The Effects of Super Speech Therapy on the Verbal Communication Abilities of Mentally Retarded Adults

Fall 1979

Jane D. Hjelm
University of Central Florida

Find similar works at: http://stars.library.ucf.edu/rtd

University of Central Florida Libraries http://library.ucf.edu

Part of the Communication Commons

STARS Citation


This Masters Thesis (Open Access) is brought to you for free and open access by STARS. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of STARS. For more information, please contact lee.dotson@ucf.edu.
THE EFFECTS OF SUPER SPEECH THERAPY
ON THE VERBAL COMMUNICATION ABILITIES OF MENTALLY RETARDED ADULTS

BY

JANE D. HJELM
B.A., University of Central Florida, 1978

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Arts: Communication
in the Graduate Studies Program of the College of Social Sciences
of University of Central Florida at Orlando, Florida

Winter Quarter
1979
ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to Dr. David Ingram, my thesis chairman, for his constant support and true professionalism in the preparation of this document. Without his academic knowledge and sincere moral support, this study could never have been accomplished.

I would also like to thank Dr. Albert Pryor and Dr. Thomas Mullin for their contributions to my study. A very special thanks is in order to Dr. Gladys Bennett for her constructive guidance as well as her extra efforts in molding my professional career. A sincere thank you goes to Walter Payne, Jean Conway and the workshop staff members who contributed to this research.

I wish to extend my thanks to Susan who displayed true friendship in unsettling times during this study. Also, to David, I express my insurmountable thanks for all of his professional advice and dedication during endless preparations for this project. But, most of all, I thank him for his warm and unselfish love, for without him, my goals would have been most difficult to attain.

Finally, I would like to thank my mother and father for the faith and unending support they have given me during my education. Never did love so unselfishly nor more deeply penetrate the life of another as did their love penetrate mine.
# TABLE OF CONTENTS

**LIST OF TABLES** ................................................. v

**INTRODUCTION AND RATIONALE** ................................. 1

  * The Incidence, Nature and Classification of Mental Retardation ........................................ 2
  * Communication Problems of the Mentally Retarded ................................................................. 3
  * Influencing Factors of Speech Deviance Among the Mentally Retarded ...................................... 5
  * Environmental Influences ........................................................................................................... 6
  * The Relationship Between I.Q. and Communication Skills ......................................................... 7
  * The Importance of Communication Skills ...................................................................................... 9

**STATEMENT OF THE PROBLEM** ..................................... 26

**METHODOLOGY** .......................................................... 27

  * Test Site ................................................................................................................................. 27
  * Subjects .................................................................................................................................. 27
  * Instrumentation ....................................................................................................................... 28
  * Independent and Dependent Variables ..................................................................................... 28
  * Procedure ............................................................................................................................... 31
  * Data Analysis ............................................................................................................................ 34

**RESULTS** ........................................................................ 35

**DISCUSSION** .................................................................... 37

**SUMMARY AND CONCLUSIONS** ..................................... 46

**APPENDIX A.** Training Session: Experimental Booklet .... 48

**APPENDIX B.** Raw Scores of Judges’ Ratings of Each Speaker .................................................. 60

**LIST OF REFERENCES** .................................................. 62
<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interrater Reliability Scores Among Judges</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>Comparisons of Means for Group 1 and Group 2</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>Means of Judges' Ratings of Each Speaker Pre and Post Therapy</td>
<td>36</td>
</tr>
</tbody>
</table>
INTRODUCTION AND RATIONALE

Much attention has been focused on promoting more independent living among individuals designated as mentally retarded (Trippi, Colao, & Alvarez, 1978). Trippi et al. (1978) stressed that retarded persons should live in a manner as nearly normal as possible within the community's mainstream.

Special needs of the mentally retarded are often associated with adjustment to the expectations of others (Jordan & Lance, 1976). For example, it is of necessity that the mentally retarded 1) have the ability to be successfully interviewed for a job; 2) relate responsibly with fellow workers; 3) converse with friends and total strangers; and 4) have the ability to request help and advice from supervisors (Jordan & Lance, 1976). Sawyer and Baker (1978) stated that work is no longer the sole criteria of adjustment, but that social skills are also needed to expand personal independence. The general purpose of any adjustment services program should be to change behaviors that interfere with a person's attempt to become a functional, independent member of his community (Sawyer & Baker, 1978). It is for these reasons that it is essential that effective communication skills be developed (Jordan & Lance, 1976).
The Incidence, Nature and Classification of Mental Retardation

Mental retardation is found in two to three percent of the population (Jordan, 1966). These individuals may be characterized as having short attention spans, poor grammar, and minimal content in spoken language, problems in evaluation and organization of perceptual clues, and displays of frustration in communication activities which may lead to withdrawal and to a lowered threshold of frustration (Vetter, 1969).

The American Association of Mental Deficiency has classified the mentally retarded into four major categories: 1) profound (I.Q. 's of 20 and below), 2) severe (I.Q. 's of 25-35), 3) moderate (I.Q. 's of 36-52), and 4) mild (I.Q. 's of 53-68) (Vetter, 1969). Kolburne (1969) stated that the categorization of mental retardation that is most often used in educational research is: 1) custodial (I.Q. 's of 25 and below), 2) trainable (I.Q. 's of 25-50) and 3) educable (I.Q. 's of 50-75).

Stevens (1969) described the profoundly mentally retarded as demonstrating poor motor development as well as the absence of speech skills. He claimed that these persons may be nonrehabilitative. The moderately retarded are capable of speech and language development and have social awareness (Stevens, 1969). Finally, the mildly retarded, the largest group of mentally retarded persons, may be taught communication and social skills, however, there may be slow development in
walking, talking and feeding (Stevens, 1969).

**Communication Problems of the Mentally Retarded**

Kastein (1955) stated that the development of language and speech is closely associated with the development of intelligence. Language is a psychic process that signifies expression of thought and ideas (Karlin & Strazzulla, 1952). Language includes phonological, morphological, syntactic and semantic elements as well as rules for combining these elements into sequences that express thoughts, intentions, experiences and feelings (Marge, 1972). Speech represents the verbal means of communication as a tool of language (Karlin & Strazzulla, 1952). Although speech includes the development of language, this paper will refer to articulation, rate and voice as the components of speech development relating to the mentally retarded (Van Riper, 1972).

Communication deficiencies are a recognized part of behavior of the mentally retarded (Everhart, 1960; Karlin & Strazzula, 1952; Rigrodsky & Steer, 1961; Schiefelbush & Bair, 1963; Schlanger, 1957). Schiefelbush and Bair (1963) studied the incidence of communication deficiencies among these individuals and found that 1) 57-72% of those institutionalized, 2) 72-82% of those in day schools and, 3) 8-26% of the mentally retarded in public schools had some type of communication disorder. Sirkin and Lyons (1941) examined 25,000 institutionalized mentally retarded subjects and found that only one-third of those studied
had speech within a normal range. Schlanger (1953) studied an institutionalized mentally defective population and found the incidence of speech disorders to be 68%. Schlanger (1957) in a later survey of retarded children, reported that 55-66% of this population demonstrated deviance in speech.

Schlanger (1957) also found that 78% of the retarded population had speech defects, displayed articulation errors and nearly all those with voice and stuttering disorders were accompanied with articulation problems as well. Karlin and Strazzula (1957) found omissions and substitutions to be the most common of the articulation deficits in the mentally retarded.

Wilson (1966) studied the articulation characteristics of the mentally retarded within the public school setting. Of those sampled, articulation errors decreased as the mental age (MA) of the retarded individuals increased. Sibilant and blend sounds were the most commonly misarticulated sounds while nasals were the least defective. Lower MA capacities were characterized by omissions while distortions dominated the speech disorders of those with higher MA's. He also found that more unvoiced sounds were deviant than were voiced sounds.

Schlanger (1957) reported that voice abnormalities among mentally retarded persons with speech defects reached 47%. Karlin and Strazzula (1957) revealed that voice problems centering around nasality and huskiness are common among this population and that stuttering was found in only 2% of those observed.
Schlanger (1957) reported stuttering in as many as 17% of the retarded group under study.

