studying arousal properties of red versus green, twenty students were each exposed for 60 seconds to 5 red slides and 5 green slides in alternating order. The results of the two electrodermal measurements, indicated that red is a more arousing color than green.

CONNOTATIVE MEANING OF COLOR

The colors black and white have connotative meanings. The color black means bad, strong, and powerful. The color white mean good, weak and purity. There has been evidence that the colors black and white has certain connotative meanings attached to them. According to John E Williams (1964) p721 who conducted a study on the connotative meanings of black and white shows that caucasians and black have similar meanings for these words. Williams says an abundance of informal evidence can be offered to support the observation, that, in our culture, the word (and color) black carries a negative or bad connotative meaning while the word white carries a positive or good meaning. His examples included phrases that were associated with the connotative meaning of black, which were as follows. Things look black, to blacken one's reputation blackmail, black list, blackball, black sheep, etc. He goes on to say that in each case black is associated with something unpleasant

and connotes badness. In contrast he goes on to say that even the Bible's central theme of good and evil is constantly represented by the symbolism of black and white and dark and light.

Williams & Foley (1968) study was designed to investigate the connotative meanings of color signs and corresponding color significant among young adults. Semantic differential rating of 10 color names and 10 corresponding color hues revealed highly similar meanings along evaluation, potency, and activity dimensions. It was concluded that color names and hues are virtually equivalent in terms of the connotative meaning, which they evoke.

PREFERENCE FOR COLOR

In a study done by Elaine P Gelineau (1981) a three-part investigation was conducted to explore the meaning of color preferences. The study suggested the notion that mood, affect, personality and color are associated to these emotions is rationally appealing. This researcher is in agreement. In the study researched by Elaine the psychometric approach to the measurement of color preferences was examined. A ninety-subject study suggests that stability of color preference cannot be assumed for all persons. The study suggested that responses to color have been found to be affected by hues and intensity and not

measured as a function. This study stated that several other recent studies reported differential color effects, using various physiological indices when "pure color" was presented, lending renewed support to the color affect hypothesis. The study suggested that the stimulus colors have not always been clearly specified, making it difficult to compare results across studies and secondly the study stated that the hue or intensity of a color has often been the only variable of interest when color studies were done. Controls for saturation and lightness have usually been absent. The test for color preferences has been constructed so that they often appear to address attention to color versus selectivity for specific colors. The study suggested that standard light source has not always been used, screening procedure for color vision dysfunction and etc. However the study suggests further consideration when conducting studies about color preferences such as surface of color, matte and glossy, and the effect of difficulties in certain test such as keeping the colors clean and time of day.

PERCEPTION ABOUT COLOR

Chris J. Boyatzis and Reenu Varghese studied 60 children (30 girls and 30 boys) and concluded that all children verbally expressed an emotional reaction to each

color. Children were tested individually in a quiet section of their classroom. Children were asked what their favorite color was and were shown that color first. Children were then shown the other eight colors, one at a time and in a random order. For each color children were asked. "When you look at this color, how does the color make you feel?" Children were allowed to state more than one emotional response for each color, although the children were not explicitly encouraged to do so. After stating their emotional response, children were asked why they felt that way about the color. In additions children displayed distinct emotional associations with colors. All groups of children expressed a higher percentage of positive emotional responses for bright colors than for dark colors, and virtually all groups of children showed more negative feelings for dark colors than would be expected by chance. Boys were more likely than girls to have positive emotional reactions to dark colors; however the girls' emotions for dark colors were mostly negative.

Leonard Weller conducted a study on the effect of color on emotional responses by examining whether the color of paper affects the kind of emotional response obtained from questionnaires. Two hundred and twenty-one students read three vignettes, each describing a murder or rape, and

responded by answering a set of eight questions for each case. A three-way analysis of variance was performed in which color (pink, blue, white), type of verdict (guilty, not guilty) and sex were the main effects. The results showed that there were significant differences for color and verdict but not for sex. The color of the questionnaire did affect the responses. Specifically, the color pink produced less emotional responses than did the color blue. This study supports the more general contention of Ott (1979) that the visual system has a role in regulating a variety of psychophysiological functions and specifically that pink has a different effect than blue. This study provided contrasting evidence that pink is more calming than blue, in contrast with the more generally accepted view that pink produces arousal where as blue induces tranquility.

SUMMARY OF LITURATURE REVIEW

Overall the review of this literature indicated that people have a positive emotional response to color. Past studies have indicated similar results that color does have an effect on a person's mood and behavior. People appear to have similar perceptions about color. Children also have demonstrated similar emotional responses to color.

CHAPTER THREE

VARIABLES IN THIS STUDY

There were several variables taken into consideration for this study. Students in different majors were studied to see if there was a similar response to color by participants in a rehabilitation class as compared to that of participants in the art class and educational psychology classes.

This study explored male and female differences in color preferences. This study focused on certain adjectives to describe specific colors, such as red being associated with exciting, happy and angry. If the participant did not write the emotional response adjective chosen to represent that color it was not taken into consideration as being the correct response.

PROBLEMS IN THIS STUDY

There have been no significant problems in this study.

PROCEDURES, METHODS AND MAIN CONCERNS.

The procedures and methods of this study were an extension from the study done by Wexner (1954) to test the hypothesis, is there a positive relationship between color and emotional responses? This researcher also used an expansion of the study design by Wexner (1954). The methodology was as follows: Color cards were placed in front

of the classroom in an arranged order so that the participants would not draw color associations. Wexner placed the card in a random order in front of the classroom. The color cards were 17 $\frac{3}{4}$ inches by 11 $\frac{3}{4}$ inches. The colored paper was mounted on cardboard. This researcher used eight colors and arranged the colors in front of the classroom. The participants were asked to arrange the colors in their order of preference. The participants were asked to sort the colors in order of preference by putting a number of 1 to 8 in the box located next to each color. This eliminated the handling of the color card so they would stay clean. The participants were told to look at each color and start with their favorite color and continue recording their feelings or emotional response for each color. The participants were told to write their descriptive responses on the response sheet. They were told to use whatever mood-tones or feelings they wanted to use for their responses. However, this researcher only identified eleven different adjectives as correct responses to match up with the eight colors. The participants did not have a time limit to complete the task. They had as much time as they needed to respond to the colors and record their answers.

A Chi-square measurement was used to analyze the data of all similarities and differences of the males and

females. The results are indicated on the following charts with follow-up discussion.

