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COLOUR PREFERENCE, SIZE DISCRIMINATION AND MOTOR PERFORMANCE OF CHILDREN 7-10 YEARS OLD

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ABSTRACT

This investigation was designed to determine the colour preference; assess size discrimination and motor performance ability of children 7-10 years Old. Ninety school children (45 males and 45 females) with a mean age of 8.50 (SD + 2.3) were subjects for the study. Subjects reacted to a questionnaire relating to colour preference and colour charts. They also participated in a catching test to assess the motor performance ability. Data collected were analysed using descriptive statistics and a two-way analysis of variance.

Results indicated that colour preferences of subjects were sex biased with males preferring red colour and females blue colour. Size discrimination ability was fairly well established among subjects. ANOVA indicated a significant effect for the age and sex factors for catching.

It was concluded that red and blue colours were preferred by male and female subjects respectively and that the highest level of catching skill is well established at age 10.

INTRODUCTION

Children, like adults, are constantly placed in situations where they have to make choice in terms of colour, discriminate between size of materials and get involved in different physical activities. Researchers in various disciplines have examined the variables of colour, size and motor performance either singly or in one combination or the other in different situations.

Victoria (1972) described colour as the quality of an object by which it emits, reflects or transmits certain rays of light. Colours have been associated with emotions in that they have definite effects on human beings. Talabi (1979) is of the view that red colour conveys a feeling of excitement or anger, blue colour conveys the emotion of depression and it is cool while black colours is flat, dead and unattractive especially when used singly. Oguntona (1984) conjectured that choice of colour has much to do with traits of individual personality, in the

sense that people's choice of colour would differ according to their personality. The results of Gremza and Witt (1969) indicated that colour preference is influenced by age.

Several investigators (Coules, 1966, Tailor and Summer, 1945 and Adeyanju 1987) have studied the effects of colours on perception. Coules (1966) reported on the effect of photo-metric brightness and judgement of distance. Results indicated that brighter objects appear nearer than dimmer objects. Similarly, Tailor and Summer (1945) used depth perception instrument to determine the relationship between apparent and actual distance of various colours with regard to the brightness of the individual colour from a constant distance. They found that when apparent distance of different colours are held constant, the brighter colours are much more further than they appear; while the darker colours were actually nearer than they appeared.

Effects of colours on motor performance has been investigated. Morris (1974) investigated the effects of three ball colours and two background colours upon the catching performance of elementary school children. He reported that ball colour affected performance. Blue and yellow colours produced significantly higher catching score than white. Cobb (1969) also reported significant difference with regard to colour recognition among athletes in several sports. Red and blue colour were recognised more readily than black. Morris (1976) observed that the effect of the colour combination diminished with children above 7 years up to 11 years of age.

Catching is reception skill that is basic to performance in many sports. Haywood (1986) identified the differences exhibited by novice and experienced children in catching. Novice catch balls with their body which involves little force absorption and that this is found in initial catching by children. To become more proficient, novice catcher must 'give' with the ball to absorb the force of the ball. Stricker, et al. (1983) investigated the standards of performance for throwing and catching among children. They reported that at 8 years of age, most of boys and almost half of the girls tested were at the highest level of catching.

It is the purpose of this study to determine the effects of colour preference and the ability to discriminate size, and their relationship to motor performance among children aged 7-10 years old.

Subjects: Subjects for this study were ninety children (45 males and 45 females). With a mean age of 8.50 (SD + 2.31) who attended a summer school during 1986 long vacation. Subjects were randomly selected from classes 2-5 with equal number of boys and girls from each class.

Instrument: Instrument for the study consisted of: (i) A questionnaire, (ii) prepared colour charts and (iii) performance in catching test. The first part of the questionnaire sought demographic information. The second section was completed when children made their colour choice among three colours. The last section of the questionnaire was concerned with size discrimination.

The colour preference chart was made from cardboard. Three circles, 10cm in diameter each were painted either red, blue or black. They were then arranged in a linear formation vertically on a white background in the following order: Blue, Red and Black. The size discrimination chart was made up of three coloured circles red, blue and black pasted on a white background and arranged in a trian-

gator formation. The coloured circles were of different sizes. Blue circle was the largest with a diameter of 10cm. Black and Red circles had diameters of 9.5cm and 9cm respectively.

