Colour Preference among Children in a Nigerian Montessori School

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Abstract

Colour preference among children has been explored in a variety of populations and cultures. However, there is scanty research on the psychology of colour and, in particular, colour preference among children in Nigeria. Sixty (60) children (30 males and 30 females) randomly drawn from a population of students of a Montessori School in Ibadan, Nigeria participated in the study. A One-Way Analysis of Variance (ANOVA) for Repeated Measures Design was used to test five hypotheses stated in the study. Results identified the order of colour preference by the children as red, yellow, tint, white, green, blue, brown and black. Red and yellow were significantly preferred to black. There was significant difference in order of colour among female children, children of age group 9-12 years and children of age group 3-8 years. In conclusion, red and yellow prove to be more stimulating and attractive than any other colour. These findings will be helpful to teaching agencies, and advertising companies and entrepreneurs that major in the production of children materials to know the right colour to use on their products.

Keywords: *Colour preference, sex differences, age group, children materials, Nigeria*

1. Introduction

Wenzel, Langer, Kassar and Bencze (2012) define colour preference as the tendency to prefer certain colours over others. Some colours are perceived as pleasant and attractive, while others appear less pleasant or neutral, sometimes even repellent. Colour preference among children has been explored in a variety of populations and cultures. However, there is little understanding concerning the psychology of colour and in particular colour preference among children in Nigeria. Furthermore, factors that have been identified as responsible for the order of colour preference in populations from industrialized countries may not be the same for populations in the developing countries, such as Nigeria. Hence, the present study has been carried out to assess the order of colour preference among a group of children in Nigeria.

A number of theories have, in recent times, been put forward about what rules these preferences (Ou, Luo, Woodcock & Wright, 2004; Hurlbert & Ling, 2007; Palmer and Schloss, 2010). The ecological valence theory (EVT) (Palmer & Schloss, 2010), for example, proposes that colour preferences arise from affective responses to colour-associated objects. People like/dislike colors to the extent that they like/dislike the objects that are typically related with that colour. In line with this theory, Palmer and Schloss (2010) establish that 80% of the difference in American preferences for 32 colours may well be accounted for by the average valence ratings of the objects connected with these colours. For instance, strongly detested dark greenish yellow was associated with strongly detested materials, such as dirty water, bile, and rotten food, while strongly pleasant saturated blue was associated with strongly pleasant natures, like clear sky and sparkling water. Earlier investigation on infant colour preferences has been consistent with the innateness proposition, in that young infants favourably stare mainly at blue and least at yellow-green or yellow (e.g., Teller, Civan, & Bronson-Castain, 2004; Zemach, Chang, & Teller, 2007; Franklin et al., 2008; Franklin, Bevis, Ling, & Hurlbert, 2010).

Burkitt, Barrett and Davis (2003), in a study of children's colour choices for completing drawing affectively characterized topics, argue that, in all age groups and for all topics, the children used more preferred colours for the nice figures, their least preferred colours for the nasty figures, and colours rated intermediately for the neutral figures. It was also found that, in all age groups and for all topics, black tended to be the most frequently chosen colour for colouring in the drawing of the negatively characterized figures. By contrast, primary colours were predominantly selected for the neutral figure; while a wide range of mainly primary and secondary colours were chosen for colouring in the nice figure. This means that children have learned to associate pleasant situation to bright colors and liken unpleasant conditions to dark colours.

In the face of the reasonably current life of present-day gender typing by colour, there are differences in colour processing and preferences among children, which may have biological origins. Children, in many circumstances, show gender-differentiated fashions of play and toy preferences (Alexander, 2003) and hormonal processes are known to influence sex-dimorphic behaviour (Cohen- Bendahan, van de Beek, & Berenbaum, 2005; Hines, 2010).

Read and Upington (2009) claim that the age when infants begin showing a preference for colour is at about 12 weeks old. Factors such as gender and age group cause consumers to acknowledge and recognize colour differently. Young people are more open than their elders to test with colour. Perception of colour is different between age groups. For example, red represents love and blood for teens, but blood and passion for the 55 and older age group (Akcay, Sable & Dalgin, 2012).