**Influencing Factors of Speech Deviance Among the Mentally Retarded**

Defective speech in the mentally retarded may be a symptom of the same factors causing the mental deficiency, such as organic abnormalities (Schlanger & Gottsleben, 1967). It may also stem from factors, wholly unrelated to those resulting in the symptom of the retardation, due to environmental influences (Schlanger & Gottsleben, 1957).

Kastein (1955) stated that speech defects may be found in mentally retarded persons with cerebral palsy, secondary retardation and emotional disturbances or illnesses. In those with cerebral palsy, speech disorders may be due to neuro-motor impairment as a direct result of the cerebral palsy. Retardation in these individuals occurred in 50-70% of the cases studied by Kastein (1955). In secondary retardation, there is little or no neuro-motor impairment but there are disorders of perception and behavior. Speech in these individuals may be absent or impaired in that speech is poorly articulated and often whispered. Emotional problems and their related communication problems depend on the severity of the symptoms.

Van Riper (1972) stated that sensory deprivation resulting from a hearing loss may cause a delay in speech. He claimed that neurologic dysfunctions are the main causes of the speech delay
in the mentally retarded. This may be due to prominent perceptual difficulties. Hall (1938) claimed that the auditory memory span seems to be associated with intelligence, therefore, there are usually higher incidences of speech defects among the retarded population.

Environmental Influences

Although organic factors may contribute to a delay in speech, its development may be strongly affected by social and cultural influences (Schlanger, 1959). In addition to organic factors, Van Riper (1972) stated that experience deprivation and emotional problems interfere with communication development. Schlanger (1959) claimed that a mentally retarded person may improve communications through the influence of the environment if the behavior is within his genetic and psychological limits.

Environments that offer little motivation to an individual may cause a delay in speech development since growth in speech is dependent upon psychological satisfaction (Schlanger, 1954; and Karlin & Strazzula, 1952). Dub (1948) supported that a speech defect is usually accompanied by a lack of psychological balance. Schlanger (1954) found that there was a lack of challenge in communication among institutionalized persons which resulted in a minimization of speech experiences. He found that these institutionalized persons had less speech than did noninstitutionalized. Siegel and Hawkins (1963) also supported
the view that the environment greatly influences the speech development of the mentally retarded. They studied the relationship between the I.Q. levels of individuals and the reactions of others to persons with varying I.Q.'s. Those subjects with low I.Q.'s received more responsiveness from others which reduced the necessity or opportunity for the retarded individual to engage in verbal enrichment (Siegel & Hawkins, 1963).

The Relationship Between I.Q. and Communication Skills

Wilson (1966) claimed that speech deviations of the retarded have been clearly defined. It was once thought that the retarded child had articulatory development similar to that of children with normal intelligence if the MA of the retarded child is considered rather than the chronological age (CA). Wilson (1966) found that this was not true even when matching the MA of the retarded person against the CA of the normal child. His study suggested that the extent of articulation deviation is a function of the MA as well as the CA and that sound acquisition in the mentally retarded varies considerably from that of normal children.

Schlanger (1953) found that the retarded were inferior to normals in motor skills, auditory memory span and sound discrimination abilities. He suggested that defective speech and low MA's may influence each other.
Bangs (1942) performed a clinical analysis of articulation problems of mentally retarded children. He found a positive relationship between 1) speech proficiency and intelligence quotients and between 2) speech proficiency and MA. He claimed that mental age is a better predictor of speech proficiency than is chronological age and that mentally retarded children do not qualitatively differ from children of normal intelligence in regard to speech defects.

Everhart (1960) claimed that there is a definite parallel between intellectual capacity and defective speech. Gens (1950) reported that delayed speech may be attributed to the lack of mental ability. His study indicated that of those mentally deficient children enrolled in public schools, three-fourths have speech disorders as a result of lower intelligence.

According to Kastein (1955), 60% of the children referred for speech evaluations at Columbia Presbyterian Medical Center appear to be retarded due to lack of speech skills. He claimed that a low I.Q. is not necessarily the cause of the delay in speech development. A child with normal intelligence, for example, may have defective speech, and a child with lower-than-normal intelligence may demonstrate normal speech. It is for these reasons that Kastein (1955) suggested that a child's response to speech therapy should be taken into consideration before his mental potential can be accurately assessed.

Although there are differing opinions as to the relationships
that exist between mental retardation and speech defects, it may be concluded that 1) there are more speech defects in the mentally retarded population than there are in normals, and 2) organic and environmental factors play an important part in the development of speech (Bangs, 1943; Hall, 1938; Schlanger, 1959; Siegel & Hawkins, 1963). Organic factors may cause speech defects in the mentally retarded due to poor sequencing, motor dysfunction and poor auditory discrimination (Schlanger, 1953). Speech development, influenced by environmental factors, may in turn cause deprivation of communication ability (Kastein, 1955).

The Importance of Communication Skills

   Effective communication skills of the mentally retarded promote efficient functioning in the environment (Rigrodsky & Steer, 1961). Although verbal content is important in communication, nonverbal speaking qualities may often classify the content (Schwartz, 1973). The communication skills through which a speaker presents his information are often a basis for the listener's reaction to his communication as well as his impression of the speaker (Leather, 1976; Steward & d'Angelo, 1975; Winter, 1976). Defective speech may result in penalty from others, thus hindering social growth as well as emotional being (Van Riper, 1972). Recognition of the speaking qualities that affect the communication skills of the mentally retarded increase the chances for progress in the rehabilitation process (Rigrodsky & Steer, 1961).
The speaking qualities that affect intelligibility are 1) voice qualities, 2) rate and nonfluencies, and 3) articulation. Voice qualities are considered as intensity characteristics of speaking while rate qualities are the rapidity or slowness with which one speaks (Van Riper, 1972). Articulation qualities are viewed as substitutions, omissions and/or distortions of sounds (Van Riper, 1972).

**Voice Qualities.** Speech patterns correlate with psychological traits (Winter, 1976). Leathers (1976), Stewart d'Angelo (1975) and Winter (1976) claim that the voice is the most efficient way of communication because it carries information about personality, mood and present state of functioning.

The voice can shape perceived personality characteristics of the communicator and can be an accurate indicator of such states as introversion/extroversion and ascendance/submission (Leathers, 1976; McCardle, 1974; Pearce & Conklin, 1971; Winter, 1976). Personality, demographic and credibility characteristics can be perceived by an audience if the same speaker uses different styles of vocal cues, according to a study done by Pearce and Conklin (1971). In this study, speakers in a condition that utilized a small range of inflections, low volume and low pitch, were rated as more trustworthy, more attractive, better educated, more honest and more person-oriented than were the speakers utilizing a wide range of inflections, high volume and pitch. These results indicated that
the audience drew inferences from vocal cues as to their evaluation of the speaker in regard to credibility, personality and demographic characteristics (Pearce & Conklin, 1971).

Addington (1971) studied the effects of pitch variety and voice quality on competence, trustworthiness, and dynamism. He found that increases in pitch variety had little effect on credibility but decreases in variety of pitch resulted in lower credibility ratings. Voice aspects of nasality and tenseness lead to a reduction in credibility (Addington, 1971; Leathers, 1976).

Diehl and McDonald (1956) studied the relationship of a speaker's voice to his ability to communicate information and how a speaker's voice quality affects an audience's rating of his voice. It was concluded that breathy and nasal voice qualities appeared to interfere with a speaker's ability to communicate information, however, neither harsh nor hoarse voice qualities appear to have any negative effect on communicating information.

Glasgow (1944) studied the effects of hypernasality. Four recorded specimens of descriptive prose and poetry in both clear and nasal quality styles were given to subjects. The subjects were to complete a short answer test to measure their comprehension of the literature. The results indicated that hypernasality impairs the audience's ability to understand both prose and poetry more than the clear-tone condition (Glasgow, 1944).
The qualities of the voice can greatly enhance or damage credibility depending on the vocal cues used by the communicator (Leathers, 1976). Not only do these qualities affect credibility ratings but they affect listener's comprehension of the material being communicated (Glasgow, 1944).

