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COLOR EFFECT OF TEACHER ATTIRE ON THE ATTITUDES OF
EDUCABLE MENTALLY RETARDED PUPILS



A Thesis
Presented to
the Graduate Faculty
Central Washington State College



In Partial Fulfillment
of the Requirements for the Degree
Master of Education



by
Herman B. Sowell
July, 1969

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CHAPTER I

INTRODUCTION

The literature abounds with the historical aspects of color symbolism and its effects. The mystics, the amulet wearers, the aural healers and the eager chromopaths all believed that color was involved with the supernatural and that color had significance beyond sensuous delight. The biologists have demonstrated unquestionably that color does have a physical effect upon the human organism. The "color psychologists" working in industrial complexes are studying the effects of color on the worker.

This study was concerned with the effect of color as it pertained to pupil attitudes in the school environment.

The cultivation of a positive attitude toward school has long been held to be an integral part of sound motivation for school learning. In the field of special education the modification of attitudes of the educable mentally retarded pupil has been one of the more important objectives in the programs for the retarded.

Sherif, Muzafer, and Cantril (1945) state that attitudes imply a subject-object relationship and that attitudes are related to definite stimuli or stimulus situations.

Young (1967) asserts that attitudes are dispositions of primary affective arousals.

Theorizing that clothing behavior is a neglected part of educational psychology, Hartman (1949) affirms that it is just as significant as feeding behavior, motor behavior, and other behaviors that occupy the attention of the student of human behavior.

Birren (1961) in his comprehensive study of color concluded that colors influence and affect living things.

Teacher clothing color being a stimulus component of a mobile stimulus object would then play an integral part in affective arousals that lead to attitude dispositions. The dispositions are those that are directed toward the school environment.

Purpose

It was the purpose of this investigation to study the effects of teacher clothing color, specifically the color red and the color black, on attitudes of elementary age mentally retarded pupils. The attitudes studied were the attitudes directed toward the generalized concept of "school" as manifested by the sum of specific concepts.

Terms Used in the Study

For the purposes of this study the following terms are defined.

Attitude

The predisposition to act in a negative or positive direction toward a stimulus object.

Color

The name of a hue as identified in the Maerz and Paul Dictionary of Color (1951).

Red

A hue identified by coordinates L6 Plate 1 in the Dictionary of Color.

Black

A hue identified by coordinates C7 Plate 48 in the Dictionary of Color.

Hypotheses

(1) The null hypothesis of no significant difference in pupil attitude as a result of teacher wearing red attire under stipulated conditions is postulated.

(2) The null hypothesis of no significant difference in pupil attitude as a result of teacher wearing black under stipulated conditions is postulated.

(3) The null hypothesis of no significant difference in pupil attitude as a result of teacher exchanging red for black attire and wearing for a stipulated period is postulated.

(4) The null hypothesis of no significant difference

in pupil attitude as a result of teacher exchanging black for red attire and wearing for a stipulated period is postulated.

Related Research

The general problem of relationships between and among color responses has been studied in many contexts. Norman and Scott (1952) give an excellent review of studies dealing with color preferences, form-color abstractions, and the effects of color on physiological functions of color. Nakshian (1956) relates studies alleging a vast body of assumptions both popularly and scientifically held concerning the effects of color environment on behavior. A review of the literature disclosed little in relation to the effect of color on attitudinal dimensions of the affective domain. The general problem of the relationship between color and behavior, however, was quite extensive.

Birren (1950) in his work on color states that historical records of color show little interest in the physical nature or its abstract beauty but rather in a symbolism that attempted to resolve the strange workings of creation and give to it some personal or human meaning. He further states that although Medical Science may shun the idea of the use of color for any direct biological action upon the human body it does admit color influence in the realm of the psychic. He asserts that the role of

color in all forms of life is too evident to be either denied or ignored.

Burnham (1963) states:

The aesthetic significance of color is generally recognized in everyday life, but many scientists are skeptical regarding the capacity of color stimuli, as such, to evoke genuine affective response like excitement, depression, pleasure, or other emotions, moods and feelings (p. 206).

