

## **A COMPARATIVE STUDY OF DEVELOPMENT OF REACTION ABILITY IN NORMAL AND DEAF AND DUMB GIRLS BETWEEN 8 TO 14 YEARS**

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### **ABSTRACT**

A comparative study of development of Reaction Ability in normal and deaf and dumb girls between 8 to 14 years is administered on around 350 students of different schools who were taking formal education. Out of 350 students 175 were selected from normal category and 175 from physically challenged i.e., deaf and dumb category. In each 25 girls were selected (25 subjects in normal girls and in each age group i.e., 8, 9, 10, 11, 12, 13 & 14 years totaling to 175; 25 subjects in deaf and dumb in each age group i.e., 8, 9, 10, 11, 12, 13 & 14 years totaling to 175). These subjects were tested initially in Reaction Ability and the same subjects were exposed to the same tests after exactly one year without any formal sports training and the development in their Reaction Ability was noted. After the statistical treatment of data by utilizing t-test and f-test the following findings were noted: The reaction ability of normal girls is found developed from 8<sup>th</sup> to 14<sup>th</sup> year sequentially. In deaf dumb girls it is found maximum at the age of 8<sup>th</sup> year.

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### **INTRODUCTION:**

Motor development objectives are concerned with making physical movements, useful with as little expenditure of energy as possible. The term motor is derived from the relationship of a nerve or nerve fiber to the one that connects the Central Nervous System with muscles through their conceptions the movements' results. Effective motor movement can only results if there is harmonious working of the muscular and the nervous system. It helps in keeping a greater distance between fatigue and peak performance. The activities that involve hanging, jumping, dodging, leaping, kicking, bending, throwing will enable a person to perform his daily work much effectively without reaching a point of wearing out, so quickly.

A comprehensive list of components of motor ability for performance of various physical activities (including sports) include muscular strength, muscular endurance, muscular power, cardiovascular endurance (alternatively also known as cardiopulmonary endurance), agility, speed, balance, flexibility, reaction time, coordination (eye-foot coordination, eye-hand coordination, whole-body coordination). In addition, traits like simple motor response, reflexes, sensory input and awareness of space and tempo

(characteristic speed and rhythm of movement) are also considered important in motor performance- ability especially during the early years of body development.

Speed, like strength and endurance is a conditional ability. It has a complex nature as it depends to a considerable extent on the central nervous system, because we can influence the functioning of central nervous system only to a very limited extent, therefore, speed performances cannot be improved to a considerable extent as in the case of strength and endurance. Speed ability primarily signifies the ability to execute motor movements with high speed. These movements may be cyclic or acyclic in nature. Theiss and Schnabel (1987) define “it is the performance prerequisite to do motor actions under given conditions (movement task, external factors, individual prerequisites) in minimum of time”. From general point of view we can have five types of Speed Abilities: reaction ability, acceleration ability, locomotion ability, movement speed, and speed endurance. Here the research scholar is in pursuit to study only the single aspect i.e., Reaction Ability development among normal and deaf dumb girls between 8 to 14 years of age group.

The need today is to search some extraordinary talent in an individual for the laurels in international sports arena. In this case it becomes obvious that the search should not limit only with the normal. The qualities that an individual possess should be innate and may be nurtured with good scientific platform, deaf dumb being no exception to it. Hence the search to prove the innate qualities of the deaf and dumb and bring them to equal stature with normal is the basic aim of the researcher.

### **NEED OF THE STUDY:**

The population of the normal mass is comparatively more to the deaf dumb resulting the opportunities designed are more for normal mass. But at the same time there is a society always struggling to uplift the physically challenged and trying to give them the best and equal opportunities so that the handicapped ability should not be the hurdle in normal and natural unfolding of an individual.

Considering the inability, which has the opportunity to be converted into compensatory ability for excelling in the sports arena the researcher, felt high need to evaluate the development of Reaction Ability among the deaf dumb and compare with the normal, which is a performance prerequisite.