ASSUMPTIONS

The assumptions that color connotes similar meaning as it relates to the emotional responses are similar for different populations and have similarities in response. The studies have suggested there is a basic communality of color choices upon biological factors. Color-mood association in young children is similar to those across studies with little cultural conditioning. There appears to be no sex differences in the choice of color. This study focuses on adults responses to color and color preferences.

LIMITATIONS

There were no limitations for this study.

SELECTION METHOD

Random selection of 49 students from California State University San Bernardino

COLLECTION METHOD AND DATA

Participants were asked to select their favorite color and after the selection were asked to record their feelings about each color. The participants recorded all data on response sheets.

ANALYSIS OF DATA

Statistical graphs were used to calculate and measure the results of this study. The Chi-square measurement was used to analyze the data of sex differences. The most favorite color choices selected by all the groups were calculated according to the number of responses to that color. These measurements were calculated in the form of statistical tables and are presented in the following discussion.

CHAPTER FOUR

TABLE OF RESULTS

TABLE 1 (A)

Rehabilitation class responses to colors

Rehab.	Red	Yellow	Blue	Green	Black	Brown	Orange	Purple
Exciting	1	0	0	1	0	0	0	1
Energetic	2	3	0	0	0	0	0	1
Happy	1	1	0	2	0	0	0	6
Peaceful	0	0	2	2	0	0	0	0
Calming	0	0	2	3	0	0	0	1
Angry	2	0	0	0	0	0	0	0
Strong	0	0	0	0	1	0	0	0
Weak	0	0	0	0	0	0	0	0
Sad	0	0	0	0	3	0	0	0
Boring	0	0	0	0	0	0	0	0

TABLE 1 (B)

Art Class responses to colors

Art Class	Red	Yellow	Blue	Green	Black	Brown	Orange	Purple
Exciting	1	2	1	0	0	0	0	1
Energetic	1	2	0	0	0	0	0	0
Happy	1	2	1	0	0	0	0	1
Peaceful	0	0	4	2	0	0	0	0
Calming	0	0	0	1	0	0	0	0
Angry	2	1	0	0	0	0	1	0
Strong	0	0	0	0	0	0	0	0
Weak	0	0	0	0	0	0	0	0
Sad	0	0	0	0	2	0	0	0
Boring	0	0	0	0	0	1	0	0

TABLE 1 (C)

Education Psychology class responses to colors

Ed. Psy.	Red	Yellow	Blue	Green	Black	Brown	Orange	Purple
Exciting	1	1	0	3	0	0	1	1
Energetic	1	5	1	0	0	0	0	0
Happy	1	6	1	0	0	0	0	2
Peaceful	0	1	2	2	0	0	0	0
Calming	0	0	6	1	0	0	0	1
Angry	1	0	0	0	0	0	0	0
Strong	0	0	0	0	0	0	0	0
Weak	0	0	0	0	0	0	0	0
Sad	0	1	1	0	3	2	0	0
Boring	0	0	0	0	0	0	0	0

INTRODUCTORY TO THE TABLES ANALYSIS

The above data was calculated and placed into tables to show the relationship between certain colors and emotional responses selected by the participants. This was done with red and yellow often being associated with the emotional response of excitement, energy and happiness. The data indicates that red and yellow were similar within the groups and across other studies examined in the same way. However these indications were more apparent in the Rehabilitation and Educational Psychology classes.

TABLE 2

Tables 2,3, and 4 show how many of the participants chose the red and yellow response. All classes agree that the color red and yellow evokes exciting and happy responses. Some students associated yellow and red most often with energy. This researcher took energy into consideration for these two colors as well. These adjectives have been associated with these colors across studies as well.

TABLE 2

Students selected the colors red and yellow to represent excitement, happiness and energy

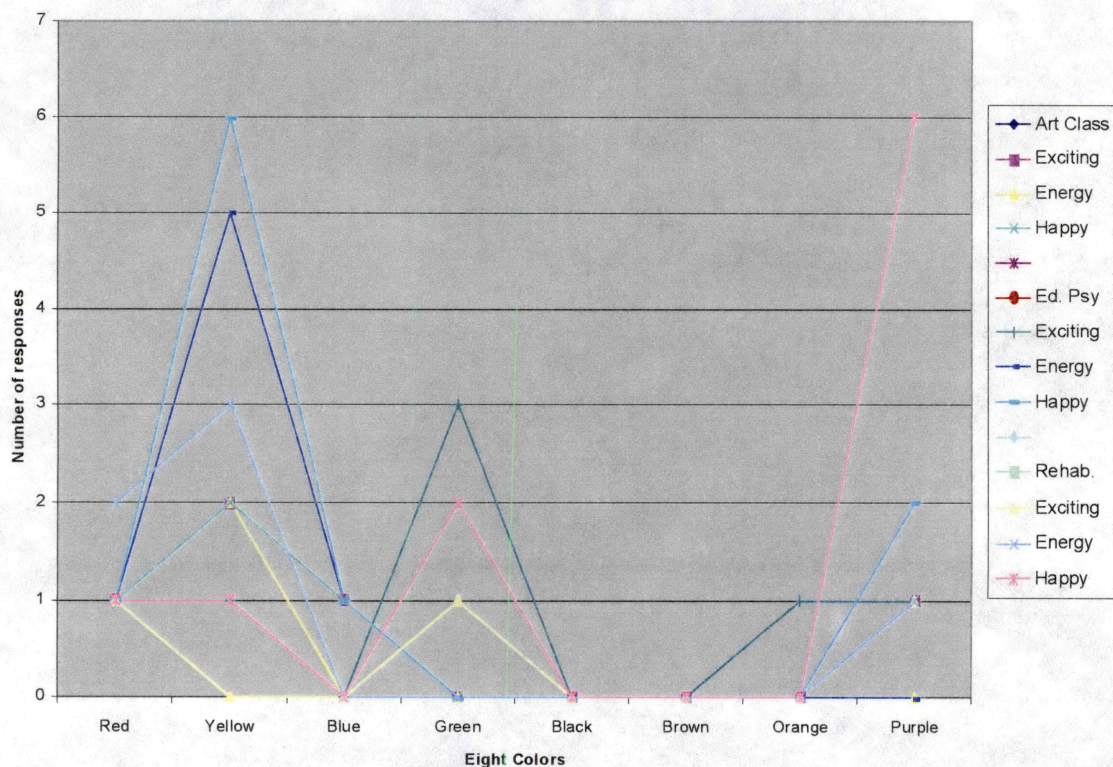


TABLE 3

In comparison to red and yellow, purple was chosen most often as being an exciting color only when it was chosen as a favorite color.

