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MOTIVATION OF SEVERELY MENTALLY
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1969
THE ROLE OF BRIEF PERSISTENCE IN MOTIVATION
OF SEVERELY MENTALLY RETARDED BOYS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

George Jurcisin, B.Sc., M.A.

* * * * * * * *

The Ohio State University
1968

Approved by

Charles J. Mard
Adviser
Department of Physical Education
DEDICATION

To my mother and father who made this study a reality; and to my beloved wife and children who persevered throughout.
ACKNOWLEDGMENTS

The author wishes to express his sincere appreciation to Dr. Charles C. Mand, Dr. Willard F. Ashbrook, and Dr. Chalmer G. Hixson for their patience, guidance, and constructive criticism; To Dr. Alvin Howard for his inspiring spirit and valuable help in collaborating with the writer in the past two "Persistence" studies; to Congressman William Harsha for his interest without which the study could not have been completed; to Ralph Becker, Educational Psychologist for his assistance with the testing, scoring and tabulating of the data obtained in the study; to Grace Hull and Mrs. Jane Ott for their cooperation in the editing and typing of the manuscript; and finally to acknowledge the splendid cooperation and sacrifice of the education department and nursing service staff at the Columbus State School for Retardates, Columbus, Ohio.
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CHAPTER I

INTRODUCTION

In some psychiatric hospitals and institutions for the mentally retarded, the "Tender Loving Care-T.L.C. Philosophy" prevails. That is, a "laissez-faire" attitude prevails. If a mentally ill-patient or severely mentally retarded child refuses to cooperate in achieving his rehabilitative or habilitative treatment program today, the prevailing pattern in the usual institutions is "don't disturb him," "take no risk" but try again another day as he may just not feel well. However, waiting periods may be so frequent and of such a long duration, that rehabilitation or habilitation of the patient is impossible to reach during his lifetime. On the other hand, what would be the outcome of the patient's recovery period if his program were structured and actively pursued from the very onset of his hospitalization or school residency? Mentally ill or mentally retarded persons should not be given Carte Blanche - considered fit to program their own treatment or education.

Previous studies of this writer, (1,2) utilizing the "Persistence Technique," presented favorable results of an intensive exercise program for geriatric and middle aged mentally ill patients. These patients were at least negativistic, seclusive, physically unfit, and unable to care for their daily needs. To summarize the programs, six to seven persons, ages 35-71, were induced to do the adaptive physical educator's (Corrective Therapist) bidding or else be passively manipulated. They met for five daily sessions in the clinic, covering a 12-week period for the geriatric group and 4 weeks for the middle-aged group, respectively. The aim was to increase self-sufficiency, physical fitness, and socialization. In addition, the value of a "persistent attitude" in treatment was assessed. The latter is defined briefly as meaning that the individual must do the adaptive physical educator's and the staff's bidding, and if he refused he was
passively manipulated (he is moved bodily, arm, legs, etc., not abusively, but in a helping manner). Encouraging results from these studies warranted studies with children over a wide age range.

Consequently, severely mentally retarded boys at the Columbus State School, Columbus, Ohio, were selected for this study and the previous experimental design was repeated with a minimum of modification.

### Mental Retardation

There are an estimated 5,500,000 persons, or 3 per cent of the population in this country afflicted with mental retardation in some degree (3). Each year 126,000 babies will be diagnosed as mentally retarded. By 1970 the number is expected to be 6 million. Approximately 200,000 of this total will be diagnosed as severely mentally retarded, with an I.Q. 20-34. These severely mentally retarded children cannot contribute to the welfare of the community, but instead are an added burden as institutions must be maintained for their care.

Mental Retardation is defined by Heber as "subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior." (4) Rosanova, et al. further distinguishes mental retardation from mental illness by describing it as "not a disease but a condition in which a person is delayed or arrested in the development of normal capacities." (5) They further state that mental retardation is deficient mental functioning and mental illness is disturbed mental functioning. It is important to differentiate these two terms so as to understand the greater difficulties in communication and motivation of the severely mentally retarded persons versus the severe mentally ill person. Further clarification can be made through I.Q. classification, as outlined in The American Association on Mental Deficiency Journal (6):

<table>
<thead>
<tr>
<th>I.Q. Range</th>
<th>Classification</th>
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<tr>
<td>0-19</td>
<td>Profoundly retarded</td>
</tr>
<tr>
<td>20-34</td>
<td>Severely Retarded</td>
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<tr>
<td>35-49</td>
<td>Moderately Retarded</td>
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<tr>
<td>50-74</td>
<td>Minimally Retarded</td>
</tr>
<tr>
<td>75-90</td>
<td>Dull Normal</td>
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<td>90 plus</td>
<td>Slow Learner</td>
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Regardless of the fine line of demarcation in defining or establishing research studies relating to etiology of the mentally retarded population, incidence figures disclose 3 per cent of the normal population will be mentally retarded. Therefore, it is of the utmost importance to pursue a structured and realistic program, emphasizing physical fitness, self-sufficiency, and socialization, for these people.

Nature of the Experimental Group

Of all the sub-classifications of mental retardation, the severely mentally retarded (20-34 I.Q.), has been one of the least investigated by psychologists, educators, and medical specialists. Over the past 60 years, a great deal has been learned about what this disorder condition is and perhaps even more about what it is not. Throughout this period, more emphasis has been placed with educable mental retardates (50-75 I.Q.) and trainables (35-49 I.Q.), than with the severely mentally retarded, who are non-verbal, seclusive, non-toilet trained; and, they walk poorly and feed themselves with their hands. For the most part they are relegated to a maintenance regimen. Furthermore, perplexing problems have remained unanswered in this period because of the non-persistent attitude in dealing with these children. A child in some cases is permitted to structure his own daily routine or behavior controls are limited, due to a shortage of funds and personnel, e.g. he climbs walls, soils himself frequently, sleeps or lies in the corner, bites, kicks, hits, and spits. What proper structuring methods to use is as provocative today as in the past.

These children may be compared to schizophrenic children who have been rejected by their parents, usually the mother, who has conceived unwillingly and rejects the child from birth. In the case of the severely retarded child, the rejection may also start with the mother who may be cold and sadistically critical of her offspring, insists that he meet her excessive demands for neatness and cleanliness, for politeness and observance of social forms, or for fulfillment of her own ambitions. At the same time she destroys the child's self-confidence by her constant nagging, disapproval, and complete non-acceptance of him as a person. Such a mother frequently describes
stubborn child who has been a chore and a burden, until finally he has to be institutionalized or put in restraint or seclusion.

If school personnel also continue this caustic and deteriorating attitude, the frustrated child will eventually fall into the problem child category. The probability of this occurring is common as many of these institutions are understaffed with minimal resources available. This results in a maintenance type program, as educable and trainable mentally retardates receive the preferred programming.

**Statement of the Problem**

The study is designed to discover the role Brief Persistence can play in increasing self-sufficiency, physical fitness, and socialization of negativistic, seclusive, physically unfit severely mentally retarded boys who are unable to care for their daily needs.

**Purpose of the Study**

The purpose of the study is to determine the effect of a "Brief Persistence" attitude in increasing physical fitness, self-sufficiency and socialization of negativistic, physically unfit, severely mentally retarded boys, who are unable to care for their daily needs.

Four hypotheses are advanced by the writer:

1. There will be a decrease in time spent by the Adaptive Physical Educator in the use of "Brief Persistence" (passive manipulation) of the young, severely mentally retarded boys.

2. There will be an increase in crawling ability from (1) patterning to (2) active homolateral crawling.

3. There will be an increase in physical fitness, as measured by the Kraus-Weber Minimal Fitness Test; distance traversed as measured by the exercycle and treadmill; and grip strength as measured by the manuometer.

4. There will be an increase in interpersonal relationship and ADL (Activities of Daily Living), as judged by nursing service and class observer.

On the basis of the information gathered in this study, the above hypotheses will be accepted or rejected.
Persistence as a Motivator

The process of persistence contributes to self-definition. That is, people generally behave according to the expectations of others. Persistence by the Adaptive Physical Educator and staff, involves expectation for behavior. From the child's point of view, this expectation is based upon the staff's definition of him as "able to achieve." This expectation and definition become incorporated in the child's conception of self. Thus, persistence contributes not only to physical rehabilitation or habilitation but also to psychological rehabilitation or habilitation.

Psychologically, then, there is something within everyone which urges them toward greater activity and more independence. But there has to be something that makes these things worthwhile. For many people, the difference between being active and inactive, of socializing or not socializing, of enjoying life or sinking into an uncomfortable lethargy, may lie in whether or not someone else is willing to choose that activity and urge them to participate. This is true in and out of institutions for many people, although it is a bigger problem with an institutionalized group of individuals. In other words, a hospital tends to accumulate people whose "self-starters" don't work.

In spite of a lot of grumbling which so may of them do when they are nudged to do something, they are gratified that people are enough interested to motivate behavioral change. This is bound to have a general effect on personal behavior. It is like the child who seems to stubbornly refuse to do anything about cleaning up his room but will be helpful around the house if he senses that he has a loving mother. If, on the other hand, he felt as though mother looked upon him as a nuisance, or otherwise rejected him, he would likely respond in one or the other aggressive or passively-aggressive ways.

The Adapted Physical Educator's objective, then, was to maintain this "persistent attitude" defined briefly as meaning that each individual must do the Adapted Physical Educator's bidding or always be passively manipulated.

Brief Persistence to be effective--success or failure--must be repeated as many times as is indicated, e.g. mild resistance to marked resistance. Commands may have to be repeated 4-5 times and shouting
initiated in the case of intense distractability or preoccupation. Consequently, individualization or teaching on a 1-1 basis is essential in the beginning because of this heterogeneity, so that an interpersonal relationship or empathy can be established. An "I'm here to help you" impression should be conveyed to the child.

It is good to refuse to give in to apathy and asocial behavior patterns. However, to the layman, this insistence may be misinterpreted as cruelty, abuse, and callousness, whereas to the professional it may be another tool to "break through" the unnatural behavior barriers: seclusiveness, preoccupation, resistiveness, negativism, poor physical fitness, etc. Davis (7) aptly puts it as "A moving individual is more able to solve his problems than an immobile individual."

Persistence is not only relegated to the child but a positive and consistent attitude on the part of the staff should be adhered to. That is, it should be integrated on a 24-hour basis. Everyone who comes in contact with the child must maintain this attitude. It does no good if one person is persistent and the other person is permissive. A "physiological" and "psychological" vacuum results. After the first "Persistence study, results seemed to indicate that long term mentally ill geriatric patients were inhibited in their self-direction towards fulfilling physical, psychological, and social needs, as a consequence of their psychological preoccupations. Their "self-starters" did not work. It was felt that a "Persistence" attitude would bridge this gap by serving as a "trigger" mechanism in re-directing the patient back to a more acceptable behavior pattern. Behavioral changes do not just happen; they are made. Therefore, positive program structuring was reinforced by a "Persistence" attitude.

Other reasons for pursuing "Persistence Approach" included little turnover rates in the old admissions to the institutions; more emphasis should be placed on patient independence rather than on hospital dependence; little significant research results to date involving the mentally ill and mentally retarded; and finally there is a need for more program structuring of the handicapped child on the same level as the normal child receives, but with modifications according to individual handicaps.
One of the world's largest centers for treating brain-damaged children, the Institutes of Human Potential, has had much success in treating severely brain-damaged children through the initial prescription of passive manipulation of crawling (patterning) of the child in his neurological reorganization program (8). Three to five people serve as patterners, who position the child on a cushioned table and alternately flex and extend his extremities in the crawling motions which are activated in the normal human phylogenical sequence of mobilization. These children are immobile for the most part and cannot move voluntarily or cannot complete the crawling pattern due to damage to the central nervous system. Some of these children are resistive and refuse to initiate the crawling movement as in the case of autistic children, who may be either emotionally disturbed or brain-damaged, depending on which authority or etiology is accepted.

Remarkable and dynamic results have been achieved from the Doman-Delacato Creeping and Crawling Technique. Their rationale is that healthy brain cells take over the functions of dead brain cells and that depressed brain cells may be stimulated through this perceptual-motor technique which utilizes position, tactile-kinesthetic, auditory, visual and motor sensory pathways. Crawling is the lowest level of neuromuscular control (reflex stimulation is first), according to their Profile, which evaluates forty-two different functions of the human being (9). It is generally believed that all humans must master the sequential perceptual-motor achievement levels for better learning achievement.

In this study the Adaptive Physical Educator used the patterning and crawling sequence\(^1\) solely as a perceptual-motor communicating medium with non-verbalizing mentally retarded boys. Therefore, the entire Doman-Delacato Program was not utilized. If the child crawled, when initially he refused or could not, then communication

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\(^1\) The writer completed a two-weeks intensive orientation course June 2, 1967, by personal invitation from the Institutes for The Achievement of Human Potential, Philadelphia, Pennsylvania.
through the perceptual-motor mechanism had to be achieved. From this initial approach, a sequential adapted physical education program was constructed emphasizing physical fitness, self-sufficiency and socialization. In addition, the "Persistence Technique" and "homo-lateral patterning" of the experimental group by nursing service personnel on the ward for five minutes, served as a reinforcement of the Adapted Physical Educator's efforts in the gymnasium.

