

INTELLIGENCE IN RELATION TO  
SPEECH DISORDERS

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Dissertation Submitted to The University of Mysore  
for The Degree of Master of Arts

[IN PART FULFILMENT]

1976

UNIVERSITY OF MYSORE  
DEPARTMENT OF POST - GRADUATE STUDIES AND RESEARCH IN  
PSYCHOLOGY  
MANASA GANGOTHRI  
MYSORE

I N T E L L I G E N C E I N  
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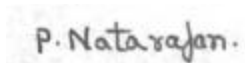
MYSORE

1976

DECLARATION

I declare that the investigation  
Reported in this Dissertation was  
carried out by me during the year  
1975-76 in the Post-Graduate Depart-  
ment of Psychology, University of  
Mysore, in part fulfillment of the  
requirements of the M.A., Degree  
Examination of Mysore University.

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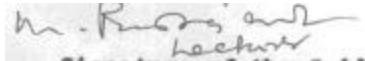


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## CHAPTER - I

Regarding the relationship between Speech and Intelligence, a number of views have been expressed by different authors and investigators.

There seems to be a common belief that the incidence of speech disorders is more among the people having low intelligence. But there are also evidences to show that there can be geniuses among people with speech defects.

Esquiral pointed out that there are various grades of mental defectives, although for practical purposes he suggested two types corresponding to a high and low. In seeking objective criteria for differentiation of various grades he suggested the use of speech as the best index. He viewed speech as closely related to intellectual abilities. His views and observations were by-far the most advances of his times. <sup>1</sup>

It is important to note that during the 19<sup>th</sup> century upto 20<sup>th</sup> century, despite of all the increased interest and progress made by Esquiral, Itard and Seguin in the area of mental difficiencies, no

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1 SHAFFER & LAZARUS in 'Fundamental Concepts in Clinical Psychology' (1952) PP 6 to 7

tools had yet been developed to measure objectively, the intellectual capacities of both normal and defective children. The concept of mental age had not yet been developed. Nevertheless it was this earlier exploration of Esquival, Itard and Seguin that ultimately helped, stimulate, Binete to introduce his concept of Mental Age and provide the tool to the newly arising field of clinical psychology.<sup>2</sup>

Vigotsky, in 1934 was one of the first, to express the view that speech plays a decisive role in the formation of mental processes, and that the basic method of analysing the development of higher psychological functions, is investigation of that re-organisation of mental processes which takes place under the influence of speech.<sup>3</sup>

Intercommunication with adults is of decisive significance because the acquisition of language system involves the re-organisation of all the child's basic mental processes. Thus the word becomes a tremendous factor which forms mental activity, perfectly the reflection of reality and creating new forms of attention of memory, imagination of thought and action. Vigotsky arrived at the conclusion that human development has its source in verbal communication between two people

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2 SHAFFER & LAZARUS in 'Fundamental Concepts in Clinical Psychology' (1952) PP 6 to 7.

3 WOOLMAN BENJAMIN B in 'Handbook of Clinical Psychology' PP 765

Becomes later the means of organization of child's own behavior.

There is a dynamic relationship between verbalization and socialization, and socialization and intelligence. The foundation for speech training should be laid in infancy, remembering however that the fundamental objective is not speech, but socialization. <sup>4</sup>

Speech commences from the moment of birthcry of the infant. From this birthcry to the utterances of the first conventional adult like word, the infant progresses through a series of essential developmental stages as he learn to speak. Each child will pass stage by stage according to a rate in general keeping with his physical and mental development.

The birthcry and all the infant's vocalization during the first two or three weeks of its life are reflexive total bodily expression in response to stimuli from within and without him as such, the expression is innate and takes place without interest or awareness on the part of infant. Vocalisation it self arises as a column of air, reflexively expelled from arises as a column of air, reflexively expelled from the lungs passing over vocal folds tense enough to produce sounds. Though the infant's early sounds are produced without purpose and lack specific mean-

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4 WOOLMAN BENJAMIN B in 'Handbook of Clinical Psychology'  
PP 765.

meaning, the constitute response to a world, in regard to which the infant has formulated no intentions and from which he has received no meaning.<sup>5</sup>

At about 6 or 7 weeks of age, the infant begin to show by his reactions that he is aware of the sounds he is making. He indicates definitely that he produces sounds when he is enjoying himself. Such an act brings the child to a new developmental speech level called 'Babbling'. He produces variety of sounds that are greater than those contain in any given language. Babbled sounds are uttered completely at random. As the child matures the sounds produced, resemble words spoken by older members of the environment. In this respect, the babbling stage constitute a definite advancement in the progression towards the use of a real spoken language.

The child will produce vowels, before consonents. Of the vowels a variety of //a// repeated at length with variation in pitch and intensity will probably be among the first to be heard. Labial consonents such as //P// and //b// are likely to follow and then the probable order is velare /k//g/, dentals /t//d/ and finally nasals /m//n/.

The babbling stage may be considered a training and preparatory period for later articulate utterances.

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5 BERRY & EISENSEN in 'Speech Disorders, Practice and Principles' 1951 PP 19-22.



Lalling which usually begins during second six month of child's life, may be defined as the repetition of 'heard' sounds or sound combinations. The great significance of lalling is that hearing and sound production have become associately successful imitation to the incentive for repetition of sounds, and repetition for further attempts at imitation. During lalling period the child's cry will be a special kind of cry to attract the attention. When the child becomes aware of the potency of his vocali-zation he is well on the way towards true speech.

The child at about 9 to 10 months of age may be heard imitating sounds which others have made, and which are prevelant in its environment. In this Echolatic stage there is no actual comprehension of sounds imitated. It is a distinct advance over lalling, however in that the child reveals a definite acoustic awareness of other persons. Some infants demonstrate the remarkable ability to echo sound combination of extreme intricacy and contextity.

Somewhere between 12<sup>th</sup> and 18<sup>th</sup> months of age "the average child" really begins to talk. By talking it is meant that the child intensionally uses conventionalized sound patterens (words) and his observable behavior indicates that he anticipates a response appropriate to the situation and the words

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he is uttering. Obviously before the child can truly speak, he must himself be able to understand speech. It is highly probable that the child will have considerable verbal understanding before he begins to speak, and that as he matures his verbal understanding will continue to be appreciably in excess to his own verbal utterances.

### **THE RELATIONSHIP BETWEEN SPEECH-PATHOLOGY AND CLINICAL PSYCHOLOGY**

Regarding the relationship between speech disorders and psychological processes, the National Conference in Graduate Education in Speech Pathology and Audiology in U.S.A has this to say - "The field of speech pathology and Audiology is concerned distinctively with the process and disorders of human symbolization and communication and interacts with the biological, physical, behavioral and social sciences".

The relationship of speech pathology as a discipline to the field of clinical psychology are clearly inherent in the above statement.<sup>6</sup>

### **DEFINITION OF SPEECH AND SPEECHDISORDER.**

Definition of speech: 'Communication through conventional, vocal and oral symbols'<sup>7</sup>

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6 HIGHLAND PARK ILLIONIS - 1963

7 TRAVIS in 'Handbook of Speech Pathology' - 1957

Definition of Speech Disorder:

"A speech deviation refers to any marked and main-tained deviation from a pattern accepted as standard in a speech community"<sup>8</sup>

"A speech defect refers to a deviation, sufficient to divert attention from the communicating content to the manner of communication".<sup>9</sup>

Any individual who speaks so that attention is distracted from the content of his communicative effort to the manner of production may be considered to have a speech disorder. In majority of speech disorders basic defect is in the manner of "production rather than in the content, in 'how' rather than in 'what' of the speaker's utterance.