Students selected the color purple to represent excitement

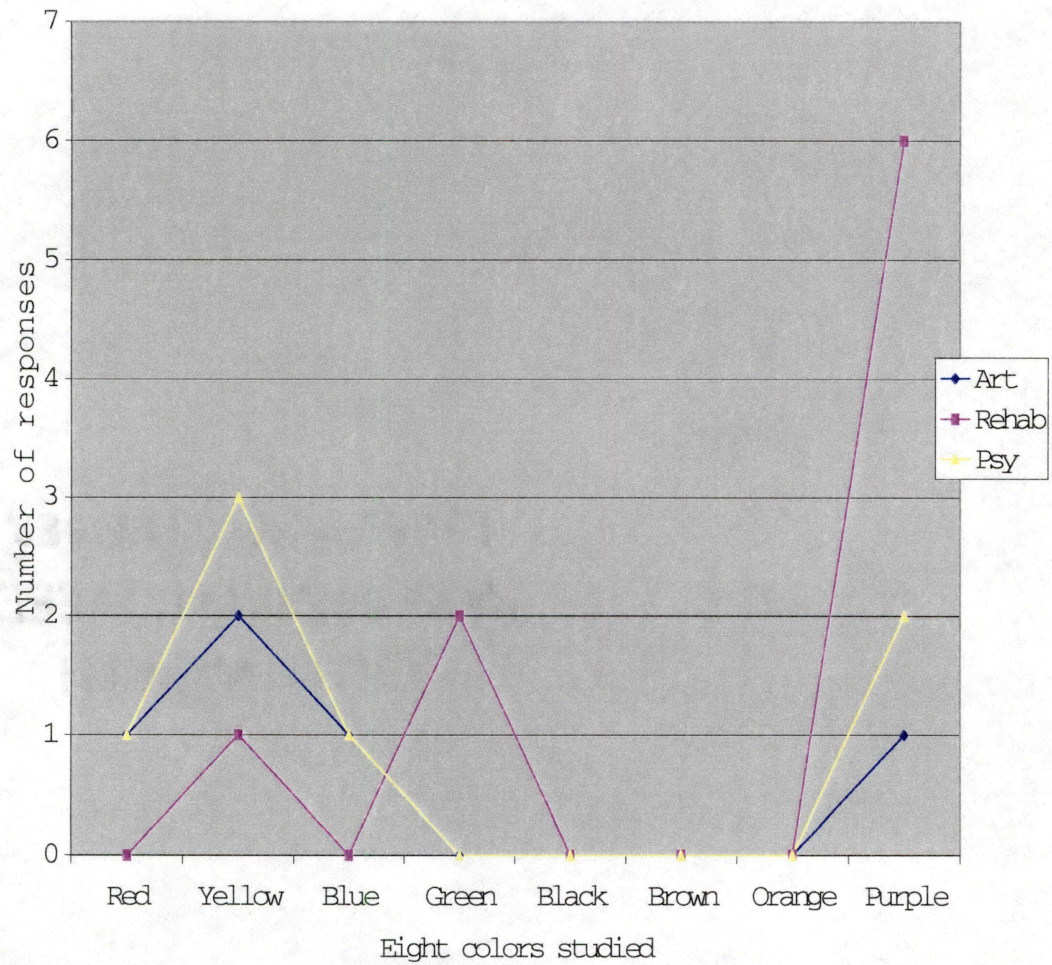
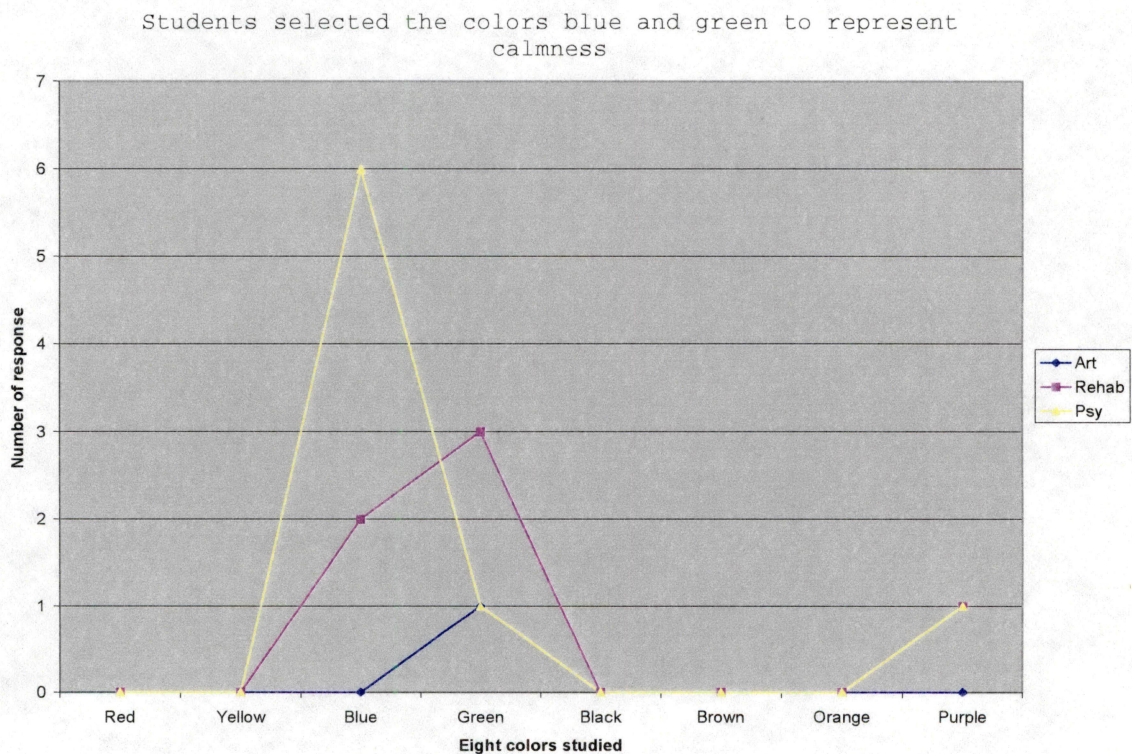


Table 4, 5 and 6 indicates that blue and green are considered calming, serene, and peaceful colors. The result indicates that this is consistent with in other studies.