Oberteuffer (10) believes that proper behavior controls are one of the outcomes of the child's physical education participation. Somewhere in the first year of life the behavior of the infant begins to take on social implications. His intra-uterine aloneness begins to disappear. He becomes related to others, first to his mother, then to family, then to playmates, and eventually he may develop a vision of the relation of himself to the world of people. This socializing process is not done without pain. The self-preservative drive is strong, and the competition or aggression manifested against other individuals is the result of it. In view of this, Timme (11) holds it the duty of civilization in general and the school as its agent to modify this aggression into behavior useful in group life. The hitting, shoving, and biting of the child must be modified as he grows older.

One can see the part physical education plays in the socialization process. Timme (11) reiterates that "Play is training in socialization, and is by far the best and perhaps the only means of socializing the child." In conclusion, Oberteuffer (10) states that:

Play weans him from self centeredness to material objects, to playthings, to playfellows, to the group, to the world of people. This process goes on all the time, with or without leadership, with or without the school. The important thing is to give direction to it, plan its outcomes, and the school and all of its teachers are responsible for such direction-giving and behavior planning.

Limitations

1. The study is being conducted at the Columbus State School for the Mentally retarded. No conclusions will be drawn concerning students in other residential schools for the mentally retarded.
2. These boys needed "Brief Persistence" or passive manipulation from the start.

3. The study was for a duration of four weeks, a total of 20 days.

4. There was a ratio of two nursing assistants for 47 residents on the ward.

Definition of Terms

Adaptive Physical Educator (Corrective Therapist) - applies the principles, tools, techniques and psychology of medically oriented physical education in assisting the physician and the child in the accomplishment of prescribed objectives.

"Brief Persistence" - each individual must do the adaptive physical educator's or staff's bidding or always be passively manipulated.

Chronological Age - age from birth to the present day.

Experimental Group - the one group (intra-individual design), that is subject to the experimental factor or condition, the effect of which it is the purpose of the experiment to discover. Each subject serves as his own control.

Fine Motor Skills - smaller and more specialized muscle activity.

Flexibility - ability to increase the range of motion at a given point.

Gross Motor Skills - large muscle activity.

Homolateral Crawling - body remains in contact with the floor and the propulsive movements are made with the arm and leg on the same side of the body flexed with head flexed toward leading hand and the arm and leg on the opposite side of the body extended.

I.Q. - Intelligence Quotient is the most commonly used device for expressing level of mental development \[
\frac{M.A. \times 100}{C.A.}\]

Kinesthetic - the sense of muscular activity. The sensations caused by stimulation of sensory-end organs in the muscles and joints.

M.A. - Chronological age X I.Q.
Mental Retardation (Severe) - Subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior. I.Q. is 20-34.

Motivation - the actual response to a stimulus which is based upon the individual's general tendency for effective arousal, his expectations of the outcomes, and the incentive value of the situation.

Motor perceptual - experiential background of movement exploration, (time and space).

Motor-sensory - muscular sensitivity to an object. Stimulus received upon sense organs and receptors which cause muscular behavior from reflexive to controlled behavior.

Negativism - uncooperative, refuses to respond to instructions, walks away when asked to respond.

Neuromuscular - relationship of the nerves to the muscles, the development which depends upon the quality and quantity of use.

Passive manipulation - child is moved bodily--arm, legs if requested pattern--walk, crawl, creep is refused. However this procedure is not done in an abusive or punitive manner, but in an "I'm here to help you" approach.

Patterning - passive manipulation of arms, legs, head, in crawl--creep position by 3 to 5 persons for inducing neurological reorganization.

Perceptual-motor-learning - change in response in which muscular contractions, static and dynamic, play a major part; and in which bodily movements make up much of the adapted response.

Physical Fitness - organic capacity of the child to perform the tasks of daily living without undue tiredness and fatigue and still have a reserve of strength and energy available to meet satisfactorily sudden emergency demands placed upon him.

Seclusive - independent, prefers to be by himself, is a sitter, stands in corner, hyperactive if touched by someone, does not know anyone's name.
Self-care - slovenly dressed, soils self, dependent on nurses to dress, feed, etc., unmanageable, no self-sufficient.

Short interest span - preoccupied, mumbles to self, does not pay attention, can't sit still, hyper active.

Social Age - degree of relating with others.

Strength - the ability to do work, the ability to move against or withstand resistance.

Tests of Significance - reject null hypothesis at .01 and .05 levels of confidence (Fisher t Test used).
CHAPTER II

HISTORICAL OR RELATED LITERATURE

The writer found that relatively few "Persistence" type studies were undertaken with respect to severe mentally ill patients. Most of the studies dealt with the "Total Push" or "Direct Approach" programs, as they affected chronic schizophrenic patients. None of the "Persistence" type studies dealt with either the slow learner, educable mentally retarded, trainable, or the severely mentally retarded child.

Since there may be some confusion concerning the relationship between "Persistence" and "Total Push," it is advisable to examine previous definitions of "Total Push." Myerson, Tillotson, and Sines, rather explicitly define the concept. Myerson (12) calls the thorough use of hydrotherapy, physiotherapy, the use of drugs, diet, and exercise, as well as occupation and entertainment as "Total Push." In this regard, he explains that the term "Total Push" is graphic rather than exact, since nothing can be total and the aggregation of forces do not necessarily conform to the crude word "push" but only to its meaning of power or force. It is the utilization of an enlightened, thorough-going, steadfast pressure of humane and physiologically sound consideration. Tillotson (13) calls it the organized intensive, individual activation of patients, used as an adjunctive treatment. "Total Push" then seems to be mainly an adjunctive treatment, at least in those treatment situations specifically called "Total Push."

Myerson (12) completed one of the first studies on "Total Push" in 1939 and emphasized the following factors:

Hospitalization of a patient under the care usually given produces a "prison-stupor" or a prison psychosis which interacts with the social retreat of the original schizophrenia. Schizophrenia is in certain of its characteristic
manifestations, a retreat from social contact into delusion.

These patients live in a "motivation vacuum"—reward and punishment disappear from his life. He is neither praised nor blamed for his conduct. In other words, the psychologic retreat of the schizophrenic is enhanced in all directions by the usual hospital care which he receives.

A physiologic vacuum also operates. With the best will in the world, the institutions do not provide adequate exercise, adequate out-of-doors and sunshine, and unless the patient shows a willingness to work, there is neither the time nor the inclination to push such a patient into activity. So on the back wards of all hospitals one finds the chronic schizophrenic, who sits on benches, stands in a corner or paces automatically to and fro, grimacing, passive and absorbed in his delusions, bursting forth now and then into spasms of hostility and aggression and then subsiding into his automatisms. (Writer's Note: severely mentally retarded boys may be described as yelling, screaming, screeching, jumping and climbing, inappropriate crying and laughing, grunting, fuming, hissing, chattering, and hitting, pushing and pinching.)

Hopelessness is not necessarily involved here but we are dealing here mostly with a personality imbalance. The organism is an ecology—chemical, physical, psychological. Disturb ecology in one place, and one gets a diffuse change in activity involving functions apparently far away, so to speak, from the new factor introduced.

One of the essential difficulties in chronic mental patients is the resistance of the patient to games and exercise. If the patient will not actively exercise at first, passive motions carried on by a physical trainer, break down this resistance very readily, e.g., the mere throwing of a bean-bag generally succeeds in bringing the patient into cooperation and he can be progressed from simple to complex activities.

This sort of prison stupor is one of the dangers that threatens the hospital attendant and the hospital physician.

Tillotson (13) emphasized the practice of "Total Push" with all personnel taking part on a 24-hour basis. The patient had to do what the doctor prescribed or he was forced to participate in a helpful way. He summarized his findings by stating that "Such an intensive method of treatment has not only improved the mental and physical status of these patients, but since its success depends upon the thoroughly coordinated efforts of all personnel, it has been stimulating to the entire personnel and has added much to the hospital morale."
Although Myerson and Tillotson conducted their studies with chronic schizophrenics, their care producing prison stupor may be carried over to the severely mentally retarded boy. These children also live in a "motivation vacuum" in which reward and punishment disappear from their lives. Due to a shortage of professional personnel, inadequate facilities, and non-structuring of the child's physical, social, and psychological behavior (a result of non-communication on a non-verbal level), a "problem child" is created.

Atoman and Jurcisin (1) reported in an initial study in which physical reactivation was evaluated as a treatment approach for elderly male deteriorated mental patients. Ten patients were selected by the hospital staff to participate in a five month adapted physical education class, organized to determine what effect physical reconditioning exercises and practice in functional movement patterns might have in bringing about a change in patients previously unable to respond to ward activities and off-building programs. All of the patients had been psychotic for 10 years or more, had shown little or no improvement under chemotherapy and electric shock therapy, and were resistive and negativistic.

The experimental program was an attempt to produce a "reversal of the schizophrenic process" by giving a group of geriatric mental patients an opportunity to function in a physical, social and psychological level once again, at the same time giving them positive guidance. Results indicated that (1) physical reactivation assisted the patient to regain his former status as the functional, self-sufficient individual; (2) guided progression from individual activities to group participation appeared to result in improved communication and ability to relate to other patients; (3) marked improvement in physical fitness, appeared to be possible with geriatric mental patients who had traditionally been allowed to deteriorate physically; (4) improved motivation and self-direction.

Following these encouraging results, Jurcisin and Howard (2) completed a clinical study emphasizing "Persistence as A Motivator." The primary purpose of the study was to improve physical fitness, self-sufficiency, and socialization of long-term mentally ill geriatric patients in an adapted physical education setting. A secondary purpose was to determine the value of a "persistent attitude" in the treatment of such persons.
Utilizing the Intra-Individual Design, seven of the worst patients on the geriatric service were screened and selected by the staff psychiatrist and nursing personnel on the basis of seclusiveness, negativism, uncooperativeness, and poor physical fitness. The study was set up to test five hypotheses: (1) there will be a decrease in time spent by the Adaptive Physical Educator in passive manipulation of the patient; (2) there will be an increase in distance traversed as measured by the exercycle, treadmill, and stair-climbing; (3) there will be an increase in grip strength as measured by the manuometer; (4) there will be an increase in interpersonal relationships on the ward; (5) there will be an increase in ability to undertake activities of daily living. During the 12 weeks, paper and pencil, manual and mechanical instruments were used for measuring behavioral changes related to the testing of the hypotheses.

The group met daily for 12 weeks and engaged in calisthenics, exercycle riding, finger strengthening, treadmill walking, and stair-climbing. The persistent attitude was used in the gymnasium as well as on the ward.

Observations in the gymnasium were made by an impartial observer, clinical psychologist and nursing personnel rated the patients on the ward. Results indicated: (1) the first hypothesis found support in only three members, (2) exercycle distance remained essentially unchanged; (3) there was some improvement in grip strength, (4) ratings with regard to ability to undertake activities of daily living and increasing interpersonal relationships showed marked improvement. These improvements were made during the first four weeks and then there was a plateau at which there was little improvement, indicating that maybe a four-week study was sufficient time to motivate these types of patients. Therefore, these results support the view that persistence is a potentially valuable technique in the treatment of the mentally ill.

Jurcisin and Howard (3) then followed up this study with a four-week partial cross-validation experiment with middle-aged mentally ill patients. Six middle-aged mentally ill individuals were exposed to a "persistent attitude" in the adapted physical education gymnasium for four weeks in an attempt to increase their physical fitness, self-sufficiency.
and degree of socialization. Administrative difficulties prevented obtaining a control group. The five hypotheses which were advanced and the relevant findings were as follows:

1. There will be a decrease in time spent by the therapist in passive manipulation of the patient. After the first session was held, it became apparent that this hypothesis could not be tested because it appeared extremely unlikely that any patient in the group would require any passive manipulation during the course of the study, at least.

2. There will be an increase in distance traversed as measured by the exercycle, treadmill, and stair walking. This hypothesis is partially supported. The median gain is quite large with regard to treadmill distance and negligible with regard to exercycle. All patients progressed from one to six flights of stair walking within the 20-day period.

3. There will be an increase in grip strength as measured by the manuometer. This hypothesis is supported more for the left hand than the right.

4. There will be an increase in interpersonal relationships on the ward, as judged by Nursing Service personnel. Supported, but there remains room for more improvement.

5. There will be an increase in ability to undertake activities of daily living as judged by Nursing Service personnel. Ratings were so high initially that there was almost no room for improvement. Thus no test of the hypothesis could be accomplished, the writers feeling that the patients could accomplish the required tasks before the start of the study.

Overall results support the view that improvements of the type mentioned above can be accomplished during relatively brief intervals. It is felt that these findings, then, have potential consequences for programs designed to support the contemporary view of avoiding lengthy periods of hospitalization.

In another vein, Somner (14) studied the effects of a Permissive versus a Directive Approach upon the amount of patient participation in ward activities consisting of 40 females, ages 25-35, who did not respond to drugs and other treatments. The activity program consisted of rhythm band, folk dancing, exercises-to-music (eurhythmics); bowling,
and ball toss. During the first 5 weeks, the Directive Approach was initiated. It consisted of the nurse asking the patient to participate in activities, and if he was silent or hesitant he was led to the activity area or given verbal encouragement and coaxing was used as well. Conversely, the next 5 weeks was directed by the nurse in the Permissive Approach. She asked the patient whether he wanted to participate but no coaxing or leading was followed up.

