

YOUNG CHILDREN'S COLOR
PREFERENCES

By

JEANETTE EVANS EASTERLING
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Thesis Approved:

Josephine Zoller

Thesis Adviser
James Hester

Rick Stinnatt

D. D. Durham

Dean of the Graduate College

891302

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CHAPTER I

THE PROBLEM

Children's lives are influenced to a greater extent today than ever before by the wide and varied use of color. The majority of the investigations of children's color preferences were completed in the 1930's (Collier, 1956). This study was concerned with the color preferences of young children and how these preferences were related to age, sex, and their parents' color preferences. This study also examined young children's color preferences as influenced by toys and clothing items which were familiar to the child in his everyday life.

The Need

There is evidence that individuals tend to have strong positive and negative feelings about color (Sargent, 1923; Birren, 1955). Therefore, determining the color preferences of people on a basis of the effect of a given color on the emotions is most difficult to obtain (Sargent, 1923). These emotional responses to color are influenced by past experiences (Staples and Walton, 1933). A child's attitude toward a color may be affected if he has seen it worn by a person whom he especially likes or dislikes.

Colors get, it is thought, their value for feeling either through some connection with emotionally toned objects like vegetation, light, the sky, blood, darkness and fire or else through some relation to emotional situations, like mourning or danger, which they have come to symbolize (Sargent, 1923, p. 53).

Since the interests and preferences of children may be subject to change, children's color preferences may need to be reevaluated from time to time (Bou and Lopez, 1953). Some of the factors which have been important in recent years in forming and modifying individuals' perceptions of, and concern for, color preferences, are: mobility of our population, more and better means of mass communication, increased urbanization and the influence of automation in our present day society (Collier, 1956). Abbott (1947) wrote:

That color has definite effects on the minds and bodies of men and some animals and influences the growth of some plant life is an established fact. Man is still groping for the explanations of some of these effects, but in the meantime he is using the power of color as he finds it to accomplish certain ends. (p. 129)

The literature revealed that research is needed to measure the more tangible effects of color. Implications for further research concerning young children's color preferences are apparent for the following reasons: (1) the available research is not current; (2) young children's opportunity for color choices may have changed over the years; (3) teachers and parents of young children could profit from current findings as they plan, select and buy for young children.

The Purpose

The major purpose of this study was to determine the color preferences of young children and to ascertain if children's color preferences are related to their choice of color for toys, clothes and their parents' color preferences. Specific purposes were to determine children's expressed color preferences according to age and sex. A related purpose was to determine consistency of children's color preferences by a test-retest.

Hypotheses

The following hypotheses were examined:

- (1) There is no difference in the color preferences of three-, four-, and five-year-olds classified according to sex.
- (2) There is no difference in the color preferences of boys and girls classified according to age.
- (3) There is no difference in the color preferences of girls classified according to age.
- (4) There is no difference in the color preferences of boys classified according to age.
- (5) There is no relationship between the color preferences of young children and their choice of color for clothes and toys analyzed according to age and sex.
- (6) There is no difference between the color preferences of young children and the color pref-

erences of their parents.

- (7) There is no difference between young children's first preferences for color for a test and retest (within a four weeks' period of time) analyzed according to age and sex.
- (8) There is no difference between young children's first preferences for color of clothing for a test and retest (within a four weeks' period of time) analyzed according to age and sex.
- (9) There is no difference between young children's first preferences for color of toys for a test and retest (within a four weeks' period of time) analyzed according to age and sex.

Definition of Terms

The following definitions are presented to aid the reader.

Color

Webster's Dictionary (1965) defined color as "a phenomenon of light (as red, brown, pink, gray) or visual perception that enables one to differentiate otherwise identical objects" (p. 163). In this study an extended meaning of color will be used. This definition includes the visual sensation, distinct from form and embraces such terms as "pigment", "colorant" and "coloring matter". The three

properties of color significant to this investigation are hue, value and intensity or chroma (Schwartz, 1960).

Hue

There are three major qualities of color which may be used to describe any given color. These terms are hue, value, and intensity. Hue (color) refers to the chromatic quality of a color which we indicate by its name (such as blue). In order to change the hue of a color, another color is mixed with it (Sargent, 1923).

Value

Value (brightness) refers to the relation of a color to black and white. In order to change the value of a color, it is mixed with something lighter or darker than itself (Sargent, 1923).

Intensity

Intensity (chroma or saturation) refers to the color strength of a hue as compared with a colorless gray. This comparison is being made when a color is said to be a brilliant blue or a dull blue. In order to change the intensity of a color, it is mixed with something to make it grayer than it is. The intensity may be reduced by adding some of the complement to it. The intensity may also be reduced by mixing the color with a neutral gray which is neither darker

nor lighter than itself--in this case the intensity is changed without changing the value or hue (Sargent, 1923).

Munsell (1946) further illustrates the meanings of the color terms and how these qualities interact:

Every color sensation unites three distinct qualities, defined as HUE, VALUE, AND CHROMA /intensity/. One quality may be varied without disturbing the other. Thus, a color may be weakened or strengthened in Chroma without changing its Value or Hue. Or its Hue may be modified without changing its Value or Chroma. Finally, its Value may be changed without affecting its Hue or Chroma. (p. 14)

Complementary Colors

A complementary color is one of a pair of contrasting colors that produce a neutral color when combined in suitable proportions (Webster's Dictionary, 1965).

Primary Colors

The six colors to be used for the purposes of this investigation are the primary and secondary colors. The primary colors (red, blue and yellow) are those colors that cannot be produced from other colors (Webster's Dictionary, 1965).

Secondary Colors

The secondary colors (violet, green and orange) are those colors that may be formed by mixing two primary colors in equal or equivalent quantities (Webster's Dictionary, 1965).

Shades and Tints

Two color terms that are related to this study are shades and tints. Webster's Dictionary (1965) defined a shade as being a variation of a color produced by adding black to it. A tint is a color variation produced by adding white to it.

Color Spectrum

Another color term utilized in this study is that of color spectrum. The spectrum refers to the "series of images formed when a beam of radiant energy is subjected to dispersion and brought to focus so that the component waves are arranged in the order of their wavelengths (Webster's Dictionary, 1965). The colors are arranged from red, the longest wave length, to violet, the shortest wave length. The color spectrum may be evidenced when viewing a rainbow or when looking at the colors that are dispersed by a prism held in the sunlight.

Color Preference

For the purposes of this study, the term color preference may be defined. Woodworth (1938) defined this term as "the color which was selected first from the sample of possible choices presented to a person" (p. 381).

Rank Order

Rank order of color preference, for the purpose of this study, is synonymous with "descending order of preference" (Collier, 1956). According to Webster's Dictionary (1965) the term rank means to have a position in relation to others and order is defined as putting things into their proper places in relation to each other.

CHAPTER II

RELATED LITERATURE

Age and Color Preferences

Jastrow (1897) reported a relationship between age and color preferences of 4500 individuals from six to seventy years of age. His work was connected with the Psychological Laboratory of the World's Columbian Exposition held in Chicago. His findings showed blue to be most preferred by slightly more than a fourth of the total individuals tested, with red following as second in preference. He also found that the over-all popularity for blue tended to increase with age.

Katz and Breed (1922) tested the color preferences of 2,500 subjects to determine if color preferences changed with increasing age. The summary of their findings indicated:

1. At every age from 5-15 blue was most frequently preferred. Of approximately 2500 pupils tested, from K-college, 47 percent found blue the most pleasing of the six colors. Green was a distant second, red close third, violet and yellow occupied the next positions and orange proved the least pleasing of the six.
2. There was a general distinct rise in the preference values of green, blue and violet, the colors of the short wave length (cool colors) and a corresponding decline in the values of red, orange, and yellow, the colors of the

long wave length (warm colors), as the children advanced in age and grade. (p. 265)

Riker (1925) tested 1,199 children in first through eighth grades in Wisconsin and found a change in color preferences with increased age. Blue was consistently most preferred but green gained in esteem with age. Garth (1922), Garth, Ikeda and Langdon (1931), and Garth and Collado (1941) studied color preferences of full-blood Indians, Japanese and Filipino children. The results of each of these studies verify the finding that color preferences change with increased age.

Garth and Porter (1934) tested color preferences of 1,032 young children from one to seven years of age, using the six spectral colors plus white and found white to be least liked with yellow the least preferred color. Red was the most preferred color at all ages but was declining by the first grade. Bou and Lopez (1953), in testing 2,496 Puerto Rican children in grades 2, 4 and 6, found that blue gained in esteem with increased age and orange was least preferred for all three age groups.

Gale (1933) studied children's color preferences and tested third through eighth grade children in four Chicago elementary schools. She found a definite preference for warm colors with orange selected for first choice. Her results also indicated no change in color preferences in relation to age. Gale's findings are in conflict with results of most other studies. More recently Collier (1956) studied the color preferences of 591 children in the first,

third, fifth and seventh grades in New York. He tested the children for preference for the six spectral colors plus gray and white. Results of his study indicated that yellow was most preferred and gray least preferred at all age levels. The final descending order of preference for the eight colors tested was yellow, orange, red, blue, violet, white, green and gray.

Sex and Color Preferences

Jastrow's study (1897) concerning sex differences in color preferences of adults yielded considerable differences. Males overwhelmingly preferred blue, whereas women's first choice was red with blue a very close second. Other relatively marked color preferences of men were the colors related to blue (blue violet and violet) and other preferences of women were lighter red (or pink), and, to a lesser extent, green and yellow. He also found that men confined their choices to relatively fewer colors than did women. Winch (1909) and Dashiell (1917) found that most preferred colors for both sexes was the same but that there was some variability in ranking some of the other colors.

Observable sex differences in color preferences of children from various cultures was found by Garth (1924), Mercer (1925), Hurlock (1927), Gesche (1927), Garth and Collado (1941), and Garth, Ikeda and Langdon (1931). The major differences were in the ranking of yellow, green, orange and violet, but none were significant. There is no

consistent order of color preferences for either sex, but this may be attributed to the method of testing, both the number of colors and the colors used and the different cultures of the subjects.