Rate and Nonfluencies. Speech rate and nonfluencies may influence the reactions of a listener to the speaker (Miller & Hewgill, 1964; Rosenberg & Curtiss, 1954). The rate of speech is described as the speed with which words are emitted (Van Riper, 1972). Fluency of speech, however, is determined by the number of halts and pauses which interrupt the flow of utterance (Leathers, 1976).

Leathers (1976) stated that rate is a valid and accurate indicator of a speaker's psychological state. Orr (1968) revealed that intelligibility declined when a speaker reached 275-300 words per minute depending upon the type of acceleration and material, the individual's aptitude and motivation, and the presentation conditions. He concluded that retention of material presented under accelerated conditions is not adversely affected. Leathers (1976), however, commented that an individual's thought rate is faster than his speech rate and if that speech rate is too slow or the pauses are too long, the listener will loose attention. He stated that duration of hesitations or pauses is a highly variable phenomenon that depends on individual differences, sensitivity to pressures of social interaction and to the requirement
Rosenberg and Curtiss (1954) investigated dysfluency and how it affects the listener's responses. The results indicated that subjects lost eye contact with the nonfluent speakers over longer periods of time than with normal speakers. The total amount of conversation with nonfluent speakers was found to be elicited less often by others than was conversation with normal speakers (Rosenberg and Curtiss, 1954). They concluded that listener's behavior is significantly affected by nonfluency in that it seems to be a behavioral depressant to the listener.

Miller and Hewgill (1964) studied the possible relationships between the quality and type of nonfluency presented by a speaker and audience ratings of source credibility. The results indicated that as the quantity of nonfluency of a speaker increased, audience ratings of perceived source credibility decreased and was more pronounced when the nonfluent behavior involved repetitions rather than vocal pauses. Reduction in source credibility ratings occurred on competence and dynamism but not on trustworthiness (Miller & Hewgill, 1964). It may be concluded that trustworthiness and nonfluency are independent of each other and that an audience may perceive a stutterer to be as trustworthy as a nonstutterer, but considers him less competent and credibility is negatively affected by nonfluencies of the speaker (Miller & Hewgill, 1964).

A person's speech is an important determinant of the way people
will react to him (Davis, 1973). Defective speech rates of
dysfluencies in the mentally retarded may negatively affect
listener reactions toward him (Davis, 1973). This will determine his
acceptance or rejection by the listener which is also an influ­
encing agent in rehabilitation (Addington, 1971; Miller &

Articulation. Articulation maturation is subjected to
disturbances in sequencing, rate and patterns of development
growth (Everhart, 1960). The development of acceptable patterns
of articulation depends upon many complexities of the individual
and the environment (Everhart, 1960). One of these elements is
intelligence (Everhart, 1960).

It is generally recognized that defective articulation is likely
to have an adverse effect on the personality of the speaker, due
partly to the reactions of the listeners (Jordan, 1960). Jordan
(1960) found that the reactions of listeners to articulation
defectiveness are primarily dependent on: 1) the frequency of the
errors and 2) the degree of the articulation deviation. Van Riper
(1972) claimed that a speech deviation is not considered a speech
disorder unless it 1) calls attention to the speaker; 2) interferes
with communication; or 3) causes the speaker to become self­
conscious or maladjusted. When an articulation problem falls into
one of these categories, the speaker is likely to be evaluated by
his peers as handicapped (Silverman, 1976).

Previous research has indicated that listeners may react
adversely to defective articulation in their ratings of the severity of the defect (Jordan, 1960; Morrison, 1955; Perrin, 1954; Sherman & Cullinan, 1960; Sherman & Moodie, 1957).

Jordan (1960) found that defective articulation is distracting to the listener.

Individuals with severe articulation problems may find the demands of modern life very difficult due to penalties from society which result in anxiety, guilt and hostility on the part of the speaker (Van Riper, 1972). Unintelligible speech may cause difficulty in expressing emotion which leads to frustration (Van Riper, 1972). The speaker may find that he is better off not using speech, thus he withdraws or resorts to gesturing and/or other devices to get attention (Van Riper, 1972). Defective articulation, therefore, is a critical variable in the development and maintenance of good communication skills in the mentally retarded (Jordan, 1960; Van Riper, 1972).

Therapy. There is a large number of people for whom programs for teaching verbal skills are not readily available (Carrier, 1974). It is erroneous to assume that nonverbal and severely deficient persons can interact and process environmental stimuli and experiences in the same way as normal persons (Hara & Lance, 1978). Due to the complexity of the communication system, the mentally retarded lack communication skills and are slow in acquiring learned behavior (Carrier, 1974). Speech therapy can, however, aid in the general adaptation of the mentally retarded by
making them more like other individuals (Schlanger & Gottsleben, 1957). Vetter (1969) believed that mental retardation is a reversible condition if the techniques of general remediation are discovered and applied appropriately. Certainly speech therapy can contribute to the rehabilitation of the mentally retarded but it must be directed at environmental modifications and behavioral change of the defective communication skills (Schiefelbush & Bair, 1963).

The Need of Special Therapy for the Mentally Retarded. Schlanger (1958) stated that the speech therapy with retarded persons is possible, but that the therapist must anticipate 1) reduced learning capacities, 2) slow development and 3) maladjustment problems. Maladjustment is more closely associated with the person's reactions to the environmental pressures than with his organic predisposition (Schlanger, 1958). There may be problems in speech and language with a lack of motivation to speak frequently, therefore, therapy emphasis must be placed on the emotional aspect of a client's communication behavior (Schlanger, 1958).

Sommers et al. (1970) studied the factors of stimulibility and the severity of articulation in the mentally retarded and found that the observed stimulibility factors were not related to improvement in articulation skills as they were with normal individuals. This suggested that articulation problems of the mentally retarded
are unique and resistant to change without therapy (Sommer et al., 1970). Sommer et al. (1970) also stated that once therapy had been discontinued, retarded persons did not improve in articulation without the benefit of correctional services. This indicates a need of special provisions for facilitating generalization (Sommers et al., 1970).

Since there is a high incidence of disorders of verbal communication among the mentally handicapped, there is a dramatic need for speech and language therapy with this population (Freeman & Lukens, 1962). A successful program must provide for many opportunities for frequent repetition of meaningful communication experiences by the use of specific social speech patterns appropriate to various life situations (Freeman & Lukens, 1962).

Cruickshank and Johnson (1958) stated that only the most severely retarded are unable to speak. An appropriate pattern of therapy may include: 1) developing the self-concept; 2) motivating the need for clear speech; and 3) developing an awareness of speech as a means of influencing the actions of others. Schlanger (1954) stated that gains in the speech area are revealed in greater self confidence. Therapy with the mentally retarded must include continual diagnostics so that the therapist can determine more accurately the changes in levels of speech and language skills and potential development (Schlanger, 1958). Successful therapy may
also include operant and classical conditioning with an emphasis on the reinforcement of the newly-learned skills (Freeman & Lukens, 1962; Van Riper, 1972). Training the mentally retarded in speech must reflect consideration of processing deficits with emphasis on consistency and simplicity (Carrier, 1970; McCormick & Elder, 1978).

Limiting factors on the acquisition of communication skills of the mentally retarded are attending behaviors and motivation of the individual, according to Miller and Yoder (1974). Mentally retarded persons usually have poor reasoning abilities and inadequacies in abstraction and symbolization, therefore, concrete materials must be used in therapy with these individuals (Karlin & Strazzula, 1952). Actual speech therapy should not be concerned with the correction of defective sounds but with motivation and utilization of language (Karlin & Strazzula, 1952). The aim of therapy is not to attain perfect speech but to develop usable speech (Karlin & Strazzula, 1952).

Schlanger (1959) studied the effects of therapy on institutionalized brain damaged mentally retarded children whose I.Q.'s ranged from 24-53. Therapy consisted of developing a positive attitude toward oral expressive and receptive language and creating situations in which satisfying experiences were structured. In the initial examination of each subject, apathy was the behavior that best described the attitudes toward communication (Schlanger, 1959).