Results clearly indicated: (1) that the Directive Approach secured twice as many patients to participate than the Permissive approach. (2) Participation declined markedly with the Permissive Approach, (3) although rewards in the form of candy exceeded the Permissive Approach, it did not compare to the Directive Approach. Therefore, a permissive or laissez-faire approach is inadequate as a method of encouraging regressed schizophrenic patients to engage in recreation type activities.

These writers and the author agree that "Brief Persistence" or "Total Push" as a motivating force tends to be more important in redirecting seclusive, resistive, non-sufficient physically unfit institutionalized patients than a "Permissive" or Laissez-faire approach.
CHAPTER III

METHODS AND PROCEDURES

Research men report that every approach to solving a problem should follow certain systematic steps. These steps might be regarded by some as "procedures," by others as "approach" and by others as "attack." Whatever it is called . . . it is important. Important because it points out the "guide post" the writer followed in "digging out" the information. It must be admitted that proving that "Brief Persistence" will motivate selected mentally retarded boys to improve their physical fitness, self-sufficiency, and socialbility . . . presents a problem. Consequently, the writer, in approaching this problem, decided to make the following attack: Selection of Subjects, Grouping Patients for the Study, Hypotheses, Sources of Data, Duration Time of Study, Volunteers, Chronological Sequence, Actual Class Procedure. (See Daily Diary of group behavior in Appendix B).

Selection of Subjects

Thirty severely mentally retarded boys were recommended by five qualified staff members for the study.

For the purposes of this study the writer is primarily concerned with the selection of severely mentally retarded boys. This choice allowed him to use "Brief Persistence" and adapted physical education as a means of improving physical fitness, self-sufficiency, and socialization of the so-called "hopeless" mentally retarded boy without the use of any further supportative therapy.

Since all of the boys recommended by the staff could not be used the following criteria were established as a means of selecting subjects for this study:
1. Negativism
2. Inability to care for daily needs (self-care)
3. Seclusiveness
4. Poor physical fitness
5. Short interest span

Three of the five criteria qualified the boys for the study. These criteria were selected only after due consideration of a pilot study and two studies with long-term mentally ill patients; the critical reading of case histories, and school staff notes. The school superintendent also approved these criteria.

In reviewing the social, psychological and educational placement form—Summary Sheet (See Appendix C), some salient points were observed to understand the background of each subject. It was found that each bit of information about the nature of the subject, provided valuable data. Data that served as a basis for conducting an adapted physical education study in terms of the needs of severely mentally retarded boys.

At periodical intervals, the staff wrote down important comments that were associated with each subject's problem. These comments gave added justification for establishing the aforementioned criteria for selecting subjects for the study. For example, the pediatrician reported: "This boy is not toilet trained; feeds self with fingers; needs self-help training; sensory-motor dysfunction." The nurse writes: "He is becoming a real problem. Climbs on top of windows--climbs walls--bites other children and has a short interest span."

It is believed that an integrated school program structured on a 24 hour basis, in conjunction with the "Brief Persistence" technique and adapted physical education, should improve physical fitness, self-sufficiency, and socialization. For these reasons, severely mentally retarded boys were selected by the afore-mentioned criteria.
Grouping Subjects for the Study

The Intra-Individual Design was selected for the study. McNemar justified this design by stating, "As is well known, one of the most efficient research designs is the use of the individuals of an experimental group as their own control. The performance of a group of individuals is determined for two different experimental conditions; and the resulting change, increase or decrease, in the behavior is interpreted as being due to the difference in conditions." Dr. Richard L. Jenkins, former Chief of Behavioral Research V.A.C.O., further justifies the Intra-Individual Design as . . . "a control group would serve no purpose with severely mentally retarded children who are consistent in their chronic regression." In this regard the writer found that I.Q. tests have not been given to the severely mentally retarded children selected for the study, for the past two years. This seems to reiterate the general stability of the group behavior improvement pattern. In addition, all of the subjects were considered "hopeless" and they were on no structured school program. They had made no positive change in behavior through traditional motivation methods.

Six severely mentally retarded boys were selected from a larger list of potential candidates, by the physician, medical director, and the nursing service staff (nurse, nursing attendants, psychiatric aides). The latter were asked to provide the names of residents who met the following criteria: negativistic, uncooperative, unable to care for daily needs, and being seclusive. A capsule summary of the group is presented in Fig. 1. (The boys at these levels are usually able to learn and respond to simple words and simple commands if shown what to do.)

Since only 2-3 volunteers were available for the duration of the study, individual attention was limited to a small group of subjects. In addition, a 1-1 relationship had to be established the first week of the study to establish rapport, interpersonal relationship and empathy with this type of hetero-genetic behavioral background. This factor influenced small group participation.

As there was a limited time allotted to the experiment and the subjects had to be screened throughout the school (2,000 population), large group participation was not feasible.
FIGURE I

Biographic Description of Subjects (Severely M.R.)

<table>
<thead>
<tr>
<th>Resident</th>
<th>(M.A.)*</th>
<th>I.Q.)*</th>
<th>A.A.M.D.**</th>
<th>Med. Code No.</th>
<th>Diagnosis</th>
<th>Description Comments from Clinical Folder</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>10-1</td>
<td>3 yrs</td>
<td>30</td>
<td>320</td>
<td>M.R. due to encephalopathy Assoc. w/neck injury at birth w/sec. microceph.</td>
<td>Not toilet trained; Sensory-motor dysfunction; climbs windows-walls, pounds windows, bites other children, destructive, no speech, eloper; exclusive.</td>
</tr>
<tr>
<td>S2</td>
<td>9-10</td>
<td>3 yrs</td>
<td>35</td>
<td>690</td>
<td>M.R. w/o phys. defects. Anoxemia at birth; mongoloid slant.</td>
<td>Hyperactive, uncoop. no toilet training; exclusive, screams, babbles no verbalization; poor phys. fitness (over wt).</td>
</tr>
<tr>
<td>S3</td>
<td>9-8</td>
<td>1 yrs</td>
<td>16</td>
<td>350</td>
<td>M.R. due to postnatal cerebral insertion.</td>
<td>Hyperactive, uncoop. Unable to dress; short interest span; runs, walks abnormally, twitch of left side. Eats objects off floor, exclusive; no speech.</td>
</tr>
<tr>
<td>S4</td>
<td>11-3</td>
<td>3 yrs</td>
<td>30</td>
<td>690</td>
<td>M.R. w/disease and cond. due to unknown causes.</td>
<td>Poor phys. condition, exclusive. Needs more interaction and self help training; hides self in blanket; eats feces-objects. No speech.</td>
</tr>
<tr>
<td>S5</td>
<td>8-7</td>
<td>2 yrs</td>
<td>18</td>
<td>690</td>
<td>M.R. w/disease and cond. due to unknown causes</td>
<td>Needs indiv. attention; improve communications; Not toilet trained; exclusive; abnormal gait; poor phys. cond. no speech.</td>
</tr>
<tr>
<td>S6</td>
<td>8-1</td>
<td>2 yrs</td>
<td>30</td>
<td>690</td>
<td>M.R. w/disease and cond. due to unknown causes.</td>
<td>Walks w/broad base, uncoop; extremely agitated; not toilet trained; poor phys. cond. no speech screams out loud; exclusive.</td>
</tr>
</tbody>
</table>

\[ \bar{x} = \frac{9-5}{5} = 2 \text{ yrs} \]

\[ \bar{X} = \frac{9-5}{8} = 2.9 \text{ mos.} \]

*S.M.A. and S.M.O. obtained from Vineland Soc. Maturity Test by psychologist.

** The accepted coding of mental retardates is illustrated in the A.A.M.D. Journal (American Journal of Mental Deficiency, Ind. Ed. 1961 "A Manual on Terminology and Classification in Mental Retardation."
Nursing Service was unable to followup with "Brief Persistence" on the ward, due to a shortage of personnel.

Another factor in favor of the small group was that the selection of subjects was governed by the five criteria and not just picked at random by the writer. It was difficult, therefore, to select a large group, successfully.

**Hypotheses**

As convenient points around which the discussion of this study might be centered, the writer posed four hypotheses. They are as follows:

1. There will be a decrease in time spent by the Adapted Physical Educator of "Brief Persistence" (passive manipulation) of the severely mentally retarded boys
2. There will be an increase in crawling ability as a result of patterning (passive manipulation of limbs for homolateral crawling), reinforced by "Brief Persistence."
3. There will be an increase in physical fitness, as measured by the Kraus-Weber Minimal Fitness Test; distance traversed as measured by the exercycle and treadmill; and grip strength as measured by the manuometer.
4. There will be an increase in interpersonal relationship and ADL (Activities of Daily Living), as judged by nursing service and class observer (physical educator).

**Sources of Data**

Seven tests were devised to find out whether the propositions were true or false.

*Test I* measured the degree of homolateral crawling, according to the Doman-Delacato criteria. Delacato describes this criteria in the following manner:
As the child arrives at three to twenty weeks of age, his mobility consists of crawling on his abdomen in a homolateral pattern. That is, the child moves forward with the arm and leg on the same side of the body extended and the arm and leg on the opposite side of the body flexed. His head turns toward the flexed side. As he moves, this entire body position is reversed. Mobility is a two-dimensional function aimed at seeking vital and basically crude comfort. This body position places his eyes in such a position that the infant is biocular in visual performance. That is, as his right arm and leg come up his right eye looks at the right hand, the left eye does not. It remains in contact with the crawling surface. As the position is reversed, the left eye looks at the left hand, and the right eye has no part in the visual process. At this stage the child operates visually biocurally, using only one eye at a time, just as he uses one side of his body at a time in the homolateral pattern.

The same is true in audition. With each move, one ear is occluded by contact with the crawling surface. At this stage the child cannot place sound in space because auditorially he receives the stimulus from one ear or the other. This performance is at the level of pons. This is basically a one-sided level of function. Mobility is homolateral; one side is used for propulsion at a time. Vision is biocular; he uses one eye at a time. Audition is biaural; he hears with one ear at a time.

This degree of crawling was numbered from (1) refuses to crawl, to (2) homolateral crawling.

Test II measured minimal physical fitness achieved. The child must pass all six test items. The subject was rated on a (1) to (3) continuum—refuses=1, failed=2, and passed=3.

Test III measured the total distance walked on a non-motorized treadmill. A pedometer recorded total steps made in 30 seconds.

Test IV measured the distance pedaled on an exercycle, as measured by a speedometer—.1 of a mile gradations/or total seconds moved as measured by a stopwatch. If the subject refused to pedal continuously or did not record at least .1 of a mile on the speedometer, a stopwatch was used to record the total number of seconds the subject
used in attempting to ride the exercycle. Some subjects were pre-occupied or were distracted, which prevented active pedaling for the allotted two minutes.

Test V measured the grip strength of both hands, on a manu-ometer which measures lbs. per sq. inch. The best of three trials was recorded.

Test VI measured the Activities of Daily Living (ADL)--self-sufficiency of the group, from a total of 24 selected items. A (1) to (3) continuum in achievement made was used, with the highest level of achievement made being "always" in performing each task. The lowest level of achievement made was "never" in performing each task.

Test VII measured the degree of participation with the highest level of achievement being "totally active" to the lowest level of achievement made, being "totally inactive." This enabled the writer to see the effects of "Brief Persistence" or passive manipulation.

Duration Time of Study

Evidence from the past two studies conducted by this writer with long-term mentally ill patients, (1, 2) indicated that improvements were made during the first four weeks, and after the 4th week the patient reached a plateau and further gains were minimal up to 12 weeks. Consequently, the experimental group met daily in the gymnasium for four weeks with one hour set aside the first week so as to establish rapport, and communicate with the child from a perceptual-motor approach. Severely mentally retarded boys who are unable to communicate verbally had to be shown what to do by stimulating the tactile-kinesthetic, auditory, visual and motor perceptual performance areas of the brain. It also seemed wise to start at the lowest developmental function--crawling, and progress him forward according to the boy's present motor functioning level. If a severely mentally retarded child cannot crawl, creep properly, then we cannot expect him to walk, march, run, etc., correctly. It seems that most normal children follow this sequential pattern but
we fail to use this principle with the mentally handicapped or brain-damaged child. How else can one reach the non-verbalized severely mentally retarded child?

It is believed that the sensory or (receptive) levels of the brain are stimulated before motor (or expressive) levels of the brain are activated, similar to the blind and deaf habilitation programs. In addition, six stereotyped behavioral problem boys, grouped together, initially, are not conducive for establishing successful motor learning experiences.

During the next three weeks, all six subjects were programmed together, but one hour and 35 minutes was necessary for completion of the structured study program. The extra 35 minutes was added for executing "patterning" movements to the six subjects (5 minutes each) prior to "persistence" crawling in the Krawl Box.

Volunteers

Three volunteers (2 residents and 1 physical educator) assisted the writer in the "patterning" of the children the first week. During the ensuing three weeks, however, only three residents (adequate mentally retarded workers), assisted the writer in the study. There were no other professional or non-professional volunteers readily available.

Chronological Sequence of the Study

Six severely mentally retarded boys were selected according to the established criteria, (see Figure 1, page 21).

