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EFFECT OF FREE PLAY ON NEUROPSYCHOLOGICAL ABILITY OF SCHOOL CHILDREN

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Abstract:

The present study was undertaken to study the effects of free play program on neuro psychological ability of school children. A sample of six hundred boys and girls were randomly selected, age ranging from 6-10 years from Presidium School, Gurgaon, India. All the subjects were randomly divided into two groups and each group consists of three hundred subjects. Experimental group participated in 16 weeks structured free play program for the duration of 30 to 45 minutes 5 times a week whereas control group did not participate in any program except their daily routine. Measurement of neuro psychological ability was assessed before and after the training program by administrating the Trail Making Test (TMT). In the present study, the time taken to complete the test was recorded. If an error occurred, the participant was directed to correct it but the clock used to time the test was not stopped. Total time taken to complete the task was considered as the final score. To analyze data descriptive statistics and the analysis of co-variance (ANCOVA) at 0.05 level of significance was applied and showed significant difference was found in neuro psychological ability.

Key Words: Neuro Psychological Ability, Free Play & Trail Making Test

Introduction:

In recent years, the intersection of cognitive psychology, developmental psychology, and special populations has received increasing attention from a variety of academic and educational audiences (Baron-Cohen, Tager Flusberg, & Cohen, 2000; Florian, 2007; Marschark& Spencer, 2003). Today the environment is seen as critical to development, but so are biological factors and individual differences. In fact, some psychologists assert that behaviors are determined 100% by biology and 100% by environment—they can't be separated (P. H. Miller, 2011). Current views emphasize complex coactions (joint actions) of nature and nurture. For example, a child born with a very easygoing, calm disposition will likely elicit different reactions from parents, playmates, and teachers than a child who is often upset and difficult to soothe; this shows that individuals are active in constructing their own environments. But environments shape individuals as well—if not, what good would education be? So today, the either/or debates about nature and nurture are of less interest to educational and developmental psychologists. As a pioneering developmental psychologist said over 100 years ago, the more exciting questions involve understanding how "both causes work together" (Baldwin, 1895). It is not a myth that teaching can change the organization and structure of the brain. For example, individuals who are deaf and use sign language have different patterns of electrical activity in their brains than people who are deaf and do not use sign language (Varma, McCandliss, & Schwartz, 2008) It is not a myth that teaching can change the organization and structure of the brain. For example, individuals who are deaf and use sign language have different patterns of electrical activity in their brains than people who are deaf and do not use sign language (Varma, McCandliss, & Schwartz, 2008)

The purpose of this study was to investigate the effect of free play on neuro psychological ability of school children, as it may help to aid in turn in the area academic for the better attention and concentration of the students.

Methodology:

A sample of six hundred boys and girls were randomly selected, age ranging from 6-10 years from Presidium School, Gurgaon, India. All the subjects were randomly divided into two groups and each group consists of three hundred subjects. Experimental group participated in 16 weeks structured free play program for the duration of 30 to 45 minutes 5 times a week whereas control group did not participate in any program except their daily routine. Measurement of neuro psychological ability was assessed before and after the training program by administrating the Trail Making Test (TMT).The TMT consists of two parts, A and B. Part A consists of one sample test and one task. The numbers are randomly printed on the sample worksheet. The subject is required to join consecutive numbers in order by drawing connecting lines. The worksheet consists of numbers 1 to 25. The time taken to join consecutive numbers is taken as the subject's score.Part B consists of a sample test as well as the main task. The numbers 1 to 4 and the letters A to D are presented on a sample worksheet. The numbers 1 to 13 and letters A to L are presented on the task worksheet. The participant is required to alternate between numbers and letters as s/he proceeds in an ascending sequence. Subjects are asked to connect numbers-alphabets as fast as they can. The examiner points out errors as they occur so that the subject can complete the test without errors. The score is only based on the time taken.

If the time taken to complete Part A is less than the time taken to complete Part B, the subject is considered to have difficulties in complex conceptual tracking. In the present study, the time taken to complete the test was recorded. If an error occurred, the participant was directed to correct it but the clock used to time the test was not stopped. Total time taken to complete the task was considered as the final score. Number of errors was not recorded.

Results:

To investigate the effect of free play program on neuro psychological ability of school children, analysis of variance (ANOVA) and analysis of covariance (ANCOVA) as a statistical technique were employed at the 0.05 level of significance. Further LSD post hoc means comparison was also used when F value was found significant.

The data collected was analyzed by using descriptive statistics and scores of experimental groups and control group with regards to neuro psychological ability is presented in table-1

Table 1: Descriptive Statistics of the Data Measured in the Post Testing of Neuro Psychological Ability

Group	Mean	Std. Deviation	N
Experimental	138.7300	16.21749	300
Control	258.3367	18.78242	300
Total	198.5333	62.36817	600

Table 1 depicts post mean and standard deviation of neuro psychological ability pertaining to experimental and control group. For experimental groupmean and standard deviation of subjects was 138.730±16.217 and for control group mean and standard deviation of subjects was 258.336 ± 18.782.