Eysenck (1941) did an extensive study on the color preferences of 15 men and 15 women and found high agreement between the sexes. The average order of color preferences was blue, red, green, violet, orange and yellow. He found, however, that men slightly preferred orange over yellow and women preferred yellow over orange. The average orders given by both sexes were identical, the correlation between them being .95. The results of data from 17 investigations that he reviewed were combined to determine how high the agreement was between sexes for color preferences. This review indicated that the correlation between the order of color preferences for men and for women was .95, identical to the results from his own study.

Socio-Economic Status and Color Preferences

Winch (1909) studied 2000 school children's color preferences from seven to fifteen years of age and compared children who lived in an expensive geographical area, high socio-economic group, with children who lived in a middle income area, middle socio-economic group, and with those children who lived in the business section of London, low socio-economic group. He found some evidence that the

development of a child's color preference depends on socio-economic status. He found that the children in the high and medium socio-economic schools tested showed very similar results with their order of color preference. In the early grades they preferred blue first, then red, yellow, green, white and black. When children in higher grades were tested, it was found that the order of preference changed to blue, red, white, green, yellow and black, but later the children chose green over white. In testing children in low socio-economic schools, some differences were found. In the early grades the order of color preferences was the same as that of the early grades of the middle and upper socio-economic schools. Although black rated last, it rated higher with more children in the low socio-economic schools than it did in the middle and upper socio-economic schools. However, when the children in the higher grades were tested, the order of preference changed to blue, red, green, white, yellow and black and stayed at that order of preference for all higher grades.

Michaels (1924) tested 535 New York City boys, six to fifteen years of age, for color preferences. His results indicated evidence that socio-economic status does affect the development of preferences for colors. The 88 ten-year-old boys tested from a school in a working class neighborhood selected blue with a strong lead, orange a distant second with red and violet almost at a tie for third place with red slightly favored, then yellow and green. Twenty-

seven ten-year-old boys from a school in a high socio-economic area were tested and very different results were obtained. The order of color preference was violet, red and blue (red and blue were almost equal), orange, yellow and green. Riker's (1925) study of 1199 school children in Wisconsin from the first through the eighth grades also supported Winch's and Michael's findings that the development of color preferences depends on their socio-economic status.

Katz and Breed (1922) found differences in the color preferences of younger children according to socio-economic status. Red was a greater favorite among the children in poor than among the children in expensive neighborhoods and green was preferred more by the children in the expensive neighborhoods than those in the poor neighborhoods. However, these differences tended to gradually be overcome as the children advanced in age and school attainment.

A more recent study by Collier (1956) tested the color preferences of 591 children from the first, third, fifth and seventh grade levels, from two city, two suburban and two central schools within sixty miles of Syracuse, New York. He concluded that socio-economic status had no significant effects on color preferences. The rank correlations between upper and lower socio-economic status were significant at the .001 level of confidence.

Personality and Color Preferences

Individual reactions to colors seem to differ as psychic makeup differs (Jaensch, 1930). Preference for warm colors is felt to be related to the extroverted person and especially to young children. Warm colors create feelings of excitement. Introverted and more mature people tend to prefer cool colors, which have a tranquilizing effect (Rickers-Obsianhina, 1943; Jaensch, 1930).

Considering the emotional effects of colors on a person, Holden and Bosse (1900) indicated:

. . .in general, the predominating, or what we may call the background colors in nature are the blues and greens--the colors of the sky, the sea, the woods and the fields. The yellows and reds, complementary to the background colors, are found in smaller masses, and serve to call attention to particular objects, such as the blooming flower and the ripened fruit. These colors we may call the accent colors in nature.

The colors of the red end of the spectrum are generally conceded to be exciting or irritating when presented in large masses. Some of the lower animals are thrown into a frenzy at sight of them. The greens and blues, on the contrary, are known to be quieting and restful. (p. 270)

Harmon (1944) reported that activities of a muscular nature are better performed in bright light and in bright surroundings. Exacting mental and visual tasks are better performed with softer and deeper colors in the environment. Sargent (1923) indicated that the brighter and warmer tones are joyful and exciting whereas the darker and cooler colors are more inward and restful.

Birren (1955) wrote that there are precise reactions and moods associated with color. He indicated that a person

who reacts freely and agreeably to many colors is likely to be responsive to individuals and keenly interested in the world at large. A person who is not color oriented and perhaps dislikes many colors may be of solemn countenance and have a glum disposition.

In examining young children's drawings, Hurlock and Thompson (1934) found that four-year-old children use color for the pleasure such colors offer them. By the first grade 65 percent of the children's use of color could be said to be appropriate to their drawings. At each age level the appropriateness of the colors used slightly increased.

In interpreting the art expression of young children from three to five years of age, Alschuler and Hattwick (1947) concluded that a child's delight in color showed emotional tendencies; i.e., the frequent use of blue or black indicates self-control and the repression of emotion; red has the highest affective value and reveals uninhibited expression; yellow seems to go with infantile traits and dependence on adults; green shows balance, fewer emotional impulses, and a simple and uncomplicated nature.

Katz (1931) of the New York State Psychiatric Institute and Hospital found that mental patients generally prefer blue, with green as second choice, then red, purple, yellow and orange. He indicated that morbid patients preferred warm hues whereas hysterical patients chose cool hues.

Color Identification

Cook (1931) studied young children in relation to color matching and color naming. She found that two-year-old children are able to match color specimens which differ in hue, brightness or saturation with a 45 percent accuracy. By six years of age, children could match the color with 97 percent accuracy. She found that color naming ability of the hues red, green, yellow and blue for two-year-olds to be 25 percent and for six-year-olds to be at 62 percent. A few years later Hildreth (1936) examined 138 preschool children, three to six years of age, to determine their ability to correctly name ten standard colors. Nearly a third of the group below five years of age could name all ten colors and another third of the group could name nine colors. In the group over five years, 75 percent named all ten colors and 17 percent named nine colors correctly.

Synolds and Pronko (1949) explored the color naming ability of 74 children, three to eight years of age. The youngest children could not name the colors, whereas by seven years 94 percent of the children could name the colors. There was a rather sharp separation between the color naming abilities of the preschool children and those in elementary school.

Synolds and Pronko reported trends that suggest that not all hues are equally discriminable, particularly in certain combinations. They found that 100 percent of the four-year-olds could discern a red digit on a blue background whereas

only 75 percent of them could see the reverse. This trend may be supported by evidence that indicates that infants strongly prefer red and yellow, but that with increasing age, blue and green gain in value (Holden and Bosse, 1900; Katz and Breed, 1922; Marsden, 1903; Myers, 1908; Staples, 1932). It is possible that the earliest color preferences have a physiological basis, but that, as development progresses, social conditioning may become the major basis for color preferences (Staples and Walton, 1933).

Conditioning and Color Preferences

Staples and Walton (1933) investigated the relationship of color preferences and pleasurable experiences in the presence of a particular color. They chose 13 three- and four-year-old children for their investigation since color preferences of young children are less marked than those of older children and adults. They felt that with nursery school children preferences might be more easily established or existing preferences modified. The children were tested for existing color preferences and then given a series of pleasurable experiences accompanying the presence of colored lights of a predetermined color. Then the children's color preferences were tested again and compared with their color preferences previous to the experiment. After a five-month interval the children were reexamined for color preferences. Staples and Walton's results showed that the pleasurable experiences with a given color resulted in a decided increase

in preference for that color. These preferences were also maintained to a smaller but significant degree after a five-month interval.

Schwartz (1960) studied the effects of conditioning upon second grade children's color choices and color usage. The major findings of her study were:

1. The effect of conditioning on the color preferences of second grade children through an emotional experience of pleasure or displeasure caused statistically significant differences in the group responses to stated color preference.
2. The influence of the conditioning on the color preferences of second grade children had some slight effect on their use of color in art expression. (p. 108)

These results indicate that color preferences are probably acquired responses, based on emotional experiences and are capable of being modified by subsequent experiences.

Methods of Studying Color

Predictions from studies on color preferences may be true only under conditions comparable to those under which the results were obtained (Burnham, Hanes and Bartleson, 1963). There have been many studies of color preferences using many different methods of investigation. The most common methods that have been used can be divided into four groups (Dorcus, 1926; Collier, 1956). These methods are the method of paired comparisons, the method of simultaneous presentation, the method of modified simultaneous presentation and the method of serial presentation.

Method of Paired Comparisons

The method of paired comparisons involves the pairing of each color with every other color (Dorcus, 1926; Collier, 1956). This method requires more time in obtaining data and in treating the data once data have been secured than any of the other methods (Dorcus, 1926). Those investigators who have chosen to use this method have done so on the basis of its superiority as a testing technique (McDougall, 1908; Myers, 1908; Yokoyama, 1921; Dorcus, 1926; Walton and Morrison, 1931; Collier, 1956).

Barrett (1941) compared the order of merit method, simultaneous presentation, with that of paired comparisons. Barrett found that by the method of paired comparisons two, three or four stimuli may be given the same number of choices and thus be indeterminate as to their real position in the series because the subject is not forced to make a choice between them. In studying preferences for color combinations for simple designs, Gordon (1912) abandoned the method of paired comparisons in favor of the method of simultaneous presentation.

The method of presenting the combinations of paired combinations was rejected after some trials. Anyone who has tried it with esthetics tests will recognize, I think, the serious objection against it, that it so quickly exhausts the esthetic reaction. (p. 354)

The method of paired comparisons is most often used to measure aesthetic judgments. The number of pairs to be judged is much larger than the number of individual stimuli (number = $n(n-1)/2$). The testing becomes tedious when the

subject is required to judge about fifteen or more stimuli (Brown and Ghiselli, 1955).

Method of Simultaneous Presentation

The method of simultaneous presentation, or order of merit method, involves the comparison of all color stimuli displayed at the same time (Dorcus, 1926; Collier, 1956). This method has been employed by more investigators than any of the other methods for studying color preferences (Bradford, 1913; Dashiell, 1917; Michaels, 1924; Mercer, 1925; Ricker, 1925; Gesche, 1927; Staples, 1932; Hildreth, 1936; Eysenck, 1941; Garth, 1922; Garth, 1924; Garth and Porter, 1934; Schwartz, 1960). One reason this method has been utilized so widely is that it requires a minimum amount of time to give (Barrett, 1914). However, there are several criticisms of this method. One question this method presents is, does the subject make his choice from all the colors presented, or does he make his choices from small groups within the whole? Also, in looking at all the colors presented, a subject's decision may be influenced by factors of contrast and after images (Dorcus, 1926).