For four weeks, the subjects were measured with mechanical and manual instruments. The seven variables (tests) were measured before and after the four-week study by an impartial observer, a physical educator, who maintained a position which enabled him to see all participants at all times. In addition, six nursing service personnel also rated Activities of Daily Living—the sixth variable—in the AM and PM on the ward.
Observers (raters) were oriented in appraising the experimental group on an impartial basis and were requested to read each scale carefully for clarity. To lessen the chance of bias, they were told that their names would not be used in the study. They turned their evaluations in to the writer before the study began (pre-testing) and after its completion (post-testing) the next day.

Actual Class Procedure

Before outlining the class procedures, a brief statement on the ward environment is of importance. The dining room is located inside the cottage on the first floor, where the subjects are housed. There are only four toilets—all of them on one side of the cottage, but also on the first floor. This is hardly enough for 47 residents. Regarding supervision, there are one to two nursing assistants/psychiatric aides—mostly one assistant for 23 residents. Recreation therapy is provided regularly.

The experimental design of the past two studies (1) and (2) was repeated with a minimum of modification.

During the first day of the study, the Adapted Physical Educator led each boy through the six sub-tests in the gymnasium without the use of "Brief Persistence," while the impartial observer-physical educator rated each subject. The seventh sub-test was evaluated on the ward by nursing service personnel and the impartial observer.

Each daily session for the remainder of the week consisted of following the adapted physical education program in conjunction with the "Brief Persistence Technique" on a 1-1 basis (each child and the writer played together for one hour). Concurrently, nursing service personnel were utilizing the "Persistence" approach in their various contacts with the boys, so that the "Persistence Technique" was integrated on a 24 hour basis. Nursing service also administered homolateral patterning, under supervision of the writer for five minutes. This also enabled them to start successfully the "Persistence Technique" at the lowest motor developmental level, thereby establishing contact and rapport through this perceptual motor stimulation. In this
regard, the adapted physical educator supervised a three-man team in
"patterning" each boy for five minutes to reinforce the crawling pattern.

The following sequence was adhered to: (See Figure 2). Each
child was taken to the toilet before going downstairs to the gymnasium
by the adapted physical educator and the three volunteers. The writer
stayed in the toilet with the boy and encouraged him to talk to his
stomach muscles by touching them, making expressions with his face
to encourage defecation.

The boy was then escorted downstairs to the gymnasium--
pushed, pulled, carried, etc., regardless of his resistance. The
Adapted Physical Educator encouraged each child by saying, "We must
go downstairs to exercise as the doctor and I want to make you stronger,
have fun, and play with your next door neighbor, and be able to take
care of yourself, etc." Gestures, making enjoyable noises all the while,
and squeezing muscles were used to "paint" a clearer picture.

Upon entering the gymnasium (see Figure 3) the child was led
to the "patterning" table and the writer supervised a three-man team
which manipulated the child in a passive manner to stimulate the
homolateral crawling pattern in the brain. This procedure involved
flexing one set of limbs--r. arm - r. leg--on the table in a gliding manner;
the opposite set of limbs--l.arm - l. leg--were extended with the head
flexed toward the flexed arm-hand. The head patterner counted the
cadence out loud as he flexed the head from side to side by saying,
"and one and two; and one and two, etc." Turning the head from side
to side stimulates the eye and ear on the side turned. The time dura­
tion is five minutes. The objective was to establish interpersonal
relations and communication and stimulates perceptual motor learning
on a successful basis.

Immediately following "patterning" the child is directed to the
Krawl Box for five minutes, to simulate active homolateral crawling.
If the child refused to cooperate, then "Brief Persistence" was used in
gently pushing the child through the Krawl Box in the homolateral
pattern, until he understood what to do.
### FIGURE 2

**Activities in Time Sequence**  
*(1-1 Basis, 1st Week, each subject)*

<table>
<thead>
<tr>
<th>Order</th>
<th>Time Assigned (Minutes)</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3</td>
<td>Toilet</td>
</tr>
<tr>
<td>2.</td>
<td>2</td>
<td>Walk to Gym</td>
</tr>
<tr>
<td>3.</td>
<td>5*</td>
<td>Patterning</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Nurses also executed &quot;patterning&quot; on ward in P.M. to reinforce active crawling, establish rapport, and communication.</em></td>
</tr>
<tr>
<td>4.</td>
<td>5</td>
<td>Crawling</td>
</tr>
<tr>
<td>5.</td>
<td>10</td>
<td>K-W Ex.</td>
</tr>
<tr>
<td>6.</td>
<td>8</td>
<td>Ring Around the Rosie</td>
</tr>
<tr>
<td>7.</td>
<td>8</td>
<td>Rest Period-Bench-Bean Bag</td>
</tr>
<tr>
<td>8.</td>
<td>3-5</td>
<td>Motor Treadmill</td>
</tr>
<tr>
<td>9.</td>
<td>5</td>
<td>Exercycle</td>
</tr>
<tr>
<td>10.</td>
<td>3</td>
<td>Squeeze Ball</td>
</tr>
<tr>
<td>11.</td>
<td>3</td>
<td>Drink from water fountain</td>
</tr>
<tr>
<td>12.</td>
<td>2</td>
<td>Back to Ward</td>
</tr>
<tr>
<td>13.</td>
<td>3</td>
<td>Toilet</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60 Minutes</strong></td>
<td><strong>(3rd-4th week to completion of study)</strong></td>
</tr>
</tbody>
</table>

*6 S's in Total Group*

Same schedule was adhered to except 35 minutes was assigned to patterning (30 minutes, 5 minutes each for 6 S's) - 8:00-8:35 A.M., with 5 minutes allowed for getting into position on table. The class then completed sequential exercises from 8:45 - 9:45 A.M.
FIGURE 3
Gymnasium Activities Sequence

(1) Pattern Table 5 Minutes  
(2) Krawl Box 5 Minutes Mats K-W Ex.  
(3) Circle Game (Red Plastic type forms circle) 10-15 Minutes  
(4) Motorized Treadmill 2 - 5 Minutes  
(5) Rocking Chair Board  
(6) Exercycle 5 Minutes  
(7) Squeeze Exerball Bean Bag Toss 6 Minutes  
(8) Drinking Fountain 2 Minutes  
Gymnasium Door
The Kraus-Weber Minimal Fitness Exercises are then given on the mat, to improve physical fitness with a minimum amount of strain or exertion. These exercises are a followup of the Kraus-Weber Minimal Fitness Test in which one repetition is required and poor results served as a basis for these exercises.

1. **Sit-ups--legs straight--arms straight.** The abdominal muscles or flexors of the trunk are strengthened in conjunction with the hip flexors. These muscles are very important in maintaining the upright posture. Then if the child refuses to cooperate, he is passively manipulated until he assumes the position. Ten to 15 repetitions are executed.

2. **Sit-ups--knees fixed--arms straight.** The hip muscles are fixed or unable to assist the abdominal muscles in flexing the trunk thereby isolating the rectus-abdominus muscle in flexing the trunk. Very few retardates can perform this exercise and Test Item 1 must be done repetitively 10 to 15 times before progressing to this very difficult activity. Five repetitions are not enough to strengthen the rectus-abdominus with exercise (1) above. He needs to do more repetitions.

3. **Leg raises over head.** The hip flexors and the lower abdominals are strengthened. The child was allowed to use his hands and allowed to flex hips in leg raises until these muscles were gradually strengthened. The Adapted Physical Educator and volunteers used "Brief Persistence" if the child refused to cooperate. Five repetitions were executed.

4. **Upper back levers.** The upper back extensor muscles are strengthened. Static contractions were initiated by passively extending the neck against the child's resistance and when the writer releases the head rapidly, the child contracts his neck muscles to prevent his chin from hitting the mat. Five repetitions were executed passively and progressed to active movements. A pillow was put under the hips to improve range of motion.

5. **Lower back levers.** The lower back extensor muscles are strengthened. The pillow was put closer to the thighs to eliminate
gravity and gradually the pillow was moved under the hips so that the extensor muscles can contract against gravity. Five repetitions were also executed, with "Brief Persistence." This was one of the more difficult exercises for all the subjects.

6. **Touch toes--Standing position.** This exercise does not strengthen the back or hamstring muscles of the thigh but helps to stretch the tendons and ligaments. If the children could not touch their toes because of tight plantar flexors of the foot, they were started on touching their knees and progressed downward to the toes. Five repetitions were executed, with "Brief Persistence" necessary.

It Test items 4 and 5 there are some indications that failure in these test items correlate highly with failure in school achievement. Kephart (41) writes that Kagerer made an interesting diagnostic interpretation while using the Kraus-Weber Minimal Fitness test. First grade children were tested to determine their ability in activities including flexibility of the posturing mechanism. These test scores were then correlated with achievement in school as measured by standardized school achievement tests. Substantial and consistent correlations were found between activities designed to measure ability to move within a posture and achievement in school. Those children whose posture was most flexible and had the widest range did better in first-grade classroom work than those whose posture was rigid and who were unable to perform activities which required flexibility in the posturing mechanism.

The next sequence is playing a singing game--modifying "Ring Around The Rosie," for socialization and to strengthen muscles of the lower extremities. The Adapted Physical Educator encouraged humming noises as all the children were non-verbal. "Ring Around the Rosie, a pocket full of Posies, when George says fall down, Fall Down!" is the way the tune goes. All the children hold hands with the writer and the volunteers in a circle formed by a fluorescent red tape on the floor. During the singing or humming of the tune, the group starts walking around the circle until they hear "Fall Down!" Everyone either falls
down voluntarily or they are pulled down to the floor. The Adapted Physical Educator then tells them to use their knee muscles to get up, points to them and puts their hands on their knees to stimulate the tactile sensation. Other names in the group are used instead of George, such as John, Jim, etc. Pointing to or shaking hands with class members is substituted for verbal responses.

The motorized treadmill is then used to assist poor walkers and negativistic subjects who are tied to the treadmill by a safety strap. The moving treads throw the child off balance and he must walk or fall down. However, the safety strap prevents falling down but the children are unaware of this protection. The motor is set for 1 mile per hour which was found to be safe for 70 year old mental patients, (See Figure 4). There are no norms for mentally retarded children. The subjects start on 30 seconds and progress to 2 minutes.

Exercycle riding followed treadmill walking and was specifically used to improve cardiovascular endurance and flexibility of lower joints. "Brief Persistence" was used by the writer by turning the pedal for him. It provided repetitive activity for the motor active boys.

The exer-ball was then squeezed five times with each hand to increase grip strength. This should enable them to be able to open doors, hold on to the stair-rails, turn the water fountain, eat, etc. Passive manipulation was given if the subjects refused.

Next, the drinking fountain was stressed to improve self-sufficiency. The writer passively moved the subjects hands on the water fountain if they refused to take a drink, by squeezing the fingers on top of the faucet.

The final activity was tossing a 2 lb. bean bag to the subjects while they were sitting on the Rock and Roll Bench during the 7 minute rest period. It stimulated socialization and eye-hand coordination. Passive manipulation was used initially, when the subjects refused to cooperate.

Upon completion of the adapted physical education program, all the subjects walked up the stairs back to the ward, where they
FIGURE 4
Motorized Treadmill

Treadmill Speeds
(Electric) in Feet per Min. and Miles per Hour

Position A: Large Pulley
Position B: Small Pulley
To Small Pulley

<table>
<thead>
<tr>
<th>Position</th>
<th>Turns Per Minute</th>
<th>Feet Per Minute</th>
<th>Miles Per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-A</td>
<td>2.3</td>
<td>164 -10&quot;</td>
<td>1.87</td>
</tr>
<tr>
<td>2-A</td>
<td>1.3</td>
<td>93 - 8&quot;</td>
<td>1.005</td>
</tr>
<tr>
<td>3-A</td>
<td>7.5</td>
<td>54</td>
<td>0.61</td>
</tr>
<tr>
<td>4-A</td>
<td>4</td>
<td>28</td>
<td>0.33</td>
</tr>
<tr>
<td>X-A</td>
<td>30.5</td>
<td>218 - 7&quot;</td>
<td>2.67</td>
</tr>
<tr>
<td>1-B</td>
<td>2.5</td>
<td>179 -2&quot;</td>
<td>2.036</td>
</tr>
<tr>
<td>2-B</td>
<td>1.5</td>
<td>124 -2&quot;</td>
<td>1.41</td>
</tr>
<tr>
<td>3-B</td>
<td>0.9</td>
<td>64 -6&quot;</td>
<td>1.00</td>
</tr>
<tr>
<td>4-B</td>
<td>4.2</td>
<td>32 -3&quot;</td>
<td>0.524</td>
</tr>
<tr>
<td>X-B</td>
<td>35.5</td>
<td>255</td>
<td>2.70</td>
</tr>
</tbody>
</table>

Bolt Positions are 1, 2, 3, 4, and X in Both A and B Setting.
were escorted to the toilet, to lessen the chance of urinating or soiling their pants.

During the last three weeks, all six boys were programmed together and thirty-five minutes was added to allow for the "pattern"ing" which was given to each boy followed by crawling opportunity in the Krawl Box. Nothing else was changed.

In addition, during some of the exercises, the Adapted Physical Educator varied the exercise sessions by teaching counting of fingers out loud then touching and feeling each finger—1, 2, 3, 4, 5—to inhibit distractability in K-W exercises, touching and feeling the muscles exercised for recognition and touching other members in the group for socialization.