Basic to this study are the theories of affect as projected by Schachtel (1943) and Goldstein (1942). Schachtel's premise is to the effect that the experience of affect and the experience of color are quite comparable and that one may examine the less obvious of the two, affect, by the response to the more obvious, color. He puts forth the example of an individual entering a room containing two designs. On one wall is a large blob of color. On the opposite wall is a large design in black and white. The blob of color is immediately perceived without conscious attention. The individual is aware only of color. The black and white design requires direct attention before it can be perceived. The experience of affect is passive. This theory concerning the nature and relation of the response to color strongly suggests that much can be learned from the response to color by the individual, especially concerning the relation of the external environment to the affective drives of the individual. He further contends that colors give life, vividness, warmth and many other

feeling qualities to the senses. The different colors differ in the quality and intensity of their affective tone.

Fortier (1953) in a study supporting Schachtel's theory cautions that there need not be affective reaction to color. He contends that it is the response to color which is important.

In a reply to Fortier's support of Schachtel's theory of the correspondence between color and effect Keehn (1954) questions Fortier's cited experimental evidence. He concludes that (a) the evidence from the Rorschach test, (b) the evidence from the Mosaic Test, and (c) the evidence from the examination of finger paintings to support Fortier's agreement with Schachtel's theory must be regarded as irrelevant.

On the basis of his empirical findings, Goldstein (1943) formulated a theory concerning the differential effect of red and green "environments" on Behavior. Working with patients with organic pathology he found that differently colored backgrounds produced different differential effects. Goldstein postulated that red causes an increase in attraction and an increase in susceptibility to the influence of external stimuli. Also he postulated that red would induce a state of "excitation" and "stimulation" on an emotional level. From his findings he takes the position that red will have a facilitating effect on behavior. Where intellectual activity is concerned red

is effective in stimulating ideas. Goldstein summarizes his position by stating that red is inciting to activity and favorable for emotionally determined actions. Also, that red may be suited to produce the emotional background out of which ideas and actions will emerge. Goldstein further states that an individual under the influence of various colors differs in his entire attitude toward the world.

Studies have been made dealing with the emotional aspects of color in mood-tones, responses to colors, and reactions to tests and work environment involving color.

Wexler (1954) using students in a General Psychology class assessed the degree to which colors were associated with mood-tones. Sets of grouped adjectives and synonyms judged as descriptive of mood-tones were paired to color cards that the subject felt best reflected the mood-tone of the adjective. It was found that for each mood-tone certain colors were selected to go with mood-tones significantly more often than with remaining colors. The implication of the study was that colors have affective value. Murray and Deabler (1957) in their study of colors and mood-tones involving Purdue students, hospital patients and Nursing assistants found that certain colors have a general affective meaning for all groups. Red and black were the colors most consistently associated with certain mood-tones. The data strongly suggests that people associate color and

mood-tone in their minds.

Drechsler (1960) made a study testing hypotheses that colored stimuli elicit more emotional responses than did gray. The results showed that different colors did have different quantitative effects in this regard. More emotional responses were observed under red and green colors than under gray.

Hill (1964) in a study using 30 male schizophrenics to investigate the effects of color as it reflects the affective or cognitive process concluded that high stimulus strength color cards reflected more affect and less ability to perform cognitive tasks.

In his investigation of the possible effects of using colored stimulus materials in such fantasy tests as the Make a Picture Story and the Thematic Apperception Test, Brackbill (1951) used 50 subjects diagnosed as psychoneurotic and 50 subjects supposedly normal. He found that the mood of stories told by the subjects to colored cards to be a more accurate index of the subject's affective tone than were the stories told to black and white cards. The use of color had the effect of arousing lighter or happier associations.

The clinical psychologists base their assumptions of color effects, for the most part, on the Rorschach responses. Goodman (1950) using a psychogalvanic activity with 50 male subjects concluded that the assumption that color on

the Rorschach is an emotional stimulus and is reacted to is not valid. He found that the individual cards have different affective value for different individuals, and that no single card is consistently a more effective stimulus than any other.

Siipola (1949) in her study on the influence of color on reactions to ink blots credits the affective reactions such as associative blocking and behavior disorganization to the theory that color blots are affect laden because of an intrinsic, mysterious affinity between color and affect. Drechsler (1960) makes the observation that attempts to test the validity of color-affect relationships have suffered from dependence on the Rorschach.

Guilford (1934) in an exhaustive study of affective values of colors concluded that in spite of the differences in experimenters, color material, the age, the sex or the race, the order of preference of the different hues is a rather uniform phenomena. He stoutly maintains the results of his study show that color preference is not a matter of convention. Cheskin (1947) relates that most experiences with color are only on a level of sensation. He says that most people are not conscious of color effect and have no awareness of its influence. He further states that although the sensation does not reach the conscious mind, it nevertheless creates an emotional response.