Colour preferences appear to vary from childhood to adulthood. Infants of both sexes have a preference for reddish colours (Franklin et al., 2010; Jadva, Hines & Golombok, 2010) while blue is most frequently preferred among adults (Hurlbert & Ling, 2007), particularly men. A further comprehensive gender investigation discovered a significant gender differences for pink and purple (for example, girls rating them as happy colours, but boys rating them as unhappy colours), with slightly significant results for red and brown (for example, boys rating them as happy colours, but girls rating them as unhappy colours). No particular gender differences were found for yellow, orange, and white, blue, green and black (Pope, Butler,& Qualter, 2012). It is considered that bright colours accentuate positive qualities, while dark colours emphasize negative qualities (Lev-Wiesel & Daphna-Tekoha, 2000; Cox, 2005).

In a study of children's emotional associations with colours, Boyatzis and Varghese (1994) found that children had positive reactions to bright colours (for example, pink, and blue, red) and negative emotions for dark colours (for example, brown, black and gray). They add that children's emotional reactions to bright colours became increasingly positive with age. In an effort to determine whether age influenced preference for the colours black and white by infants and young children, May and May (1981) found that, as a group, age affected colour preference. A pro-black bias was found for the younger children. The findings suggest that colour preference of infants and young children is not the same as for older children and adults. May and May (1979) have studied whether a preference for white was present in infant and children. Statistical analysis did not however, support the existing literature, thereby refuting the published idea that white preference is a general quality in all human beings.

Walsh, Toma, Tuveson and Sondh (1990) investigated the effect of colour on children's food choices and postulated that children preferred foods that were red, green, orange and yellow, in that order. Radeloff (1990) looked at the role of colour in the perception of attractiveness and reported that females preferred a favourite colour significantly more often than males, while males preferred bright colours significantly more often than females. In a similar study on the effect of gender on colour preference, Donabedian (2004) opines that both boys and girls chose blue more often than red and yellow. Boys chose red more often than blue and yellow. The girls continued the previous pattern of blue more often than red and yellow. When colour perception was investigated among both healthy and peadiatric patients, Park (2009) found that girls preferred red and purple more than boys do. In this study, regardless of gender effects, healthy children and pediatric patients preferred blue and green the most and white the least.

The importance of knowing colour preference among children cannot be overemphasized. This is because colour is highly informative for identifying objects and people rely more on colour than on other perceptional features when locating an object. In other words, colour plays a role in speeding visual processing. In the recent past, there has been problems with the growth of companies using the same colours and other industries using colours that may not be inviting to the children on their products. This has certain consequences on the producers and the consumers.

Many advertising companies and manufacturers that produce children's materials have, over the years, concentrated their research on how to improve the attractiveness of their products in terms of packaging but play down on colour combination. Colour has a strong force to produce brand picture, have an effect on the buyer's judgment-making process and alter the mood of consumers. Colour can contribute to differentiating products from contenders and making positive or negative feelings about products (Grossman & Wisenblit, 1999; Singh, 2006). It means that if a firm

satisfies the desire of its customers, it is bound to make more profit as a result of increase in sale. Based on this fact, the study will be of most relevance to manufacturing industries that produce children's materials; teachers who teach young children at crèche, playgroups and schools; religious leaders who give instruction to infants and young children in churches and mosques.

The problem being addressed in the present study, therefore, is to examine the effect of sex and age in the order of colour preference among children. Therefore, the following hypotheses were tested:

1. There will be a significant difference in the order of colour preference by the entire children.
2. There will be a significant difference in the order of colour preference by the male children.
3. There will be a significant difference in the order of colour preference by the female children.
4. There will be a significant difference in the order of colour preference by the children whose chronological age range between 9 and12 years.
5. There will be a significant difference in the order of colour preference by children whose chronological age range between 3 – 8 years.

2. Methodology

This study is a cross-sectional survey, with colour preference as the dependent variable and children, gender, and age as major independent variable. Sixty (60) subjects made up of 30 males and 30 females participated in the study. The population was made up of pupils of a Montessori School in Ibadan, Nigeria. By employing the stratified sampling technique, the population was first divided into two strata (male and female). Each stratum was subsequently divided into two groups (higher age and lower age). Simple random sampling was then employed in each stratum to select 15 males and 15 females among the subjects who fall into the lower age group (3 – 8 years). Similarly, 15 males and 15 females were randomly selected among the upper age group (9 – 12 years). This means that each group consisted of equal number of males and females. The subjects were all Nigerians with a mean age of 8.2 years and SD of 2.30.