**Characters of the Speech Disorders:**

Disordered speech has the following characterstics. Specifically an individual may be said to have a disorder of speech - is speaking defectively - if his overt products or the self evaluations of his products, actual or potential, may be described in one or more of the following ways.

1. They are not easily intelligible because of articulatory disorders.
2. They are not readily audible.
3. They are audible but vocally unpleasant.

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8)  
( TRAVIS in 'Handbook of Speech Pathology' - 1957  
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9)

4. They are visibly unpleasant because of the manner of production.
5. They are deviant in regard to conventional speech rhythm, changes in vocal pitch or stress or labored in manner of production.
6. They are linguistically deficient.
7. The manner (voice, articulation, language) is inappropriate in terms of age, sex and physical appearance of the speaker.
8. The speaker responds to his own communicative efforts or fails to engage in oral communication because he believes that one or more of the above characteristics may be present.

#### Types of Speech Disorders

The products of speech disorders are frequently classified into four major groups.

##### 1. Misarticulation:

In speech, articulation is the production of individual sounds in connected discourse; the movement and placement during speech of the organs which serve to interrupt or modify the voiced or unvoiced airstream into the meaningful sounds, the speech function performed largely through the movements of the lower jaw, lips, tongue and soft palate.<sup>10</sup>

Misarticulation or articulatory disorders are those deviations which involve substitutions,

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10 TRAVIS L.E.

In 'Handbook of Speech Pathology and Audiology'  
1971 PP-7.

omissions, distortions and additions of sounds, these difficulties may occur as the articulators (tongue, teeth, lips, palates, jaws) modify the flow of air from the larynx by changing their positions and contacts. Learn to direct the air flow and to make rapid shifts in the position of the articulators in order to emit intelligible sounds and sounds sequences is largely imitative and associative, utilizing visual perception, Kinesthetic awareness, memory and auditory discrimination.<sup>11</sup>

Several tests for the assessment of articulatory proficiency, have been in wide use among speech clinicians. Test inventories which consists of pictures as stimuli which is likely to elicit verbal responses that will include the individual sound in initial, medial and final position and in sound clusters.

There are several assumptions inherent in articulatory testing.

- i) Articulatory proficiency is correlated with maturation and will complete for most of then children when they attain 8 years.
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11 SAMUAL CIRK - 1962

In 'Educating Exceptional Children' PP 304

ii) Most children show proficiency in vowel production by age 5 years than they show over all constant proficiency.

iii) Some consonants eg: /p/h/k/ and /g/ are proficiently produced much earlier than others eg: /s/g/l/ and /r/<sup>12</sup>

Seigal, Winitzy and Conkey found that specific stimulus words used to evoke a response made little difference in the quality of response. On the positive side they found imitative method (presenting the word and stimulus picture) elicited more correct responses than the spontaneous method (presenting the stimulus picture alone to evoke anticipated word)<sup>13</sup>

## 2. Stuttering

It is a disturbance of rhythm and fluency of speech by an intermittent blocking, repetition or prolongation of sounds, syllables, words, phrases or posture of the speech organs.

Theories which explain stuttering phenomena can be categorised into two major groups.

(i) Organic theories

(ii) Behavioral (Psychological or sociological) theories

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12 SAMUAL CIRK - 1962 PP 305

13 SIEGEL G.M, WINITZ H and CONKEY H Chapted "The influence of testing instruments on articulatory responses of Children" in the journal of speech, Hearing Disorders 1963 Vol-28(1) PP 67-76

### Organic Theories

There are a number of Neurophysiological theories of stuttering all pointing to some difficulty in the neural flow which in turn causes incoordination, hesitation, and repetition in the muscular activity of speech.

The theory of cerebral dominance (Travis 1931) states that stuttering is the result of lack of cerebral dominance.

Eisenson indicates that from 55% to 60% of the stutterer are constitutionally predisposed to stuttering on the basis of perseveration.<sup>14</sup>

### Behavioral (psychological) theories

Johnson's diagenetic theory, 1942, states that the parents failing to realize that the very young child is passing through a normal stage of language learning, diagnose the child's normal repetitions, hesitations, as stuttering, a label which becomes a stigma, adding fear to anxiety. Most of the psychological theories relate stuttering to the emotional factors which has developed through past experiences. Among these there is the conflict theory of stuttering by Sheehan considering stuttering is a neurotic symptom. Vanraiper believes that stuttering has a multiple origin.

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14 BERRY & EISENSEN 1951 (Ed)

In Speech Disorders, practice and Principles.

The stutrerer may have a constitutional predisposition to emotional conflict and he may come from a background of low frustration tolerance.

The following are the few established findings relating to the persons who stutter.<sup>15</sup>

i) Stuttering occurs in about 7 to 12% of the school age population.

ii) There are more male than female to approximate ratio of 3:1 or 4:1, stutrerers.

iii) Most stuttering begins in an early childhood, about the age when children in U.S. and in most of the western countries are likely to begin their school career. A second peak period for stuttering is early adolescence stuttering rarely has its initial onset during adulthood.

iv) As a group, stutrerers are normal or above in intelligence. In this respect they tend to be different from most other groups of speech defective children.

### 3. Delayed Speech Development:

Some children do not develop speech according to their age level, or they develop only a partial understanding of language or vocal expression. This lack or retardation in speech development has been classified as 'delayed speech'. Some of the causes of delayed speech

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15 BERRY & EISENSEN 1951



Include hearing loss, mental retardation, emotional disturbances, environmental deprivation, cerebral disfunction, glandular irregularities and 'congenital aphasia',<sup>16</sup>

Perental influences

Many studies have indicated that parents specially mothers of the young speech defective children were less well adjusted than parents of non speech defective children. In many instances, when a child who is physically and intellectually normal fails to develop speech, the basis of retardation maybe found in his reaction to his parents' expectation and anxieties.

Rejection:

A Child who senses parental rejection and who cannot identifies himself with his parents and especially with his mother, is likely to be delayed in speech development. Mowrer points out that child must first identify himself with his parents with respect to verbal behavior before he can begin to wieh to speak. He must, of course, be physically and intellectually mature and ready before the identification, will motivate and evoke true speech. The rejected child either may make no such initial identification or may loose the identification when once

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16 BERRY & EISENSON

rejection is sensed.<sup>17</sup>

4. Voice Defects:

- which include aberrant quality, inadequate or poorly controlled loudness, limited and inappropriate pitch.

5. Cluttering:

Indistinct speech of 'Dysrhythmia' associated with delayed language maturation.

6. Cleft-plate speech: (Hypernasality and Distorted articulation)

7. Speech defect associated with hearing loss:

CAUSES OF SPEECH DEFECTS

Mainly there are two causes.

1. Organic cause
2. Functional cause

Organic Cause: Some speech defects are obviously organic in origin. Severe hearing impairments especially if they are congenital are acquired during the first two years of life. Are associated with recognised defect of voice and articulation. The voice and articulatory of children with oral clefts are attributable to the physical condition. Severe dental irregularities, paralysis of the organs of speech mechanism or the vocal mechanism is almost invariably associated with defective

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17 WOOLMAN BENJAMIN B  
in 'Handbook of Clinical Psychology' 1965  
PP 774

Articulation and vocalization. Cerebral palsied condition that involves speech mechanism also directly associated articulation and vocalization and often less directly with impairments of language functions. Aphasic involvement as well as Disartharities in adults are clearly associated with neuropathology.