Table 2: Descriptive Statistics of the Data Measured in the Post Testing After Adjustment With the Initial Difference

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental	138.774[a]	.861	137.083	140.465
Control	258.293[a]	.861	256.602	259.984

(a) Covariates appearing in the model are evaluated at the following values: Pre neuro psychological ability = 258.2950.

The mean and standard error of neuro psychological ability for experimental and control group after adjustment has been shown in Table 2. The adjusted mean of experimental group was 138.774 and for control group mean was 258.293.

Table 3: Anova Table for the Post Test Data on Neuro Psychological Ability

Source	Sum of Squares	df	Mean Square	F	Sig. (p- value)
Pre NPA	54489.571	1	54489.571	244.916	.000
Treatment Group	2142671.787	1	2142671.787	9630.749	.000
Error	132821.975	597	222.482		
Total	2329983.333	599			

Significant at 0.05 level of significance, NPA = Neuro Psychological Ability

Table 3 shows the F value for comparing the adjusted mean of the treatment group during post testing. Since p- value for the F statistics was.000 which was found less than 0.05, therefore it was significant.

Since F- statistics was significant, post hoc comparison was done for the adjusted mean of experimental and control group which is presented in Table 4.

Table 4: Post Hoc Comparison for the Experimental Group Mean in Post Measurement Adjusted With the Initial Differences

Group (I)	Group (J)	Mean Difference (I-J)	Sig. b (p- Value)
Experimental	Control	-119.519*	.000
Control	Experimental	119.519*	.000

* Significant at 0.05 level of significance

Table - 4 revealed the post hoc comparison of means between experimental group and control group. It is clearly reveals that mean difference was significant at 0.05 level of significance as p-value (0.000) was less than 0.05.

The graphical representation of adjusted post-group mean of experimental group and control group for Neuro Psychological Ability is presented in Figure-1.

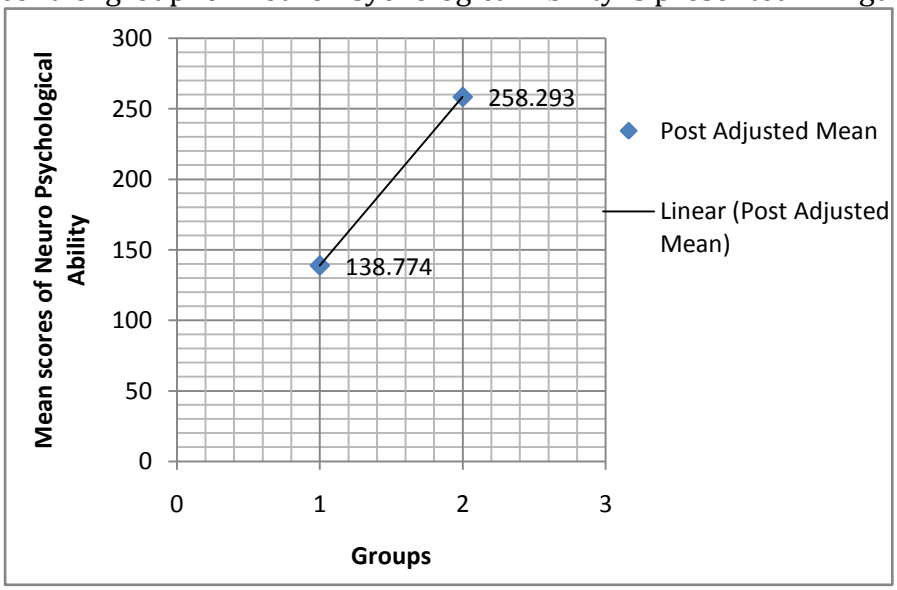

Figure 1: Graphical Comparison of the Adjusted Mean in Neuro Psychological Ability of Control Group & Experimental Group

Discussion:

From the findings it was evident that the free play given to experimental group was found to enhance the Neuro Psychological Ability of the children. Neuro Psychological Ability includes memory, concentration, attention, perception, imagination and creativity. Sports and free play a crucial role in all round development of children. Playful behavior appears to have positive effects on the brain and on a child's ability to learn. In fact, play involves exploration, and exploration lead to investigation and also allow children to use their creativity while developing their imagination, skill, and physical, cognitive, emotional strength, ability to sort, order and classify objects according to color, shape or size and develop concepts of quantity, distance, area, time, weight, length. Several experimental studies show that school kids pay more attention to academics after they've had a recess--an unstructured break in which kids are free to play without direction from adults (Pellegrini and Holmes 2006.There is some circumstantial evidence, too: Chinese and Japanese students, who are among the best achievers in the world, attend schools that provide short breaks every 50 minutes (Stevenson and Lee 1990). Bjorkland and Pellegrini 2000 stated that physical education classes are not effective substitutes for free playtime.A longitudinal study measured the complexity of children's block play at age 4 and then tracked their academic performance through high school (Wolfgang, Stannard, & Jones, 2001).Researchers found that the complexity of block play predicted kids' mathematics achievements in high school.

The Finding of the study is in consonance with findings of Bergen and Mauer (2000) found that children who had high levels of play with literacy materials in preschool were likely to be spontaneous readers of place signs and have greater pretend verbalizations in a "town-building" activity at age five.A number of studies revealed that students participating in extracurricular activities did better academically than students who did not participate (Marsh & Kleitman, 2002).

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