### **OBJECTIVES OF THE STUDY:**

1. To find out, access and analyze the developments taking in Reaction Ability among normal girls and that of deaf dumb at particular age group.
2. To understand if any higher or compensatory ability among deaf dumb children is noticed when compared to the normal children.

3. To understand various parameters of speed ability in certain age group of certain physical abnormality.
4. To understand scientific base for methods of training physically challenged children.
5. To understand how the society would help its weak counterpart.

**SIGNIFICANCE OF THE STUDY:**

1. The study may reveal the physical and mental problems of deaf dumb children.
2. The study may also profound a training methodology and loading procedure in Reaction Ability training for physically challenged children in specific age group.
3. Results may also be helped to enhance sports terminology communication skills with physically challenged children.
4. Evaluation of development of Reaction Ability may fetch platform for establishing training methodology for enhancing performance in specific sports.
5. The comparison of development of Reaction Ability will give clear picture of the positive and negative aspects of Reaction Ability, which in turn ensure the proper training.

**DEFINITION OF THE TERMS:**

**DEVELOPMENT:**

Development is a process of qualitative transformation, which brings about progressive changes towards maturity and functional improvement in the organism of human being.

**GROWTH:**

Growth is a process anatomical in nature involves structural changes and quantitative to measure.

**REACTION ABILITY:**

In sports Reaction Ability is required to react quickly and effectively to various signals and changing situations. Reaction Time is a component to reaction ability which also includes the time of reaction or response. Hence, in sports the speed of movement (i.e., response) is an important part of the total reaction.

It is the ability to react effectively and quickly to a signal. In sports, signals can be of different type e.g., visual, tactile, acoustic. Depending on the degree of complexity of the reaction required the reaction ability can be further differentiated into simple and complex reaction ability.

**NORMAL CHILD:**

Normal: typical; usual; healthy; according to the rule or standard. If a child is found to be disease free, exhibits proper growth and development according to the age in

its physical, mental and social health and status, then he/she may be defined as a normal child.

### **DEAF AND DUMB:**

Deaf: is unable to hear; hearing indistinctly; hard of hearing.

Dumb: is mute; speechless; unable to speak.

### **8 TO 14 YEARS (CHRONOLOGICAL AGE):**

Chronological age is the number of years and days elapsed since birth.

### **REVIEW OF RELATED LITERATURE:**

\* In 1973, Constantine and colleagues completed an interesting study which looked at the ability of a child to accelerate movement and to inhibit movement when asked to do so. Their subjects ranged in age from 4 to 9 years of age. They found that 'both' the ability to inhibit movement and to significantly increase movement speed was often moderately related. The ability to move faster or slower was achieved better by older children in the study. In a 1973 study carried out in Cratty's laboratory, found a significant change in a "draw slowly" measure of impulse control between the ages of 5 and 8 years, in contrast to the findings reported above by Bucky et al.

\* A group of educationally retarded boys was taken for twelve weeks of judo instruction. Davis and Byrd tested the boys by means of the California Test of Personality, the Wide-Range Achievement Test and the AAHPER Special Fitness Test (i.e., a test specifically intended for use with handicapped children). Subjecting the results to statistical analysis they found that there were significant changes in total adjustment and in some measures of fitness. One particular case was of special interest. He was completely withdrawn, spoke to no one, showed no emotion and was completely uninterested in life. Before the end of the twelve-week program this boy was assisting the slower learners at judo and was at the end of the experimental period elected captain of the judo team. Davis suggests that "these gains were attributed in part to breaking the well-established repeated failure pattern".

\* From 1920 to 1930, one of the conclusions Piaget drew from watching his children grow was the conviction that thought sprang from actions, and not from other sources such as language.

\* Newell C. Kephart was a clinical psychologist who, in several books, a series of 19 one-hour films, and several articles, has outlined a theory proposing that motor learning is the basis of all learning.