Therapy with the mentally retarded is a unique and complex
process (Sommers et al., 1970). The mentally retarded have pronounced limitations, therefore therapy should be based on the development of functional communication rather than perfect speech (Karlin & Strazzula, 1952).

**The Efficiency of Therapy.** Freeman and Lukens (1962) emphasized that speech pathologists must realize that the effects of therapy must extend beyond the clinical setting to the outside environment. This generalization may be a time-consuming part of therapy and constant attention to efficiency is needed (Carrier, 1974; Costello & Bosler, 1976; Freeman & Lukens, 1962). Caton (1976) emphasized efficiency and accountability within the therapy sequence, thus synthesization of the program is desirable. Rehabilitation facilities must utilize every tool and management concept to maximize the quality of their services. Thus accountability is becoming a necessity in the evaluation of performance and cost effectiveness (Selby, 1977).

The length of therapy of a given case varies as do the factors affecting remediability (Dickson, 1974). These factors are: 1) stimulability of the client, 2) the severity of the speech defect and 3) the consistency with which the client makes the speech error (Dickson, 1974).

Sommers et al. (1967) administered articulation therapy to normal children and found that therapy was effective regardless of the severity of the speech problem. Articulation was found to
improve in this group after 8½ months of therapy (29 sessions). Mecham (1955) found speech improvement in a group of mentally retarded individuals after 24 sessions of group and individual therapy.

Lubman (1955) administered therapy to a retarded population utilizing visual stimuli in 15-minute therapy sessions and Lubman found that the retardates responded mainly to praise, however, improvement was limited and slow. The clients were seen by their therapist individually each week for six months. Following each visit, the therapist informed the individual's classroom teacher as to the content of that particular session in order to gain carryover. The older clients (17-21 years) did not learn as quickly as the younger ones due to the difficulty in breaking long-term faulty speech habits (Lubman, 1955). Lubman (1955) concluded that the degree and length of time to attain achievement in speech improvement is dependent on the cooperation of others that are involved and interested in education for the mentally retarded.

Schlanger (1959) studied the effects of therapy on speech improvement and found no significant changes within 18-24 months after therapy. There were, however, trends toward more positive attitudes, awareness, and responsiveness to oral communication. After 36-42 months of therapy, there was some progress in the intelligibility of speech and an improvement in communication interaction, but the improvements were minimal when related to the
amount of therapy administered (Schlanger, 1959). Schlanger (1959) concluded that although the oral communication of the subjects was limited due to behavioral disturbances and neurological factors, improvements in speech were possible with a therapy program that is long term and intensive.

Sommers et al. (1970) also studied the effects of speech therapy on the articulation improvements in the mentally retarded. It was found that improvements in articulation were a function of the number of therapy sessions and/or the intensity of the therapy application. It was not possible to evaluate the influence of intensity in this particular study. There was a significant improvement in those subjects who received 30 minute therapy sessions four times weekly (119 sessions) as compared to the control group which received no therapy. There was no significance in the improvement of the group that received therapy for 30 minutes only once a week (30 sessions) as compared to the control group. This suggested that as the number of therapy sessions increased, articulation improvements increased (Sommers et al., 1970).

Direct articulation therapy as is used in public schools (Van Riper, 1972) was administered to an experimental group in two, one-half hour sessions for a period of three years (Wilson, 1966). The placebo group received no specific guidance in correcting individual sound errors but were given nonphoneme oriented speech
and language stimulation for the same amount of time as the experimental group. This group was created to see if alterations in speech were due to special attention given to these individuals. The control group received no therapy (Wilson, 1966). Results indicated no significant differences in articulation progress for the three groups. The therapy had no more effect than did maturation on sound error reduction. Wilson (1966) concluded that the approach to speech therapy commonly used in a public school setting has little value in improving the articulation of the mentally retarded.

It would seem then that traditional programs for articulation therapy are developed for normal persons and have been generally ineffective with the mentally retarded (Raymore & McLean, 1972). Therapy with these individuals may become a long and tedious process, therefore, there is a need for therapy to utilize supportive personnel and paraprofessionals to increase the impact of carryover and to economize the cost and use of professional manpower (Raymore & McLean, 1972).

Super Speech. Super Speech, an innovative therapy approach initially designed for the educably mentally retarded (EMR) within a sheltered workshop setting, was based on previous methodologies (Backus & Beasley, 1951; Low et al., 1959; McDonald, 1964; Mysak, 1959; Van Riper, 1972). It includes theoretical constructs from operant (Skinner, 1938) and classical conditioning (Kimble, 1961), cognitive psychology (Marx, 1970), and communication (Barnlund, 1968; Sereno & Mortensen, 1970) and persuasion theories (Insko,
1967). The eclectic theoretical model which was used was "SMRC" (Stimulus-Mediation-Response-Contingency) rather than the more traditional S-R or R-R models.

Specific variables were critical in the diagnosis. For example, variance toward improvement of the communication problem and stimulability were important aspects. If variance was observed, the clients were enrolled in therapy. A brief diagnostic session was utilized in which these few stimulable variables that were critical to the therapy were isolated. The therapy was then based on speech in a meaningful conversational setting rather than articulation drills of traditional therapies. Therapy centered around communication situations that were meaningful to the clients as suggested by Griffith and Craighead (1972), Karlin and Strazulla (1952), and Low et al. (1959). Traditional articulation therapy approaches were deemphasized in Super Speech because the goal of the program was to attain usable and intelligible speech of the clients rather than striving for perfect speech.

Super Speech therapy was based on 1) improvements in precise articulation movements; 2) adjustments in the rate of speaking and, 3) encouragement of audible vocal habits and qualities. These variables were stated as important in effective communication according to Addington (1971),
Glasgow (1944), Jordan (1960), Leathers (1976), Miller and Hewgill (1964), Pearce and Conklin (1971), Silverman (1976) and Templin (1938). During the early therapy sessions the improved responses of the client's speech patterns were strengthened and therapist-monitored at the conversational level. During in-service training, supervisors, administrators and staff members were encouraged to reinforce the newly learned, yet weak responses of the clients on an all-day-long basis. Counseling to improve communication images was also provided.

Motivation and attitude improvements were primary concerns of the Super Speech program as was the development of an awareness of the influencing capacity of clear, intelligible speech. These aided in an improvement in self concept. Confrontation and/or operant conditioning served as feedback, but only in a positive atmosphere. This was in accord with Schlanger's (1958) findings that effective therapy with the mentally retarded may depend on individualization of the design as well as the promotion of positive emotional reactions.

The duration of previous therapy approaches has ranged from eight and one half months to three years of therapy (Lubman, 1955; Mecham, 1955; Schlanger, 1959; Sommers et al., 1970; Wilson, 1966). The Super Speech program was designed in an attempt to obtain significant improvements in conversational communication over a period of eight to ten weeks. Stabilization and reinforcement of Super Speech in the environmental setting may have been one of
the most efficient factors in the therapy design. In this program, speaking precision was constantly reinforced at work through the use of supportive personnel. Carrier (1970) and Sommers et al. (1962) supported this procedure through the suggestion of the use of para-professionals in rehabilitation of the mentally retarded. Supervisors as well as coworkers were recruited as helping members of the speech therapy team in that the team reminded the client to "use his good talking" as well as reward him with extensive praise for desired behaviors. Not only was the use of professional and supportive personnel in a team effort successful in attaining desired responses, but it was economical in time and cost.
STATEMENT OF THE PROBLEM

Rehabilitation programs for the mentally retarded adult include efforts to prepare them for lives that are productive and useful. In addition to emphasis on work and social skills, there is a great need for programs that encourage good communication skills.

Communication problems in the mentally retarded may interfere with possible work opportunities as well as normal social interactions. These disturbances in speech may be in the form(s) of voice, rate and/or articulation deficits.