A more specific definition of the method of simultaneous presentation is the subject arranges all of the stimuli in a series according to his order of preferences when all the stimuli are presented to him as a series. Barrett (1914) felt that simultaneous presentation is preferred over the method of paired comparisons because the simultaneous method

requires a subject to give each stimulus of the series its own rank. The method of paired comparisons does not require a subject to make an absolute choice for rank order of preference. Gordon (1912) rejected the method of paired comparisons because she felt that it is too time consuming so that it causes the subject to lose interest and, therefore, the colors lose their aesthetic appeal.

Yokoyama (1921) used the simultaneous method of presentation to study preferences of colors and forms but found it unsatisfactory. In testing over 200 students he found that the observers were unable to comprehend the large number of stimuli, which led to memorial confusions. They also tried to be logical in their choices. He felt that there were spatial errors, contrast effects and extraneous associations.

Method of Modified Simultaneous Presentation

The method of modified simultaneous presentation, or modified order of merit, involves the comparison of colors, depending upon responses produced by color names (Dorcus, 1926; Collier, 1956). This method is essentially a modification of the method of simultaneous presentation. However, this method is not considered to be a justifiable scientific method since it uses color names only to study color preferences. The problem involved is that in referring to color names an individual may think of one hue as being highly saturated and another hue as being low in saturation.

Consequently a group being tested would include many different saturations and brightness factors for the colors under consideration (Dorcus, 1926).

Winch (1909) tested 2000 school children seven to fifteen years of age using the method of modified simultaneous presentation for the color names of white, black, red, green, blue and yellow. Several years later Hurlock (1927) used the method of modified presentation in a study of children's color preferences. She had a list of 13 colors written on a slip of paper and had each child underline the color name he preferred. The reason that she used this method of presentation was:

. . .when colors are shown on charts and the subjects then asked to designate in some way their preference, it may happen that the specific colors used are not the shades preferred and another color is then given first place. (p. 399)

Michaels (1924) made an investigation to determine if the method of simultaneous presentation and that of modified simultaneous presentation yield different results. He tested 27 boys from a school in an upper socio-economic area using actual colors. Eight days later he retested the boys using the same procedure, only substituting color names for the actual colors. He found that it makes no difference whether the actual color is used or if the color name is used for testing color preferences.

Katz and Breed (1922), in working with school children, found that a considerable number of children in the lower grades were unfamiliar with even the names of the pure

colors. The wrong names given by the kindergarten classes to the Bradley colored papers are presented in tabular form on page 25 in this thesis. One hundred and twenty-five children were examined individually.

The results showed that the older children were more familiar than the younger ones with the names of the elemental colors, but found difficulty in naming the different nuances of the same color. For example, objects were called red that were any color from a violet-red to a red-orange (Katz and Breed, 1922, p. 256).

Method of Serial Presentation

The method of serial presentation involves giving successive series of colors and selecting a complete series over another series (Dorcus, 1926; Collier, 1956). Major (1895) quoted Cohn (1894) as indicating that he:

. . . declares the serial method inapplicable to colors, for two reasons. In the first place, the qualities contrast with one another, so that a different impression follows from each particular presentation of a series. Secondly, the separate colors 'operate not as members of a continuous series, but as independent qualities'. (p. 57)

Major (1895) questioned whether the method should be completely excluded from the study of colors. Major tested a modified method of serial presentation to determine if such a modification would be applicable to color preference studies. He used a method of isolated exposure, exhibiting one color at a time. The order the colors were presented to the subject followed the order of the spectral scheme. The series of colors began at any point on the spectrum. The purpose of following the order of the color spectrum was to

WRONG NAMES GIVEN TO BRADLEY COLORED¹

PAPERS BY KINDERGARTEN PUPILS

| Color Displayed | Name Given | Number of Children |
|-----------------|------------|--------------------|
| Red | Purple | 1 |
| | Brown | 4 |
| | No name | 3 |
| Orange | Red | 4 |
| | Yellow | 13 |
| | Brown | 7 |
| | Pink | 1 |
| | No name | 11 |
| Yellow | Brown | 3 |
| | Green | 1 |
| | No name | 3 |
| Green | Brown | 1 |
| | Yellow | 4 |
| | Blue | 1 |
| | Purple | 1 |
| | Orange | 1 |
| | Pink | 1 |
| | No name | 1 |
| Blue | Purple | 5 |
| | Green | 1 |
| | White | 1 |
| | Red | 1 |
| Violet | Purple | 39 |
| | Blue | 38 |
| | Green | 2 |
| | Red | 2 |
| | No name | 10 |

¹S. A. Katz and F. S. Breed, "The Color Preferences of Children," Journal of Applied Psychology, VI (1922), p. 256.

eliminate independent qualities of the colors and to allow the colors to operate as a continuous series.

Stimuli for Testing Color Preferences

In designing testing instruments for studying colors and color preferences, investigators have used many color stimuli. Some investigators (Holden and Bosse, 1900; Bradford, 1913; Mercer, 1925; Dorcus, 1926; Polson, 1926; Gesche, 1927; Staples and Walton, 1933; Hildreth, 1936; Schwartz, 1960) have used squares, rectangles and/or circles of colored paper. Other investigators have made use of balls of yarn (McDougall, 1908), colored flowers (McDougall, 1908) and colored blocks of wood (Myers, 1908; Staples and Walton, 1933; Rodriguez, 1950). Colored lights or colored spots flashed on a screen have been used for the color stimuli (McDougall, 1908; Walton and Morrison, 1931; Staples and Walton, 1933). Corcoran (1953) used the printed picture of an object. He was the first to make use of symbols of everyday objects familiar to the child. Schwartz (1960) used a combination of geometric and realistic forms to study preschool children's color preferences.

Implications for Present Study

The literature reviewed indicated that age tends to be related to color preferences. The changes in color preferences with age and the rate of change may be the result of numerous factors. The literature showed variable results

concerning the influence of sex and socio-economic status for color preferences.

Related literature illustrated the early concern and interest children have in colors in that they are learning color names at the preschool level. A further implication was that young children's earliest color preferences may have a physiological basis, but as they develop social conditioning becomes a factor in color selection. This factor was supported by studies whose results showed that young children can be conditioned for color preference.

Methods of Study

Whereas the method of paired comparisons is considered by many experimenters to be a superior technique in that it controls many variables, the lengthy testing time could become tedious for young children. Hence young children could lose interest in the test and results may not be accurate.

The method of simultaneous presentation has a great advantage over the paired comparisons method for studying young children's color preferences. There is only one presentation from which a child may make all of his choices in a relatively short amount of time. If the number of stimuli were limited, young children may be able to express their color preferences with this method. In order to better control for factors of contrast and after images, the method could be adapted for use with young children to prevent contrast and after images by allowing the stimuli to be

independent of each other so that a child could pick up any particular stimulus object and examine it more closely.

Related literature indicates that the method of modified simultaneous presentation is inadequate as a scientific method of studying color preferences. There is evidence that young children are not yet familiar enough with color names to perform well under the testing conditions of this method.

Although the modified method of serial presentation that was adapted by Major (1895) may indeed be successful with people who know the color spectrum, it would not work with those who do not know the order of the spectrum. This method would not be adequate for studying preschool children since most young children do not yet know the order of the spectrum.

CHAPTER III

PROCEDURE AND METHOD

To achieve the purpose of this study, which was to determine young children's color preferences, the following steps were followed: (1) selection of subjects, and (2) development and administration of the testing instruments.

Subjects

The subjects for this study of young children's color preferences included 29 three-year-old children, 36 four-year-old children and 32 five-year-old children. There were 45 boys and 52 girls. The parents of the children answered a questionnaire to determine the relationship between parents' and their children's color preferences. The children tested were enrolled in nursery schools, day care centers and child development laboratories in Stillwater, Oklahoma.

Development and Administration of

Testing Instruments

In designing the testing instruments for this study, a combination of geometric and realistic forms were used as in

Schwartz's (1960) study. Such a design seems to be a better means of arriving at a preschool child's true color preferences or his combination of choices under differing situations.

On the basis of the literature reviewed, for the purpose of considering young children's color preferences, the method of simultaneous presentation was adapted for use with young children. This method, according to reported literature, is a valid testing method for color preferences and will best maintain the young children's attention since it may be administered in a minimum amount of time.

Criteria for Tests

The following criteria were used when constructing the two testing instruments, the Easterling Color Screening Test (ECST) and the Easterling Color Preference Test (ECPT).

1. The tests were constructed so that young children could readily respond to the tests without depending on writing, reading, or verbal ability.
2. The tests were constructed to be administered to an individual child.
3. The tests were on the young child's interest level in order to create and maintain an interest.
4. The tests were short, in order to keep at a minimum the effects of fatigue; and to permit the children to complete the tests without being away from their regular routine for too long a period of time.

5. The tests were presented in an environment to reduce to a minimum the effects of extraneous stimuli.
6. The scoring was objective. (Records Sheets, Appendix A)

Environmental Controls

The environmental controls were consistent for the color screening test and the color preference test. In order to control for extraneous color stimuli each child was seated at a table covered with a neutral gray cloth. The gray cloth also covered the area directly in front of the child. The container which the stimulus objects were cast from was a neutral gray. The experimenter wore black, gray and/or white clothing so as not to influence a child's preference for any particular color.

Because color screening tests are often designed for use under average daylight, color temperature 6500°K (Kelvin), artificial lighting that adequately substituted for average daylight was used when testing the children (Heath, 1963). This lighting was provided for by a fluorescent desk lamp.

Easterling Color Screening Test (ECST)

A color screening test was developed to examine each child for color blindness, understanding of colors and ability to follow directions. The colors included in the ECST correspond to the six primary and secondary colors which were utilized in the ECPT, plus brown and gray. Brown was

added because it is most often confused with green in color blind subjects. Gray is often confused with pastel blue greens (Heath, 1963). However, in this test gray was selected because it is a neutral color and could serve as an environmental control.

The eight colors were presented to the children as approximately two-inch yarn balls, five balls of each color, randomly placed in a circular gray container nine inches in diameter and two inches tall. A set of the eight colored balls was put in a small plastic sack, from which the investigator selected at random one colored ball at a time and placed it before the child on the table. The subject was then asked to select the matching colored balls from the gray container. There was no comment on the subject's selection of colored balls or how many balls he could select. When the child had finished, the investigator asked, "Is that all of the balls or are there more in the container?" This procedure continued until the subject had matched colored balls for each of the eight colors.