In the area of problems dealing with the influence

of color "environment" upon performances involving intellectual and psychomotor functions Pressy (1921) Pierce and Weinland (1934) have reported studies. Pressy investigated the question of whether color "environment" has effect upon mental and motor efficiency. Using color "environment" produced by blue, green and red colored lights he measured activities such as: speed of finger tapping, rate of verbal association, speed and accuracy of multiplication, immediate memory for nonsense syllables and judgments of the pleasantness of touch substances. The results indicated that hue had no differential effects upon any of the behaviors measured. Pierce and Weinland using subjects operating a Bogardus factory test machine in a work room under white and colored lights found no significant differences in performance.

The above two studies did not confirm some of the traditional notions about the effects of colors. A conclusion might be made that some special influences attributed to particular colors are responses suggested by tradition.

More directly related to the present investigation of the relationship between color and behavior are those studies involving specific hues in the context of color environment. The hue, red, is of specific concern.

Ellis (1900) in his work on the psychology of red observes:

Among all colors, the most poignantly emotional tone undoubtedly belongs to red (p. 365).

In all parts of the world red is symbolical of joyous emotion. Other colors are symbolical of mourning but never red (p. 365).

Ellis also holds that red is the color that fascinates attention earliest, attracts attention most vividly and gives us the most emotional shock.

Schachtel (1943) in his discussion of the affective significance of red finds it striking, explosive and exciting. To Prescott (1942) red is a color which commands attention and is a color with many meanings. Wilson (1966) using electrical dermal measuring techniques found red to be more arousing than green. Murray (1957) sees red as exciting, cheerful and powerful.

Gerard (1957) has painstakingly reviewed the area of color and its psychophysiological influences. Testing the reactions of the whole organism with advanced techniques he sought to determine if the response to color is differential. Among his findings he found that affective responses based on personal experiences and feelings of the subjects indicated that red was disturbing to anxious subjects. He found red to be more related to excitation in general.

In contrast to the studies devoted to ramifications of the color red, the color black has received considerably less attention. Two studies will be related here. Winch (1909) in her study with school age children found black to be the least preferred color. Cheskin (1947) finds black to be depressing and having no attraction power.

In summarizing the related literature the evidence lends support to the theory that color has affective implications. Red was the color found most often to have exciting and stimulating effects on behavior. Black was reported as having a negative, depressing, despondent effect. A conclusion can be made that color "environment" plays an important part in the affective domain of the organism.

CHAPTER II

METHOD

Subjects

The subjects for this investigation were selected from elementary special education classes for the educable mentally retarded pupil of the Tacoma Public Schools. The pupils and teachers were components of three classes selected on the basis of similarity of population, teacher, and classroom setting. The sample consisted of three female teachers and 35 pupils of which 18 were girls and 17 were boys. One class of ten pupils and their teacher served as a control group. Two classes of pupils and their teachers served as the experimental groups. One of the experimental classes consisted of 12 pupils, the other class consisted of 13 pupils. All classes were approximately equally divided as to sex.

The age range of the pupils was from 121 months to 161 months; the IQ range was from 53 to 85. The distribution was as follows. The control group, group A, had a mean age of 11-1 years and a mean IQ of 74. Experimental class, group B, had a mean age of 11-6 years and a mean IQ of 69. Experimental class, group C, had a mean age of 11-9 years and a mean IQ of 76.

Apparatus

The apparatus consisted of red dress smocks and black dress smocks. The smocks were worn as outer garments.

Instruments

A Semantic Differential (Osgood, Tuci, and Tannenbaum, 1957) was developed using evaluative scales. The instrument consisted of five concepts to be rated on five seven point scales. The concepts to be rated were school oriented concepts within the school environment. The concepts were (1) Principal (2) Teacher (3) Playground (4) School (5) Myself. The evaluative scales were (1) Sweet-Sour (2) Clean-Dirty (3) Happy-Sad (4) Beautiful-Ugly (5) Honest-Dishonest. This design produces a five by five matrix giving 25 responses for each individual school concept or 125 responses for the generalized concept of "school."

The Semantic Differential was selected because it is extremely flexible, the reading and writing requirements are minimal, and the instructions are simple.