Functional Cause:

Children with normal sensory intake learn to speak for the most part by ear and to a lesser degree through what they see, associated with what they hear, is defective in acoustic end results or to the manner of their own speech. Such defects are established by identification and imitation. Essentially imitative speech defects are caused by older person, usually a parent but occasionally an older sibling or playmate who is serving as a model for the child. Some children who learn to speak normally but defectively change their identifications. Similarly some children who learn to speak quite normally change to deviant pattern as the result of later identification. Also lack of environmental stimulation may cause delayed speech development in the child.

INCIDENT OF SPEECH DEFECT

Most studies of the incidence of the speech defect have been limited to school age population, usually it is considered to be between 5 to 21 years of age. Most recent survey conducted in 1959 by

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Committee on Legislation of the American Speech and Hearing Association. This report estimated at least 3 million children in America would be in need of remedial attention for defect of speech or hearing. Carhart has written that high school teachers in 405 Illinois High School, reported that 20.8% of the students were judged to be in need of remedial speech lessons.<sup>18</sup>

This is interestingly contrast to another study made by carhart in 1945, which he reported that approximately 1% of the First World War draftees were considered to have serious defective speech. American speech and Hearing Association, mid century white house conference report (1952) which estimated that 5% of the School age population based on an assumed population of 40,000,000 had defective speech.<sup>19</sup>

#### Sex distribution

It is widely recognised that boys begin to speak later and arrive at articulatory efficiency about a year later than girls - The incidence of defective speech whether of functional or organic basis is also higher among males than among females. Studeis on this point have been reviewed by Berry and Eisonson (1956) and Milisen (1957). Apparently the proportion

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18 CARHART in 'Journal of Speech Disorders 1945'  
Vol 8 Pp 91-107

19 White House Conference Report 1952

of males with defective speech continues to be greater than that for females throughout the school grades and through the college years. In one representative study Morley (1952) found in a survey taken during the period of World War II, - at the University of Michigan that the incidence and proportion of speech defective students were consistently higher among male than among female students. The ratios ranged from 1:6:1 to 3.4:1 to male and female.<sup>20</sup>

#### RELATION OF SPEECH DEFECTS TO OTHER DISABILITIES

Since the child with defective speech may be found in any group of exceptional or otherwise normal children may have a high or low I.Q. Child may be severely handicap in motor skill or have good co-ordination he may hear exceptionally well or he hard of hearing he may be well adjusted emotionally and socially or he may be emotionally disturbed, he may have a well built body or suffer from multiple physical handicaps, he may be energetic or lazy, he may come from a professional home or from a laboures home. However speech difficulties are encountered most frequently in the cerebral palsied, deaf and hardness of hearing and mentally retardedness. In addition, children who are not exceptional in any other characterstics sometimes have speech difficulties

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20 TRAVIS LE. In 'Handbook of Speech Pathology' 1957

as the sole deficiency in their development.<sup>21</sup>

Level of Intelligence and Speech Disorders

Although speech defect maybe found among the persons of all level of intelligence the conscenses of the evidence leaves little question that the lower the intelligence greater the incidence of speech defect. This in no way suggest that a genine should not have a speech defect. Stutters as a group or as individuals are likely to fall. Within the normal to above the normal range of intelligence or that a person with voice disorder is expected to be dull, and an individual who has de-layed language is usually mentally retarded.

Surveys of the range of intelligence and averages of speech defective school children are reviewed by Berry and Eisenson.<sup>22</sup>

The results indicate that, of a selected population speech defective school children as a group fall below the average of population from which they are drawn.

If we switch the point of departure and consider the incidence of speech defect among mentally retarded we find general conscenses that it is considerably higher than in the population at large.

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21 SAMUEL CIRK (1962) in 'Educating Exceptional children'  
Pp 295

22 BERRY and EISENSON (1956) Pp 7 to 8

Furthermore we are likely to find that the lower the intelligence of the group study the greater the incidence of the defective speech and language production. Some specific more recent investigators will be briefly considered.

Sachs, 1951, studied the incidence of speech defect in a groups of 210 mental defectives ranging between 10 and 20 years of age, he found that 57% had defective speech.<sup>23</sup>

Gens found that from 70 to 75% of institutionalized mentally defective children has disordered speech.<sup>24</sup>

Smith reviewed the literature on the relationship between the speech defect and mental relation and found that incidence ranges from 8 to 79% depending upon the intellectual range of the group studied. With the severely retarded, Language development is delayed, articulation problem were more prevelant and voice problems occurred commonly.<sup>25</sup>

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23 SACHS in unpublished master thesis, University of Virginia 1951

24 GENS in 'Speech retardation in normal and subnormal Child'-(Training School Bulletin)1939 Vol.48 Pp61-70

25 SMITH in journal of speech and language retarded Training School bulletin 1962 Vol.58 Pp 111 to 124

## CHAPTER II

### PREVIOUS STUDIES

The dependence of language on intelligence can be illustrated by observing the frequent absence of language and speech in the severely mentally retarded. Absence of these functions has actually been employed as the basis of classification of mentally retarded children.

Binet & Simon, 1914, employed the principles that an Idiot, is any child who never learns to communicate with his kind of speech - one who can neither express his thought verbally or understands the verbally expressed thought of others. This inability being due solely to defective intelligence and not to any other disturbance in defining the idio.<sup>26</sup>

Tredgold in 1947 has observed that in Idiocy "Speech is usually absent although some do learn to articulate simple monosyllables like Man, cat, eat but none of them can form sentences".<sup>27</sup>

Vigotsky in 1934, was one of the first to express the view that speech plays a decisive role in the formation of mental processes and that the basic method of analyzing the development of higher psychological functions and reorganizations takes place under the

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26 & SHAFFER and LAZAROUS in Fundamental Concepts

27 in clinical Psychology" 1952 Pp 6 to 9



influence of speech.<sup>28</sup>

Renfrew(1963) after reviewing Luria's study, she contents that "this experiment demonstrate how closely linked that speech process can be with mental development". "If we accept that the speech and mental development are closely related it seems to me that in the education of mentally handicap, stress should be laid on the development of the understanding and use of speech".<sup>29</sup>

Irwin, in 1952, in his studies of speech development in infants upto 30 months of age concluded the relationship between speech and intelligence is not very dependable at 18 month but at that 20<sup>th</sup> to 30<sup>th</sup> month there aer reliable correlation between various indices of speech development on both the Kuhlmann and Cattell intelligence test. 3D

Sirkin and Lyons, found that only 1/3 of institutionalized mental defectives, speak normally and that the lower the intelligence rating, lower the incidence of normal speech.<sup>31</sup>

Bangs, in 1942 made a careful study of the speech difficiency of mentally defective children concluded that mental age has much greater predictive value for speech than does chronological age.<sup>32</sup>

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28 VIGOTSKY L.S 1962 in 'Thought and Language' Pp 295

29 RENFREW in 'speech therapy with backward children' Pp 563

30 IRWIN O.C in Journal of speech and Hearing Disorders 1952  
Vol.17 Pp 269 to 279

31 SIRKIN ELYONS in American journal of mental defectives  
Vo.46 Pp 74 to 80

32 BANGS in journal of speech disorders Vol 7 Pp 443-356

Craig surveyed and analysed population of 692 first, second, third and fourth grade children enrolled in 4 Negro schools in Augustha, Georgia for the incidence of speech defects and factors of intelligence. He found that at the fourth grade level the children with severe speech problem tended to fall below the non-defective group.<sup>33</sup>