2.1 Research Instrument

The instrument of data collection for this study was eight (8) cardboard papers of 6 inches by 6 inches size constructed by these researchers. Eight (8) different colours: red, green, yellow, blue, white, black, tint and brown, were drawn on each piece of cardboard papers for the subjects to identify and order according to their preferences. A stop watch was used for timing the subjects. A recording sheet was used to record the order of preference and other vital information needed for this research, such as age and sex of the respondents.

2.2 Procedure

2.2.1 Pilot Study

At the inception of this study, these researchers approached the proprietor of the Montessori School in Ibadan to obtain permission to involve the school and its students in a research. The permission was granted and the study started with a pilot study to establish the validity and reliability of the testing materials using 10 males (consisting age groups 3 – 8 years and 9 – 12 years) and 10 females (consisting age groups 3 – 8 years and 9 – 12 years). Face validity and test-retest reliability were established. For the face validity, the eight different coloured cardboards were presented to a senior lecturer in the Department of Psychology, University of Ibadan. He was to study them carefully so as to establish expert judgment on the suitability of the testing materials, which he did. He gave the go ahead for the study having considered the materials relevant to the study. Furthermore, ten graduate students of Psychology were sampled for confirmation of the different colours and to determine their appropriateness for the study. The eight colours were therefore retained as valid. For the reliability test, twenty (20) children of the school were used, but these were not included in the main study. The retest came up 10 minutes after the first test.

2.2.2 Main Study

The main study was conducted in an office provided for these researchers by the school authority. This office had two open windows and was well illuminated with fluorescent lighting. In the office were a table and two chairs facing each

other. On arrival, the pupils were welcomed and instructed to sit and to make themselves comfortable on the chairs opposite the researcher. Then the purposes of the research were explained to them. Each of the pupils was encouraged to ask questions in case they needed some clarification. The eight (8) different colour 6 x 6 inches cardboards were presented to them. The subject were instructed to look very well at the different coloured cardboards for 30 seconds after which they were asked to order the different colours according to their preference. For clarity, some of them who could not understand the instructions in the English language were instructed in their local language, Yoruba. After the first trial, the pupils were made to wait for 10 minutes for the second trial. The preferences were recorded immediately after each test, after which some demographic data, such as name, sex, age and religion, were sought. Respondents in this study were assessed everyday of the week from Monday to Friday between the hours of 9 am and 11 am. It took about 35 to 40 second for an average pupil to order the eight colours according to his/her preference.

2.3 Scoring Procedure

The coloured cardboards were assigned a number each and the subject ordered them according to his or her preference. After the retest, the average for each colour according to the order of preference was scored.

2.4 Design/Statistics

Statistical Package for Social Sciences (SPSS) was used to compute the One-Way Analysis of Variance (ANOVA) for repeated measure design. It showed the difference in order of colour preference. The post hoc was also determined by suing a multiple comparison test: Scheffe statistics to show where statistical differences occurred between the groups of colour.

3. Results

The five hypotheses stated in this study were examined with a One-Way Analysis of Variance (ANOVA) for Repeated Measures Design. The result for the first hypothesis is presented in Table 1.

Table 1. One Way Analysis of Variance (Anova)

Dependent Variables	Source	Sum of squares	Of	Mean square	F	P
General children	Main effect (colour) explained	232.817	7	33.260	10.663	<.0001
	residual total	232.817	7	33.260	10.663	.000
		1472.175	472	3.119		
		1704.992	479	3.559		
Male children	Main effect (colour) explained	112.979	7	16.140	5.122	<.0001
	residual total	112.979	7	16.140	5.122	.000
		730.983	232	3.151		
		842.963	239	3.531		
Female children	Main effect (colour) explained	146.263	7	20.895	6.783	<.0001
	residual total	146.263	7	20.895	6.783	.000
		714.633	232	3.080		
		860.896	239	3.602		
Higher age children (9 – 12 yrs)	Main effect (colour) explained	102.462	7	14.637	4.577	<.0001
	residual total	102.462	7	14.637	4.577	.000
		741.933	232	3.198		
		844.396	239	3.602		
Lower age children (3 – 8 yrs)	Main effect (colour) explained	144.896	7	20.699	6.711	<.0001
	residual total	144.896	7	20.699	6.711	<.000
		715.567	232	3.084		
		860.464	239	3.600		

Table 1 shows that there was a significant difference in the order of colour preference by the entire children F (7, 472) = 10.663; p < .01. As shown in Table 2, the order of preference is Red, Yellow, Tint, White, Green, Blue, Brown and Black. However, a multiple comparison analysis showed that Red and Yellow were significantly preferred to Brown and Black, while Red, Yellow, Tint, White, Green and Blue were significantly preferred to Black. Thus, the first hypothesis is confirmed.