TABLE 4

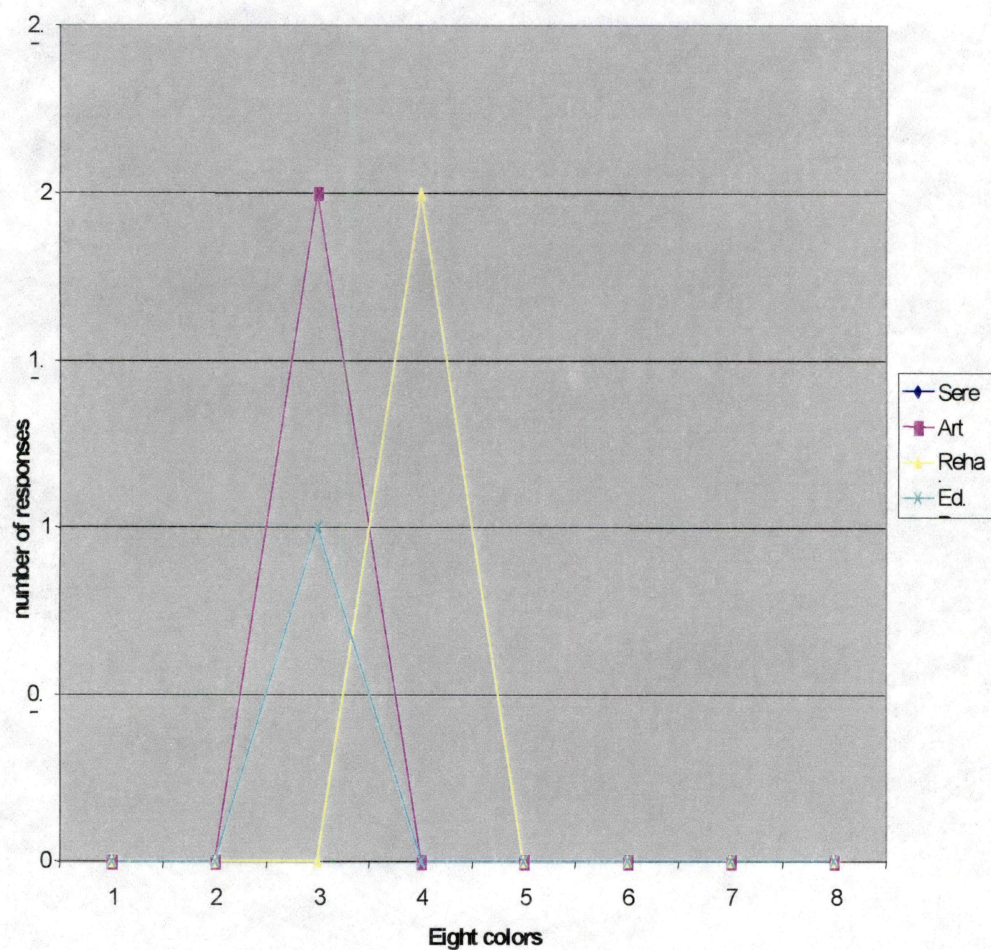


Participants had to choose specific words to represent certain colors as it was left up to the participant to choose whatever word they felt described their feelings about a particular color. However this researcher associated eleven different adjectives as correct responses to match up with the eight colors. If the participant did not write the emotional response adjective chosen to represent that color

it was not taken into consideration as being the correct response. Here the adjective or word **serene** is taken in to consideration as being the correct emotional response.

TABLE 5

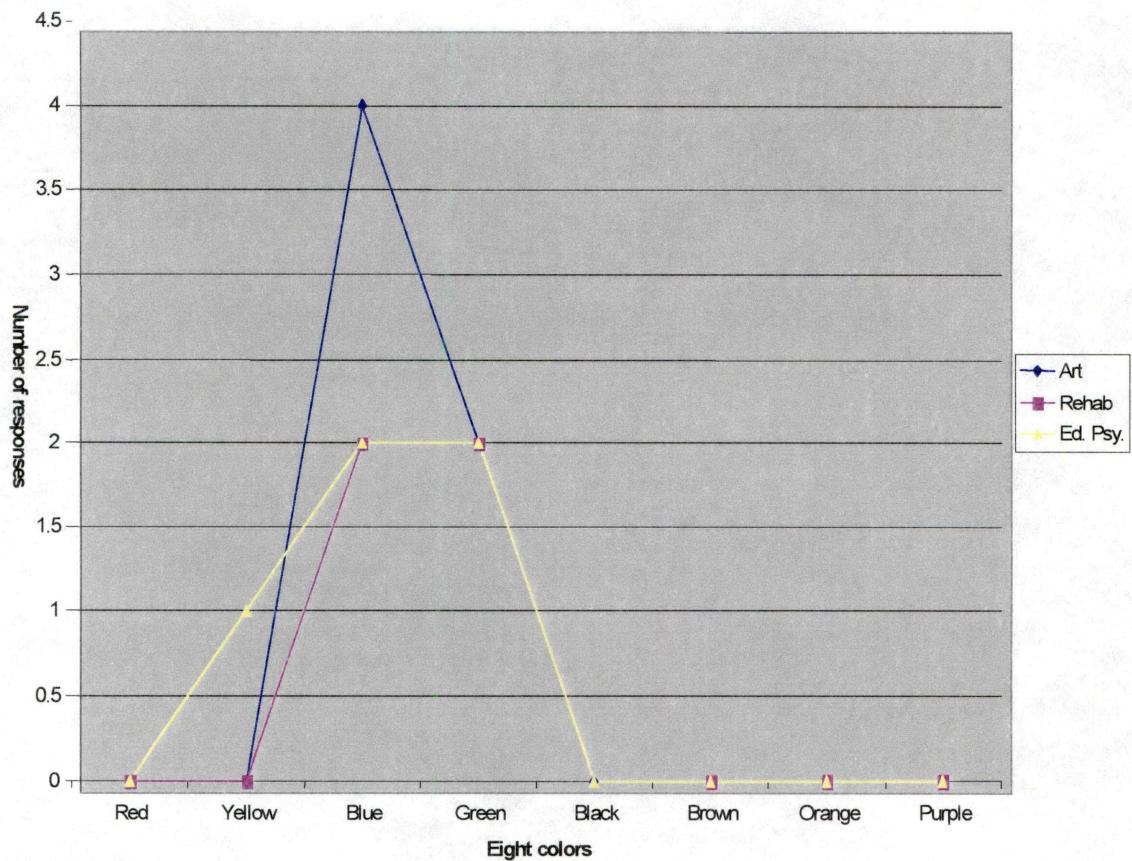
Students selected the colors blue and green to represent serenity



The results show that the blue and the green were chosen most often to represent the peaceful emotion. This researcher associated the word peaceful with the color blue and green. These results are similar to results in other studies.