Traditional speech therapies for mentally retarded individuals have ranged in duration from eight and one-half months to three years and have yielded minimal improvements. There is a need for an improved type of therapy procedure designed to obtain significant differences in controlled-monitored conversation settings of mentally retarded adults. Super Speech may be such a program which can produce significant results in few sessions.

It is the purpose of this study to present a therapy design called Super Speech and to examine its effects on the rehabilitation of a group of mentally retarded adults. It is hypothesized that the general ability to communicate in a group of mentally retarded individuals will be significantly improved following a short term of Super Speech therapy.
METHODOLOGY

Test Site

All tape recordings were obtained at a sheltered workshop for handicapped clients in the Central Florida area. The recordings were made in a portable trailer that was designed for the speech therapy program. All recordings took place during the working day in which the workshop was in full operation.

The listening sessions were done at the University of Central Florida (UCF), Orlando, Florida. All of the judges were administered the instructions and training session of the experiment in one classroom. Next, the judges were divided into two groups, one for each order of presentation. The groups evaluated the speech samples in two separate classrooms in which the noise level was at a minimum. Seating was arranged so that the judges encircled the speaker of the recorder to maximise listening ability.

Subjects

Nine speakers, five males and four females, were diagnosed by an expert in speech pathology as having communication disorders. The I.Q. levels of the subjects ranged from 47-78 and ages ranged
from 18-40 years.

Six judges, one male and five females, were selected from volunteers in an undergraduate speech class at UCF. The age range of the judge majors was 19-27 years. None were speech pathology majors.

Instrumentation

All recordings were made with a Wollensak tape recorder, model #1520, at the speed of 3 3/4 IPS. The wollensak microphone was used for each of the recorded speech samples.

All experimental listening sessions were conducted with a Wollensak tape recorder model # 1520 in conditions minimizing extraneous noise factors.

Independent and Dependent Variables

The administration of Super Speech therapy served as the independent variable and the dependent variable was the judges' evaluation of the "general ability to communicate" for each of the speech samples.

Several pilot studies were conducted in an effort to identify the most effective methods for evaluating the speech samples. In the first two pilots, the researcher operated on the assumption that intelligibility was the most relevant dependent measure. However, the majority of the speech samples could be understood even though the articulation was not precise.
Thus the ratings on the continuum, very intelligible/not at all intelligible, showed little variability. Therefore, it was necessary to change the rating criterion to focus on the effectiveness of overall communication skills. The initial pilot studies also demonstrated the need to give judges immediate feedback on their performances in the training session. When such feedback was withheld until all of these samples had been presented, the judges expressed uncertainty about their task.

In the third and fourth pilots, the criterion was changed to "the effectiveness of overall communication skills" based on rate, loudness and articulation. The training session was adjusted to provide immediate feedback in that explanations of what the judges were to be evaluating were provided prior to each training speech sample.

It was found that the variable, loudness, could not be accurately examined due to limitations of the recording equipment. Also, the criterion on which judgement was based was too detailed and complicated, thus judges were again confused as to what they were evaluating. The continuum very effective/very ineffective had to be adjusted.

Adjustments in the rating criterion and training session procedures were again undertaken. In the fifth pilot study judgement was based on the subject's "general ability to communicate" which involved a simplified evaluation of articulation precision and rate of speaking. The training session at this
point was longer and more involved than in previous pilots. A discussion was held before evaluating each training session speaker, and specific problems were pointed out. Since the dependent measure was designed to assess the effects of the therapy on each subject in relation to himself, the tapes were presented in pairs of before and after therapy conditions for each speaker. Randomization was used only to determine whether to present a speaker's pre-therapy or post-therapy tape first. Thus, a judge would evaluate both tapes of a given speaker before listening to a different speaker. This is in contrast to the procedures used in the previous pilots, where all speech samples were randomized.

After pilot number five, a final revision of the materials was conducted to refine the rating continuum. In addition, a more intensified training session was planned. The rating continuum as before, consisted of an equal interval seven point scale on which the extremes good/bad were labeled. These terms were considered as less ambiguous than the "very effective/very ineffective" scale used in pilot number five. The training session was basically the same as in pilot number five except that each speech sample was followed by a brief excerpt from the same sample. This excerpt contained the specific vocal behavior which demonstrated the speech problem as described by that particular point on the continuum.
Procedure

Nine speakers were diagnosed with communication defects (articulation, rate and voice intensity problems) and were recorded in conversational speech. A 27-45 second speech sample of connected speech (Perrin, 1954; Morrison, 1955; Sherman & Cullinin, 1960) in a conversational setting was recorded of each speaker: 1) before the administration of Super Speech therapy and, 2) after the speaker underwent 8-10 one-half-hour therapy sessions. The mean length of the recordings was 33 seconds. The length of the samples approximated the length that Jordan (1960) recommended for evaluation of defective speech.

Eighteen original speech samples (nine before therapy and nine after therapy) were recorded on a master tape. Of these original recordings, 18 representative segments were chosen by the experimenter to represent each speech sample. Five second intervals between each recording allowed for 1)a recorded announcement of the number of each speech sample and, 2) sufficient time for judgements to be made by the raters (Perrin, 1954; Speaks, Parker, Harris & Kuhl, 1972).

The conversational samples consisted of an interactional dialogue between the experimenter and the subjects related experiences concerning workshop and/or weekend activities. Because of the low I.Q. levels of the subjects, it was difficult
to obtain a flowing conversation of an appreciable length. Therefore, the tapes were spliced in order to ensure a continuous conversational sample. The experimenter's voice was also deleted from the sample. The following illustrates the splicing method of the samples.

Experimenter: What did you do this weekend? (Omitted)
Subject: We went to the mall.
Experimenter: What did you do there? (Omitted)
Subject: We shopped for presents.
Experimenter: What did you buy? (Omitted)
Subject: I bought a tie for my father.
Experimenter: Then what did you do? (Omitted)
Subject: Then we went to the movies.
Experimenter: What did you see? (Omitted)
Subject: We saw Burt Reynolds in "The End."

Therefore, after splicing, the resulting sample was: "We went to the mall. We shopped for presents. I bought a tie for my father. Then we went to the movies. We saw Burt Reynolds in "The End."

The speech segments were dubbed on a new tape in pairs of before and after therapy speech samples for each speaker. A constant intensity level was maintained by monitoring the VU meter of the recorder. Thus, a speaker's two speech samples (before and after) were presented then repeated so that the judges could compare the two samples more accurately.
Six undergraduate students served as judges. The decision to use non-speech pathology majors was guided by Perrin's (1954) observations that trained and untrained judges in speech pathology make similar comparisons of the severity of speech deficits. Thus, these deficits are noticeable not only to experts, but to the general population.

Each judge used a seven point equal appearing interval scale to evaluate the "general ability to communicate" for each speech sample. Support for using this rating system is provided by Sherman and Moodie (1957) who found that equal appearing interval scales were useful for articulation and defectiveness scaling.

The training session (Appendix A) was designed to acquaint judges with the range of representative speech samples of the seven point "general ability to communicate" scale. The speech samples were recorded by speakers other than the experimental speakers, yet they were drawn from the same sheltered workshop. The training segments represented the extremes and mid-values of the rating continuum such that "good" (1) was represented by a normal speech sample and "bad" (7) was represented by a speaker with a profound speech deficit. Numbers two through six on the scale were represented by speakers with differing degrees of communication problems in accord with the scaler increments in that (6) was more severe than the rating (5), and (5) was more severe than (4) etc.
The training session also included a booklet which reiterated the instructions and portions of the dialogue from the speech samples. The written material coincided with the tape.

The judges were asked to refrain from interactional communication while the experimental session was in process. They were instructed not to place marks between segments of any two points of the scale and to rate each speech sample. The judges were asked to record their answers following the presentation of each sample. When the experiment was completed, the judges were debriefed as to the purpose of the study. The entire training and experimental portions of the experiment took approximately 60 minutes.