For motor performance, three official standard Volley-balls were used. Each of the ball was either painted colour red, blue or black. Subjects chose the ball with the colour they prefer for use in the catching performance.

Procedure:

The administration of the tests were done on class basis. For colour preference, subjects were instructed to rate each of the three coloured circles on the colour preference chart mounted on the chalk board from 1 to 3 with 1 being the best preferred and 3 the least preferred colour. For the size discrimination test, subjects were also asked to rate the circles on the size discrimination chart with 1 for the largest and 3 for the smallest.

In the motor performance test, each subject was made to stand behind a scratch line and from there indicated the ball with a colour he/she preferred to use for the catching test. One of the testers then stood three meters away and in front of the subject with the ball colour indicated by the subject. Throwing was done under-arm and three practice trials were allowed before the ten throws for the test were completed. Rating of the catches were done on four categorizations: Clean-catch, (CC), body catch (BC) fumble catch (FC) and a non-catch (NC) with a clean catch scoring four body-catch three, fumble-catch two and a no-catch one.

Descriptive statistics were used to analyse data on colour preference and size discrimination while a two-way analysis of variance was used to analyse data from the performance test.

RESULTS

Colour preference of the subjects is presented in table 1. Colour preferences of subjects are sex biased for the four age groups. Majority of male subjects indicated preference for red colour while the females preferred blue. Only four subjects indicated preference for colour black.

TABLE 1
Percent Distribution of Colour Preference by Age and Sex

Age	Sex	Colour		
		Black	Blue	Red
7	M	20(2)	30(3)	50(5)
	F	10(1)	60(6)	30(3)
8	M	0(0)	20(2)	80(8)
	F	0(0)	70(7)	30(3)
9	M	6.7(1)	26.7(4)	66.7(10)
	F	0(0)	46.7(7)	53.3(8)
10	M	9(0)	30(3)	70(7)
	F	0(0)	60(6)	40(4)

With regard to size discrimination, all age groups and sex were able to discriminate fairly well in terms of sizes of the coloured circles. At age 7, 70 percent of the subjects judged rightly the size of the circles. At ages, 8, 9 and 10, 93.3 and 100 percent of the subjects in each age bracket respectively were able to judge correctly the sizes of the coloured circles.

In the motor performance task, the age groups showed definite trends in their performances. Subjects in age bracket 7 had the highest percentage (21.0%) of non-catch (NC) followed by age groups 8 and 9, and with age 10 having the least (5.5%) of NC. As for fumble catch, (FC) there was no clear cut distinction between the groups. Age groups 7 and 8 had 15 percent each while age groups 9 and 10 had 17 and 18 percent of their total catches in FC. The next type of catch was the BC.

Figure 1

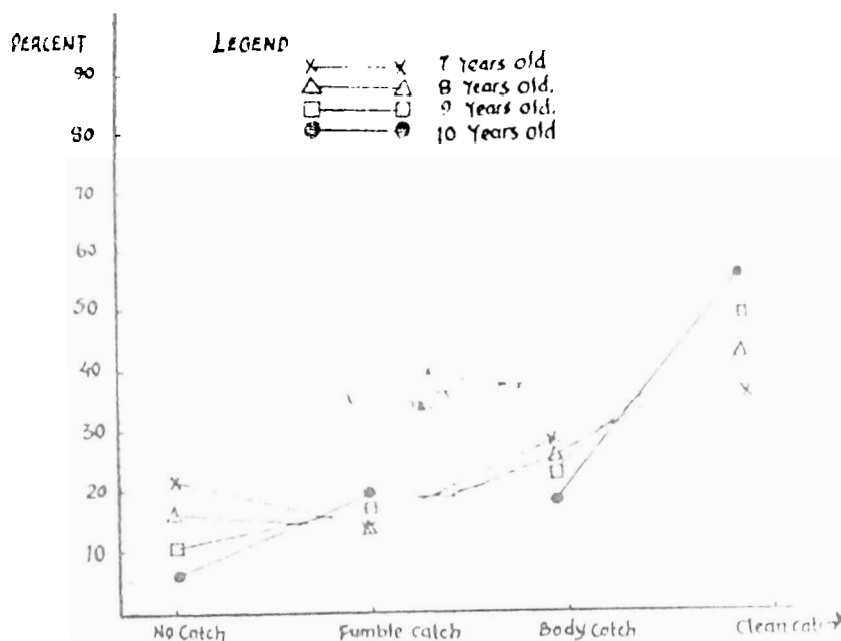


Fig1: Graphic representation of percent distribution of types of catches for the four age groups.