TABLE 6

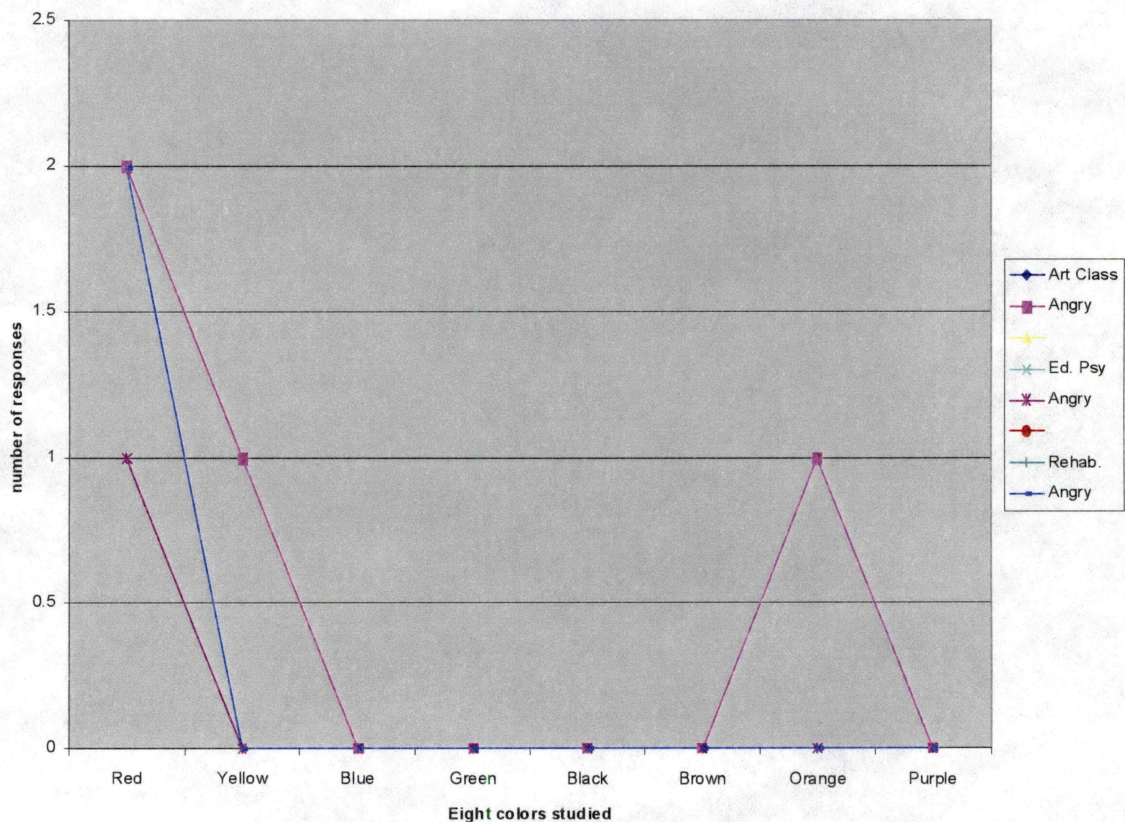
Students selected the colors blue and green to represent Peacefulness



Red and orange were the colors that had the angry adjectives associated with them. All of the other colors did not make the participants feel angry. These results are similar to results done in other studies researched in this paper.

TABLE 7

Students selected the colors red and orange to represent anger



It is apparent in Table 8 that black and brown are considered to be sad colors by students. This is true across other studies as well. The results in the Lawler and Lawler studies of children indicate that when children were given brown and a yellow crayons and were instructed to color the mood story happy or sad, they responded with brown being used most often to indicate the sad story while the yellow was used to indicate the happy story.