Morley (1965) in his study of 280 children indicated that 71 cases were associated with general mental retardation. The I.Q. was ascertained in 32 of the 71 cases. The average I.Q. was 60 with a range of 37 to 87.<sup>34</sup>

Adler and Bartelme studied the relationship between the speech onset and intelligence in 1000 boys and girls whose I.Q range from 10 to 159, for boys the correlation between age of speech onset and intelligence was 0.41 and for the girls 0.39.<sup>35</sup>

Raid studied the relationship between articulatory defects and numerous other factors in elementary school children she concluded that in children with I.Q above 70, articulation ability is not related to, and cannot be predicted from intelligence.<sup>36</sup>

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33 DOCTORAL dissertation north western University '51

34 MOREL in 'the development and disorders of speech in Childhood' 1966 Pp 86

35 Journal of American Medical Association 1929, Vol 93 Pp 1351 to 1356

36 Journal of Speech Disorder 1947 Vol.12 Pp 143 to 150

Bradbury, who studied 204 children from 2 to 6 years of age, they found a correlation of 0.80 between articulation skill and chronological age, 0.71 between articulation and mental age on the Stanford-Binet, little relationship was found between articulation and mental age, with chronological age held constant.<sup>37</sup>

Dawson, in 1929, in studying the rate of articulation found a tendency towards more rapid articulation in pupils with high intelligence than in those with low intelligence.<sup>38</sup>

Correl in 1936 reported that speech defective as a group had a lower intelligence level than normal speakers, and that articulatory cases had the greatest deficiency in intelligence. Speech defectives were also below normal, speaker in school achievements.<sup>39</sup>

B.B.Schlanger, 1953 studied the mentally handicapped children between the age of 8 and 16 years and found 56.7% of them to have articulatory problems.<sup>40</sup>

Luria studied twins with retarded development of speech concludes that, if there is retardation in

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37 Journal of Speech Disorder 1947 Vol.12 Pp 140

38 Elementary School Journal 1929 Pp 610 to 615

39 Correl in 'Archives of Speech 1936' Vol.I P 179-203

40 SCLANGER in American Journal of Mental Dificiencies 1953  
Vol. 58 Pp 114 to 122.

speech communication consequently there must also be underdevelopment of all those aspects of mental activity which depend on the acquisition of full value speech. Consequently an educational expert of this kind would contribute to the solution of that most important psychological problem, the role of speech in the formation of mental processes.

Kerlin and strazzulle (1952) concluded after studying 50 children with I.Q below 70, that language defects are even more striking than speech defects and in some cases resemble aphasia.<sup>41</sup>

Goodwill concluded after reviewing data on 454 cases of speech retardation, was the most frequent casual factor of the 454 cases, 241 had I.Q less than 70. The relationship of speech retardation and mental retardation is very close.<sup>42</sup>

Kennedy, examined the speech status of 32 retardees with I.Q below 20 and chronological ages from 7 years 9 months to 38 years, of these 22 were completely mute, 9 produced only jabbering, and only one produced recongisable words. These words were used in non-meaningful and irrelevant context.<sup>43</sup>

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41 Kerlin and Strazzule in 'Journal of Speech, Meaning Disorders in 1952 Vol.17 Pp 286 to 294

42 Goodwill in 'journal of speech, Meaning Disorders 1955 Vol.20 Pp 300 to 303.

43 University Wisconsin Thesis 1930 Pp 176 to 180.

Town studied several aspects of language, (gestures, imitative gestures, making voluntary gestures, understanding words, speaking words) in a group of 50 idiots divided into low, high and middle grade intelligent levels. His data suggests that among idiots language development is directly related to I.Q.<sup>44</sup>

In a study compiled for white house conference in 1930 by Travis and his camp, they found that the medium I.Q for stutterers was 96.5 in a group of 4059 stutterers. This was higher than the I.Q found for children having structural articulatory defects, more male stutterers than female. The ratio being 4:1, in a study of 10268 cases.<sup>45</sup>

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44 Town in psychological clinic 1913 Vol 6 P 229-235

45 Travis in 'Handicapped Child, white house Conference Ist report 1930 Pp 320 to 321.

## CHAPTER III

### Aim and Purpose of the Present Study

Past studies have brought out the findings that speech defectives, in general, are lower in their level of intellectual functioning when compared with their normal counterparts.

The aim of the present investigation is to find out whether speech defectives in our culture also are low in intellectual status when compared with the normal group.

It also sets out to study whether the subgroups among the speech defectives differ among them selves and in comparison with the normal group. If so, what types of variation occur.

Accordingly the following hypothesis have been framed.

Null Hypothesis:

(1)There is no significant difference in mental development between clinical group and normal group.

(2)There is no significant difference in mental development between misarticulation group and normal group.

(3)There is no significant difference in mental development between stutterers and normal group.

(4)There is no significant difference in mental development between delayed speech development group and normal group.

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(5) There is no significant difference in mental development misarticulation group and normal group.

(6) There is no significant difference in mental development between misarticulation and delayed speech development group.

(7) There is no significant difference in mental development between stutterers group and delayed speech development group.

### METHOD

#### Sample:

Clinical or experimental group: This group consists of 90 speech defect children who are registered and investigated at All India Institute of Speech and Hearing, Mysore and Part of the cases registered in camps which was held at Bangalore, Khammum and Vijayawada.

The clinical group consists of 30 misarticulation subjects, 30 stuttering subjects and 30 delayed speech development subjects.

While selecting these samples the speech disorders which are associated with organic involvement such as Brain damage, hearing loss etc., are not considered. Each case after diagnosis by speech pathologist as misarticulation, stuttering, delayed speech development and as non-organic type. Such cases serves the

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Purpose of samples of present study.

Only three clinical groups are taken for investigations because of the availability of the subjects and also because of most of other speech defectives will be of organic types. The present investigation includes only functional speech defectives and therefore our selection of these 3 groups are in order.

Normal or control group:

This consists of 30 subjects, who are drawn from nursery, first, second third, fourth and fifth grades to cover the age range of subjects. For the present investigation in both control and clinical group age range of subjects is 4 years to 11 years.

Materials:

In the present investigation 'Seguin form board' and columbia mental maturity scale were administered to find out the intelligence level among speech defective children and normal children. The reason for selecting these tests are as follows:

The present study is concerned with speech defectives, so an attempt has been made to select a test of non-verbal intelligence tests of Seguin form board and Columbia mental maturity scale. Both the tests are individual tests.

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Speaking who compared children with speech defect on verbal and non-verbal intelligence tests and found that they had significantly score high on performance test than the scores on verbal tests.

Several other consideration for testing intelligence of the children on Sequin form board and Columbia mental maturity scale were found more suitable. Some of the considerations in favour of selection of these tests were, tasks are interesting for these children. Instructions are easy to convey, it takes less time, score conversion tables are available, it also appears to be a 'culture fair' tests of intelligence.

According to Sperling (1948) more than one intelligent test should be used in making prognosis for speech training and articulatory cases.<sup>48</sup> So the decisions to make use of two intelligence tests in the present investigation. About the preference of M.A. to compare the mental development of the children, Bangs(1942) in one of his studies concludes that mental age has much greater predictive value for speech defectives.<sup>49</sup> Brodbury also stresses the use of concept

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49 BANGS in 'journal of speech disorder' Vol 7(1942)  
Pp 343 to 356

of M.A in testing the mental development of speech defectives.