Data Analysis

A Pearson Correlation Coefficient was administered to examine the reliability of the rating instrument. One-tailed t-tests were used to compare the means that were obtained for the pre and post therapy conditions for both orders of presentation.
RESULTS

A Pearson r Correlation Coefficient was administered as a reliability check upon the rating procedure. The results are summarized in Table 1. With $r = .60$ indicating significance at the .05 level, the analysis revealed a significant degree of reliability among the judges except in two cases in which $r$ reached .58 and .57, $p < .08$.

One tailed $t$-tests for correlated groups were used to compare the pre and post therapy means for both presentation orders. The $t$ ratio for presentation number one was 1.97 ($p < .05$) and for the second presentation was 2.05 ($p < .05$).

Table 1
Interrater Reliability
Scores Among Judges

<table>
<thead>
<tr>
<th></th>
<th>J-2</th>
<th>J-3</th>
<th>J-4</th>
<th>J-5</th>
<th>J-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-1</td>
<td>.63</td>
<td>.76</td>
<td>.67</td>
<td>.62</td>
<td>.57</td>
</tr>
<tr>
<td>J-2</td>
<td>.66</td>
<td>.76</td>
<td>.63</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>J-3</td>
<td>.70</td>
<td>.70</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J-4</td>
<td>.63</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J-5</td>
<td>.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As can be seen by the results in Table 2, the two orders of the variable presentation produced virtually identical results. The order of presentation of the speech samples did not bias the results.

**Table 2**

**Comparison of Means for Group 1 and Group 2**

<table>
<thead>
<tr>
<th>Order Presentation</th>
<th>Pre Test</th>
<th>Post Test</th>
<th>T-ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>4.147</td>
<td>3.001</td>
<td>1.97</td>
<td>p&lt;.05</td>
</tr>
<tr>
<td>#2</td>
<td>4.258</td>
<td>2.925</td>
<td>2.05</td>
<td>p&lt;.05</td>
</tr>
</tbody>
</table>

Table 3 indicates the means of the raw scores (Appendix B) for each speaker in the pre and the post test conditions. In viewing these results the rated degree of improvement for each speaker can be seen.

**Table 3**

**Means of Judges' Ratings of Each Speaker Pre and Post Therapy**

<table>
<thead>
<tr>
<th>Speakers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Therapy</td>
<td>5.33</td>
<td>2.33</td>
<td>5.84</td>
<td>1.67</td>
<td>3.83</td>
<td>6.17</td>
<td>2.67</td>
<td>5.00</td>
<td>4.17</td>
</tr>
<tr>
<td>Post Therapy</td>
<td>3.34</td>
<td>6.34</td>
<td>4.67</td>
<td>1.17</td>
<td>2.67</td>
<td>3.00</td>
<td>2.50</td>
<td>2.50</td>
<td>3.67</td>
</tr>
</tbody>
</table>
DISCUSSION

Speech therapy with the mentally retarded has been a slow and tedious process in the past (Raymore & McLean, 1972). Several authors have stated that these therapy efforts have resulted in little or no progress (Lubman, 1955; Raymore & McLean, 1972; Schlanger, 1959) because therapy with these individuals is a unique and complex process (Schlanger, 1958; Sommers et al., 1970). Although previous traditional therapy designs have been of little value in the improvement of communication skills of the mentally retarded (Raymore & McLean, 1971), the results of this study suggest that Super Speech is an effective therapy sequence with this population.

Researchers have reported on therapy sequences ranging from 24 to 312 sessions over a period of years (Lubman, 1955; Mecham, 1955; Schlanger, 1959; Sommer et al., 1970; Wilson, 1966). These researchers report minimal success in relation to the amount of therapy. The current results indicate that an eight to ten week sequence of Super Speech Therapy produced significant improvements in the communication skills of mentally retarded clients. This represents an appreciable savings in time and money for speech programs with mentally retarded clients.

In a recent paper on single subject designs, Costello (1978)
demonstrated the value of examining the results of individual subjects in clinical studies where large samples are not feasible. The results of the current study take on additional meaning when viewed from the "single subject" perspective.

By comparing the total means of the judges for each speaker in Appendix B, the speakers may be placed in one of three categories: 1) those who showed a dramatic improvement between the pre and post therapy conditions; 2) those who improved measurable but to a more moderate degree; and 3) those who the judges rated as making no progress.

Speakers one, six and eight may be grouped in the "dramatic" category since the differences in the total means of each reached approximately +2 or better. These individuals were judged as improving up to six scaler increments on the seven point continuum. This indicated dramatic improvements in the general ability to communicate. Speaker number six was rated in the pre therapy condition by four judges as having a "severe" to a "profound" communication problem. However, in the post condition, the ratings improved in that communication skills were typically described as "speech that is a little distracting but understandable." Some judges even rated the post condition as reflecting "good" speech. These descriptive labels were extracted from the training session during which the judges were introduced to phrases and labels that best described each point on the continuum. Before this speaker engaged in the Super Speech program, his rate of delivery was so
rapid that his words slurred together and it was very difficult to understand his speech. After eight to ten weeks of therapy, his speaking had reached a much slower pace which allowed for careful articulation precision. His speaking at this point was quite clear.

Speaker number one began therapy with a severe stuttering problem as well as an excessive rate of delivery. His words and phrases were so fast and chopped that a coherent message could barely be extracted from his speaking. Upon completion of the therapy sequence it appeared that normally paced his speaking and words flowed smoothly. The intelligibility of his speech increased significantly. His speech was rated in the pre condition as an "obvious" to a "severe" communication problem and improved in the ratings of the post condition, as did speaker number six, with ratings of speech that were designated as "a little distracting at times." Again, some of the judges rated this condition with a one which represents "good" speech.

The "moderately improved" group consisted of speakers three, four, five and nine. The differences of the combined means reached slightly above +1. These speakers improved up to two scaler increments. This indicated judgements of moderate improvements in the "general ability to communicate" after the administration of the therapy. Speaker number five received ratings in the pre therapy condition as having "more than a slight problem" to a "moderate" communication problem, consisting of extensive word slurring, whereas
in the post condition, the ability to communicate was typically judged as only a "slight communication problem with the slurring of some sounds." Speaker number five entered therapy with listless speaking in which little energy was expended and articulation precision was at a minimum. After the Super Speech program, she was quite aware of articulated sounds and her speaking increased in intelligibility.

Speaker number nine was rated by most of the judges in the pre condition as having a moderate to a severe communication problem. The post condition indicated ratings of the communication deficit as still moderate yet the ratings had reached no worse than moderate. This speaker began the therapy program with a non-energetic speech in which words and phrases were slurred together. Intensity was also a problem for this speaker in that he spoke so softly that it was difficult to understand what was being said. After Super Speech, his volume increased as did his articulation precision. His communication skills were subsequently improved in that others could understand his speech clearly.

Speaker number four was also in the moderate improvement group. When she first began the program, her speaking was slurred and mumbled, though intelligible. Her speaking was not diagnosed by the speech pathologist as being severe as were many of the other cases. It is interesting to note that her speech in the pre therapy condition might have been judged as "good," yet after the administ-
ration of Super Speech her communication skills were judged as even better. While her lack of communication skills before the therapy may have been a potential hinderance for future employment, her post therapy skills were rated as normal by all but one of the evaluators. These communication skills were no longer likely obstacles for employment.