TABLE 8

Students selected the colors brown and black to represent sadness

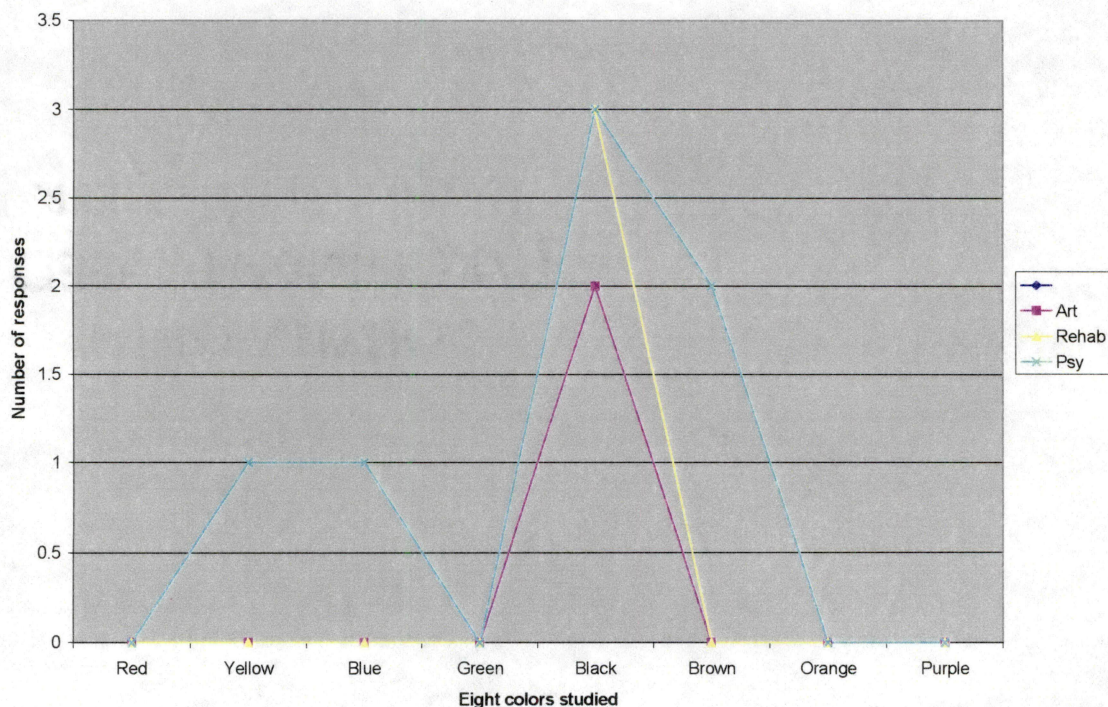
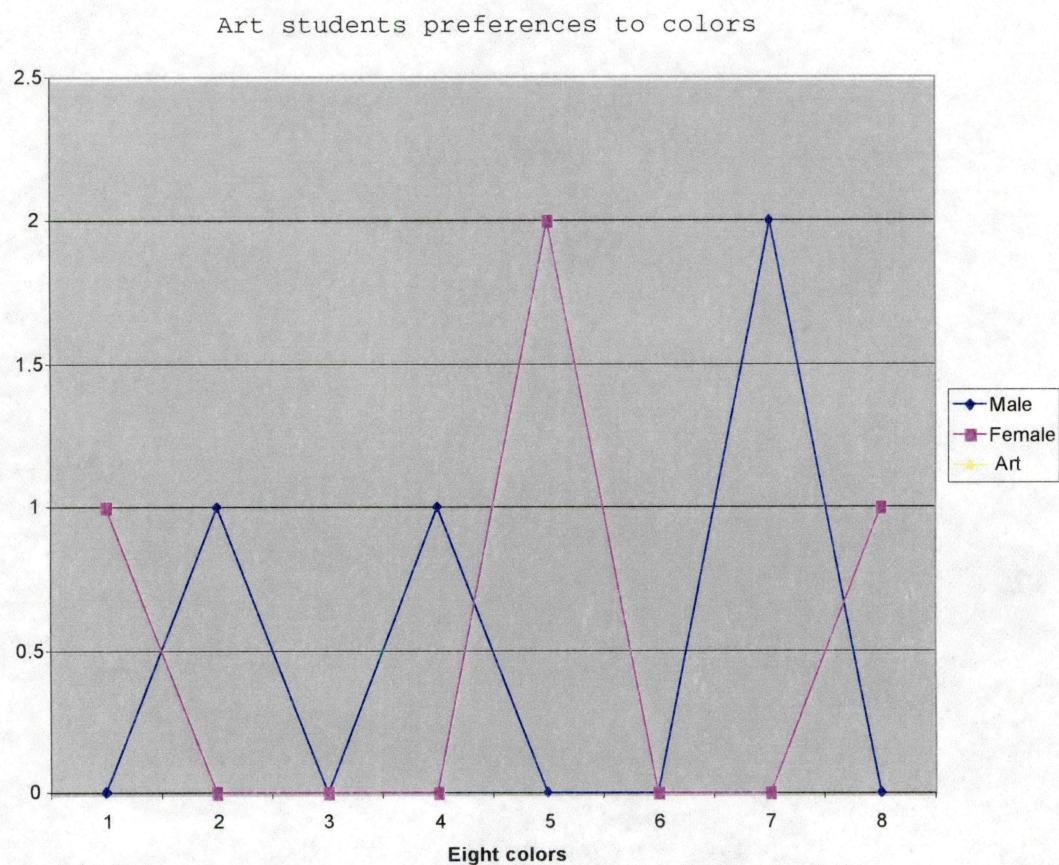


TABLE 9

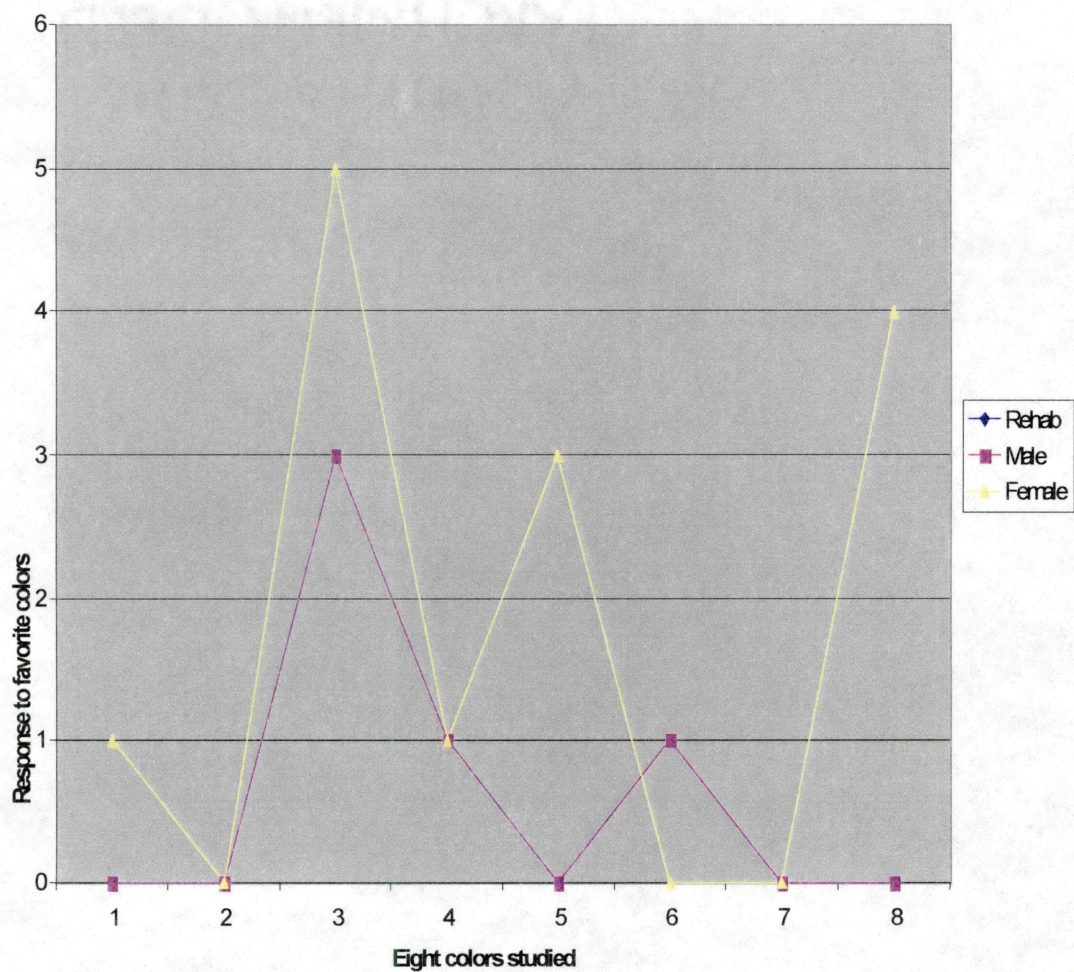


Charts 9,10,11 and 12 indicate favorite colors chosen by the two groups: males and females.