The result of the second hypothesis presented in Table 1 reveals also that there was a significant difference in the order of colour preference by the male children F (7.232) = 5.12; p < .01

Table 2. Scheffe Multiple Comparison Analysis Showing the Order of Preference among Children

Dependent Variables	Mean	Colour	1 2 3 4 5 6 7 8
General children	3.6833	Red 1	
	3.7917	Yellow 2	
	4.0250	Tint 7	
	4.3000	White 5	
	4.5167	Green 3	
	4.6667	Blue 4	
	5.0167	Brown 8	* *
	5.9667	Black 6	* * * * * *
Male children	3.4500	Red 1	
	3.7500	Yellow 2	
	4.0167	Tint 7	
	4.5833	White 4	
	4.7333	Green 5	
	4.8500	Blue 3	
	5.0333	Brown 8	
	5.6833	Black 6	* *
Female children	3.8833	Red 2	
	3.6667	Yellow 5	
	3.9167	Tint 1	
	4.0333	White 7	
	4.1833	Green 3	
	4.7500	Blue 4	
	5.0000	Brown 8	
	6.2500	Black 6	* * * * *
Higher age children (9 – 12 years)	3.5833	Red 1	
	3.7333	Yellow 2	
	4.2500	Tint 7	
	4.3000	White 5	
	4.4500	Green 3	
	4.6167	Blue 4	
	5.2667	Brown 8	
	5.6333	Black 6	* *
Lower age children (9 – 12 years)	3.7833	Red 1	
	3.8000	Yellow 7	
	3.8500	Tint 2	
	4.3000	White 5	
	4.5833	Green 3	
	4.7167	Blue 4	
	4.7667	Brown 8	
	6.3000	Black 6	* * * *

As shown in Table 2, the order of preference is Red, Yellow, Tint, Blue, White, Green, Brown and Black. To determine the direction of the significant effect, Scheffe's multiple comparison test was carried out and it showed that Red and Yellow were significantly preferred to Black. This finding supports the second hypothesis.

The third hypothesis states that there will be a significant difference in the order of colour preference by the female children. It can be seen from Table 1 that there was a significant difference in the order of colour preference by female

children F (7,232) = 6.783; p < .01. It can be seen in Table 2 that the order of preference is Yellow, White, Red, Tint, Green, Blue, Brown and Black. However, a multiple comparison analysis (Table 2) indicated that Yellow, White, Red, Tint and Green were significantly preferred to Black. This confirms the third hypothesis.

The result of the fourth hypothesis presented in Table 1 shows that there was a significant difference in the order of colour preference by children whose chronological age ranged between 9 and12 years old, F(7,232) = 4.577, p < .01. As shown in Table 2, the order of colour preference is Red, Yellow, Tint, White, Green, Blue, Brown and Black. The multiple comparison test showed that Red and Yellow were significantly preferred to Black. Thus, the fourth hypothesis is supported.

Lastly, the comparative analysis of children whose chronological ages ranged from 3 – to8 years presented in Table 1 shows that significant difference exists in the order of colour preference F (7,232) = 7.711; p <.01. Table 2 presents the order of colour preference as Red, Tint, Yellow, White, Green, Brown and Black. The results of the multiple comparison test show that Red, Tint, Yellow and White were significantly preferred to Black. Thus, the fifth hypothesis is confirmed. The summary of colour preferences is shown in Table 3.

Table 3. Summary of Results

Independent Variable		Order of Color Preferences							
Sex	Male	Red	Yellow	Tint	Blue	White	Green	Brown	Black
	Female	Yellow	White	Red	Tint	Green	Blue	Brown	Black
Age	9 -12 years	Red	Yellow	Tint	White	Green	Blue	Brown	Black
	3 – 8 years	Red	Tint	Yellow	White	Green	Blue	Brown	Black
General		Red	Yellow	Tint	White	Green	Blue	Brown	Black

4. Discussion

The study was primarily designed to examine the effect of sex and age on order of colour preference among children, using the children of a Montessori school as subjects. In achieving this, five hypotheses were stated and examined with a One-Way Analysis of Variance (ANOVA) for Repeated Measures Design. The results obtained show that there was significant difference in the order of colour preference by the entire children, male and female children whose chronological ages ranged between 9 and12 years and children whose chronological ages ranged between 3 and 8 years.