- \* Studies summarized by Bloom have pointed out the difficulty of predicting later intelligence by evaluating the perceptual-motor attributes of young children.
- \* Bayley, who in 1968 published a longitudinal study of 54 individuals from birth to 36 years of age, has found that an infant's abilities can be factored into six separate attributes by the age of 5 months; visual following, social responsiveness, perceptual interest, manual dexterities vocalizations, and object relations.
- \* Rutherford found that although the boys had motorically gained significantly, the girls had not. Kephart's rather carefully designed methods of motor training of neurologically impaired youngsters should prove of value when attempting to improve motor functions.
- \* Delacto's theory is based on a view of neural function which suggests that specific "layers" of the brain mediate discrete motor functions.
- \* Minerva selected one from each group (identical twins and fraternal twins) and gave them a six month period of motor training involving a variety of tasks. Minerva concluded that the more complex tasks are modifiable through training, but the more basic locomotors functions are not.
- \* In a 1972 study, based upon the observations of over 700 children over a seventeen year period, Emma Pikler adds further data to the controversy concerning whether or not various kinds of early environmental conditions will elicit marked changes in motor development.
- \* Werner recent data indicated that with consistent and sophisticated teaching, some kinds of motor competencies may be accelerated during early childhood.
- \* A study by Walters, present evidence that the child who engages in prolonged and vigorous pre-birth movements can be counted upon to be advanced motorically during the first few years of life.

## **METHODOLOGY:**

### **SAMPLE:**

The samples of this study is randomly selected from different schools with their date of birth lying between 1999 to 1993 in normal subjects (girls) and deaf dumb subjects (girls). The selected age groups of the subjects were from 8 to 14 years. In each group 30 subjects were selected initially with a margin of  $\pm 5$ . All the selected subjects were non-sportsman staying either in school hostels or at their residence to ensure the untrained development in motor abilities. In all 350 subjects were tested initially and the same 350 subjects were tested finally after one academic year (12 months). The tests were conducted for two days for four hours on each group of 25 subjects approximately.

In all 350 subjects were considered for obtaining the difference between development is evaluated by subtracting the initial test from the final test score. Every subject was allotted with a code and a separate self contained form for test results. The tests were selected in the aspects of development of Reaction Ability. The tests are administered individually under standard conditions applicable for specific tests and the time period required between two tests is amply considered.

### **VARIABLES:**

**Dependent Variables:** (1) Normal girls. (2) Deaf Dumb girls.

**Independent Variables:** Development of Reaction Ability (Nelson's Scale Drop Test)

**Inter-weaning Variable:** Age groups (8, 9, 10, 11, 12, 13 & 14)

### **TOOLS AND MEANS:**

The research scholar has used some of the selected speed ability tests which are applicable to the selected age group and samples and are universally accepted and established standard tests for assessing development of motor abilities.

**Reaction Ability test:** (1) Nelson's Scale Drop Test

### **PROCEDURE:**

The subjects were selected from different schools in normal category (girls) and deaf dumb schools (girls). In all 01 test was selected for evaluating the development of Reaction Ability of the subjects between 8 to 14 years. The test was administered with all specified and standard conditions. The conditions of the subjects were observed normal and motivated to take part in the tests. An introductory talk regarding the initial day's workout is assessed for confirmation of tirelessness and recovered state.

### **STATISTICAL METHODS:**

To analyze the collected data the scores are arranged according to the comparison and in sequential order so as to find out the statistical values. The following statistical variables are selected for comparing, analyzing and interpretation of numerical values and basing on which the findings are discussed.

(1) Mean is computed by adding all the scores and then dividing by the number of scores involved. The mean is used in the study to measure the average development.

(2) For testing the hypothesis for the difference between various sample means the t test is used at significance of .05 levels.

(3) For testing the hypothesis for the difference between various sample means the f test is used at significance of .05 levels.