Subjects in age group 7 had the highest percentage of BC (29%) followed by age groups 8, 9 and 10 in that order.

There was a reversal of position in the last type of catching that is clean catch (CC). The age group 7 which had the highest percentage of NC now have the lowest percentage of CC (35%) followed by age group 8 with 42% CC and age group 9 with 50.3% CC. Subjects in the age 10 bracket had the highest percentage (59%) of their catches in the CC category.

A two-way analysis of variance was carried out on the scores for the four categories of catches with age and sex as the independent variables. A summary of the ANOVA is presented in Table 2.

TABLE 2

Summary of F-Ratio from Two-Way-Analysis of Variance: On Scores for Catches

	Main Effect	Age	Sex
No Catch	7.43 ⁺⁺	5.09 ⁺⁺	14.17 ⁺⁺
Fumble Catch	1.25	5.0	3.58 ⁺⁺
Body Catch	2.84 ⁺	3.58 ⁺	0.63
Clean Catch	5.15 ⁺⁺	4.04 ⁺⁺	8.47 ⁺⁺

+ $P < .05$

++ $P < .01$

All the main effects except FC were significant. The age and sex factors were also statistically significant for all catches except for FC in age and BC in sex.

To determine which of the age group and sex were significantly different from one another, the Scheffe Post Hoc analysis were carried out for age and sex. Table 3 presents the summary of post hoc for age and type of catch.

TABLE 3

Type of Catch	Age Group				Critical Value	
	7	8	9	10	.05	.01
Clean Catch	18.7	18.8	19.3	24.6 ⁺⁺	2.76	13
Body Catch	14.6	12.0 ⁺	8.2 ⁺⁺	6.0 ⁺		
Fumble Catch	2.2	2.4	2.0	2.4		
No Catch	1.6 ⁺⁺	1.9 ⁺	7.7 ⁺⁺	7.5 ⁺⁺		

+ $P < .05$

++ $P < .01$

Means that are underlined by the same line are not significantly different.

For the CC, age group 10 was significantly different from the other three. There was a pairing off of BC. Age groups 7 and 8 were not significantly different from each other but were statistically different from age groups 9 and 10 which were not different from each other. The four age groups were not significantly different from each other in FC. As for the NC, there was no significant difference between ages 7 and 8 and between ages 9 and 10 but each pair was significantly different from the other.

The post hoc analysis for mean performance of sex by age revealed some significant difference for sex in some age bracket. There was a significant difference between male and female subjects in age 8 for CC; age 7 for BC; age 9 for FC; and age 7 for NC. Male subjects performed significantly better than the female subjects in CC, BC, FC and NC.

DISCUSSION

Red was the most popular colour among the children used in this study followed by blue. This result is in agreement with Winch (1939) who found red is the most preferred colour followed by blue. The preference for red colour may

be attributed to its brightness and power to stand out of other colours (Munsell, 1941). The physiological aspect of colour that makes it appeal strongly to people have been identified by Bulough (1938). They include whether the colour is stimulating, soothing and warm. The red colour has two of these properties while blue has only one of the properties.

In this study also, colour preference is sex biased. Male subjects indicate preference for red while females preferred blue colour irrespective of age. One would have expected the colour preference in this study to be the reverse for the sex especially considering the commonly held view that females have eyes for colour. Probably the view holds true for adult but not for children. The outcome of Gramaza and With (1969) that colour preference is influenced by age is contradicted by the outcome of this study. The reason for this is best left to speculation.

The ability to discriminate between sizes of objects seemed to be fairly well established among the subjects in this study irrespective of age and sex. However, age still had some effects. The older subjects were a little better in the discrimination of size.

Considering the results of previous studies (Coules, 1966 and Adeyanju, 1987) on the effects of colour on perception, one would expect the red colour to be closer and perceived larger than the others especially since the differences between the coloured circles was .50 centimetre. The contrary result further confirm the fact that the ability to discriminate is fairly established at the age of 7.