On the basis of the above it was decided to calculate M.A. of the children for the purpose of comparison of the intelligence of the two groups of children.

Seguin Form Board:

A performance test of intelligence originally device by Seguin. Although it was originally used for training the mental defectives, it has been used for rough and quick assessment of mental development. It is fairly valid test of 'G' (General mental ability) below mental age of 10 years.<sup>46</sup>

As our sample consists of children with speech defect the test was used with facility. Shortest time scored under 3 trials was taken into account to obtain the mental age. Another strong reason for the use of this test is Indian norms were available. Of course Indiannorms were not significantly differed from western norms.<sup>47</sup>

Administration of the Test:

The child was asked to sit on a chair comfortably, before which, there was a stool. The child

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46 CATTEEL in 'Guide to mental testing' 1953 Pp 44-46

47 Dr Bharatraj J in unpublished thesis 1973 Pp 96

was asked to put the blocks in the right holes. Instructions are given as below.

"See here are 10 wooden blocks, put these blocks in the right holes". If the subject did not understand the instructions once again the same instructions with encouraging words were given. And they were asked to do the same. Even then if the subject failed or hesitated to put the blocks, the investigator demonstrated the procedure with one inserting and taking them out. Again the subject was asked to do as the investigator did. 3 trials were given. Shortest time of the three trials was taken into consideration for the purpose of calculating mental age. Maximum time limit is 60 seconds.

Columbia mental maturity scale:

This is an individual test. It is designed to yield an estimation of intellectual ability of the children in the M.A. ranges from 3 to 12 years. It is different from other intelligent tests. It calls for no verbal response. And for a minimum motor response on the subject's part. The test is particularly suitable for subjects verbal and motor impairments.

The scale consists of 100 items each printed on a card, 6 X 19". In each item, task of the subject is to select from a series of drawings the

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One which is different from or unrelated to others in the series.

The basis for discrimination ranges from perception of rather gross differences in colour, in form to recognition of every subtle relation in pairs of pictures so as to exclude one from a series of 5 drawings.

The items are arranged in order of difficulty. A typical subject may complete the test between 15 to 20 minutes. Provisions are made for simple conversion of scales into M.A and I.Q values.

Administration of test:

The ordinary condition for good test administration should prevail. The test is administered in a well lighted room, that is reasonably quite and free from distractions as in any clinical examination, good report is established with the subjects to encourage the maximum interest and motivation.

Subject is seated comfortably at a table with the examiner on the opposite side of the table. The 'S' was instructed as follows. "I am going to show you a card with pictures on it, you will see that one of the picture does not belong with others". Then the child was shown card No.1. Ordinarily child will point to the correct drawing on the first card,

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## CHAPTER IV

### RESULTS AND DISCUSSIONS

The present investigation has been carried out to find out the difference in intelligence between the normal children and children with speech disorders. For this purpose 30 in each of the three groups of children having speech disorders i.e., misarticulation, stuttering, delayed speech (called clinical groups) and thirty normal children to serve as control group have been tested.

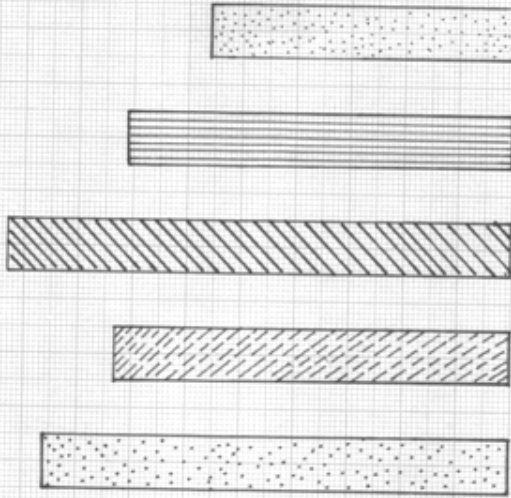
For the purpose of diagnosis of speech disorders, help from the speech pathologists has been taken. Seguin FormBoard and Columbia Mental Meturity scales have been used to assess the mental development of children. The average mental age as assessed by the two tests has been taken into consideration.

To test the difference and for the purpose of comparision various statistical measures such as Mean, SD and CR have been workedout. On the basis of these statistics the comparision of mental development of speech defectives with normals has been made.

Table I showing the Mean and S.D for Clinical group & normal groups & the CR (Mental Age score)

	Clinical group	Normal Group	Difference
N	30	30	0
Mean	72.84	85.73	12.89
S.D.	27.41	20.54	6.87
C.R	2.73 Significant at .01 level		

# Mean M.A scores of different groups



### Distribution of MA scores of Different clinical groups

Scale:

X axis = 1.5cm = 10 class divisions

Y axis = 1.0cm = 1 subject

Studying Group (N=30) -----

Delayed speech development group (N=30) .....

Mis-articulation group (N=30) \_\_\_\_\_

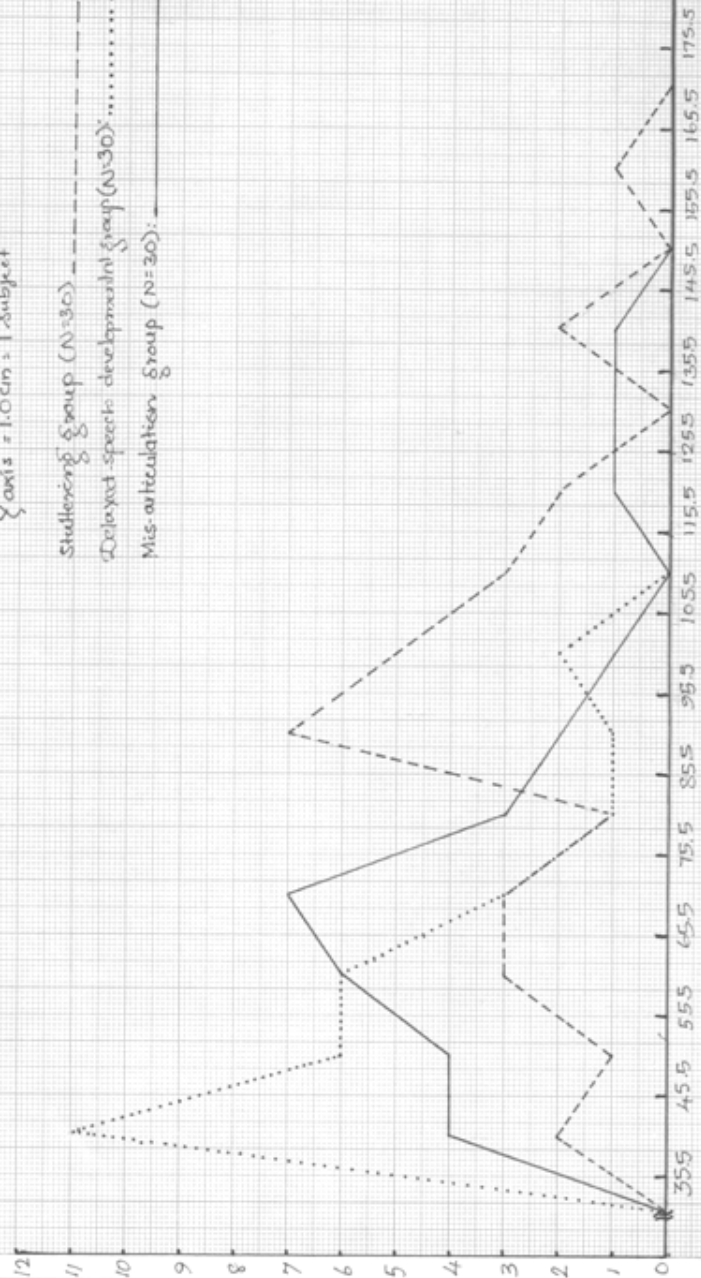


Table I shows that the mental age score of the clinical group is less than the score of the normal group. The mean M.A score of the clinical group is 72.84. The mean M.A score of the normal group is 85.73.