## **RESULTS AND DISCUSSIONS:**

The reaction ability of normal girls is found developed from 8<sup>th</sup> to 14<sup>th</sup> year sequentially. In deaf dumb girls it is found maximum at the age of 8<sup>th</sup> year.

### **RESULTS OF THE COMPARISON OF THE DEVELOPMENT OF REACTION ABILITY OF GIRLS (NORMAL AND DEAF-DUMB) BETWEEN 8 YEARS TO 14 YEARS (NELSON'S SCALE DROP TEST)**

#### **Normal girls:**

1. The maximum mean of development of reaction ability in normal girls was found at the age of 13th year, which is -0.009 sec and the minimum at 8th year, which is -0.001. The average mean of development of reaction ability in normal girls between 8 to 14 years is found to be -0.006 sec.
2. The standard deviation of development of reaction ability in normal girls is found maximum at the age of 10th year, which is 0.011 and minimum at the age of 8th year, which is 0.001. The average standard deviation of development of reaction ability in normal girls between 8 to 14 years is found to be 0.005.
3. The correlation of development of reaction ability in normal girls between 8 to 14 years of age groups is found as high as 0.62.

#### **Deaf-dumb girls:**

1. The maximum mean of development of reaction ability in deaf-dumb girls was found at the age of 8th year, which is -0.009 sec and the minimum at 9th years, which is -0.001. The average mean of development of reaction ability in deaf-dumb girls between 8 to 14 years is found to be -0.003 sec.
2. The standard deviation of development of reaction ability in deaf-dumb girls is found maximum at the age of 8th year, which is 0.008 and minimum at the age of 12th year, which is 0.004. The average standard deviation of development of reaction ability in deaf-dumb girls between 8 to 14 years is found to be 0.005.
3. The correlation of development of reaction ability in deaf-dumb girls between 8 to 14 years of age groups is found as high as 0.72.

#### **4. COMPARISON OF GIRLS (Normal and deaf-dumb):**

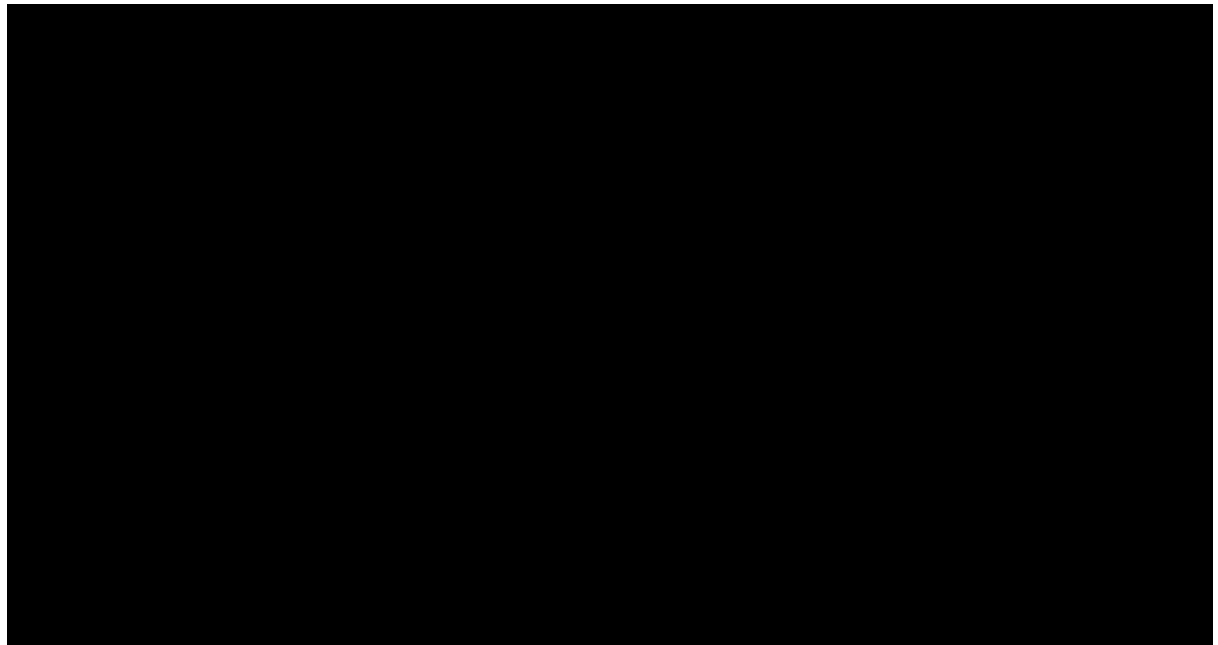
5. The average mean of development of reaction ability of normal girls between 8 to 14 years is -0.006, which is more than -0.003 sec of the deaf-dumb girls between 8 to 14 years. The difference of mean of development of reaction ability between normal girls and that in the deaf-dumb girls is -0.003 sec, which is insignificant. The maximum mean of development of reaction ability in normal girls is found at the age of 13th year, which is -0.009 sec and that in the deaf-dumb girls it is at the age of 8th year, which is -0.009 sec.