Time spent in these discussions depended on the mood and cooperation of the subject between exercises. Questions and answers were repeated 4-5 times loudly, shouting at times to inhibit preoccupation of the child and thereby establishing rapport and increasing his interest span. "Brief Persistence" had to be used when a distracted, preoccupied, or motor active child wandered off from the group activities and had to be escorted back, regardless of his resistance. All subjects had to participate actively or through passive manipulation, so as to reinforce socialization values.
CHAPTER IV

ANALYSIS OF DATA

Now that a plan of attack was executed, research men may ask "What were the results?" "Was the 'Brief Persistence' experiment worthwhile?" "How significant were the data?" "What was the highest achievement compared to the least achievement?" In order to make these appraisals more visual and meaningful, the following sequence was used: Selection of the Fisher t Test; Evaluation Procedures; Results of Evaluation; and Interpretation of the Data.

Selection of the Fisher t Test

In looking about for an appropriate instrument to evaluate the scores of the experimental group regarding tests of significance, the writer selected the Fisher t test. This test was chosen because it is a method in determining direct individual difference change with a small n (sample) of participants indicating amount of change and level of significance on a pre-post test design. It is also a method of challenging the null hypothesis in research studies utilizing small samples. The null hypothesis infers that there are no differences in the measurements of two different populations or that the differences which occur are attributable to chance. Lindquist (17) concludes that the Fisher t Test attempts to prove that these differences are not attributable to chance.

If the null hypothesis can be confidently rejected, then the data indicate that the differences which occur are real, and within the framework of the experimental problem at hand. Furthermore, it is believed that if significant changes were made, they would be attributable to the "Brief Persistence Technique." Consequently, for these reasons the Fisher t Test was selected as an aid in the statistical procedure in this study.
Evaluation Procedures

The group was observed in seven tests at the outset (pre-testing) and at the conclusion (post-testing) of the study. These seven tests were: (See Figure 5, page 37, seven test scores)

1. Homolateral Crawling (Krawl Box 8' long)
2. Kraus-Weber Minimal Fitness (See Figure 6 for all 6 test items)
3. Treadmill walking
4. Exercycle riding
5. Manuometer (grip strength)
6. Activity rating scale
7. Activities of Daily Living (ADL) See Figure 7 for 24 activities

In (1), each boy was asked to crawl on his stomach in an 8' Krawl Box. If he did not execute the homolateral crawl or refused, he received a score of (1); if he achieved the proper crawl, he scored (2). The K-W Minimal Fitness Test was scored (1) for refusing to make an attempt, (2) for making an attempt; and (3) for passing all six tests. Treadmill, exercycle, and manuometer performances were recorded mechanically for riding, walking, and grip strength, respectively. Each person was rated on a scale of one (totally inactive) to five (totally active) on most activities for the Activity Rating Scale. Six members of the Nursing Service Staff rated each boy on a three-point scale designed to measure Activities of Daily Living. Each item was scored either (1) never, (2) sometimes, or (3) always. They observed the boys in the AM ward activities, and included PM activities up to bed check. The seventh rater, the physical education supervisor, observed the experimental group on all seven tests during the pre-post testing.

The mean scores of the seven tests for the groups was obtained on a pre-post basis followed by a statistical comparison between these scores. In making the statistical comparisons, the mean rating of the seven tests was summed to arrive at a total score for each participant. This resulted in 12 total scores, 2 each for every subject as pre- and post scores. When a boy was rated by the entire group of seven raters on ADL, his score for that day was the mean of all the ratings assigned to him for
FIGURE 5
Brief Persistence with Severely Retarded Boys
(Pre-testing Data) (Post-testing Data)
by George Jurcisin

Date: _______________________
Name of boy ________________________ Rater _______________________

SEVEN TEST SCORES*

I. Homolateral Crawling no(0) ______ yes (1) ______ feet long
II. Kraus-Weber Minimal Fitness Test (Doctors and Nurses Notes): See Fig. 6
Refuses ____ (0) Fails (1) ______ Passed (2) _______

III. Treadmill (Pedometer reading - 30 steps-adult; non-motorized)

IV. Exercycle 1/10 mile speedometer reading _______ and Stop Watch:
(Circle seconds) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16,
17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34,
35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52,
53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70,
71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88,
89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105,

V. Manouometer Reading (Lbs. per sq. inch) Squeeze _________
(bes of (3) attempts)

VI. Activities of Daily Living Behavior Scale: Never (1) ___________
Sometimes (2) ______ Always (3) _______ See Fig. 7, p. 39.

VII. Activity Rating Scale:
(1) Totally Inactive- Adaptive Physical Educator must manipulate boy
during part of activity ____________________.
(2) Partially Inactive - Adaptive Physical Educator must passively man­
ipulate boy during part of activity ____________________.
(3) Moderately Active - Boy starts and stops activity but requires no
manipulation by Adaptive Physical Educator ____________________.
(4) Almost totally active - Boy continues activity with only one brief
pause ____________________.
(5) Totally Active - Boy begins activity at Adaptive Physical Educator's
signal and stops only at his signal ____________________.

VIII. S.I.Q. Score (Education Psychologist) gave Vineland Social Maturity
Test. This variable dropped as per psychologist's inference of bias.
(See Appendix D), p. 82.

*All seven tests weighted by (1) due to zero rating scores which cannot
be computed for the t.
FIGURE 6

BRIEF PERSISTENCE WITH SEVERELY RETARDED BOYS
(Pre-Testing) (Post-Testing)

by George Jurcisin

Date_________________

Name of boy ________________________________ Rater_________________

KRAUS-WEBER MINIMAL FITNESS TEST
(Used to evaluate final rating scores)

<table>
<thead>
<tr>
<th>Passed</th>
<th>Failed</th>
<th>Refuses*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item #1 Child lies flat on back, hands behind head, legs outstretched. Examiner holds his feet to mat. He then pulls up into a sitting position without using hands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item #2 Child lies on back, hands behind head and knees bent. Examiner holds his feet to mat. He pulls himself up into sitting position without using hands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item #3 Child lies on back, hands behind head, legs out straight. He raises feet ten inches from the floor while keeping legs straight and holds this position for ten seconds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item #4 Child lies face down, hands clasped behind neck, a small pillow under his hips. Examiner holds his feet to the mat. He is asked to raise his head, shoulders and chest off the mat and hold the position for ten seconds.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item #5 Child lies face down, his head resting on his hands and a pillow under his hips. He raises his legs off the mat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Item #2 Child lies on back, hands behind head and knees bent. Examiner holds his feet to mat. He pulls himself up into sitting position without using hands.

Item #3 Child lies on back, hands behind head, legs out straight. He raises feet ten inches from the floor while keeping legs straight and holds this position for ten seconds.

Item #4 Child lies face down, hands clasped behind neck, a small pillow under his hips. Examiner holds his feet to the mat. He is asked to raise his head, shoulders and chest off the mat and hold the position for ten seconds.

Item #5 Child lies face down, his head resting on his hands and a pillow under his hips. He raises his legs off the mat without bending the knees and with the feet ten inches off the mat. He holds this position for at least ten seconds.

Item #6 Child (without shoes), bends from the hips, keeping his knees straight and feet together and touches the floor with his finger tips. He should hold the position for three seconds.

*Doctor and nurse recommended for study due to poor physical fitness.

THE ROLE OF BRIEF PERSISTENCE IN MOTIVATION OF SEVERELY MENTALLY RETARDED BOYS.

by George Jurcisin

School: Columbus State School
Dept.: Education (Physical Education)

Boys Name: ____________________
Cottage: Hillcrest #1
Date: __________________________

*Activities of Daily Living Behavior scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Never (1)</th>
<th>Sometimes (2)</th>
<th>Always (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Normal Walking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Uncoordinated Walking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Running Poorly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Running Well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Jumping &amp; Climbing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Hitting, pushing, pinch others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Backing off (resists)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Play (Coop., parallel, following)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Responds to: Commands &amp; Being Called</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Being clothed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Being restrained</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Yelling, screaming, screeching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Pointing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Motioning &amp; Gesture Communicating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Dress or undress self</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Drinking from water fountain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Head banging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Toilet Training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Self feeding - ability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Grunting, fuming, hissing, chattering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Inappropriate crying - laughing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Meaningless hand movements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Playing, manipulating, examine objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Looking attentively</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Items adapted from: Dr. John McKinney's Factor Analysis Study with Severely Retarded Boys, Columbus State School, Ph.D. dissertation The Ohio State University, 1961 (19)
that period, by the raters. For example, if on the pre-testing day a subject was given a total of twelve rating scale points for ADL by the seven raters, his mean score was 1.71. Consequently, when these individual raw scores were added to the entire group scores, 84 rating points were obtained from a total of 41 raters, leaving a mean score of 2.00. These scores were then subjected to statistical treatment.

A final comparison of the group was made on the pre-post testing for each test to determine which test recorded the most significant changes performed by the group (See Table 1).

TABLE I

Comparison of Difference Mean Values Between Pretesting and Posttesting for the Brief Persistence Group

<table>
<thead>
<tr>
<th>Test</th>
<th>Pretesting Mean (N=6)</th>
<th>Posttesting Mean (N=6)</th>
<th>t Value Between Pretesting and Posttesting Mean Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Crawling</td>
<td>1</td>
<td>2.0</td>
<td>0</td>
</tr>
<tr>
<td>2. K-W</td>
<td>1.2</td>
<td>2.2</td>
<td>0</td>
</tr>
<tr>
<td>3. Treadmill</td>
<td>1.2</td>
<td>6.8</td>
<td>4.21*</td>
</tr>
<tr>
<td>4. Exercycle</td>
<td>1</td>
<td>1.2</td>
<td>0.00001</td>
</tr>
<tr>
<td>5. Manuometer</td>
<td>1.8</td>
<td>11.3</td>
<td>2.66**</td>
</tr>
<tr>
<td>6. A.R. Chart</td>
<td>2.5</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>7. A.D.L.</td>
<td>3.2</td>
<td>3.4</td>
<td>0.00001</td>
</tr>
<tr>
<td>Total Score</td>
<td>11.81</td>
<td>30.48</td>
<td>5.84*</td>
</tr>
</tbody>
</table>

*Significant at the .01 level of confidence
**Significant at the .05 level of confidence

Note: for d.f=5, a t value of 3.36 was necessary at the .01 level of confidence.
Results of Evaluation

Difference Mean Value. Since pre-post mean ratings were obtained for the four-week period, evaluation of the significant differences or the lack of any differences, lend importance to characteristics measured during this study. The analysis, which follows, was carried out noting important findings related to each significant variable change.

For the purpose of this study, .01 and .05 levels of confidence were considered significant. In addition, where low weighting on the tests prevented an accurate analysis of either negative or positive changes, lowest achievement to highest achievement made was recorded to show if there were any differences.

In the pre-testing period, some of the subjects refused to attempt a requested task and as a result they received an actual score of (0). Therefore the seven test scores were weighted by adding (1) after each score so that a t could be computed as there is no (0) on the computer (see Tables 2 through 5, pages 42 and 43).

Comparing the pre-test means (11.81) with the post-test means (20.48) for the combined group on all seven tests for the entire four-week study, the obtained t was significant at the .01 level of confidence, (see Table 1, p. 34). It is concluded that the Brief Persistence Technique was effective in motivating resistive, negativistic, asocial, and poor physically fit severely mentally retarded boys. However, when comparing pre-post means on each of the seven tests, only treadmill riding (pre-test means 1.2) (post-test means 6.8) and the manuometer grip test (pre-test means 1.8) (post-test means 11.3) showed significant gains at the .01 level of confidence and .05 level of confidence, respectively, (see Table 1, p. 40). The other five tests indicated improvement from the lowest achievement to a higher achievement level, e.g., refusal to crawl in the pre-test was scored (1) and active homolateral crawling in the post-test was scored (2).

The Status of the Hypotheses. On the basis of the information gathered in this study the four hypotheses presented on page 16 will be either proven or disproven.