Husek and Wittrock (1962) found the Semantic Differential to be particularly appropriate and an increasingly popular one for the measurement of attitudes. Greenberg, Gerver, Chall and Davidson (1965) in their work with elementary age children from deprived areas found the Semantic Differential to be suitable for attitude measurement. They further state that the instrument has a well formulated

theoretical rationale, it can be used with groups and scored objectively.

The stability of the Semantic Differential was examined by DiVesta and DiVesta (1966) under delayed and immediate retest conditions with subjects in grades two through seven. Their findings clearly suggest that over brief periods the Semantic Differential is a reliable instrument when used with children.

Rybolt (1967) studying the usefulness of the Semantic Differential with classes of educable retardates found that retesting the classes at varying time intervals did not evidence significant difference in response consistency. Kerlinger (1964) found the Semantic Differential to be a sufficiently reliable and valid instrument.

Osgood (1957) in his discussion of the validity of the Semantic Differential states that throughout the work with the semantic differential the authors have found no reason to question the validity of the instrument on the basis of its correspondence with the results to be expected from common sense.

Procedure

Three classes were selected for the investigation. The selection was made on the basis of class similarities. A random selection between the three classes was made to determine the control group and the experimental groups.

The control group was labeled group A, the experimental groups were labeled group B and group C.

The pupils in the two groups selected as the experimental groups were all tested to see if they could identify a red card of the same hue as the red smock to be used in the investigation. No color-blindness test was administered. No test was made to see if black could be identified. All the pupils identified the color of the card to be red. The experimental and control subjects were given an introduction to the measuring instrument following the instructions of Osgood (1957). They were carefully instructed in the method of marking. All questions were answered that pertained to the technique of using the instrument. No indication was given to the students that they were the subjects of an experiment. They were told that they would be rating some of their feelings about school life. The introduction to the rating activity was given prior to the day of initial testing.

The teachers of the control group and experimental groups were told that they were participating in an experiment (with their approval) but they were not told the purpose of the investigation. The introduction to the rating activity that was given prior to the day of the initial test was briefly reviewed on the testing day.

The three groups were given a pretest of the Semantic Differential. On the day following pre-testing the teacher

with experimental group B started wearing a red smock. The smock was worn continuously for ten successive school days. It was worn all of the school day during all activities. The teacher of experimental group C started wearing a black smock. The smock was worn continuously for ten successive school days. It was worn all day during all activities. The teacher of the control group A had no constraints on wearing attire.

At the conclusion of the ten day period a posttest using the instrument of the pretest was administered. The teacher of group B now exchanged her red smock for a black smock and wore it for ten successive school days, wearing it all day. The teacher of group C exchanged her black smock for a red one and wore it all day for ten successive school days. At the conclusion of this ten day period groups B and C were given a second posttest, Posttest II, using the same instrument used in the pretest and posttest. Posttest II was not given to group A. The second phase of this experiment was to test the effect of color transfer of groups B and C.

CHAPTER III

RESULTS

An analysis of variance of attitude scale scores for groups A, B, and C did not yield F scores that were significant at the .05 level of significance. See Tables 1, 2, and 3.

Analysis of variance of pretest attitude scale scores of groups A, B, and C did not yield F scores significant at the .05 level of significance. See Table 4.

The analysis of variance for the posttest attitude scale scores of groups A, B, and C did not yield F scores significant at the .05 level of significance. See Table 5.

An analysis of variance of post posttest attitude scale scores for groups B and C was significant at the .05 level of significance. See Table 6.

Table 7 presents the mean scores and standard deviations.

In essence, as can be seen, a two way analysis of variance without accounting for the interaction term was performed by the investigator. The decision to perform two one-way analyses of variance instead of performing one two-way analysis of variance was based in part on the

lack of apparent meaning of a resultant interaction term as well as lack of appropriate statistical analysis program.

On the basis of the data results, the null hypotheses of no significant differences in attitudes as postulated in null hypotheses 1, 2, 3, and 4 could not be rejected.