Easterling Color Preference Test (ECPT)

Part I. To test the children's color preferences six colors in three-inch squares were used. The colors were limited to six in number. The six colors used were the primary and secondary colors: red, yellow, blue, orange, green and violet. These hues were felt to represent the most familiar colors to preschool children (Schwartz, 1960). The

colored papers used were the Color-aid papers produced by Geller Artists Materials, Inc., 116-120 East 27th Street, New York, New York. These colors correspond to the color scale of the Ostwald Color Solid (Smith, 1965), and, to facilitate administration, were filed in a gray envelope. These color stimuli were presented simultaneously in random order. In order to insure a random order of presentation, the stimulus objects were cast onto the table directly in front of the child from a container which was large enough to allow sufficient mixing of the stimulus objects. This container was gray, nine inches in diameter and 13 inches in height, with a lid.

The method of simultaneous presentation, adapted for use with young children, was utilized for the ECPT. After rapport had been established, the experimenter explained the procedure for Part I to the child. When talking with the child, the experimenter assumed the terms most preferred, most liked, favorite and prettiest to be synonymous.

The color objects were cast from their container to the table directly in front of the child and he was asked to choose the color he preferred. The child was allowed as much time as he needed to make his selection and could handle objects to examine them more closely before making a decision. When the child chose his favorite color, he then indicated his choice to the investigator by handing the preferred color to the experimenter or pointing to the

colored object. The investigator and child returned the colored objects to the gray envelope for filing.

Part II. To test the children's color preferences when associated with stimulus objects familiar to the child in his everyday life, the same six colors were employed as in Part I. These stimulus objects were four kinds of toys (teddy bear, ball, tricycle and rocking horse) and four kinds of clothes (pair of houseshoes, coat, girl's dress and boy's overalls). Each of these objects were presented in the six colors approximately 3" x 5".

The method of presentation for Part II was the same as the method for Part I. Immediately following the administration of Part I to the subject, Part II was explained and the stimulus objects were presented in the following order: pair of houseshoes, coat, girl's dress, boy's overalls, teddy bear, ball, tricycle and rocking horse. Each type of stimulus object was presented simultaneously in random order for color. As in Part I, the stimulus objects were cast from a gray container to the table directly in front of the child. When the child chose his favorite color he handed it to the experimenter or pointed to it. The objects were then collected from the table and the next type of object was presented.

To make the testing situation realistic, the child was asked to pretend that he was going on a shopping trip and had opportunity to purchase the stimulus objects in his preferred color.

Parent's Questionnaire

In response to a request by letter (Appendix A) to have parents complete the Parent's Questionnaire (Appendix A) for color preferences, 82 parents responded. Therefore, data for this part of the study reflected only 82 responses instead of 97 responses, which was the total number of children studied. In most cases only one parent for each child returned the questionnaire. Therefore, a comparison of color preferences was made for each child and one of his parents. When a questionnaire was returned by both the father and mother, a random selection was made for one of the parents' response for this study.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to determine the color preferences of young children and to ascertain the consistency with which children's color preferences were related to their color preference for toys and clothes and their parents' color preferences. Young children's expressed color preferences were examined according to age, sex and their parents' color preferences. To determine the consistency of children's color preferences, test-retest data were obtained within a four weeks' period of time.

Table I presents the distribution by age and sex of the children studied. In order to examine the hypotheses, data are presented in terms of frequency and percentages.

Hypothesis 1. There is no difference in the color preferences of three-, four-, and five-year-olds classified according to sex.

The results indicated that no marked differences existed in three-, four-, and five-year-olds classified according to sex. An examination of Tables II and III indicate that both three-year-old boys and girls preferred violet as a first choice. However, four-year-old boys chose red first

TABLE I
NUMBER OF CHILDREN STUDIED FOR COLOR
PREFERENCES BY AGE AND SEX
N=97

| | Threes | Fours | Fives | Total |
|-------|--------|-------|-------|-------|
| Boys | 14 | 15 | 16 | 45 |
| Girls | 15 | 21 | 16 | 52 |
| Total | 29 | 36 | 32 | 97 |

and violet as a close second. The first choice of four-year-old girls was an equal number of times for yellow and violet. Five-year-old boys chose blue first with violet a very close second. There was a decided preference of five-year-old girls for violet. Orange was the least preferred color, being chosen only three times by the group of 97 subjects. As a whole the group chose violet more than twice as often as they chose any other color tested.

The findings of this study are in accord with the studies of sex differences in color preferences of children from various cultures (Garth, 1924; Mercer, 1925; Hurlock, 1927; Gesche, 1927, Garth and Collado, 1941; and Garth, Ikeda and Langdon, 1931). In the foregoing studies sex differences were found in color preferences and their rank order, although none were significant. Also, there was no

TABLE II
COLOR PREFERENCES OF YOUNG CHILDREN
ACCORDING TO AGE AND SEX
N=97

| | | Number of Responses | | | | | |
|--------|-----|---------------------|--------|--------|-------|------|--------|
| | No. | Red | Orange | Yellow | Green | Blue | Violet |
| BOYS | | | | | | | |
| Threes | 14 | 1 | 0 | 2 | 2 | 3 | 6 |
| Fours | 15 | 6 | 1 | 1 | 2 | 0 | 5 |
| Fives | 16 | 2 | 0 | 0 | 3 | 6 | 5 |
| GIRLS | | | | | | | |
| Threes | 15 | 0 | 1 | 3 | 3 | 1 | 7 |
| Fours | 21 | 2 | 0 | 6 | 4 | 3 | 6 |
| Fives | 16 | 4 | 1 | 4 | 1 | 0 | 6 |
| TOTAL | 97 | 15 | 3 | 16 | 15 | 13 | 35 |

TABLE III
YOUNG CHILDREN'S COLOR PREFERENCES
RANKED ACCORDING TO AGE AND SEX
N=97

| No. | Rank Order of Responses | | | | | | |
|--------|-------------------------|--------|--------|-------|------|--------|-----|
| | Red | Orange | Yellow | Green | Blue | Violet | |
| BOYS | | | | | | | |
| Threes | 14 | 5.0 | 6.0 | 3.5 | 3.5 | 2.0 | 1.0 |
| Fours | 15 | 1.0 | 4.5 | 4.5 | 3.0 | 6.0 | 2.0 |
| Fives | 16 | 4.0 | 5.5 | 5.5 | 3.0 | 1.0 | 2.0 |
| GIRLS | | | | | | | |
| Threes | 15 | 6.0 | 4.5 | 2.5 | 2.5 | 4.5 | 1.0 |
| Fours | 21 | 5.0 | 6.0 | 1.5 | 3.0 | 4.0 | 1.5 |
| Fives | 16 | 2.5 | 4.5 | 2.5 | 4.5 | 6.0 | 1.0 |
| MEAN | | 3.5 | 6.0 | 2.0 | 3.5 | 5.0 | 1.0 |

consistent order of color preferences for either sex which coincides with the results as shown in Tables II and III.

Hypothesis 2. There is no difference in the color preferences of boys and girls classified according to age.

No marked difference was found to exist in color preferences according to age of child. Table IV and V reveal that violet was the first choice of threes, fours and fives regardless of sex. Moreover, all three age groups selected orange the least number of times for their first preference.

Most studies of related literature that included violet in testing for color preferences indicated that violet was not a preferred color at any age level (Collier, 1956; Garth and Porter, 1934; Katz and Breed, 1922; Eysenck, 1941; Katz, 1931). However, Michaels (1924), in a study of color preferences comparing socio-economic influences, found 27 ten-year-old boys from a school in a high socio-economic area selected violet as their first color preference.

Several studies in the related literature contradict the results of this investigator's findings. The following studies revealed that color preferences do change with increased age: Jastrow (1897), Riker (1925), Garth (1922), Garth, Ikeda and Langdon (1931), Garth and Collado (1941), and Bou and Lopez (1953). However, several studies reviewed were in agreement with the results of this study indicating that color preferences did not change with increased age. Various colors were found to be consistent first preferences at different ages in the various studies. Blue was found to

TABLE IV
 COLOR PREFERENCES OF YOUNG CHILDREN
 ACCORDING TO AGE
 N=97

| | No. | Number of Responses | | | | | |
|--------|-----|---------------------|--------|--------|-------|------|--------|
| | | Red | Orange | Yellow | Green | Blue | Violet |
| Threes | 29 | 1 | 1 | 5 | 5 | 4 | 13 |
| Fours | 36 | 8 | 1 | 7 | 6 | 3 | 11 |
| Fives | 32 | 6 | 1 | 4 | 4 | 6 | 11 |
| TOTAL | 97 | 15 | 3 | 16 | 15 | 13 | 35 |

TABLE V
 YOUNG CHILDREN'S COLOR PREFERENCES
 RANKED ACCORDING TO AGE
 N=97

| | No. | Rank Order of Responses | | | | | |
|--------|-----|-------------------------|--------|--------|-------|------|--------|
| | | Red | Orange | Yellow | Green | Blue | Violet |
| Threes | 29 | 5.5 | 5.5 | 2.5 | 2.5 | 4.0 | 1.0 |
| Fours | 36 | 2.0 | 6.0 | 3.0 | 4.0 | 5.0 | 1.0 |
| Fives | 32 | 2.5 | 6.0 | 4.5 | 4.5 | 2.5 | 1.0 |
| MEAN | | 3.5 | 6.0 | 2.0 | 3.5 | 5.0 | 1.0 |

be consistently preferred at various ages, K-college, by Katz and Breed (1922); red was most preferred by 1-7 year old children by Garth and Porter (1934); orange was selected at all ages, third-eighth graders, as first preference by Gale (1933); and yellow was most preferred by all ages, first, third, fifth and seventh grades, by Collier (1956).

Hypothesis 3. There is no difference in the color preferences of girls classified according to age.