Hypothesis 1: There will be an increase in crawling ability from patterning to active homolateral crawling.
### TABLE 2

**Actual Zero Raw Scores in Pre-Test**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Ex. Gp.</th>
<th>Crawl</th>
<th>K-W</th>
<th>Treadmill</th>
<th>Exercycle</th>
<th>Manuometer</th>
<th>Rate Sc.</th>
<th>ADL</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1</strong></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>S2</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>S3</strong></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>S4</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>S5</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>S6</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>0.17</td>
<td>.17</td>
<td>.17</td>
<td>0</td>
<td>.8</td>
<td>1.8</td>
<td>.67</td>
<td>1.5</td>
<td>2.2</td>
</tr>
</tbody>
</table>

### TABLE 3

**Zero Raw Scores Weighted by Adding (1) So Can Treat Data-Compute t**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Ex. Gp.</th>
<th>Crawl</th>
<th>K-W</th>
<th>Treadmill</th>
<th>Exercycle</th>
<th>Manuometer</th>
<th>Rate Sc.</th>
<th>ADL</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S1</strong></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>S2</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>S3</strong></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>S4</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>S5</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>S6</strong></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>15</td>
<td>18.9</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1</td>
<td>2</td>
<td>1.8</td>
<td>1.6</td>
<td>2.5</td>
<td>3.2</td>
</tr>
</tbody>
</table>
**TABLE 4**

Actual Raw Scores Made in Post-Test

<table>
<thead>
<tr>
<th>Ex. Gp.</th>
<th>Crawl</th>
<th>K-W</th>
<th>Treadmill</th>
<th>Exercycle</th>
<th>Manuometer</th>
<th>Rate Sc.</th>
<th>ADL Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>.3</td>
<td>R</td>
<td>8 x</td>
<td>L 4</td>
</tr>
<tr>
<td>S2</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>.4</td>
<td>20</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>S3</td>
<td>1</td>
<td>2</td>
<td>5.5</td>
<td>.2</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>S4</td>
<td>1</td>
<td>1</td>
<td>1.5</td>
<td>.1</td>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>S5</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>.1</td>
<td>18</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>S6</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>.3</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>7</td>
<td>35</td>
<td>1.4</td>
<td>71</td>
<td>62</td>
<td>53</td>
</tr>
<tr>
<td>Mean</td>
<td>1</td>
<td>1.2</td>
<td>5.8</td>
<td>.2</td>
<td>11.8</td>
<td>10.3</td>
<td>8.8</td>
</tr>
</tbody>
</table>

**TABLE 5**

All Raw Scores Weighted by Adding (1) so Can Treat Data-compute t

<table>
<thead>
<tr>
<th>Ex. Gp.</th>
<th>Crawl</th>
<th>K-W</th>
<th>Treadmill</th>
<th>Exercycle</th>
<th>Manuometer</th>
<th>Rate Sc.</th>
<th>ADL Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>1.3</td>
<td>R</td>
<td>9 x</td>
<td>L 5</td>
</tr>
<tr>
<td>S2</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>1.4</td>
<td>21</td>
<td>20</td>
<td>19</td>
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<tr>
<td>S3</td>
<td>2</td>
<td>3</td>
<td>6.5</td>
<td>1.2</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>S4</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
<td>1.1</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>S5</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1.1</td>
<td>19</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>S6</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>1.3</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>13</td>
<td>41</td>
<td>7.4</td>
<td>77</td>
<td>68</td>
<td>59</td>
</tr>
<tr>
<td>Mean</td>
<td>2</td>
<td>2.2</td>
<td>6.8</td>
<td>1.2</td>
<td>12.8</td>
<td>11.3</td>
<td>9.8</td>
</tr>
</tbody>
</table>
Crawling Test I (See Figure 8, p. 45): Comparing the first to the fourth week, all six subjects refused to crawl in any manner but after the fourth week all of them were able to execute the homolateral crawl with the Persistence Technique and patterning. However, when comparing pre-test means (1) with post-test means (2) improvement was made but not significantly.

Hypothesis 2: There will be an increase in physical fitness as measured by the Kraus-Weber Minimal Fitness Test, distance traversed as measured by the exercycle and treadmill, and grip strength as measured by the manuometer.

Kraus-Weber Minimal Fitness Test II (See Figure 9, p. 46): All six subjects failed this test. The subjects must pass all six items or they fail the test.

Two boys passed five of six items; two boys passed four of six items; and two boys passed three of six items. Five improved from refusing initially to execute any movements to finally attempting the exercises.

Five of the boys failed the flexibility test item 6—standing, touch toes with knees extended. Four of these five boys either walked or ran on their toes—equinus position, habitually, as no organic basis was found by the medical examiner. Phillips (20) found this test item was passed more by normal girls than normal boys, ages 6 to 12, when she first replicated the K-W test.

Three of the subjects failed the lower back extension test item 5, as they bent their knees and did not extend their legs off the floor.

Two boys failed items 1 and 2—sit-ups with knees straight and knees bent position, respectively. One of these boys had a marked lordosis and was minus 35° (L) knee extension and a minus 25° in (R) knee extension when measured by a goniometer, the instrument used for measuring range of motion.

Treadmill Walking, Test III (Figure 10, p. 47): When comparing pre-test means (1.2) with post-test means (6.8) significant changes were made at the .01 level of confidence.
FIGURE 8

Actual Mean Rating Scores of Crawling by Group

1 (Homolat. Crawl)

0 (Refused)

Post-Test of 4th Week (After 20th Day)

Pre-test of 1st week (1st Day)
FIGURE 9

Actual Mean Rating Scores of K-W Test

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Passed)</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(Attempted)</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(Refused)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(Post-test—solid dot)
(Pre-Test)
FIGURE 10

Actual Mean Rating Scores of Treadmill Walking for 30 Seconds

*Significant at .01 level of confidence

(Post-Testing)
1st day after 4th week

(Pre-testing 1st day)
Only one subject took a step as measured by the pedometer, in the pre-test. This machine enabled the boys to ambulate at a very slow rhythmic pace, 1 mile per hour, in a safe manner, as they had a safety belt on during the entire study. It was also a persistence force when the subjects refused to walk. The motorized treads throw the subjects off balance and forces them to walk. Walking is a required Activity of Daily Living (ADL) item, and enables the subjects to be more self-sufficient on and off the ward. However, during the pre-post testing, the motor was removed to see what effect "persistence" played in self mobilization.

Exercycle Riding, Test IV (See Figure 11): When comparing pre-test means (1) with post-test means (1.2), the mean score difference was not significant at .05 level of confidence. All subjects improved a mean of .233 of a mile as they all recorded zero on the speedometer in the pretest. This exercise improves the flexibility of the ankle and cardiovascular endurance (circulation). The subjects were asked to ride the exercycle as fast as they could and their score was registered on the speedometer in .1 of a mile increments.

Manuometer, Test V (See Figure 12): When comparing a pre-test means (1.8) with post-test means (11.2) the mean scores of combined (R) (L) hands was significant at the .05 level of confidence. In contrast, the right hand grip strength was significant at .005 level of confidence, whereas the left hand grip strength was significant at the .01 level of confidence. In the previous studies with the geriatric and middle-aged mental patients, the left hand was stronger over the right hand. The evidence from the test on treadmill walking and manuometer strength support hypothesis No. 2.

Hypothesis 3: There will be a decrease in time spent by the adaptive physical educator in passive manipulation of the severely mentally retarded boys.

Activity Rating Scale, Test VI (See Figure 13): This variable measured the activity of the subjects in the gymnasium. Brief Persistence was needed initially to the majority of the subjects in the pre-test but improvement was made in the post-testing period as the subjects were
FIGURE 11

Actual Mean Scores of Exercycle Riding (2 Minutes)

[Graph showing mean scores across subjects (S1 to S6) with specific scores indicated for pre- and post-testing.]
FIGURE 12

Actual Mean Rating Scores of Manuometer (Grip Strength) Test

- (Post-test) (R) +
- (Post-test last week Mean Score (R) (L) solid dots o
- (Post-test (L) x
- (Pre-test (R) o (L) x
- (Pretesting 1st day) Mean open dots o Score R-L

Mean Rating Scores (lbs. per sq. inch)
The 1 - 5 continuum was:

1. Totally Inactive - persistence needed all the time.
2. Partially Inactive - persistence needed part of time.
3. Moderately active - starts-stops-no persistence.
4. Almost totally active - active but one brief pause.
5. Totally active - active entire period.
partially active. (However, when comparing pre-test means (2.5) with post test means (3.5) no significant changes were made.) This was in contrast to the previous persistence studies made by the writer, in which little passive manipulation was needed from the outset to the completion of the studies.

Three of the subjects improved from (1) totally inactive to (2) partially inactive. Two remained partially inactive (2) but one S improved from (2) partially inactive to (3) moderately active. This hypothesis also found support, but not to the .01 level of confidence.

Hypothesis 4: There will be an increase in interpersonal relationship and ability to undertake activities of daily living as judged by nursing service personnel and class observer.

ADL (Activities of Daily Living) Test VII (See Figure 14): When comparing pre-test means (3.2) with post-test means (3.4) no significant changes were made. This hypothesis was supported when comparing the mean of the 24 items in the pre-post tests but not to the .01 level of confidence. Rating showed improvement for all subjects. Similar findings were noted in the Geriatric mentally ill study conducted by the writer.

Interpretation of the Data

Results indicate a substantial increase in performance in the seven variables measured. These changes in behavior of severely mentally retarded subjects, therefore, have specific implications for applied education in the field of physical education (adapted), and special education. Such changes indicate that a four-week Adapted Physical Education Program in conjunction with the utilization of the "Persistence Technique" by the staff on a 24 hour basis, can do much to improve the severely mentally retarded boy and thereby contribute to his self-sufficiency, physical fitness, and socialization in the total developmental and educational process.

The subjects all started with zero scores on most of the seven tests but they recorded significant changes in these seven tests upon completion of the four-week study, when the pre- and post-testing mean values were summed and computed for the total seven tests.
FIGURE 14

Actual Mean Rating Scores of ADL (Activities of Daily Living)

Scale (Score)
1 - never
2 - sometimes
3 - always
Evidence suggests that the changes which did occur were attributable to persistence and adapted physical education. (Persistence and adapted physical education were the only two variables inserted into the experimental groups daily activities on a 24-hour basis. No supportive devices or medication were used in conjunction with this study.)

The experimental group improved progressively on all the seven tests regarding the improvement of self-sufficiency, socialization, and physical fitness.

The best results of the study were made with treadmill walking and grip strength-squeezing an exerball. This evidence indicates that adapted physical education, in conjunction with persistence played an important part in improving physical fitness.

It is believed by Delacato-Doman and several of their disciples, that certain passive manipulations initiated at the lowest level of neurological development compliment the functioning-patternning for homolateral crawling. These activities are said to stimulate the motor perception, the tactile, auditory, visual, and kinesthetic senses. Proceeding on this principle, these passive pattern movements were employed as a part of the daily adaptive physical education program. It seems that this patterning technique was a satisfactory method of communication.

It has been observed that if the severely mentally retarded negativistic, seclusive, resistive, and poor physically fit boy is not taught socialization, self-sufficiency and physical fitness, then he becomes a behavior problem. To remedy this, we must teach him this acceptable behavior by showing him what and how to do it and discourage unacceptable behavior by using "persistence." A task or command may have to be repeated 4-5 times due to preoccupation before it is executed but once it is executed it seems to be retained. Shouting commands seems to inhibit preoccupation in this regard.

The non-verbalized experimental group wants to socialize but can't express this desire normally. We must structure this re-socialization process just like giving a little boy a "push" on a swing. Once he relates and plays with others in an acceptable manner while having fun, then he looks forward to it. He must follow the accepted rules, though.
Interpersonal relationship and communication must be established on a 1-1 basis, initially, during the first week. Then a small group—6 boys—can be assembled for an adaptive physical education structured class.

Regarding the Kraus-Weber Minimal Fitness Test, there should be allowance for partial scores, such as poor, fair, good, normal,—indicating improvement and it would accurately classify the unfit boy for further remedial exercises. It seems that a modified KW test should be designed for the severely retarded boy. However, at the present time, this is one of the few reliable and valid fitness tests for this age level.

The majority of the subjects dragged their right leg when executing an unpatterned crawl during the first week, but all of them completed the homolateral crawl at the end of the study.

None of the boys showed any signs of fatigue at the end of both the hour and one hour-35 minute class periods. This is in contrast to many "authorities" who feel that mentally retarded children in pre-school and primary grade levels should not exceed 15 and 30-minutes of exercise respectively.

Abnormal gait patterns on the ward revert to normal walking on the motorized treadmill for three of four boys.

All the boys were testable—progressing from passive to active movements, with persistence or passive manipulation stimulating self-activation.

Persistence helped the experimental group to do what is believed to be normal in the human motor developmental sequence, e.g. crawl before creep, creep before talk. In this regard, a fine line of demarcation between practice and training must be made. Practice is defined as doing something that is related to normal functioning. It is believed that we learn to do activities of daily living, such as crawling, creeping, walking, in about 9-16 months. On the other hand, if at 2½ years you want your child to ride a tricycle—this normally doesn't occur in our developmental growth sequence but you can train him to do it—but it is not essential for survival.
Establishing rapport is necessary if good learning is to go on. Otherwise the teaching leaves the level of education and sinks to the level of training. Children are educated and animals are trained. However, in the case of the severely mentally retarded child this rapport or communication seems to be best achieved at the perceptual-motor level. The teacher should establish a mutual understanding by embracing well understood vocal, facial, manual, and body communications. We should start to communicate at the child's functional level. If a child cannot accomplish basic phylogenic movements such as crawling, creeping, climbing, etc., then we must afford him every opportunity to achieve success at this level. It is believed that motor learning precedes cognitive learning, yet we fail to realize this important principle in the case of the severely mentally retarded child. Because of lack of communication he is left by the wayside. (All six subjects in the study were non-verbal.) General education goals and adapted physical education goals should be commensurate with each other. Self realization, the learning of necessary and worthwhile skills, worthy use of leisure time, doing things with others, self-expression, and maintaining good health may be achieved by the severely retarded child but he needs proper structuring by skillful teachers. He must be shown why, what, and how to do things reflectively rather than reflexly if these goals for educational living are to be a reality.

Some of the comments of the adaptive physical educator to the subjects are partly illustrative of the Persistence Technique and its use in establishing rapport.

"See, you have to talk to those muscles (points to them). They won't do anything unless you say 'Greg, squeeze.'"

"You must move your legs (points to them). Let me help you (moves them passively)."