The last category consisted of two subjects whom the judges evaluated as making no significant improvements. The differences in the total pre and post test means reached -4 for one subject and approximately -1 for the other. Speaker number two was typically judged as varying one scale increment from pre to post therapy ratings. This indicates that the judges did not find an extreme regression after the administration of the therapy. Most rated this speaker as ranging from "normal" speech to a "slight communication" problem. The post condition resulted in ratings that described the communication as "having more than a slight problem." These results were anticipated by the experimented in that this particular speaker had unresolved emotional problems during the therapy sequence. This resulted in periods of unhappiness which curtailed the client's motivation to improve her speaking performance. The importance of a client's emotional state of mind in the success of therapy was supported by Cruikshank and Johnson.
The regression in the judges' ratings of the post condition may be due to an "off" day based on the emotional instability of this speaker. Speaker number seven also received ratings indicating no improvement in communication skills. However, the difference in the means of the pre and post test scores did not quite reach -1 indicating little regression after the administration of the therapy. This speaker had a severely distorted /r/ which affected articulation. This may have accounted for judgements of no significant improvements in this particular instance.
The results of this study indicate that the administration of Super Speech therapy has shown significant improvement in communication skills among the mentally retarded as judged by undergraduate university students. These results are generalizable to the employment environment in that the evaluation of communication skills made by non-speech pathology majors may be similar to those of customers or potential employers. Improved communication skills may increase the chances for employment in that they provide a functional communication system through which 1) interviewing; 2) interactional relationships with co-workers and, 3) requisitions for advice within the employment setting (Jordan & Lance, 1976) may be utilized. Thus the more effective the communication, the more efficiently the mentally retarded can function in the environment
(Rigodsky & Steer, 1961).

Success in communicating can improve the social aspects of the lives of the mentally retarded. Speaker number three had improved his working skills and was ready for employment except that his speech skills were poor. He could not successfully relate to others through interviewing or with his coworkers; therefore his chances for employment were greatly reduced. Shortly after he began the Super Speech program his attitude about his speaking changed, probably as a result of the reduction of penalty. Penalty, as described by Van Riper (1972), is any experience encountered in relation to a speech handicap, that results in rejection, exclusion, embarrassed withdrawal and/or condescension. This speaker was also aware that coworkers were comprehending his speech, which improved his self image for it was apparent that he could influence the actions of others through his verbal communications. He was later offered a job outside of the sheltered workshop after his speech had shown improvements in intelligibility.

Another example of the importance of good speaking upon employability was demonstrated by speaker number seven. Although the distorted /r/ sound was not manipulated first in therapy, his speech improved due to increased articulation precision. Again, shortly after his enrollment in the therapy program he was offered a job because of improved work and adjustment skills
as well as improved communication ability, despite the /r/ distortion.

Super Speech seemed to increase the affiliation among the individuals at the workshop. After therapy, the clients became more outgoing. Many who had been reported by their supervisors as being "loners" began to affiliate with the other clients during breaks and lunch as well as within the working atmosphere. Social relationships also developed in that some who had never had girlfriends or boyfriends began demonstrating dating behaviors. It appears that Super Speech may have promoted social interaction through the improvement of new communication channels.

Although the results of this study show a significant improvement in the communication skills of mentally retarded clients after Super Speech therapy, the results of the pre and post test ratings were not as dramatic as were anticipated by the experimenter. The experimenter, as well as the two experts in speech pathology, informally scaled several of the speakers as more dramatically improved than did the lay persons. Speakers number one, three and six were rated as approximately 6-7 on the rating continuum by the experts which was in close accord to the judges' ratings in the pre therapy condition. However, in the post therapy conditions, the samples were scaled by the experts as improving four to six scaler increments whereas the judges rated the speakers as improving only three scaler increments to ratings of no improvement at all. One question that arises is: "Do
experts judge speech samples as more extreme than do lay persons?" From an informal analysis it appears that experts may judge speech samples as more extreme than do the general public as opposed to previous findings by Perrin (1954). It should be considered though, that the experts knew each of the clients which may have accounted for the differences in the ratings.

It is also interesting to note that most of the judges' ratings of the majority of the speech samples were similar to those of the three experts. This implies that in a short training session of 15 minutes, lay persons can be taught to critically judge communication deficits. Had a longer, more intensified training session been utilized, the judges' ratings may have been even more closely aligned with those of the experts. If so, the improvements of the post speech samples may have been judged as more dramatic. It should be recognized however, that the more critical issue may lie in the judgements of the untrained lay person since it is the general public that the retarded individual must deal with on a day to day basis.
A review of the literature indicates that there is a great need for programs that encourage good communication skills among the mentally retarded. The incidence of communication problems among this population is high. Previous therapies with the mentally retarded have been lengthy and costly and have resulted in minimal progress in regard to communication rehabilitation in consideration to the time element. Therefore, an efficient therapy sequence is needed. The present study was designed to introduce an efficient therapy design called Super Speech for the mentally retarded and to evaluate its effectiveness as judged by untrained observers.

Nine mentally retarded clients who were employed at a sheltered workshop were diagnosed by an expert in speech pathology as having communication deficits in articulation, voice and/or rate. The subjects were recorded in a conversational setting before the administration of Super Speech therapy and 8-10 weeks after the administration of the therapy. Six undergraduate students, untrained in speech pathology, served as judges of the speech samples as to the subject's 'general ability' to communicate.

The scores for each subject were analyzed by a one tailed
The results showed a statistical significance in the dependent variable measure, thus the hypothesis that the subjects would be rated as more effective in the 'general ability' to communicate after the administration of Super Speech therapy than they would before the administration of Super Speech, was supported.

The implications of this study indicate that Super Speech is an effective therapy sequence by which general communication skills in the mentally retarded can be improved in a short period of time. 1) Not only is it beneficial to the clients but it is economical in terms of time and cost. 2)The results may imply that in seeking employment in the business world, Super Speech can be of importance to the mentally retarded in that communication skills appear to be greatly heightened. 3) Carry over implications for Super Speech therapy cannot be assessed at this time; therefore future research should be implemented in this area. In conclusion, Super Speech may be an ideal speech program for sheltered workshops and/or other rehabilitation centers.
APPENDIX A

Training Session: Experimental Booklet
An Experiment: The General Ability To Communicate

Purpose: This is a study in communication to examine the effectiveness of a speaker on the basis of overall communication skills

Date: ___________  Employment: ___________
Age: ___________
Sex: ___________
Major: ___________
You will listen to 18 speech samples each of which will be played twice. The speaker will talk for approximately 30 seconds, then you will rate each speech sample on how effectively you think the speaker's overall communication skills were.

Overall communication skills may be defined as the general ability to communicate. For example, you may listen to a speaker who sounds normal. The words are clear and all of the sounds are made carefully as in the following sentence: "I cook breakfast every morning." Another speaker, however, may have speech in which the sounds are missing or slurred. This makes speaking a somewhat noticeable problem. The following is an example: "I cook breakfast every morning." The rapid rate of another speaker may cause all of his words to slur together. This may be a communication problem. Note the following example: "I cook breakfast every morning." It may be advantageous for speech to be slow if the words are clearly pronounced. In this case it is more likely that the speech will be understood.

Keeping these examples in mind, you will be asked to rate the 18 speech samples on the general ability to communicate. You will notice various levels of general communication abilities. It is important to realize that perfect speech may not be a practical expectation from these individuals but rather judgement should be made in regard to overall general communication ability and intelligibility (understandibility) of the speech sample.
The Scale

Please rate each speech sample by circling a number from 1-7 using the following scale:

The General Ability to Communicate

1 2 3 4 5 6 7
GOOD BAD

If you mark number (1) on the scale it means that you think the speaker is good in overall communication skills - that is, his speech is not defective but is within a normal range. Ex. "I sold a shirt today." Numbers 2-6 indicate degrees of communication problems. The speaking may not be normal due to slurred sounds or a rapid rate of delivery. If you mark number (7) on the scale it means you think the speaker's communication skills are profoundly defective and even impossible to understand. You may find it very difficult to follow what he is saying because of poorly formed sounds or a rate of speaking that is too fast. Ex. "I sold a shirt today."

Before we begin to rate the speech samples, a training session will be presented so that you will be familiar with the process of rating the speakers. You will listen to a group of speakers who will represent each point on the rating scale. Before each "training session speaker" particular aspects of his communication skills will be pointed out as a guide for you. It is important to realize that the training session is only a guide to acquaint you with the rating scale.
Training Session

The General Ability to Communicate

1  2  3  4  5  6  7

GOOD      BAD

Speaker (1) Speaker 1 would receive a rating of (1) on the rating scale. The speech is normal and the sounds are carefully made. There is nothing defective about the speaking therefore the communication can be rated as good.