The results indicate that no marked differences exist in color preferences according to age of girls. Table II and III indicate that violet was the first preference of three-year-old girls. Violet and yellow were chosen equally as the first preference of four-year-old girls. Five-year-old girls also preferred violet as their first color preference. Orange was the least preferred color being chosen only twice by the group of 52 girls tested. This group of girls selected violet as their first color preference more often than they chose any other color tested. Since three-year-old and five-year-old girls selected violet as first choice and the four-year-old girls chose violet and yellow equally as first choice with all the girls choosing orange the least often it appears there is very little difference in color preferences among young girls according to age.

Hypothesis 4. There is no difference in the color preferences of boys classified according to age.

The results indicate that there is a difference in color preferences according to age of boys. An examination of Table II and III reveal that three-year-old boys preferred violet as their first color preference. Four-year-old boys selected red as their first preference with violet a close second. Five-year-old boys, however, chose blue as first with slightly fewer choices for violet. Orange was the least preferred color of the boys, chosen only once from the group of 45 boys. This group of boys selected violet more often as their first color preference than they chose any other color. The boys selected violet more often as a group but a difference in color preferences was found to exist according to age of boys.

Hypothesis 5. There is no relationship between the color preferences of young children and their choice of color for clothes and toys analyzed according to age and sex.

An examination of Table VI reveals that the young children's agreement between their first color preference and their choice of color for clothes is low, ranging from 28.57 percent to 56.67 percent for the different age and sex groups. (For more specific data see Appendix B.) Table VI also reveals that the agreement for the young children's first color preference and their choice of color for toys is low, ranging from 23.21 percent to 60.00 percent.

TABLE VI
 YOUNG CHILDREN'S COLOR PREFERENCES
 REFLECTING AGREEMENT BETWEEN
 FIRST COLOR PREFERENCES
 AND PREFERENCES FOR
 COLOR OF CLOTHES
 AND TOYS
 N=97

| | No. | Percentage of Agreement with Clothes | Percentage of Agreement with Toys |
|--------------|-----|--|---|
| BOYS | | | |
| Threes | 14 | 28.57 | 23.21 |
| Fours | 15 | 56.67 | 60.00 |
| Fives | 16 | 51.56 | 56.25 |
| GIRLS | | | |
| Threes | 15 | 42.00 | 36.67 |
| Fours | 21 | 36.91 | 33.33 |
| Fives | 16 | 34.38 | 40.63 |

In examining the young children's agreement between their color preferences and their choices of color for clothes and toys, Table VI shows that the three-year-old boys have the lowest agreement. Four-year-old boys have the highest agreement between their first color preferences and their choice of color for clothes and toys. Table VI also indicates that both the four-year-old boys and the five-year-old boys have a higher agreement than the four-year-old girls and the five-year-old girls.

Table VII reflects the consistency with which the children chose colors for clothes and toys as related to their first preference for color. It also reflects the decreasing order of preference for the colors: violet, red, green, yellow, blue and orange. The data in this table also indicate that violet was a preferred choice of all ages of children. Red was a first choice for four-year-old boys and blue was a first choice for five-year-old boys. Only the four-year-old girls chose yellow and red as often as they chose violet. In all other instances violet was preferred more often than any of the other colors.

Tables VIII and IX reflect the first color preferences of the young children for specific clothes and toys. Violet was selected as the first preference by both boys and girls at each age level for clothes in general (see Table VII). However, Table VIII indicates that when selecting a specific clothing item (houseshoes, coat, dress, overalls), the children sometimes selected one of the other five colors as a

TABLE VII
 COLORS RANKED ACCORDING TO YOUNG
 CHILDREN'S FIRST PREFERENCES
 FOR COLOR, COLOR OF CLOTHES
 AND COLOR OF TOYS ACCORD-
 ING TO AGE AND SEX
 N=97

| First Preference | No. | Violet | Red | Green | Yellow | Blue | Orange |
|------------------|-----|--------|-----|-------|--------|------|--------|
| BOYS | | | | | | | |
| <u>Threes</u> | 14 | | | | | | |
| for color | | 1.0 | 5.0 | 3.5 | 3.5 | 2.0 | 6.0 |
| color of clothes | | 1.0 | 4.5 | 3.0 | 2.0 | 4.5 | 6.0 |
| color of toys | | 1.0 | 2.0 | 4.0 | 5.0 | 6.0 | 3.0 |
| <u>Fours</u> | 15 | | | | | | |
| for color | | 2.0 | 1.0 | 3.0 | 4.5 | 6.0 | 4.5 |
| color of clothes | | 1.0 | 2.0 | 3.0 | 4.5 | 6.0 | 4.5 |
| color of toys | | 2.0 | 1.0 | 3.0 | 6.0 | 5.0 | 4.0 |
| <u>Fives</u> | 16 | | | | | | |
| for color | | 2.0 | 4.0 | 3.0 | 5.5 | 1.0 | 5.5 |
| color of clothes | | 1.0 | 3.0 | 4.0 | 6.0 | 2.0 | 5.0 |
| color of toys | | 2.0 | 4.0 | 3.0 | 6.0 | 1.0 | 5.0 |
| GIRLS | | | | | | | |
| <u>Threes</u> | 15 | | | | | | |
| for color | | 1.0 | 6.0 | 2.5 | 2.5 | 4.5 | 4.5 |
| color of clothes | | 1.0 | 2.0 | 3.0 | 6.0 | 4.5 | 4.5 |
| color of toys | | 1.0 | 2.0 | 5.0 | 3.0 | 6.0 | 4.0 |
| <u>Fours</u> | 21 | | | | | | |
| for color | | 1.5 | 5.0 | 3.0 | 1.5 | 4.0 | 6.0 |
| color of clothes | | 1.0 | 2.0 | 4.0 | 3.0 | 5.0 | 6.0 |
| color of toys | | 3.0 | 1.5 | 5.0 | 1.5 | 4.0 | 6.0 |
| <u>Fives</u> | 16 | | | | | | |
| for color | | 1.0 | 2.5 | 4.5 | 2.5 | 6.0 | 4.5 |
| color of clothes | | 1.0 | 2.0 | 3.5 | 5.0 | 3.5 | 6.0 |
| color of toys | | 1.0 | 4.5 | 6.0 | 2.0 | 4.5 | 3.0 |
| MEAN RANK | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 |

TABLE VIII
 RESPONSES OF YOUNG CHILDREN REFLECTING
 COLOR PREFERENCES FOR SPECIFIC TOYS
 N=97

| | | Color Preferences for Specific Toys | | | |
|--------|-----|-------------------------------------|------|-------|-------|
| | No. | Bear | Ball | Trike | Horse |
| BOYS | | | | | |
| Threes | 14 | R,Y,G,V ^{1,2} | V | G,B | O |
| Fours | 15 | V | R,V | R | R |
| Fives | 16 | B,V | B | B | G |
| GIRLS | | | | | |
| Threes | 15 | V | V | V | V |
| Fours | 21 | Y | R | Y | R |
| Fives | 16 | Y,V | V | V | V |

¹R=red; Y=yellow; G=green; V=violet; B=blue; O=orange

²When more than one color is indicated, an equal number of choices were made for those colors.

TABLE IX
 RESPONSES OF YOUNG CHILDREN REFLECTING
 COLOR PREFERENCES FOR SPECIFIC
 CLOTHES
 N=97

| | | Color Preferences for Specific Clothes | | | |
|--------|-----|--|------|------------------|----------|
| | No. | Shoes | Coat | Dress | Overalls |
| <hr/> | | | | | |
| BOYS | | | | | |
| Threes | 14 | V ¹ | Y | G,V ² | V |
| Fours | 15 | R,V | V | V | R |
| Fives | 16 | R,G,B | B | R,B | V |
| GIRLS | | | | | |
| Threes | 15 | V | V | V | R |
| Fours | 21 | V | V | V | R,G |
| Fives | 16 | R,O | V | G,V | G |

¹V=violet; Y=yellow; G=green; R=red; B=blue; O=orange

²When more than one color is indicated, an equal number of choices were made for those colors.

first color preference for a clothing item. The colors violet, red, yellow and blue were each selected by groups of the children as the first preference for toys in general (see Table VII). Table VII also reveals that the total group of 97 children selected violet more often for their toy preferences than any other color. Table IX indicates that the children occasionally chose each of the other five colors studied as a first color preference when selecting specific toys (bear, ball, tricycle, rocking horse). The data reflected in these tables related to Hypothesis 5 suggest that there is a low relationship between young children's general color preferences and their choice of color for specific kinds of stimulus objects.

Hypothesis 6. There is no difference between the color preferences of young children and the color preferences of their parents.

The data in Table X reveal low agreement of color preferences between parents and their children. Agreement between parents' and their children's color preferences ranged from zero percent to 33.3 percent. These results indicate that there is a marked difference between the color preferences of young children and the color preferences of their parents.

Hypothesis 7. There is no difference between young children's first preferences for color for a test and retest (within a four weeks' period of time) analyzed according to age and sex.

TABLE X
 COLOR PREFERENCE AGREEMENT BETWEEN
 PARENT AND CHILD
 N=82

| | No. | Parent-Child Agreements | |
|--------|-----|-------------------------|-----------------------|
| | | Number of Agreements | Percent of Agreements |
| <hr/> | | | |
| BOYS | | | |
| Threes | 9 | 3 | 33.3 |
| Fours | 15 | 2 | 13.3 |
| Fives | 12 | 3 | 25.0 |
| GIRLS | | | |
| Threes | 12 | 0 | 00.0 |
| Fours | 21 | 5 | 23.8 |
| Fives | 13 | 3 | 23.1 |

The percentage of agreement for the young children's first color preferences between test and retest are presented in Table XI. These data reflect a difference in individual children's color preferences when retested no more than four weeks later. The percentage of agreement for individuals' first color preferences ranged from 20 percent for three-year-old girls to 56.3 percent for five-year-old boys and five-year-old girls. Thus, when a child is tested for his color preference and is retested within four weeks, he may be expected to select the same color for both tests no more than 56 percent of the time.

Table XII reflects the consistency with which children in a test-retest situation chose colors for their first preference. It also reflects the decreasing order of preference for the colors: violet, green, yellow, red, blue, and orange. The data in this table indicate that violet was a preferred color of all ages of children on both the test and retest. There is also an indication that orange was the least preferred color of all ages of children.

Hypothesis 8. There is no difference between young children's first preferences for color of clothing for a test and retest (within a four weeks' period of time) analyzed according to age and sex.