The first hypothesis reveals that there was significant difference in the order of colour preference by the entire children. It shows the order of preference as Red, Yellow, Tint, White, Green, Blue, Brown and Black. Red and Yellow were significantly preferred to Black. This result shows that Red and Yellow were highly preferred although other colours, such as Tint, White, Green and Blue, were also preferred. These other colours cannot be said to be at an equal level with either Red or Yellow because twice were they significantly preferred by the children. This is a confirmation of Hering's theory, as recorded by Matlin (1988), that there are six psychologically primary colours, such as assigned by pairs to three kinds of receptors. One of these is red-green receptor whose response rate increases to red and decreases to green. There is also yellow-blue receptor whose response rate increases to yellow and decreases to blue. This finding also gives credence to Ptichford and Mullen (1990), who found that children prefer brown and gray significantly less than basic colours. Walsh et al. (1990) also postulate that children preferred foods that were red, green, orange and yellow, in that order. This partly supports the result of these findings.

The second hypothesis shows significance in the order of colour preference by the male children. The mean result reveals the order of colour preference as Red, Yellow, Tint, Blue, White, Green, Brown and Black. The male children significantly preferred Red and Yellow to Black. The order of colour preference by the male children partly supports the empirical finding of Donabedian (2004), that boys chose the Red most often. According to Bond (2010), red is the colour of strength, health, and vitality and is usually chosen by people with open and uncomplicated natures, and a zest for life.

The third hypothesis shows that there was a significant difference in the order of colour preference by female children. They showed order of colour preference as Yellow, White, Red, Tint, Green, Blue, Brown and Black. The female children significantly preferred Yellow, White, Red, Tint and Green to Black. This result demonstrates a complete hatred for Black by the female children because they preferred most of the other colours to Black. This finding, however, contradicts Donabedian (2004), who reported that female children chose Blue as their most preferred colour and Yellow as their least preferred colour.

The finding of the fourth hypothesis also suggests significant difference in the order of colour preference by

children whose ages ranged between 9 and 12 years. The colours were ordered as Red, Yellow, Tint, White, Green, Blue, Brown and Black. The result reveals that Red and Yellow were significantly preferred to Black. This is similar to the result obtained among the male children. It shows that children of higher age (9 – 12 years) preferred Red and Yellow to any other colour, particularly Black. Other colours preferred by children in this age bracket are Tint and White. This finding is not surprising based on the fact that bright colours have been said to draw attention to positive qualities, while dark colours emphasize negative qualities (Lev-Wiesel & Daphna-Tekoha, 2000; Cox, 2005).

Lastly, the fifth hypothesis also reveals that there was significant difference in the order of colour preference by children whose chronological ages ranged from 3 to 8 years. The colours were ordered as Red, Tint, Yellow, White, Green, Brown and Black. The result shows that Red, Tint, Yellow and White were significantly preferred to Black. The findings in the present study seems totally not in support of the account given by Hraba and Grant (1970), who found that black children 4 – 8 years of age significantly preferred the black doll as having the nice colour. Black was the least preferred by the entire children sampled in this study. This may be because Black has been associated with nasty and negatively characteristic figures, and negative emotions (Burkitt et al., 2003), and sadness (Bourgeois-Bailetti & Cerbus, 1977). This may have influenced their order of colour preference. It may also be as a result of the fact that, in this culture, Black is used to represent evil and works of darkness. This may have accounted for its least preference.

This research will have important implications for people who may be involved in using colour in practical situations. For instance, knowing which colours are more and less desired by the children might enable marketers and designers of consumer goods for children to create colour formats for their products that are designed to bring out positive feelings and thoughts. This might be, above all, significant when selling children products with strong situational associations, such as food, toys, cloth, and books. These results can also help health care providers, professionals and school proprietors to better understand appropriate colours for children populations. Besides, this research could assist market experts to effectively steer clear of arousing negative thoughts and emotions that might be activated by a certain colour.

Other people might also be able to use this research to their advantage when trying to stir up positive affect and cognition in their children. It has been demonstrated in this study that children prefer Red, Yellow, Tint, White and Blue, in that order. Red and Yellow prove more stimulating and attractive than any other colour. There are, however, some limitations of the present study, which future studies could address. For instance, it is advisable that a larger sample size of children can be used in the survey. Likewise other colours could be added in subsequent study. Finally, the sample can also be extended to children from other ethnic groups.

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