TABLE 1
Analysis of Variance of Attitude Scale
Scores for Group A

Source	df	SS	MS	F
Within	1	162.45	162.45	.0926
Between	18	31556.50	1753.14	
Total	19	31718.95		

F .05 = 4.41

TABLE 2
Analysis of Variance of Attitude Scale
Scores for Group B

Source	df	SS	MS	F
Within	2	1328.17	664.08	2.137
Between	33	10256.58	310.81	
Total	35	11584.75		

F .05 = 3.30

TABLE 3
Analysis of Variance of Attitude Scale
Scores for Group C

Source	df	SS	MS	F
Within	2	150.15	75.076	.149
Between	36	18049.07	501.36	
Total	38	18199.73		

F .05 = 3.26

TABLE 4
Analysis of Variance of Pretest Attitude
Scale Scores Between Groups A-B-C

Source	df	SS	MS	F
Within	2	3719.33	1859.66	2.49
Between	32	23884.96	746.40	
Total	34	27604.29		

F .05 = 3.30

TABLE 5
Analysis of Variance of Posttest Attitude
Scale Scores Between Groups A-B-C

Source	df	SS	MS	F
Within	2	1438.09	719.05	0.8794
Between	32	26163.50	817.61	
Total	34	27601.60		

F .05 = 3.30

TABLE 6
 Analysis of Variance of Post Posttest Attitude
 Scale Scores Between Groups B and C

Source	df	SS	MS	F
Within	1	3640.47	3640.47	8.5320*
Between	23	9813.69	426.68	
Total	24	13454.16		

F .05 = 4.28

*p. <.05

TABLE 7

Table of Mean Scores and Standard Deviations

Group	A			B			C		
	N	\bar{X}	SD	N	\bar{X}	SD	N	\bar{X}	SD
Pretest	10	113.2	44	12	128.2	11	13	138.8	20
Posttest	10	118.9	39	12	127.6	20	13	134.8	26
Post Posttest	10	-	-	12	115.0	21	13	139.2	21

CHAPTER IV

DISCUSSION

The results of this study show that the color of teacher attire has no significant effect on the attitudes of educable retarded pupils toward school.

The analysis of variance of the post posttest was significant, but the results of this one test were not sufficient to affect results of the other six tests.

The results and the experiment bear discussion from two viewpoints. These viewpoints are directed toward the study hypothesis and the study methodology.

The present study did not produce the predicted changes in attitude as indicated in related studies. These findings can be discussed as they relate to a time factor. In the related studies of affect, the time interval was relatively brief. The present study was accomplished over an extended period of time. It is conceivable that affective measurements are directly related to time.

Drechsler's (1960) intrusion hypothesis also merits consideration. He hypothesized that color intrudes on the perceiving organism in such a way that affective responses are disrupted until the stimulus is assimilated. The time

element of the present study was possibly of sufficient duration to negate changes due to assimilation.

Another aspect to consider may be found in two significant studies by Flanders, Morrison and Brode (1968) in which they found that pupils displayed a loss in positive attitude toward school and schoolwork during the school year. Their results were independent of IQ, school grades assigned by teachers, or socioeconomic status. Their conclusion was that pupil attitudes reflected teacher behavior.

The present study has implications for the student of the educable retarded pupil. It was found that the attitudes of the pupils toward school were positive on the pretest or before the experiment. On the measuring instrument a high to low score with a neutral score is possible. The high score indicated a positive score. All groups on the pretest obtained a mean score higher than the possible mean score of 100. This could imply that initial positive scores will preclude more positive scores due to a change in stimulus factors. These findings are in opposition to the generally held opinion that educable retarded pupils have a negative attitude toward school.

The methodology of this study has implications for the investigation's results. The methodology was not, perhaps, of a nature and format to adequately test the hypothesis. The design was of a low level of sophistication. More definitive statistical information would have been

provided through the use of an analysis of variance or covariance.

Research Implications

(1) A study of color effects with the retarded should be made using a more comprehensive measuring instrument.

(2) The results of this study indicate that studies of color effect on attitude might involve other environmental factors such as classroom wall colors and the color of floor coverings.

(3) If pupil attitudes reflect teacher behavior as reported by Flanders (1968) a study is needed on the effects of color environments on teacher attitudes, primarily on the attitudes toward pupils.

CHAPTER V

SUMMARY

The present investigation was concerned with the relationship of teacher clothing color with educable retarded pupils' attitude toward school.

Thirty-five elementary age pupils comprising three elementary special education classes were divided into one control class and two experimental classes. They were pretested with a modified form of a semantic differential instrument using five scales to measure each of five school concepts.

After the pretest the teacher of one experimental class wore a red smock for ten days and the teacher of the other experimental group wore a black smock for ten days. All pupils were then posttested with the pretest instrument. The teachers of the experimental groups then exchanged smock colors and wore them for another ten days. Both experimental groups then were given a post posttest.

The results obtained were not significant. The indications from related research that the color of attire would produce attitudinal changes in a negative or positive direction were not upheld.

Recommendations were made for future study.

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