With regard to the reception skill of catching, age and sex are factors to be contended with. A developmental pattern seemed to have emerged in the ability of the subjects to catch. The fact that as the age of the subjects increase, they have higher percentage of their catching in the CC category and lower percentages in the less skilled catching pattern bears this out. The reverse was the case for younger subjects. The significant difference in CC between age groups 7, 8, 9, and 10 is worthy of note.

Age groups 7 and 8 compensated for their lower percentage in the CC by having higher percentages of BC than than two other groups. This group exhibited what Haywood (1986) identified as the novice pattern of catching the ball which is found initially in catching by children. No significant difference was found among the age groups as for FC. Fumbling is an attempt to gain control of the ball when it is not possible to make a clean catch or body catch. This requires some amount of speed and fast reaction time of the hands. This seemed not to have been well developed or probably it is not needed since high proportion of the catching fell in either the CC or the BC category.

As for differences between male and female subjects in the catching skill, some differences are perceptible. In the CC category, significant difference existed between male and female subjects in age group 8. Males performed significantly better. In age groups 9 and 10, the differences between the sex were not significant. This outcome is supported by Stricker, et al., (1983) result that at 8 years of age and upward, most of the boys and almost half of the girls tested were at the highest level of catching.

The other categories of catching: BC, FC and NC, significant differences were noted between male and female subjects. In age group 7 for BC, male subjects made significantly higher BC than females; and in 9 years olds, females had significantly more FC than males. It can be conjectured that the catches of 9

years old males could have been made in FC were made using CC and BC as their mean performances in those two categories were higher than those for the females. The significantly higher mean score of 7 year old females in the NC category is indicative of the superior ability of male subjects of the same age group. This point is further buttressed by the significant performance of 7 year old male subjects over their female counterpart in the BC.

CONCLUSION

Based on the outcome of this study, the following conclusions were made:

That the colour preference of 7 to 10 year-old-children are red and blue but that this colour preference is sex biased, with male subjects preferring red while female subjects colour preference is blue.

The ability to discriminate between size of objects is fairly well established by age seven and is fully established by age 10.

The highest level of catching skill is well established at age 10 and that lower level of catching skills are used along or predominate between 7 and 10.

REFERENCES

- Adeyanju, S.A. (1987); Effect of colour depth perception on motor performance. *Journal of Health and Physical Education Communications*, Vol. 1, pp. 70-81.
- Bullough, E. (1938); The perceptive problem in the aesthetic appreciation of single colours. *British Journal of Psychology* 2, 408.
- Cobb, R.A. (1969); A comparative study of colour recognition in the peripheral field of vision of participants in selected sports. Unpublished Masters Thesis, Springfield College.
- Coules, J. (1966); Effect of photometric brightness on judgements of distance. *Journal of Experimental Psychology* 50, 19-26.
- Gramza, A. and Witt, P.A. (1969); Choice of colour blocks in the play of preschool children. *Perceptual and Motor skills*, 29, 793-787.
- Haywood, K.M. (1986); Life span motor development. *Human Kinetic Publishers Inc* Champaign Illinois, pp. 135-139.
- Morris, H.H. (1977); Effects of practice and set upon reaction time and its fractionated component in Landers, D.M. and Christina, R.W. (eds.). *Psychology of Motor Behaviour and Sports*. Human Kinetic Publishers. Champaign Illinois.
- Morris, G.S. (1974); The effects of three ball colours and two background colours upon catching performance of elementary school children. Unpublished Doctoral Dissertation, Eugene Oregon.
- Munsell (1941). *A Colour Notation*. Baltimore.
- Oguntona, T. (1984); Colour dynamics in Environmental Design Seminar Paper on African Art in Historical Perspective, University of Lagos. December 11-15,
- Stricker, J.L., Branta, C.F. and Seefeldt, V.D. (1983); Standards of performance for throwing and catching. Paper presented at the annual conference of *North American Society for Psychology of Sports and Physical Activity*.
- Talabi, G. (1979); *Art teaching in African Schools*. Heinemann Educational Books (Nig) Ltd. P.M.B. 5205, Ighodaro Road, Ibadan.
- Taylor, I.L. and Summer, F.C. (1945); Actual brightness and distance of individual colours when their apparent distance is held constant. *Journal of Psychology* 19, 79-85
- Victoria, P.J. (1972); *Art in Elementary School*. Quezon City, Phillipines.
- Winch, W.H. (1939); Colour preference of child. *British Journal of Psychology*, 3.