"I help you as much as I can. Now you have to help yourself."
Some of the non-verbal behaviors of the adaptive physical educator are equally revealing of the persistence technique. In several ways, he manifested no compunction against getting to the boys' "level"; for example, by kneeling toward them or by bending toward them. He would also put his arm around a boy's shoulder, or rub the latter's head as a gesture of positive reinforcement. Frequently he would place his face close to the boy's face and carry on a soft-spoken, "personal" conversation.
CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The writer has pointed out that some institutions for the mentally retarded have maintained a "laissez-faire" attitude in approaching the severely mentally retarded child. That is, if a child refused to cooperate in the school program, wait until he feels up to it. Institutionalized children should not be allowed "Carte Blanche" in their care. It is believed, therefore, that the school, in conjunction with the pediatrician and the staff, should structure a positive program for the child on a 24-hour basis, while utilizing a "Brief Persistence" attitude. Emphasis should be placed on physical fitness, self-sufficiency, and socialization.

Restatement of the Problem

What did the persistence program do for the severely mentally retarded boys? It did something significant. It prepared them for taking instructions through the use of perceptual motor stimulation which established rapport and communication with the child. None of these boys verbalized so they must be shown what to do, e.g. they were patterned in homolateral crawling, then they performed the crawl in the Krawl Box.

To avoid the label of "abusing" the child, the staff must take the attitude "I'm here to help you. You must do what the doctor has prescribed for you, or we must help you by passive manipulation."

What were some of the dynamics of the "Persistence Technique?" A plausible explanation of why the subjects moved in a positive direction seemed to lie in the "shock" effect of the persistent technique. Severely mentally retarded boys who had long been allowed to sink increasingly into institutional chronicity were suddenly confronted with an adapted physical educator who refused to take no for an answer. From the moment he first approached them on the wards, and encountered resistance from the
boy, his words, the tone of his voice, his serious mien, and finally the
gentle but unmistakable pressure of his hands upon the boy's back, simul­
taneously pushing and elevating him from his chair, all emphasized the
fact that the boy would indeed soon find himself in the gymnasium whether
self--or otherwise--propelled. Others in the group could hear and observe
this and may have decided early to accede to the inevitable.

In this regard, the writer proposed the following hypotheses:

1. There will be a decrease in time spent by the Adaptive Phy­
sical Educator in passive manipulation of the young severely mentally
retarded boys.

2. There will be an increase in crawling ability from patterning
to active homolateral crawling.

3. There will be an increase in physical fitness, as measured by
the Kraus-Weber Minimal Fitness Test; distance traversed as measured by
the exercycle and treadmill; and grip strength as measured by the mano­
meter.

4. There will be an increase in interpersonal relationship and
ADL (Activities of Daily Living), as judged by nursing service and a class
observer.

Nature of the Experiment

Severely mentally retarded children have been the least investi­
gated by psychologists, educators, and medical specialists. More emphasis
has been placed with trainable and educable mentally retarded children.
This severely mentally retarded child because of his frustrations and reject­
ions, is relegated to a maintenance type program, what with most of the
institutions understaffed and minimal facilities available. However, the
writer feels that "Brief Persistence" in conjunction with an adapted physical
education program can increase self-sufficiency, physical fitness, and
socialization of negativistic, seclusive, physically unfit, unable to care for
daily needs, severely mentally retarded boys.

Related Studies

In comparing this study with other related studies, the writer found
that there were little or no studies related to "Persistence" in dealing with
the resistive, seclusive, physically unfit, and non-sufficient mentally retarded population. However, "Total Push" and "Direct Approach" studies were completed but dealt solely with the chronic or long-term mentally ill patient. The writer concurs with the other authors that "Persistence" as a motivating force tends to be more important in redirecting seclusive, resistive, non-sufficient, physically unfit institutionalized patients-residents, than a "Permissive" or Laissez-faire approach.

Description of Procedures Used

Six severely mentally retarded young boys were selected for the study. Their behavior was matched according to the following criteria:
(1) Negativism (2) Inability to care for daily needs (Self-care) (3) Seclusiveness (4) Poor physical fitness (5) Short interest Span.

Four four weeks, the subjects were measured with mechanical and manual instruments. The seven variables (tests—homolateral crawling, K-W Minimal Fitness Test, treadmill walking, exercycle riding, manuometer-grip strength, and activity rating scale, were rated in the gymnasium by an impartial observer; the ADL was also rated by the impartial observer and six nursing personnel, on the ward—A.M. and P.M. These ratings were then given statistical treatment. After all the material was gathered and then recorded, the data was then interpreted.

The Actual Class Procedures included:
1. Going to the toilet before going to class.
2. "Patternning" - followed by crawling in Krawl Box.
4. Ring Around The Rosie for resocialization value.
5. Rest period on Rock and Roll Bench—toss bean bag also.
6. Walking on motorized treadmill.
7. Exercycle riding.
8. Exerball squeezing.
9. Drinking from water fountain
10. Walk upstairs and to toilet.
**Principle Findings**

Results indicate that some changes were made by the experimental group, and that the "Brief Persistence" technique was effective. Some interesting data were:

1. "Brief Persistence" in conjunction with an adapted physical education program, contributes to improvement in self-sufficiency, physical fitness, and resocialization of severely mentally retarded boys, if used on a 24 hour basis by the entire staff. Evidence supports the four hypotheses.

2. The best results of the study were made with treadmill walking and grip strength. This evidence indicates that adapted physical education, in conjunction with "Brief Persistence" played an important part in improving physical fitness.

3. Passive manipulation initiated at the lowest level of neurological developmental functioning—"patterning" for homolateral crawling, leads to active crawling.

4. According to the staff at the Columbus State School for retardates, the severely mentally retarded negativistic, seclusive, resistive, and poor physically fit boy is not taught socialization, self-sufficiency and physical fitness. As a result, he becomes a behavior problem. To remedy this, we must teach him the acceptable behavior, by showing him what and how to do it. Activities should be progressed from simple to complex and unacceptable behavior should be discouraged by using "Brief Persistence." He must be successful in the activity, as too many of these children have been failures due to poor performance in complex activities.

5. "Patterning" seems to be a valuable tool in communicating with the severely retarded boy, through the perceptual motor sensory pathways.

6. The non-verbalized severely mentally retarded boy wants to socialize but cannot express this desire normally. We must structure this re-socialization process just like giving a little boy a "push" on a swing. Once he relates and plays with others in an acceptable manner while having fun, then he looks forward to it. He must follow the rules though.

7. Interpersonal relationship and communication must be established on a 1-1 basis, initially, during the first week. Then a small group can be programmed.
8. None of the boys showed any signs of fatigue at the end of the one-hour or one-hour-35 minute class period. This is in contrast to many "authorities" who feel that mentally retarded children in the preschool and primary grades, should not exceed 15 and 30 minutes of exercise, respectively.

9. All the boys were testable—progressing from passive to active movements.

10. With regards to the Kraus-Weber Minimal Fitness Test, improvement is not recorded by this test. The child must pass all six test items or he fails. There should be allowances for part scores. Although five of the six subjects refused to execute any of the six test items, initially, they passed a mean of four test items at the completion of the study, yet received no credit for this improvement.

Conclusions

The following conclusions were made from the evidence uncovered in this study:

1. Specifically, evidence presented in this study tends to indicate that a four-week adapted physical education program in conjunction with the utilization of the "Brief Persistence Technique" by the staff on a 24-hour basis, assists in improving self-sufficiency, physical fitness, and socialization of severely mentally retarded boys.

2. Significant changes were made by the experimental group, when comparing summed pre-post testing mean of differences of all seven tests.

3. Significant changes were made in treadmill walking and grip strength when comparing pre- and post means scores.

4. "Homolateral Patterning" is valuable in establishing rapport and communicating with non-verbalizing severely mentally retarded boys.
Recommendations for Further Research

1. More effort should be extended to the young, severely mentally retarded boy in communicating with him on a perceptual-motor basis.

2. Added research should be made in regards to duration time of "Brief Persistence" with young severely mentally retarded boys. It would be interesting to discover what effect a daily dosage of "Brief Persistence" in conjunction with adapted physical education for one school year would have on young severely mentally retarded boys or girls.

3. As this study was scheduled on a 5-day week basis (Saturday and Sunday were off days), there were times on the first day of the week that the boys needed more "Brief Persistence." It would be of great interest to see what effect a 7-day week study period would have in regards to carry-over value.

4. Four of the six subjects walked in an abnormal gait pattern. However, when walking on the motorized treadmill they reverted to a more normal gait. We need more research studies relative to stretching exercises, in the child's early years, to prevent apparent deformities or abnormal gait patterns.

5. Evidence indicates that we tend to make "problem" or "hopeless" cases with our "hopeless" or "despairing" programming. It would be very interesting to see what effect the "Brief Persistence Technique would have in improving self-sufficiency, physical fitness, and socialization of short-term or acute mentally retarded boys. A true test of the "Brief Persistence" Technique should be at the time the Pediatrician or Psychiatrist makes the diagnosis. Not when he continues as a "hopeless" case for many years, in which his abnormal behavior patterns are reinforced. Traditional and classic treatments must be replaced with more relevant and workable techniques. Moreover, to help achieve better success with these types of children, the physician, nurse, psychologist, special educator, adapted physical educator, and therapist must play a more active rather than passive role.
APPENDIX A

TABLE A - Comparison of Difference Mean Values Between Pre-testing and Post-testing for the Brief Persistence Group.

TABLE B - Pre-test and post-test Comparisons on Each of the Seven Tests
Table A

Comparison of Difference Mean Values Between Pretesting and Post-testing for the Brief Persistence Group
(Computation of the t Statistic)

<table>
<thead>
<tr>
<th>N=6</th>
<th>Summed Raw Scores of 7 Tests</th>
<th>Deviation from Deviation</th>
<th>Deviation Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp. Op. Pretest Posttest Difference Mean of Differences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₁</td>
<td>11.1</td>
<td>19.7</td>
<td>+18.6</td>
</tr>
<tr>
<td>S₂</td>
<td>11.3</td>
<td>43.9</td>
<td>+32.6</td>
</tr>
<tr>
<td>S₃</td>
<td>17.3</td>
<td>33.2</td>
<td>+15.9</td>
</tr>
<tr>
<td>S₄</td>
<td>11.1</td>
<td>21.0</td>
<td>+ 9.9</td>
</tr>
<tr>
<td>S₅</td>
<td>10.0</td>
<td>31.4</td>
<td>+ 21.4</td>
</tr>
<tr>
<td>S₆</td>
<td>10.1</td>
<td>23.7</td>
<td>+ 13.6</td>
</tr>
<tr>
<td>Totals</td>
<td>70.9</td>
<td>182.9</td>
<td>112.0</td>
</tr>
<tr>
<td>Means</td>
<td>11.81</td>
<td>30.48</td>
<td>18.7</td>
</tr>
</tbody>
</table>

S₁ = subject 1, S₂ = subject 2, etc.  \( \sigma = 7.9 \)

Mean of pre-test = 70.9 + 6 = 11.81
Mean of post-test = 182 + 6 = 30.48
Mean of differences= 112 + 6 = 18.7

Standard Deviation of Differences = \( \sqrt{\frac{312.7}{6}} = \sqrt{62.4} = 7.9 \)

Standard Error of Differences = \( \frac{\sqrt{312.7}}{6} = \frac{7.9}{\sqrt{6}} = 3.2 \)

\( t = \frac{\text{Mean of Differences}}{\text{Standard Error of Difference}} = \frac{18.7}{3.2} = 5.84* \)

* Significant at the .01 level of confidence.

Note. - For d.f. = 5, a t value of 3.36 was necessary at the .01 level of confidence.

The obtained \( t \) is statistically significant at the .01 level of confidence.

It is concluded that the Brief Persistence Technique was effective.
Table B
Pre-test and Post-test Comparisons on each of the Seven Sub-tests

<table>
<thead>
<tr>
<th>Subtests</th>
<th>Mean of Differences</th>
<th>Standard Error of Difference</th>
<th>t value</th>
<th>Levels of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Crawling</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N.S.***</td>
</tr>
<tr>
<td>2. Kraus-Weber* Minimal Fitness</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N.S.</td>
</tr>
<tr>
<td>3. Treadmill</td>
<td>5.6</td>
<td>1.3</td>
<td>4.21</td>
<td>.01</td>
</tr>
<tr>
<td>4. Exercycle</td>
<td>.2</td>
<td>0</td>
<td>.00001</td>
<td>N.S.</td>
</tr>
<tr>
<td>5. Manuometer</td>
<td>9.5</td>
<td>3.57</td>
<td>2.66</td>
<td>.05</td>
</tr>
<tr>
<td>6. Activities Rating Chart</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N.S.</td>
</tr>
<tr>
<td>7. Activities** of Daily Living</td>
<td>.2</td>
<td>.0028</td>
<td>.00001</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

*Means of total 6 items  
**Means of total 24 items rated  
***N.S. = Non Significant

Note: For d.f. = 5, a t value of 3.36 is necessary at the .01 level of confidence
APPENDIX B

Sample of Daily Diary of Four Weeks Experiment

This diary was taken to see individual and group changes for recommendations and trends, e.g., fatigue threshold as result of long (1 hour) physical education experience; degree of persistence used with kinds when compared to geriatric and middle aged studies past concluded.