The difference between the Means of clinical group and normal group is 12.89 which is significant at .01 level., The C.R.being 2.73. Hence it can be said that the speech disorder and normal group children differ in their mental development.

The S.D.value 27.41 for clinical group is an indication of more hetrogenity in the group, as against the S.D. value of 20.54 of the normal group, Indicating thereby the individual difference among the subjects of the clinical group are more when compared to that of the normal group.

Backey, Lyons, Craig and Correll after studying a good number of speech defectives, reported that speech defectives as a group had a lower Intelligence level than normals. Thus the findings of the present investigation corroborate the findings of the other investigations.<sup>50, 51, 52</sup>

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50 CORREL 'Archieves of Speech 1936 Vol I P 179-203

51 BACKEY 'Journal of Speech disorder 1942-7-223-249

52 CRAIG 'Doctoral Thesis 1951 North Western University.



### Distribution of MA scores of the Mis-articulation group (N=30) & control group (N=30).

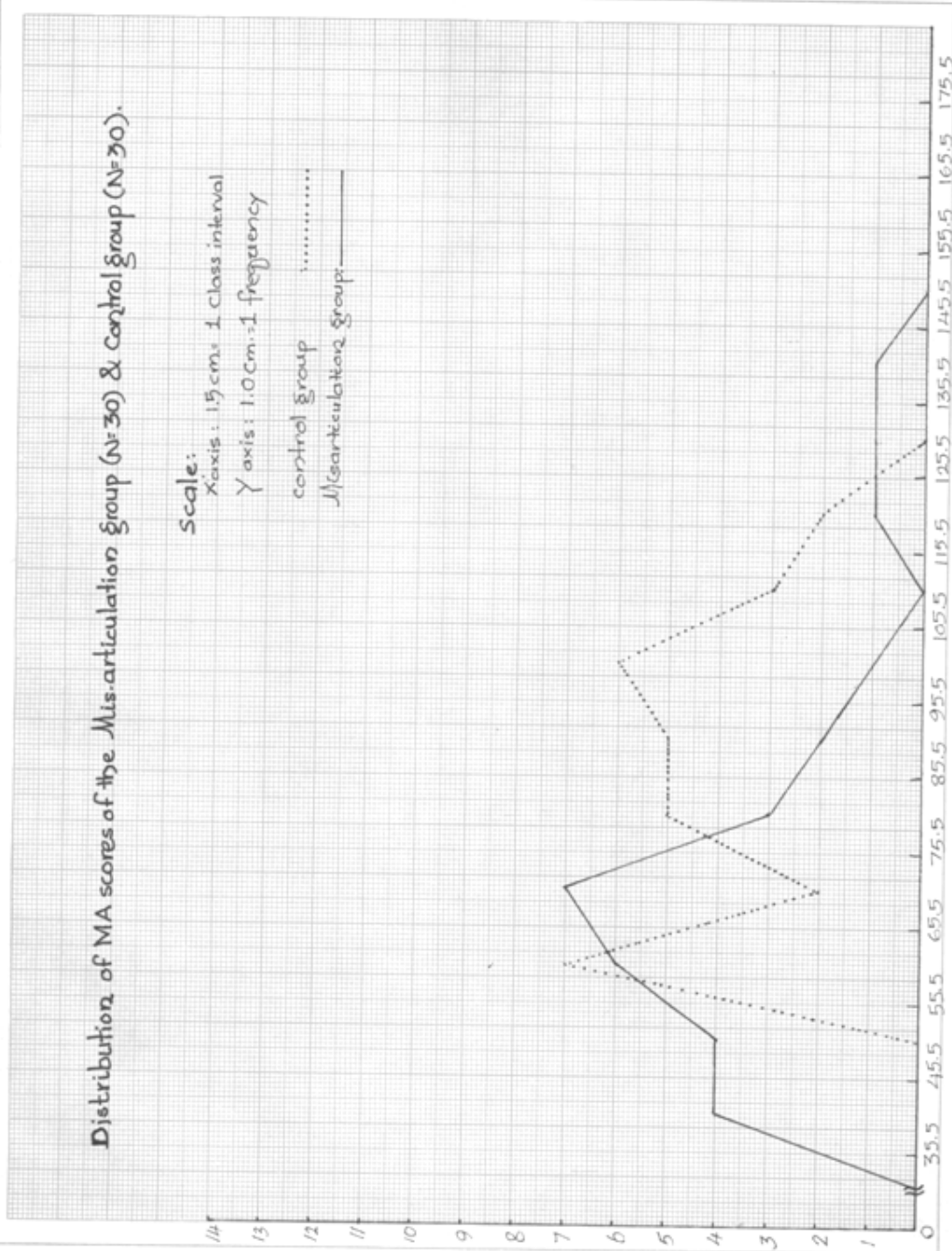
Scale:

X axis: 1.5 cm. 1 Class interval

Y axis: 1.0 cm. = 1 frequency

control group

Misarticulation group



So the null hypothesis that there is no significant difference in intelligence between normal and speech defective children can be considered as not tenable

Table 2 showing the Mean and SD for Misarticulation group and normal groups and the C.R(Mental age score)

	Misarticulation	Normals	Difference
N	30	30	0
Mean	71.11	85.73	14.62
S.D.	24.54	20.54	4.00
C.R	2.49 Significant at .05 level		

Table 2: shows that the mental age score of the misarticulation is less than score of the normal group. The Mean M.A.score of the misarticulation group is 71.11. The Mean M.A.score of the normal group is 85.73.

The difference between the Means of the two groups is 14.62 which is significant at .05 level, the C.R being 2.49. Hence it can be said that the misarticulation group and normal group differ in their mental development.

The S.D.value of 24.54 for misarticulation group is an indication of more inter individual difference in the group, as against the S.D.value of 20.54

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Ref: Speech sounds of young children. University of Lawa studies in Child Welfare.

Of the normal group. This indicates that individual differences among the subjects of the misarticulation group are more when compared to that of the normal group.

Bradbury, after studying the misarticulation cases reported that there is very little relationship between articulation and mental age. Correl<sup>54</sup> Reid<sup>55</sup> Schlanger<sup>56</sup> and others have reported that "Articulatory cases had the greater difficiency in intelligence "than normals. Thus the findings of the present investigation corroborate the findings of the above investigators.

So the null hypothesis that there is no significant difference in intelligence between normal and misarticulation children can be considered as not tenable.