Male participants in the Art class preferred the orange bright color compared to the blue cool colors chosen most often in the other two classes. However most of the females in the art class chose dark colors to represent their preferences to color.

TABLE 10

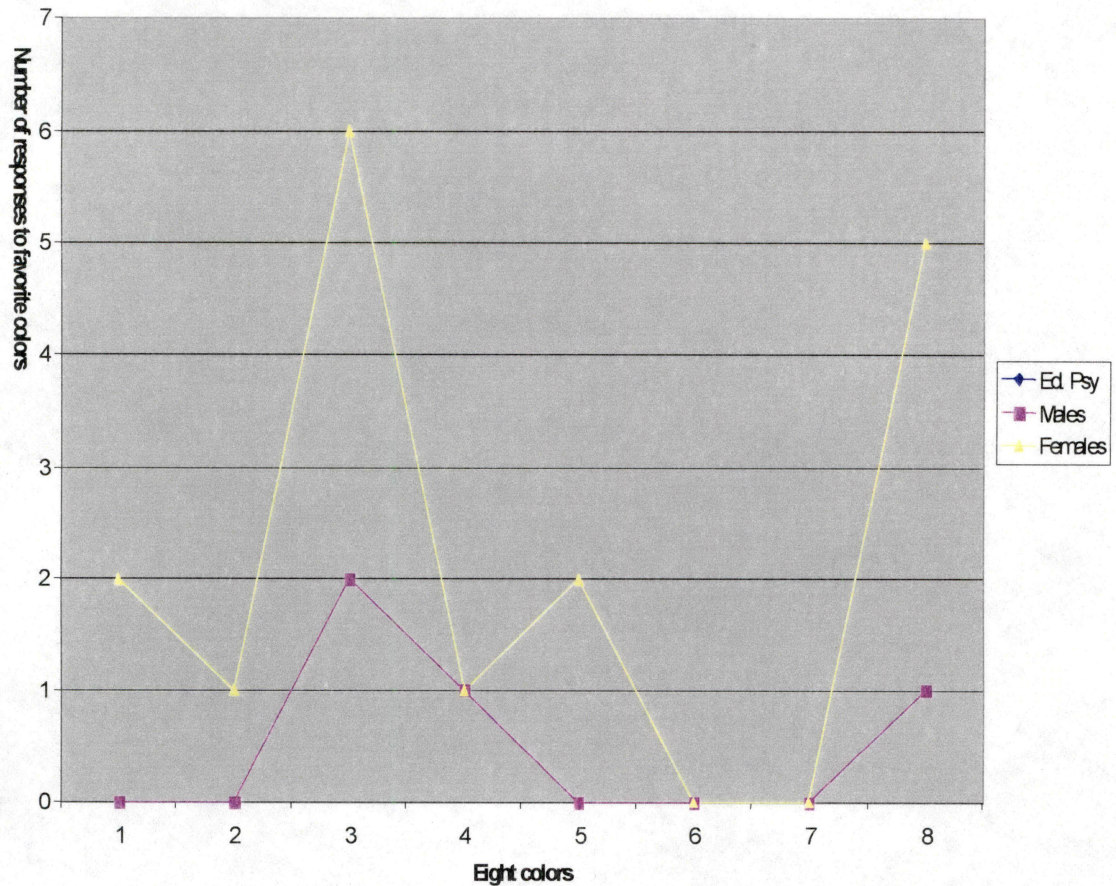
Rehabilitation students preference to colors



The results in chart 10 indicate that the males and the females in the Rehabilitation class usually preferred the colors blue and purple. These two colors are considered cool colors.

TABLE 11

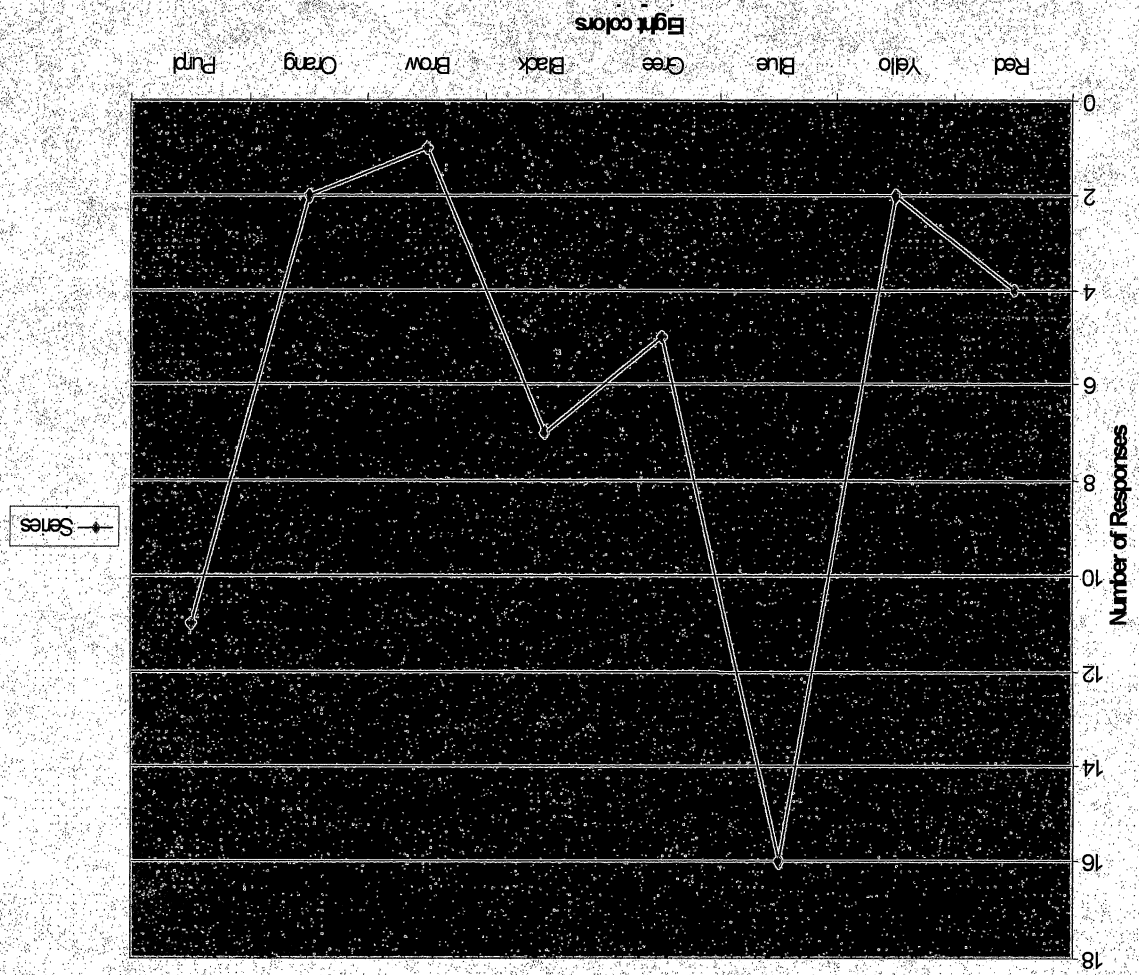
Education Psychology students preferences to colors



The colors blue and purple are considered cool colors. and female students in the Educational Psychology class selected these two colors. Very few students chose the bright colors such as red, yellow, and orange.