The percentage of agreement for the young children's color preferences for clothes for a test and retest are reflected in Table XI. Data indicate a difference in individual children's color preferences when retested no more than

TABLE XI
PERCENTAGES OF AGREEMENT REFLECTING
RELATIONSHIP BETWEEN TEST AND
RETEST OF YOUNG CHILDREN'S
COLOR PREFERENCES
ACCORDING TO AGE
AND SEX
N=97

| | | No. | First Color Preference % | Clothing | | | | Toys | | | |
|--------|----|------|--------------------------------|----------|------|-------|----------|------|------|-------|-------|
| | | | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| | | | | % | % | % | % | % | % | % | % |
| <hr/> | | | | | | | | | | | |
| BOYS | | | | | | | | | | | |
| Threes | 14 | 21.4 | 35.7 | 50.0 | 35.7 | 28.6 | 50.0 | 35.7 | 35.7 | 50.0 | |
| Fours | 15 | 33.3 | 26.7 | 33.3 | 26.7 | 33.3 | 40.0 | 46.7 | 26.7 | 53.3 | |
| Fives | 16 | 56.3 | 68.8 | 25.0 | 50.0 | 37.5 | 50.0 | 37.5 | 31.3 | 37.5 | |
| GIRLS | | | | | | | | | | | |
| Threes | 15 | 20.0 | 33.3 | 53.3 | 33.3 | 33.3 | 53.3 | 40.0 | 26.7 | 46.7 | |
| Fours | 21 | 47.6 | 42.9 | 23.8 | 38.1 | 28.6 | 38.1 | 28.6 | 33.3 | 42.9 | |
| Fives | 16 | 56.3 | 43.8 | 25.0 | 37.5 | 31.3 | 43.8 | 31.3 | 6.3 | 18.8 | |

TABLE XII
RANK ORDER OF CHILDREN'S FIRST
PREFERENCES FOR COLOR ON THE
TEST-RETEST ACCORDING TO
AGE AND SEX
N=97

| | No. | Violet | Green | Yellow | Red | Blue | Orange |
|--------------|-----|--------|-------|--------|-----|------|--------|
| <u>BOYS</u> | | | | | | | |
| Threes: Test | 14 | 1.0 | 3.5 | 3.5 | 5.0 | 2.0 | 6.0 |
| Retest | | 1.5 | 4.0 | 3.0 | 1.5 | 5.0 | 6.0 |
| Fours: Test | 15 | 2.0 | 3.0 | 4.5 | 1.0 | 6.0 | 4.5 |
| Retest | | 2.0 | 4.0 | 4.0 | 6.0 | 1.0 | 4.0 |
| Fives: Test | 16 | 2.0 | 3.0 | 5.5 | 4.0 | 1.0 | 5.5 |
| Retest | | 1.0 | 5.0 | 5.0 | 2.0 | 3.0 | 5.0 |
| <u>GIRLS</u> | | | | | | | |
| Threes: Test | 15 | 1.0 | 2.5 | 2.5 | 6.0 | 4.5 | 4.5 |
| Retest | | 1.0 | 5.5 | 2.5 | 2.5 | 4.0 | 5.5 |
| Fours: Test | 21 | 1.5 | 3.0 | 1.5 | 5.0 | 4.0 | 6.0 |
| Retest | | 1.0 | 5.5 | 2.5 | 2.5 | 4.0 | 5.5 |
| Fives: Test | 16 | 1.0 | 4.5 | 2.5 | 2.5 | 6.0 | 4.5 |
| Retest | | 1.0 | 5.5 | 2.5 | 2.5 | 4.0 | 5.5 |
| <u>MEAN</u> | | | | | | | |
| Test | | 1.0 | 2.0 | 3.0 | 4.5 | 4.5 | 6.0 |
| Retest | | 1.0 | 5.0 | 4.0 | 2.0 | 3.0 | 6.0 |

four weeks later. The percentage of agreement for color preferences for clothes ranged from 23.8 percent for four-year-old girls to 68.8 percent for five-year-old boys. Thus, an individual child's choice for his color preference for clothing may be expected to be consistent no more than 69 percent of the time.

An examination of Table XIII reveals the consistency with which the children selected their color preferences for clothing on the test and retest. The mean preferences for the clothing in decreasing order were: violet, red, blue, green, yellow, and orange. Violet was still the preferred color of all ages of children with one exception: the five-year-old boys selected red and blue more often on the retest than they chose violet. Orange was revealed (as in Table XII) as a least preferred color of all ages of children.

Hypothesis 9. There is no difference between young children's first preferences for color of toys for a test and retest (within a four weeks' period of time) analyzed according to age and sex.

Table XI presents the percentage of agreement for the young children's color preferences for toys when tested and retested. The data reflect a difference in individual children's color preferences for toys when retested no more than four weeks later. The percentage of agreement for color preferences for toys ranged from 6.3 percent for the five-year-old girls to 53.3 percent for three-year-old girls and four-year-old boys. Thus, an individual child may be

TABLE XIII
RANK ORDER OF CHILDREN'S FIRST
PREFERENCES FOR COLOR OF
CLOTHING ON THE TEST-
RETEST ACCORDING TO
AGE AND SEX
N=97

| | No. | Violet | Red | Blue | Green | Yellow | Orange |
|--------------|-----|--------|-----|------|-------|--------|--------|
| <u>BOYS</u> | | | | | | | |
| Threes: Test | 14 | 1.0 | 4.5 | 4.5 | 3.0 | 2.0 | 6.0 |
| Retest | | 2.5 | 2.5 | 6.0 | 2.5 | 2.5 | 5.0 |
| Fours: Test | 15 | 1.0 | 2.0 | 6.0 | 3.0 | 4.5 | 4.5 |
| Retest | | 1.0 | 2.0 | 3.0 | 5.0 | 4.0 | 6.0 |
| Fives: Test | 16 | 1.0 | 3.0 | 2.0 | 4.0 | 6.0 | 5.0 |
| Retest | | 3.0 | 1.0 | 2.0 | 4.0 | 5.0 | 6.0 |
| <u>GIRLS</u> | | | | | | | |
| Threes: Test | 15 | 1.0 | 2.0 | 4.5 | 3.0 | 6.0 | 4.5 |
| Retest | | 1.0 | 2.0 | 3.0 | 4.5 | 6.0 | 4.5 |
| Fours: Test | 21 | 1.0 | 2.0 | 5.0 | 4.0 | 3.0 | 6.0 |
| Retest | | 1.5 | 6.0 | 3.0 | 4.0 | 1.5 | 5.0 |
| Fives: Test | 16 | 1.0 | 2.0 | 3.5 | 3.5 | 5.0 | 6.0 |
| Retest | | 1.0 | 3.0 | 4.0 | 5.5 | 2.0 | 5.5 |
| <u>MEAN</u> | | | | | | | |
| Test | | 1.0 | 2.0 | 3.5 | 3.5 | 5.0 | 6.0 |
| Retest | | 1.0 | 2.0 | 3.5 | 5.0 | 3.5 | 6.0 |

expected to select the same color for a test and retest of his color preference for toys no more than 53 percent of the time.

Table XIV indicates the consistency with which the children chose their color preferences for toys on the test and the retest. The mean preferences for the toys in decreasing order were: violet, red, yellow, orange, green and blue. Violet was a preferred color of all ages of children with two exceptions: the five-year-old boys preferred red and blue more often than violet on the retest; and the four-year-old girls selected red and yellow more often for the initial test than they chose violet. Contrary to the data in Table XII and XIII, orange was not consistently the least preferred color for toy preferences on the test and the retest.

Tables XII, XIII, XIV reflect the consistency of color preferences of the children, when studied as a group, to be consistent in choice of violet as first preference for color and color of clothing, and consistency for orange as least preferred for color and color of clothing. In selecting color preference for toys, children were consistent in choosing the colors violet as first and red as second preference.

TABLE XIV
RANK ORDER OF CHILDREN'S FIRST
PREFERENCES FOR COLOR OF TOYS
ON THE TEST-RETEST
ACCORDING TO AGE
AND SEX
N=97

| | No. | Violet | Red | Yellow | Orange | Green | Blue |
|--------------|-----|--------|-----|--------|--------|-------|------|
| <u>BOYS</u> | | | | | | | |
| Threes: Test | 14 | 1.0 | 2.0 | 5.0 | 3.0 | 4.0 | 6.0 |
| Retest | | 1.0 | 4.0 | 3.0 | 5.0 | 2.0 | 6.0 |
| Fours: Test | 15 | 2.0 | 1.0 | 6.0 | 4.0 | 3.0 | 5.0 |
| Retest | | 1.0 | 2.0 | 6.0 | 5.0 | 3.5 | 3.5 |
| Fives: Test | 16 | 2.0 | 4.0 | 6.0 | 5.0 | 3.0 | 1.0 |
| Retest | | 3.0 | 1.0 | 6.0 | 5.0 | 4.0 | 2.0 |
| <u>GIRLS</u> | | | | | | | |
| Threes: Test | 15 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 |
| Retest | | 1.0 | 2.0 | 5.0 | 6.0 | 3.5 | 3.5 |
| Fours: Test | 21 | 3.0 | 1.5 | 1.5 | 6.0 | 5.0 | 4.0 |
| Retest | | 1.5 | 1.5 | 3.0 | 6.0 | 4.0 | 5.0 |
| Fives: Test | 16 | 1.0 | 4.5 | 2.0 | 3.0 | 6.0 | 4.5 |
| Retest | | 1.0 | 3.5 | 3.5 | 3.5 | 3.5 | 6.0 |
| <u>MEAN</u> | | | | | | | |
| Test | | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 |
| Retest | | 1.0 | 2.0 | 5.0 | 6.0 | 3.0 | 4.0 |

CHAPTER V

SUMMARY, FINDINGS, IMPLICATIONS AND RECOMMENDATIONS

The major purpose of this study was to determine the color preferences of young children and to ascertain the consistency with which children's color preferences are related to their color preferences for clothes and toys and their parents' color preferences. Subjects used for this study were 97 three-, four-, and five-year-old children participating in a group situation in Stillwater during the spring of 1973.

A color preference test was developed to determine young children's color preferences (Chapter III). A short questionnaire was developed to ascertain the children's parents' color preferences (Appendix A).

The data concerning the color preference test for the young children were objectively recorded during the testing situation. Data were presented in frequencies and percentages reflecting young children's color preferences according to age and sex. The consistency of young children's color preferences was determined by a test-retest.