Table 3 showing the Mean and SD for stuttering and Normal groups and C.R (Mental Age Score)

	Stuttering	Normal	Difference
N	30	30	0
Mean	91.73	85.73	6.00
S.D.	28.96	20.54	8.42
C.R	.92 not Significant even at 0.05 level		

Table 3 shows that the mental age score of the stuttering

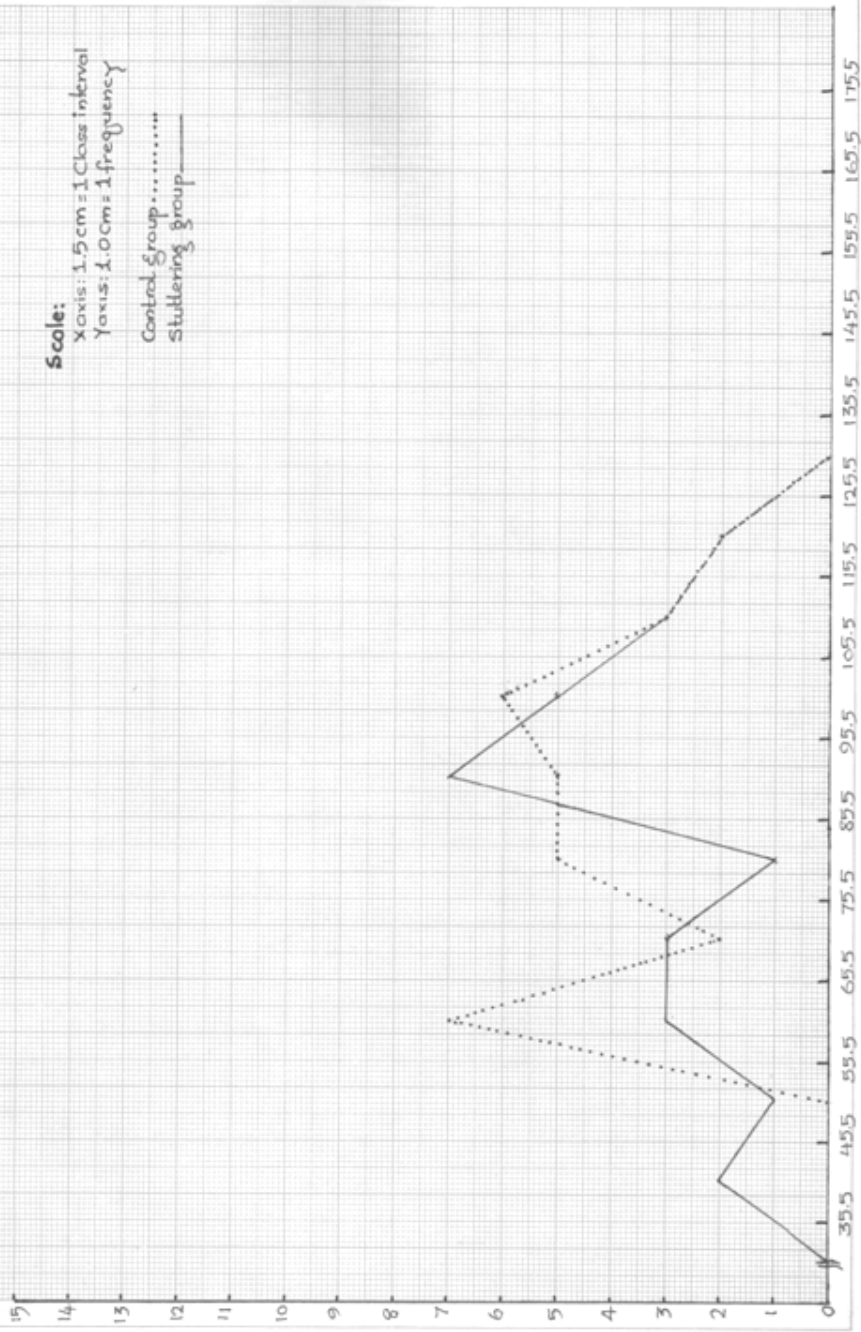
54 Correl Archives of speech 1936 179-203

55 Reid 'Journal of Speech disorders 1947 Vol 12 Pp 143-150

56 Schlanger 'American journal of mental deficiency 1953 Vol 58 Pp 114-122

### Distribution of MA scores of the Stuttering group (N=30) and Control group (N=30).

**Scale:**  
 X axis: 1.5 cm = 1 Class interval  
 Y axis: 1.0 cm = 1 frequency  
 Control Group.....  
 Stuttering group.....



Group is more than that of the normal group. The Mean M.A. score of the stuttering group is 91.73. The Mean M.A. score of the normal group is 85.73.

The difference between the Means of the stuttering group and normal group is 6.00 which is not significant, the C.R being .92. Hence it can be said that stutters and normal group children do not differ in their mental development.

The S.D. value of 28.96 for stutters group is an indication of more heterogeneity in the group as against the S.D. Value of 20.54 of the normal group. Indicating thereby the individual differences among the subjects of the stuttering group are more when compared to that of the normal group.

Travis after studying stutters reported that stutters as a group are above in intelligence when compared to normals. Thus the findings of the present investigation corroborate the findings of Travis.<sup>57</sup>

So the null hypothesis that there is no significant difference in intelligence between stutters and normal children can be considered as retained.

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57 Travis 'Handbook of speech pathology 1957

Distributions of MA scores of the Delayed-speech Group (N=30) & Control Group (N=30).