TABLE 12

All students preferences to colors



This table shows the result of the favorite color chosen by all classes. The color blue was the favorite choice followed by purple. Both colors are considered cool colors.

CHAPTER FIVE

DISCUSSION OF RESULTS

The results of this study are in agreement with those obtained by Wexner and with those of Boyatzis, Chris & Varghese. These studies results indicated that certain meanings are associated with certain colors. Bourgeois-Bailetti-Cerbus, and Lawler and Lawler identified that children as young as pre-school have positive responses to color. Color will influence the behavior of an individual. Research results suggested that the color red possibly could increase a person's motor skills and functioning. Research results show that a person's motor skills are perceived to be less active when the color blue and green are viewed. Perhaps color can aid individuals with disabilities that have poor motor skills to become more active by using the color red. Color may also be able to help individuals with hyperactive behaviors. The color blue and green is said to be calming and it could have a calming effect on a person with hyperactive behavior. In this study there were positive responses to the eight colors studied. These findings support and agree with previous studies conducted in this area.

Both males and females in all the classes researched in this study preferred blue except one. One can ask if education influences preferences for calming colors? Is there a difference in color choice as one becomes older or does color choice change with the life we experience? Some of the students completed the research in the morning as compared to other students who completed the research in the evening. Perhaps researchers should take the time of day into consideration when doing experiments with the meaning of colors?

The majority of the students chose the dark cool colors of blue, green, purple, and black as favorite colors compared to bright warm colors such as red, yellow and orange. There was no difference in the sex preference of color between bright or dark colors. Both sexes chose the dark color compared to the bright lighter colors. These results indicated that there was no difference between males and females in the preference of color. Most of the students preferred the color blue. In conclusion when one considers preference of light and dark colors the students in this study preferred dark colors, which are often associated with cool and calm.

Studies have indicated that there is a positive emotional response to color. Various colors are associated

with certain meaning. Data indicates that red, yellow, blue, green, black, white, and brown are colors frequently associated with the same emotions or moods. Good, purity, and weak are adjectives or mood-tones that are associated with the color white. Bad, sad, powerful, and strong are adjectives often associated with the color black.

Conclusions can be made that certain colors will have an effect on behavior. Personality, emotions, and behaviors can be influenced by color. Color has influenced the behavior of some artist when painting. Impressionistic artist painting in the impressionistic style had periods where they expressed their emotional feeling by creating paintings in limited colors. The artist would paint an entire painting blue. The artist would use the color blue to express his pensive mood. These periods were considered the artist blue periods when paintings were done in one color to express specific moods. The same is true about the color red. There were periods when artist painted only red paintings to express their mood. This was considered the artist red period.

The studies explored for this paper were done in the 1950' and 1960's. With today's assistive technology persons that have disabilities also need to be studied in the areas of the influence of color on personality and other

variables. Is a person's preference for color influenced by handicapping conditions?

New computer technology will be of assistance to persons with disabilities who would have previously been unable to respond to questionnaires about preference of color. With assistive keyboards persons with limited motor skills can now participate in research. New research findings will help rehabilitation therapists provide effective treatment modalities.

Research also needs to be done in the area of age in terms of person's preference of colors. As people grow older do they prefer different colors? It appears that education, time, age, emotions, disability and health may influence a person's preference of color.

CONCLUSIONS

Research has indicated that there is a positive relationship between color and emotional responses. Researchers have studied the effect of color on behavior. It has been concluded that certain colors have an emotional effect on an individual. Color affects people without their even being aware of its influence. This research was done to explore the following question. Is there a positive relationship between certain colors and emotional responses? This study had similar findings with other studies of color, which had different methodologies and methods.

Color can be used in rehabilitation therapies as a means to recognize a person's moods or personality as well as to increase communications and the effectiveness of treatment. Rehabilitation therapists represent the disciplines of art therapy, dance therapy, music therapy, occupational therapy, recreation therapy, rehabilitation counseling, speech therapy and physical therapy. A therapist in the discipline of art therapy can utilize the dimensions of color and their emotional responses in the treatment of clients who have a difficult time expressing feelings too difficult to discuss. Color exploration may assist in identifying feelings and resistance to emotional expression and growth.

Color has a definite effect on behavior. The color red and other warm colors such as yellow and orange have an arousing and exciting effect on behavior. Cool colors such as green and blue cause a person to feel rested and calm.

These effects have been tested in various studies to indicate the positive connection between color and behavior.

Color will influence behaviors. Using the color red in the treatment area or program may enhance the rehabilitation activities of a client with poor mobility skills. The color blue may be used to calm very active persons who are undergoing psychiatric treatment. Research done by Nakshian (1964) suggests that certain colors could have an effect on a person's behavior and responses to activities. Nakshian's general viewpoint states that the warm colors such as red and, other warm colors, such as orange and yellow are positive. The color red causes an arousing or exciting effect and can speed up and motivate motor reactions and induce bright moods. In contrast, the cool colors blue and green have a restful effect, on people's behaviors. The studies suggest that the restful effect of blue and green can impair the efficiency of performing activities requiring judgment, precision, and relatively fine psychomotor coordination.

Color painting has been used in rehabilitation

therapies in the treatment of individuals that are medically, educationally, socially and/or psychologically impaired. According to some rehabilitation art therapists color has a positive influence in art therapy, like symbols, that have been created during the process of psychotherapy. These symbols serve psychological functions such as giving form and substance to previously unclear experiences. Art therapy has made what was unconscious to an individual apparent to their therapist by linking thoughts, emotions, and perception.

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