Major Findings

1. When classified according to age, boys and girls showed differences in their color preferences.
2. Regardless of age and sex violet was chosen by young children as a first preference, which was also reflected in their choice of color for clothing and toys.
3. Girls, when classified according to age, were consistent in their first color preference for violet.
4. Boys, when classified according to age, were not consistent in their first color preferences.
5. There was low relationship between young children's color preferences and their choice of color for clothes and toys.
6. There was a marked difference between the color preferences of young children and their parents' color preferences.
7. Individual children's color preferences were inconsistent when tested and retested within a four week's period of time.

Implications

The following implications seem to have relevance from the findings of this study:

1. Manufacturers should utilize the color violet more often in their productions of children's clothes and toys.
2. Parents and teachers should provide opportunities for children to have violet among their choices.

3. Children should be provided with a wide range of colors to make their own personal selection without the influence of adults.

4. Teachers of young children should make available a variety of colors in art activities.

5. Parents and teachers should provide a wide range of colors even though a child has a strong preference for a particular color. This finding was supported by children's comments that they liked all the colors.

Recommendations

The investigator makes the following suggestions for further research:

1. Repeat this study on larger samples.
2. Reexamine the children used in this study six months later to determine the group's consistency for color preference.
3. Study children's color preferences for specific stimuli other than clothes and toys.
4. Study young children's color preferences as related to opposite sex (in other words, will a girl choose the same color for a boy that she chooses for herself).
5. Repeat this study with elementary school aged children.

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APPENDIX A

Lab _____

RECORD SHEET

Easterling Color Screening Test (ECST)

Child's Name _____ Age _____ Sex _____

Parents' Name _____

Address _____

Phone No. _____

Stimulus
ColorNumber of Balls Selected for Each
Color for Stimulus Color

| | | | | | | | | |
|--------|---------|---------|---------|---------|----------|---------|----------|----------|
| Red | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Orange | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Yellow | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Green | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Blue | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Violet | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Brown | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |
| Gray | R _____ | O _____ | Y _____ | G _____ | BL _____ | V _____ | BR _____ | GR _____ |

Lab _____

RECORD SHEET

Name _____ Age _____ Sex _____

Color of clothes child is wearing _____

Part I

Put a check beside the color that the child indicates as his preference.

Red _____

NOTES:

Orange _____

Yellow _____

Green _____

Blue _____

Violet _____

Part II

Write the names of the colors that the child selects as his first choice for each of the following objects as they are presented.

Houseshoes _____

Teddy Bear _____

Coat _____

Ball _____

Girl's Dress _____

Tricycle _____

Boy's Overalls _____

Rocking Horse _____

NOTES:

PARENT'S QUESTIONNAIRE

Name _____

Child's Name (enrolled in preschool) _____

Please answer the following questions using any colors preferred.

Please indicate your color preference _____

What is your color preference for the following (if you have no color preference, please indicate):

Sports car _____

Clothing: Clothes for yourself _____

Clothes for your children

| Name | <u>Boys</u> Age | Color | Name | <u>Girls</u> Age | Color |
|-------|--------------------|-------|-------|---------------------|-------|
| _____ | | | _____ | | |
| _____ | | | _____ | | |
| _____ | | | _____ | | |

Room decor (referring to the color accent or overall color effect)

Family Room _____ Kitchen _____

Living Room _____ Bedroom _____

Children's Bedroom

| Name | <u>Boys</u> Age | Color | Name | <u>Girls</u> Age | Color |
|-------|--------------------|-------|-------|---------------------|-------|
| _____ | | | _____ | | |
| _____ | | | _____ | | |
| _____ | | | _____ | | |

If you would like to know the results of this study as it pertains to your child, please indicate this by writing your name and address below:

**OKLAHOMA STATE UNIVERSITY • STILLWATER**

Department of Family Relations & Child Development
(405) 372-6211, Ext. 6084

74074

March 14, 1973

*Dear Parents:

I am a graduate student (FRCD) in Early Childhood Education and am currently studying young children's color preferences. This study concerns personal preferences and so does not have "right" or "wrong" answers. I am trying to determine if there is a trend for young children to prefer a particular color, and, if so, what colors do they prefer.

In studying young children's color preferences, I am also interested in finding their parents' color preferences. If you agree to participate in this study, please indicate on the line below and return this letter to your child's teacher. I will need you to fill out a brief questionnaire at the Child Development Laboratory.

When I have completed my study, I will share the findings on your child as well as the general findings of the study.

Sincerely,

Jeanette Easterling
Graduate Assistant
Dept. of Family Relations &
Child Development

Parent's Signature _____

*Letter given to parents of children enrolled in
Child Development Laboratories.

**OKLAHOMA STATE UNIVERSITY • STILLWATER**

Department of Family Relations & Child Development
(405) 372-6211, Ext. 6084

74074

May, 1973

*Dear Parents:

I am a graduate student (FRCD) in Early Childhood Education at OSU and am currently studying young children's color preferences. This study concerns personal preferences and so does not have "right" or "wrong" answers. I am trying to determine if there is a trend for young children to prefer a particular color, and, if so, what colors do they prefer.

In studying young children's color preferences, I am also interested in finding their parents' color preferences. If you agree to participate in this study, please complete the attached questionnaire and return this letter to your child's teacher.

When I have completed my study, I will share the findings on your child as well as the general findings of the study.

Sincerely,

Jeanette Easterling
Graduate Assistant
Dept. of Family Relations &
Child Development

*Letter given to parents of children enrolled in nursery schools and day care centers.

APPENDIX B

TEST-RETEST COLOR PREFERENCES FOR
THREE-YEAR-OLD BOYS
N=14

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|---------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 1. Test | V ¹ | V | V | V | V | V | V | V | V |
| Retest | V | V | V | V | V | V | V | V | V |
| 2. Test | B | Y | R | R | V | R | R | R | R |
| Retest | R | R | R | R | R | R | R | R | R |
| 3. Test | G | R | G | G | O | G | G | G | O |
| Retest | B | O | R | G | G | Y | G | O | V |
| 4. Test | V | V | G | Y | V | G | V | B | O |
| Retest | G | G | G | G | G | G | G | G | G |
| 5. Test | V | R | Y | G | B | Y | O | Y | Y |
| Retest | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 6. Test | V | R | B | V | B | O | O | G | R |
| Retest | R | R | R | B | R | R | V | V | R |
| 7. Test | Y | R | R | O | B | Y | B | B | R |
| Retest | R | R | R | Y | G | G | Y | Y | Y |
| 8. Test | B | O | B | G | Y | R | V | O | O |
| Retest | V | V | O | G | V | O | G | Y | V |
| 9. Test | V | V | Y | V | V | V | V | V | V |
| Retest | V | V | V | V | V | V | V | V | V |
| 10. Test | Y | B | V | V | V | V | V | R | B |
| Retest | R | Y | Y | O | O | V | B | Y | V |
| 11. Test | G | V | O | G | G | R | R | O | B |
| Retest | Y | Y | Y | R | O | O | V | G | G |
| 12. Test | V | O | Y | Y | V | Y | R | Y | O |
| Retest | V | O | V | V | B | B | Y | O | O |
| 13. Test | B | V | G | Y | G | G | G | G | G |
| Retest | G | G | G | G | G | G | G | G | G |
| 14. Test | R | V | Y | B | Y | O | Y | B | Y |
| Retest | Y | Y | Y | R | Y | R | V | V | R |

¹V=violet; B=blue; Y=yellow; R=red; G=green; O=orange

TEST-RETEST COLOR PREFERENCES FOR
FOUR-YEAR-OLD BOYS
N=15

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|---------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 15. Test | V ¹ | G | R | R | R | Br | R | R | R |
| Retest | B | R | V | R | R | R | R | O | R |
| 16. Test | R | Y | V | V | V | V | V | V | V |
| Retest | Y | Y | Y | Y | Y | O | R | G | V |
| 17. Test | G | G | G | G | G | G | G | G | G |
| Retest | G | G | Y | V | R | B | G | Y | G |
| 18. Test | R | R | R | R | R | R | R | R | R |
| Retest | V | V | V | V | V | V | V | V | V |
| 19. Test | V | O | R | G | R | R | V | O | V |
| Retest | B | V | V | V | V | V | O | R | G |
| 20. Test | R | R | R | R | R | R | R | R | R |
| Retest | R | R | R | R | R | R | R | R | R |
| 21. Test | Y | Y | G | B | G | B | B | G | R |
| Retest | B | B | B | B | B | B | B | B | B |
| 22. Test | V | V | V | V | V | V | V | V | V |
| Retest | V | V | V | V | V | V | V | V | V |
| 23. Test | R | Y | G | G | R | G | O | G | B |
| Retest | Y | R | G | V | O | B | Y | G | O |
| 24. Test | R | R | R | B | R | R | R | R | R |
| Retest | B | B | B | Y | G | R | O | B | O |
| 25. Test | O | B | O | O | O | O | O | O | O |
| Retest | O | O | O | Y | B | G | R | B | O |
| 26. Test | G | V | V | V | V | V | G | R | G |
| Retest | B | B | V | G | V | V | G | G | G |
| 27. Test | V | V | V | V | V | V | B | V | V |
| Retest | G | R | B | R | V | V | B | V | V |
| 28. Test | R | R | V | R | Y | O | B | O | R |
| Retest | O | G | G | B | G | B | R | G | O |
| 29. Test | V | V | V | V | V | V | V | V | V |
| Retest | V | G | Y | Y | O | G | R | O | B |