Scale:  
 X axis = 1.5 cm = 1 Class Interval  
 Y axis = 1.0 cm = 1 frequency

Delayed-speech group: ———  
 Control group: ·····

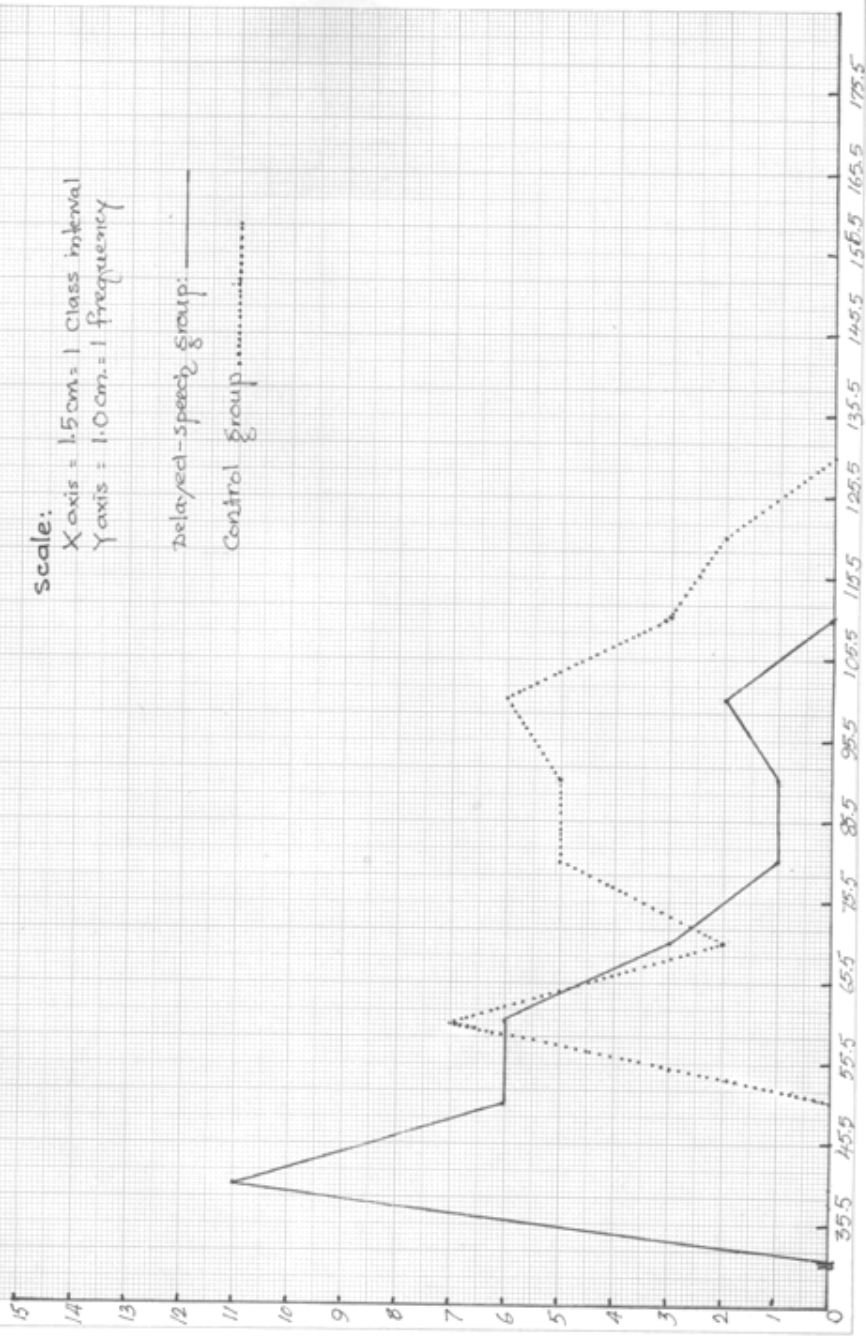


Table 4 showing the Mean and S.D for Delayed Speech Development group and normal groups and the C.R. (Mental age score)

	Delayed speech Development.	Normals	Difference
N	30	30	0
Mean	55.70	85.73	30.03
S.D.	13.06	20.54	6.48
C.R.	6.65 Significant at .01 level		

Table 4 shows that the mental age score of the delayed speech development group is less than the score of the normal group. The Mean M.A. score of the delayed speech development group is 55.70. The Mean M.A. score of the normal group 85.73.

The difference between the Means of the two groups is 30.03 which is significant at .01 levels, the C.R. being 6.65. Hence it can be said that the delayed speech development group and normal group differ in their mental development.

The S.D. value 13.06 for delayed speech development group is an indication of more homogeneity in the group, as against the S.D. value of 20.54 of the normal group. Indicating thereby the individual differences among the subjects of the delayed speech development group are less when compared to that of the normal group.

Goodwin, after studying 454 cases of speech retardation reported speech retardation and mental retardation are very closely, related. Thus the findings of the present investigation corroborate the findings of Goodwin.<sup>58</sup>

So the null hypothesis that there is no significant difference in intelligence between normal and delayed speech development children can be considered as not tenable.

Table 5 showing the Mean and SD for clinical group and normal groups and the CR(Mental age Scores).

	Misarticulation	Stuttering	Difference
No	30	30	0
Mean	71.11	91.73	20.62
S.D.	24.54	28.96	4.42
C.R	2.98 Significant at .01 level.		

Table 5 shows the mental age score of the misarticulation group is less than, the score of the stuttering group. The Mean M.A. score of the misarticulation group is 71.11. The Mean M.A. score of the stuttering group is 91.73

The difference between the Means of the misarticulation and stuttering group is 20.62 which is

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58 Goodwin 'Journal of Speech hearing disorders 1955 20 - 300 - 303.



significant at .01 level, the C.R. being 2.98. Hence it can be said that misarticulation group and stuttering group differes in their mental development.

The S.D.value 24.54 for misarticulation group is an indication of more homogeneity in the group, as against the S.D. value of 28.96 of the stuttering group, indicating thereby the inter individual differences among the subjects of the stuttering group are more when compared to that of misarticulation group.

Travis, after studying both the misarticulation cases and stuttering cases reported that stuttering group is higher in mental development than that of the misarticulation children.

Thus the findings of the present investigation do agree with Travis's conclusions.

So the null hypothesis that there is no significant difference in intelligence between misarticulation and stutt-ering children can be considered as not tenable.

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Table 6 showing the Mean and S.D for misarticulation and delayed speech development group and the C.R

(Mental age scores)

	Misarticulation	Delayed speech Development	Difference
N	30	30	0
Mean	71.11	55.70	15.41
S.D.	24.54	13.06	11.48
C.R	5.95 significant at .01 level		

Table 6 shows that the mental age score of the misarticulation group is more than the score of the delayed speech group. The Mean M.A. score of the misarticulation group is 71.11. The Mean M.A score of the development group is 55.70.

The difference between the Means of the misarticulation group and delayed speech development group is 15.41 which is significant at .01 level, the C.R being 5.95. Hence it can be said that the misarticulation group and delayed speech development group differs in their mental development.

The S.D. value 24.54 for misarticulation group is an indication of more inter individual difference in the group, as against the S.D. value 13.06 of the delayed speech development group, indicating thereby the individual differences among the subjects of the delayed speech development group are less when

compared to that of the misarticulation group.

So the null hypothesis that there is no significant difference in intelligence between misarticulation and delayed speech development group can be considered as not tenable.

Table 7 shows the Mean and S.D for stuttering and Delayed Speech development Group and the CR (Mental Age Score)

	Stuttering	Delayed Speech Development.	Difference
N	30	30	0
Mean	91.73	55.70	36.03
S.D.	28.96	13.06	15.90
C.R	6.21 Significant at .01 level.		

Table 7 shows that the mental age score of the stuttering group is more than the score of the delayed speech development group. The Mean M.A. score of the stuttering group is 91.73. The Mean M.A. score of the delayed speech development group is 55.70.

The difference between the Means of the stuttering group and delayed speech group is 36.03 significant at .01 level, the C.R. being 6.21. Hence it can be said that the stuttering group and delayed

Speech development group differs in their mental development.

The S.D. Value 28.96 for stuttering is an indication of more heterogeneity in the group, as against the S.D. value of 13.06 of the delayed speech development group, indicating thereby the individual differences among the subjects of the stuttering group are more when compared to that of the normal group.

So the null hypothesis that there is no significant difference in intelligence between stuttering and delayed speech development children can be considered as not tenable.

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## CHAPTER V

### SUMMARY AND CONCLUSION

The sample consisted of 90 speech defective children and 30 normal children of both sexes. And the age level ranging from 4 to 11 years. The cases registered and investigated at "All India Institute of Speech and Hearing, Mysore" constituted the clinical group samples. Normal children are drawn from Ist, IInd, IIIrd IVth grades of nursery schools in Mysore City.

Two intelligence tests (Seguin form board and Columbia Mental Maturity Scale) were administered to test the mental development.

The results revealed significant difference between speech defectives and normals. Difference in intelligence between different types of speech defectives were found out. On the basis of the results obtained the following conclusions may be drawn.

- (1) The clinical group (inclusive of misarticulation, stuttering, delayed speech development groups) as a whole, found significantly lower in mental development than that of the normal group.
  - (2) Misarticulation group also found lower in mental development than found to be that of the normal groups and stuttering
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Group. But this was higher in mental development than that of delayed speech group.

- (3) Stutterers as a group was found to be higher in mental development than that of other clinical group and also normal group.
- (4) Delayed speech development group showed lower mental development when compared to all other clinical group and to normal group.

## CHAPTER VI

### Suggestions for further study

1. Parent's emotional stability and child's speech disorder.
2. Parent's educational, social and economical differences and their effects on child's speech disorder.
3. Personality pattern among stutterers may be investigated.
4. Level of achievement among speech disorder children can be tested.
5. Relationship between emotional adjustment and speech disorder maybe investigated.
6. Sex differences among speech disordered children can be investigated.

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