**Table No. IV.2:** evaluation of significance of development of reaction ability in normal and deaf-dumb (girls) by using t-test and F-test.

<b>GIRLS (NORMAL &amp; DEAF-DUMB)</b>	<b>t-Test Results</b>	<b>F-Test Results</b>	<b>COMMENTS</b>
<b>08 NG &amp; DDG</b>	0.4705	0.8711	Insignificant
<b>09 NG &amp; DDG</b>	0.021	0.800	Insignificant
<b>10 NG &amp; DDG</b>	0.057	0.0006	Insignificant
<b>11 NG &amp; DDG</b>	0.019	0.494	insignificant
<b>12 NG &amp; DDG</b>	0.0002	0.629	Insignificant
<b>13 NG &amp; DDG</b>	0.0002	0.106	Insignificant
<b>14 NG &amp; DDG</b>	0.7306	0.513	insignificant

\* Significant at 0.05 level.

<b>MEAN VALUES AND COMPARISON OF THE CATEGORY OF SUBJECTS: GIRLS (N &amp; DD)</b>	<b>HAND REACTION INITIAL</b>	<b>HAND REACTION FINAL</b>	<b>HAND REACTION DEVELOPMENT</b>
<b>NORMAL GIRLS 08 YEARS</b>	0.15688	0.154884	-0.001996
<b>DEAF &amp; DUMB GIRLS 08 YEARS</b>	0.151284	0.141484	-0.0098
<b>NORMAL GIRLS 09 YEARS</b>	0.156796	0.151752	-0.005044
<b>DEAF &amp; DUMB GIRLS 09 YEARS</b>	0.154736	0.153496	-0.00124
<b>NORMAL GIRLS 10 YEARS</b>	0.1558	0.147764	-0.008036
<b>DEAF &amp; DUMB GIRLS 10 YEARS</b>	0.153164	0.149248	-0.003916
<b>NORMAL GIRLS 11 YEARS</b>	0.15306	0.147984	-0.005076
<b>DEAF &amp; DUMB GIRLS 11 YEARS</b>	0.152796	0.15068	-0.002116
<b>NORMAL GIRLS 12 YEARS</b>	0.153052	0.145188	-0.007864
<b>DEAF &amp; DUMB GIRLS 12 YEARS</b>	0.151732	0.148508	-0.003224
<b>NORMAL GIRLS 13 YEARS</b>	0.147236	0.137588	-0.009648
<b>DEAF &amp; DUMB GIRLS 13 YEARS</b>	0.150868	0.147312	-0.003556
<b>NORMAL GIRLS 14 YEARS</b>	0.147076	0.137968	-0.009108
<b>DEAF &amp; DUMB GIRLS 14 YEARS</b>	0.151252	0.148832	-0.00242





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