¹V=violet; G=green; R=red; Br=brown; O=orange; Y=yellow; B=blue

TEST-RETEST COLOR PREFERENCES FOR
FIVE-YEAR-OLD BOYS
N=16

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|---------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 30. Test | B ¹ | B | B | B | B | B | B | B | B |
| Retest | B | B | O | B | B | B | B | B | B |
| 31. Test | V | V | V | Y | V | V | G | R | G |
| Retest | V | G | Y | Y | B | R | O | G | O |
| 32. Test | V | B | B | B | V | V | B | B | V |
| Retest | V | B | R | V | B | V | B | V | V |
| 33. Test | G | G | G | G | G | G | G | G | G |
| Retest | R | R | R | R | R | R | R | R | R |
| 34. Test | R | R | R | R | R | R | R | R | R |
| Retest | R | R | R | R | R | R | R | R | R |
| 35. Test | V | V | V | V | V | V | V | V | V |
| Retest | V | V | V | V | V | V | V | V | V |
| 36. Test | B | B | O | R | O | O | V | V | B |
| Retest | O | B | V | O | O | O | O | O | O |
| 37. Test | B | B | B | B | B | B | B | B | B |
| Retest | B | B | B | B | B | B | V | G | B |
| 38. Test | G | R | O | P | G | O | V | V | Y |
| Retest | R | V | Y | V | O | Br | V | G | R |
| 39. Test | V | R | G | O | V | B | O | V | R |
| Retest | V | R | Y | R | R | O | B | B | G |
| 40. Test | B | G | G | O | V | G | G | R | R |
| Retest | G | B | Y | B | G | O | B | V | G |
| 41. Test | B | Y | Y | O | V | Y | B | B | G |
| Retest | Y | G | O | R | B | B | G | V | Y |
| 42. Test | G | G | B | V | V | V | G | V | G |
| Retest | V | G | R | G | B | G | V | B | V |
| 43. Test | V | G | O | R | B | B | B | B | G |
| Retest | V | G | B | R | G | G | R | G | B |
| 44. Test | R | R | R | R | R | R | R | R | R |
| Retest | R | R | R | R | R | R | R | R | R |
| 45. Test | B | Y | V | B | V | G | B | B | B |
| Retest | V | Y | R | B | B | G | R | B | Y |

¹B=blue; O=orange; V=violet; Y=yellow; G=green; R=red; P=pink; Br=brown

TEST-RETEST COLOR PREFERENCES FOR
THREE-YEAR-OLD GIRLS
N=15

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|---------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 46. Test | V ¹ | V | V | G | V | V | V | G | V |
| Retest | V | V | V | B | G | G | V | V | V |
| 47. Test | V | V | V | V | G | V | V | Y | V |
| Retest | V | V | V | V | B | V | V | V | V |
| 48. Test | V | V | V | V | V | V | V | V | V |
| Retest | R | B | G | V | V | V | V | V | V |
| 49. Test | V | V | V | V | V | V | Y | V | R |
| Retest | G | V | R | B | V | V | V | V | V |
| 50. Test | V | V | V | V | Y | V | V | V | V |
| Retest | V | V | V | V | V | V | V | V | V |
| 51. Test | G | G | B | V | V | V | V | V | V |
| Retest | V | V | B | R | V | G | Y | B | B |
| 52. Test | G | Y | O | B | R | Y | R | B | R |
| Retest | B | V | G | O | Y | R | R | R | V |
| 53. Test | Y | V | R | R | R | R | R | Y | Y |
| Retest | V | R | V | V | B | R | G | R | Y |
| 54. Test | V | G | R | B | R | B | R | R | R |
| Retest | R | V | R | R | R | G | G | O | Y |
| 55. Test | Y | R | R | R | R | R | R | R | R |
| Retest | R | R | R | R | R | R | R | R | R |
| 56. Test | G | G | R | V | R | Y | V | Y | O |
| Retest | V | Y | R | R | V | Y | B | V | O |
| 57. Test | O | O | O | O | V | O | O | O | G |
| Retest | B | B | B | B | Y | V | B | R | V |
| 58. Test | B | B | R | V | R | Y | V | O | G |
| Retest | G | R | O | B | B | B | G | B | R |
| 59. Test | V | V | Y | B | Y | O | O | Y | G |
| Retest | O | O | G | V | O | Y | V | R | R |
| 60. Test | Y | O | V | V | G | V | R | V | V |
| Retest | B | V | V | V | V | V | V | R | O |

¹V=violet; G=green; B=blue; R=red; Y=yellow; O=orange

TEST-RETEST COLOR PREFERENCES FOR
FOUR-YEAR-OLD GIRLS
N=21

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 61. Test | G ¹ | V | G | G | R | O | O | Y | R |
| Retest | V | O | G | Y | G | V | G | G | V |
| 62. Test | Y | B | V | R | Y | R | V | R | O |
| Retest | R | B | R | G | Y | V | R | R | R |
| 63. Test | V | V | R | R | G | R | R | Y | V |
| Retest | V | B | V | G | B | V | R | R | R |
| 64. Test | V | V | G | G | O | R | Y | G | G |
| Retest | V | O | B | Y | O | V | B | G | R |
| 65. Test | B | B | V | B | G | Y | R | O | G |
| Retest | B | B | B | R | V | O | Y | G | B |
| 66. Test | V | Y | R | O | V | Y | G | B | O |
| Retest | V | V | B | G | O | G | R | B | O |
| 67. Test | R | B | R | V | B | Y | B | Y | R |
| Retest | Y | Y | O | V | B | Y | V | V | R |
| 68. Test | G | Y | Y | Y | R | Y | Y | Y | Y |
| Retest | Y | Y | Y | Y | V | Y | Y | Y | Y |
| 69. Test | Y | V | V | O | G | O | G | Y | R |
| Retest | V | G | V | B | Y | V | O | O | V |
| 70. Test | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Retest | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 71. Test | B | B | R | B | B | B | B | B | B |
| Retest | R | B | G | O | Y | Y | Y | O | G |
| 72. Test | V | V | V | V | B | V | V | B | B |
| Retest | V | B | G | V | V | V | V | B | B |
| 73. Test | G | V | V | V | B | V | V | V | B |
| Retest | V | G | O | O | B | O | V | R | Y |
| 74. Test | Y | R | Y | R | G | Y | R | R | Y |
| Retest | R | O | R | G | B | Y | B | G | R |
| 75. Test | G | V | B | V | R | V | G | V | V |
| Retest | R | V | G | V | G | R | R | G | V |
| 76. Test | Y | R | G | Y | Y | G | R | G | R |
| Retest | Y | G | V | R | Y | V | O | V | R |

¹G=green; V=violet; R=red; O=orange; Y=yellow; B=blue

FOUR-YEAR-OLD GIRLS (Continued)

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|---------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 77. Test | V | V | G | V | G | V | Y | G | B |
| Retest | V | V | Y | V | V | V | B | G | V |
| 78. Test | Y | V | V | Y | R | G | R | Y | Y |
| Retest | Y | Y | Y | Y | V | R | R | R | Y |
| 79. Test | V | V | Y | V | V | V | V | V | V |
| Retest | V | V | B | V | G | V | B | R | V |
| 80. Test | R | R | R | R | R | R | R | R | R |
| Retest | R | R | B | B | B | R | Y | G | O |
| 81. Test | B | G | O | Y | V | B | R | R | R |
| Retest | V | V | O | G | R | R | Y | V | B |

TEST-RETEST COLOR PREFERENCES FOR
FIVE-YEAR-OLD GIRLS
N=16

| | First Color Preference | Clothes | | | | Toys | | | |
|----------|------------------------|---------|------|-------|----------|------|------|-------|-------|
| | | Shoes | Coat | Dress | Overalls | Bear | Ball | Trike | Horse |
| 82. Test | V ¹ | O | R | B | G | O | R | Y | Y |
| Retest | R | B | Y | V | R | Y | G | V | R |
| 83. Test | O | R | R | R | R | O | R | O | O |
| Retest | O | V | V | V | V | V | V | V | O |
| 84. Test | V | V | Y | G | V | R | P | V | O |
| Retest | V | G | O | R | V | V | V | O | V |
| 85. Test | V | V | V | V | V | V | V | V | V |
| Retest | V | V | V | V | V | V | V | V | V |
| 86. Test | V | G | Y | G | G | V | V | B | B |
| Retest | V | V | V | V | V | V | V | V | V |
| 87. Test | V | V | G | V | R | V | V | G | V |
| Retest | B | V | G | V | V | V | R | O | Y |
| 88. Test | Y | O | V | Y | V | G | B | Y | B |
| Retest | Y | B | O | G | G | V | V | V | G |
| 89. Test | G | G | B | G | Y | G | G | B | G |
| Retest | Y | G | O | Y | R | R | R | O | B |
| 90. Test | V | G | V | G | R | Y | V | V | R |
| Retest | R | G | R | V | O | O | V | R | G |
| 91. Test | Y | O | V | Y | G | Y | Y | B | Y |
| Retest | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| 92. Test | R | R | R | B | O | R | O | O | B |
| Retest | B | O | R | V | O | Y | G | V | G |
| 93. Test | Y | R | B | V | O | R | Y | V | R |
| Retest | Y | R | V | R | B | O | G | O | B |
| 94. Test | Y | Y | Y | Y | Y | Y | B | R | G |
| Retest | V | Y | V | Y | B | Y | R | B | O |
| 95. Test | R | R | Y | B | G | B | Y | R | V |
| Retest | R | V | R | B | B | Br | R | O | G |
| 96. Test | R | O | V | R | B | Y | G | O | O |
| Retest | V | O | Y | R | B | Y | G | R | B |
| 97. Test | R | B | V | R | B | V | O | G | V |
| Retest | R | Y | V | G | B | V | G | B | R |

¹V=violet; O=orange; R=red; B=blue; G=green; Y=yellow; P=pink; Br=brown

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VITA

Jeanette Evans Easterling

Candidate for the Degree of

Master of Science

Thesis: YOUNG CHILDREN'S COLOR PREFERENCES

Major Field: Family Relations and Child Development

Biographical:

Personal Data: Born in Ponca City, Oklahoma, March 25, 1949, the daughter of Harry Lee and Carolyn Evans.

Education: Graduated from Ponca City Senior High School, Ponca City, Oklahoma, in spring of 1967; attended Central State College, Edmond, Oklahoma, one year; received a Bachelor of Science degree in Psychology from Oklahoma State University, Stillwater, Oklahoma, in May, 1971; completed the requirements for the Degree of Master of Science in Family Relations and Child Development in May, 1974, from Oklahoma State University at Stillwater, Oklahoma.

Professional Experience: Graduate Research Assistant, Department of Family Relations and Child Development, Oklahoma State University, spring of 1973; Graduate Assistant, Department of Family Relations and Child Development, Oklahoma State University, 1973-1974.

Professional Organizations: Omicron Nu, Southern Association for Children Under Six, Oklahoma Association for Children Under Six, Oklahoma Education Association.