Speaker (2) Speaker 2 would receive a rating of (2) on the scale because of a slight communication problem. You will hear some slurring of the sounds, yet the problem is not very noticeable.

If you listen, the following excerpt of the sample will indicate slurred sounds as in the phrase ".. and this one guy, I asked what he was doing ..".

Speaker (3) Speaker 3 would receive a rating of (3). This is an example of speech with more than a slight problem - the speech problem has become quite noticeable. You will notice a few words that are mumbled. Many of the sounds are slurred and the words generally are not clear.

If you listen closely to this excerpt of the sample you will hear mumbled words that are difficult to understand as in the phrase . . . "tonight we're
going to go across the island to dance with them. . ."

Speaker (4) The next speaker would receive a rating of (4). This is an example of speech with a moderate problem. The speaker talks so fast that the words just blend together without any attempt to form the sounds carefully. The speech can still be understood for the most part, but it is a little distracting at times. The following excerpt of the sample represents how an extreme rate of speaking can cause sounds to be made unclearly as in the phrase: . . ."I'm very calm and not at all very tense . . ."

Speaker (5) The next speaker would receive a rating of (5) on the scale. This is an example of an obvious problem which is a little more severe than a moderate communication problem. The words are so poorly formed that the sounds slur together. Many of the words are often difficult to understand. The following excerpt represents part of the speech in which many of the words are difficult to understand: . . ."I like doing ceramics. . ."

Speaker (6) The next sample would be rated (6). This is an example of communication with a severe problem. Many of the sounds are omitted or so badly slurred that it is hard to follow some of the phrases.
The following excerpt is an example of slurred words and phrases that are difficult to understand: ... "I had breakfast. I had a piece of toast ..."

Speaker (7) Our next speaker would receive a (7). The speech is so slurred that the listener probably cannot understand it at all. The communication ability is profoundly defective thus it may be rated as bad. In the following excerpt, only one or two words can even be identified: ... "I think they came back Wednesday. ..."

Training Session Part II

The following four speech samples will conclude the training session. You will hear two speech samples of the same person. The samples will be presented in no particular order. You may rate the two speech samples as the same or approximately the same or as very different. Please rate each sample. After you have heard both samples you may want to compare the two. At that time you may even then change your answers if you wish. The two samples will be played again so that you can check your ratings and adjust them accordingly if you feel it necessary.

Please do not mark more than one number for a given speech sample or in between the numbers on the scale. Mark one number (1-7) only. When the training session is over, the rating of the 18 speech samples will begin.
The General Ability to Communicate

<table>
<thead>
<tr>
<th>Speaker (1)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Sample GOOD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speaker (1)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Second Sample Repeat</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speaker (2)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

The following are guidelines as to how you should have marked the scale.

**Speaker (1)**

First Sample
(1) This is normal speech.

Second Sample
(1) This is also normal speech. There is not a noticeable difference between this speech sample and the first sample.

**Speaker (2)**

First Sample
(4) The speech reveals a moderate problem but you can understand what is being said.

Second Sample
(5) Many sounds are poorly formed thus some are difficult to understand. This sample is not as clear as the first.
You may now ask any questions that you have regarding the rating procedure and/or the training session. If you wish, specified training tapes may be played again.

Final Rating

The final rating of the speech samples will now begin. Please be sure to rate all of the speech samples, using only one number on the rating scale. If you change any of your answers, be sure to completely erase the undesired rating. We ask at this time that there be no communication among the judges. Thank you.
The General Ability to Communicate

<table>
<thead>
<tr>
<th>Speaker (1)</th>
<th>First Sample</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GOOD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Speaker (2)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Speaker (3)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Speaker (4)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Speaker (5)</td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Repeat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker (6)</td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Repeat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker (7)</td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Repeat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker (8)</td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Repeat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaker (9)</td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>First Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Second Sample</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Repeat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Repeat with First Sample

Second Sample  | 1 | 2 | 3 | 4 | 5 | 6 | 7
APPENDIX B

Raw Scores of Judges' Ratings of Each Speaker
## Raw Scores and Means of Judges' Ratings of Each Subject

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Group 1 J-1 J-2 J-3</th>
<th>Group 2 J-4 J-5 J-6</th>
<th>Group 1 Mean</th>
<th>Group 2 Mean</th>
<th>Total Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>6 5 5</td>
<td>6 5 5</td>
<td>5.33</td>
<td>5.33</td>
<td>5.33</td>
</tr>
<tr>
<td>Post</td>
<td>4 4 4</td>
<td>1 4 3</td>
<td>4.00</td>
<td>2.67</td>
<td>3.34</td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>2 2 3</td>
<td>2 1 4</td>
<td>2.33</td>
<td>2.33</td>
<td>2.33</td>
</tr>
<tr>
<td>Post</td>
<td>3 3 5</td>
<td>2 3 3</td>
<td>3.67</td>
<td>2.67</td>
<td>3.64</td>
</tr>
<tr>
<td>(3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>6 5 7</td>
<td>5 7 5</td>
<td>6.00</td>
<td>5.67</td>
<td>5.84</td>
</tr>
<tr>
<td>Post</td>
<td>4 4 5</td>
<td>3 7 5</td>
<td>4.33</td>
<td>5.00</td>
<td>4.67</td>
</tr>
<tr>
<td>(4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>3 2 4</td>
<td>1 2 3</td>
<td>3.00</td>
<td>2.00</td>
<td>1.67</td>
</tr>
<tr>
<td>Post</td>
<td>1 1 1</td>
<td>2 1 1</td>
<td>1.00</td>
<td>1.33</td>
<td>1.17</td>
</tr>
<tr>
<td>(5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>3 4 3</td>
<td>4 4 5</td>
<td>3.33</td>
<td>4.33</td>
<td>3.83</td>
</tr>
<tr>
<td>Post</td>
<td>2 3 2</td>
<td>3 2 4</td>
<td>2.33</td>
<td>3.00</td>
<td>2.67</td>
</tr>
<tr>
<td>(6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>5 5 7</td>
<td>7 7 6</td>
<td>5.67</td>
<td>6.67</td>
<td>6.17</td>
</tr>
<tr>
<td>Post</td>
<td>4 3 1</td>
<td>4 3 3</td>
<td>2.67</td>
<td>3.33</td>
<td>3.00</td>
</tr>
<tr>
<td>(7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>2 2 3</td>
<td>3 4 2</td>
<td>2.33</td>
<td>3.00</td>
<td>2.67</td>
</tr>
<tr>
<td>Post</td>
<td>3 4 1</td>
<td>2 2 3</td>
<td>2.67</td>
<td>2.33</td>
<td>2.50</td>
</tr>
<tr>
<td>(8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>5 4 5</td>
<td>6 4 6</td>
<td>4.69</td>
<td>5.33</td>
<td>5.00</td>
</tr>
<tr>
<td>Post</td>
<td>2 3 3</td>
<td>2 2 3</td>
<td>2.67</td>
<td>2.33</td>
<td>2.50</td>
</tr>
<tr>
<td>(9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>2 6 6</td>
<td>4 3 4</td>
<td>4.67</td>
<td>3.67</td>
<td>4.17</td>
</tr>
<tr>
<td>Post</td>
<td>4 4 3</td>
<td>4 3 4</td>
<td>3.67</td>
<td>3.67</td>
<td>3.67</td>
</tr>
</tbody>
</table>
LIST OF REFERENCES


Kastein, S. The responsibility of the speech pathologist to the retarded child. *American Journal of Mental Deficiency, 1955, 60,* 750-754.


Mysak, E. A servo model for speech therapy. Journal of Speech and Hearing Disorders, 1959, 24 (1), 144-149.


Schlanger, B. Speech therapy with mentally retarded children. Journal of Speech and Hearing Disorders, 1958, 23 (3), 298-301.


Spriestersbach, D.C. Research in articulation disorders and personality. *Journal of Speech and Hearing Disorders, 1956, 21* (3),
329-335.


Winter, R. Scientists analyze the voices of Nixon, Haldeman, Erlichman and Dean. Science Digest, 1976, 79 (6), 62-68.