Monday: March 4, 1968 (Pre-testing)

1. \( S_1 \) Runs to window, climbs it; pulls window cord out; climbs on tables; slaps wall several times while laughing and smiling as if having a good time; puts mouth to window; bites medicine ball; goes down sliding board forward and backwards; looks at excercycle but would not ride it; eats or chews on cabinets; bangs on windows with palm of hands—hard (must be cautioned); inappropriate gestures with hands; drinks urine from floor where \( S_2 \) soiled himself; chews on splintered sticks from walls; makes hissing sounds; chews mop strings; shouts—"Aye! Aye!" periodically; tries to open gymnasium door; never sits still—has short interest span; creeps on tables; shouts "Hi did el!" Had three bowel movements on floor—put shorts down as if toileted trained but there were no toilets in gymnasium, urinated in sewer, however. He was resistive, negativistic, non-verbal, not self-sustaining in experimental tests by physical educator. Never stops, very tense and on go all period. Refused to ride excercycle, treadmill, manuometer, crawl, but drank from fountain with help. The hour had no tiring effect on him (he just returned from acute hospital for lobar pneumonia).

2. \( S_2 \) Soiled self; walked to treadmill and turned wooden fly wheels by hand. Uncooperative in testing as he backed off each activity. No verbalization and he walked in an uncoordinated gait pattern. He seemed tired as he sat or stood alone or resisted the physical educator while mumbling out loud.

3. \( S_3 \) Roly poly type boy who is a motor active child; cannot focus right eye (turns outward) and both eyes cannot converge. Needs passive exercise as he has short interest span and seem pre-occupied. No verbalization but giggles. Never tires; runs about gym gesturing with hands, head, body. Tries to run away from physical educator. Refuses to execute activities by self.

4. \( S_4 \) He has a mannerism of crossing hands inside his T shirt; no verbalization but grunts and makes a hacking sound; has a black-blue mark on cheek where he hits himself with his right fist; expresses masked facial expression, and his eyes seem to be wider apart than usual. Backs away from all requested
activities but sits on exercycle and rocks back and forth for 30 seconds and stops; walks on toes and feet abducted 45° with his hands, arms inside T shirt.

5. S₅  Cries, nose runs all time down shirt, physical educator must give him Kleenex to blow his nose; has short interest span; physical educator must use persistence to get him on mat for K-W tests which he failed; pushes shoves physical educator; no verbal communication; has abnormal gait assuming a wide base with kyphotic type posture; galls up when running. Refused to cooperate in testing. (Dropped as sent home on pass by mistake. S₇ Replaced him.)

6. S₆  Cries and screeches while backing off when physical educator takes him to gymnasium and all the way down. Resisted all activities and just wanted to go back upstairs; soiled pants; tore piece of yellow writing paper off of desk; seems to have visual problems as he closes his eyes most of the time and they seem to be out of focus (convergence is out of line) when his eyes are open. Has abnormal gait, walks and runs on toes, while his hands, arms are positioned in shoulder abduction—90° with pronated forearms and palmar flexed wrists, fingers in clawed position.

7. S₇  This boy looks very frightened and runs away from everyone including physical educator when entering gymnasium. He shouts "wooey, wooey" and runs in spurts to water fountain while gesturing with his hands—arms; squeaks like animal at times; soiled self near end of testing period; refuses testing by physical educator but will drink from water fountain if physical educator turns faucet on; seems very tense and confused; stares inappropriately.

Summary: All boys seem to need some degree of "Persistence" while with the geriatric and middle-aged patients little persistence was used, initially.
Tuesday - March 5, 1968

1. **S₁**
   (8 a.m. to 9 a.m.) 1-1 basis. No climbing, tearing, chewing. Resisted both patterning (5 minutes) and crawling in the Crawl Box but with persistence he made three attempts at crawling (unpatterned homologous type with both arms and dragging of right leg); needed persistence in Kraus-Weber exercises; tried to run to window to climb but caught by physical educator; catches bean bag after few attempts; confused in Ring Around the Rosey Game for executing deep knee bends; tense on motorized treadmill but sings out while walking for 30 seconds; needs passive manipulation on exerball, 1 minute. Drinks from water fountain if physical educator turns faucet; did not soil or have bowel movement today.

2. **S₂**
   (9 a.m. to 10 a.m.) - Resisted patterning (5 minutes) and crawling in Crawl Box. After 2nd attempt with passive manipulation he executed next three unpatterned homologous crawls by using both arms and one leg (left) simultaneous and dragging right leg—hollered "Theo, Theo" while physical educator used passive manipulation. During K-W exercises he lay down on the pillow and said, "pillow." The p.e. requested pillow and pt. handed it to p.e. Smiles as if happy. Needs persistence on mat as he wants to get up and run, moves about without purpose, etc. but physical educator would not permit it. Persistence also necessary in bean bag throw, Ring Around the Rosey, treadmill, exerball. Really scared of treadmill and exercycle.

3. **S₃**
   (10 a.m. to 11 a.m.) - Had diaper on in ward. Physical educator used persistence to go on toilet before going to gymnasium. He urinated and diaper was requested off and only shorts put on (this pt. soils himself frequently and refuses to go when on the toilet seat); resists patterning (5 minutes) and passive manipulation in Crawl Box two times but next 3 attempts he executes unpatterned homologous crawl - used both arms and right leg but drags left leg; motor active kid as he never sits still but giggles and moves body parts all time. He is overweight as fat folds stick out and his eyes to not seem to function properly (right eye turns out while left eye turns in-strabismus); needs passive manipulation on K-W due to his preoccupation and non-purposive body movements; refuses to toss bean bag, but walks in circle while p.e. sings Ring Around.
the Rosey; frightened on treadmill, 30 seconds and exercycle, 2 minutes, refuses active squeezing of exerball so passive manipulation of fingers must be given; can drink from water fountain. Least resistive in crawling. Will make a better adjustment of 6 boys at end of 4 wks.

4. **S_4**

(1-2 P.M.) - Fights patterning (5 minutes) but executes unpatterned homologous crawl in Crawl box, with insistence by p.e. (5) times. Needs persistence in K-W exercises, bean bag throw. Ring Around the Rosey, treadmill. He wears masked facial expression, eyes seem wide apart from normal, has mannerism of putting hands-arms in pants (inside) and makes grunting sounds; walks with feet abducted and plantar flexed foot; hits cheek bone (R) (L) with fists as if punishing himself (black blue marks present); waits for p.e. to turn water faucet on for him--too weak. Range of motion in (R) knee extension is -15°; (L) knee extension, -25°. Gait (L) knee bent.

5. **S_5**

(2-3 P.M.) - Screeches and hollers loudly as he does not want to go to the gymnasium with the p.e. but p.e. uses persistence and drags him down. Hollers all way down; walks on toes, seems to have visual problems, holds objects real close to him with eyes out of focus; resists patterning (5) minutes and Crawl Box as he hollers entire period but persistence continued to be used with unpatterned homologous crawl elicited--both arms, left leg and drag of right leg near end of each bout (5) total. Blows nose in tissue on desk and throws in trash can and gives colored ball to p.e.; passive manipulation on K-W exercises, bean bag throw, Ring Around Rosey, exerball, drink from water fountain; walks up stairs without hollering, after walking on treadmill, 30 seconds, exercycle 1 minute, squeeze of exerball (passive), 1 minute.

6. **S_6**

(4-5 P.M.) - resists patterning (5) minutes but relaxed more near end, but needs persistence in Crawl Box for all 5 attempts; he sings after p.e. sings "In the good old summer time" but not understandable--hums or says irrelevant words; passive manipulation in K-W, bean bag throw, Ring Around Rosey, exercycle, treadmill, but catches bean bag 2 times at close range, after dropping it regularly; walks abnormally, rt. foot plantar flexed, slobbers due to protruding tongue; needs help with exerball, 1 minute and water fountain. (Predict better adjustment, sings at end of 4 weeks)
Summary: We don't teach for socialization, self sufficiency, physical fitness so boy behaves abnormally. Never will sublimate accepted activities unless we teach him acceptable behavior. We must start at lowest developmental movement—crawling and progress according to functions of child. Need neurological reorganization. Sensory areas (receptive) need stimulation before motor (expressive) activated.

Friday, March 29, 1968 - Final day, fourth week

1. \( S_1 \) Relaxed in patterning. Homolateral crawl; persistence once on K-W exercises. Tosses bean bag in group and sings, sociable in Ring Around Rosey Game. Persistence with motorized treadmill, 30 seconds but does 10 steps by self if p.e. hollers or uses persistence. He will follow instructions satisfactorily but one has to shout in his ears to disturb his preoccupation. Rides exercycle 2 minutes with some persistence, squeezes exerball with passive manipulation and drinks by self. The Medical Director, who wanted to observe the experimental group and did (in hidden area--back of gym) commented that it was the first time he saw \( S_1 \) follow directions for a long period of time (15 minutes, without jumping or running off).

2. \( S_2 \) Wanted to go to toilet and looked sternly and made loud noises to communicate to p.e. After toilet, ran back to bean bag toss, smiling. Smiles in crawling first time. Cooperative in K-W exercises; walks stiff-legged on non-motorized treadmill, 10 steps, 30 seconds if p.e. shouts at him (seems preoccupied as he looks at ceiling, inappropriately at times.) Rides exercycle fast for 1 min. (.3 total of mile) and stops; then goes again for 1nd min. Sociable in RRR and exerball squeezing.

3. \( S_3 \) Best behavior to date. Follows instructions, counts with fingers, does K-W, tosses bean bag in group, walks treadmill (non-motorized) 30 steps in 30 seconds, turns exercycle, 2 minutes (.4 mile) and with (.5 mile, average for p.e.); squeezes exerball and takes own drink. Says "Hi" to p.e. when asked, 3 times. Seems to have difficulty with toilet training, soiled pants at night according to Nursing Service, even though he went to toilet 5 times during day and had two bowel movements. One bowel movement just before bedtime. Night nurse attendant and psychiatric aide say that he is more extrovert, and improving. However day nurse attendant says he was getting worse, e.g. threw pins at her as she keeps him on toilet too long.
4. \( S_4 \) Cooperative on patterning table and crawls homolateral (right side dominant) but has sore on left knee which seems to hurt him, but he takes bandage off. Squeals and grunts as if trying to talk to p.e. in K-W exercises while smiling and looking at p.e., OK in RRR, bean bag toss (runs to area, first time), takes 10 steps in 30 seconds on non-motorized treadmill; rides exercycle, 1 minute of 2 minutes with some persistence. He likes to watch wheel turn when others' ride it. Squeezes exerball by self, but gently. Drinks by self and still puts hands inside shirt (T) unless p.e. takes it away from him.

5. \( S_5 \) Will walk normal if taken by hand. Seems to walk on toes as an attention getting mechanism, as he laughs when corrected. Slower time in crawling. Hums tune in RRR and to Good Old Summer Time, used in group games. Squeezes right hand but needs persistence with left on exerball. Drinks by self.

6. \( S_6 \) Real happy in gym environment. Cooperative in patterning, crawl, K-W exercises, except lower and upper back extension. Walks on non-motorized treadmill, 8 steps in 30 seconds, exercycle ride, 2 minutes and smiles happily in RRR. Tries to help \( S_4 \) in K-W exercises and takes safety strap on treadmill and gives it to p.e. to put on. Squeezes left hand but needs passive exercise to right, as he has a mannerism of holding junk—mop strands, broom strips, etc. in his fingers, left. Takes own drink now. Had bowel movement (runs) in office 1st time, but nurse said quite a few boys had accidents today, that usually go to toilet.

Final Summary:
1) All six play in group exercises better (\( S_2, S_3, \) and \( S_5 \) and \( S_6 \) most improved with regard to group activity, "but \( S_1 \) and \( S_4 \) do more individual type activities.
2) All boys testable—passive to active movements with persistence or passive manipulation stimulating self-activation.
3) All boys improved to some degree (resistance and refusal to some degree of participation.
4) The majority of boys needed persistence initially. This investigator's studies indicated little persistence needed.
5) All wait for p.e. to take them to gym—no persistence needed.
6) We are giving these children (severely retarded) a maintenance type of program (survival) instead of educating them or working towards educational goals. Communicating with them (non-verbalized boys) through the "muscle sense" and structuring a sequential physical education program, starting with lowest level of developmental functioning and progressing from simple to complex activities, seems to be
a start. Other educators and professional personnel must modify their techniques according to the child's level of functioning. As these (severely retarded—20-35 I.Q., Vineland Social Quotient) boys are functioning on a non-academic level (below kindergarten) motor perceptual tests and techniques must be used, if a program is to be meaningful, and purposeful. These children are not hopeless but unguided.

7) A one hour physical education experience, if structured from simple to complex and stressing physical fitness, self-sufficiency, and socialization is not fatiguing to the child as advocated by some "experts" (non-physical education authorities). They advocate a maximum of 15 minutes to pre-school or kindergarten children.

8) Pre-testing of all round personality before setting up a program is very important. We have to have a starting point, e.g. If gait or walk is poor, we have to start at his functioning motor performance level and progress upward, just as we do with organically involved children (fracture, upper motor neuron lesions, polio, etc.). With emotional and retardates, we have to start with zero and work up.

9) Patterning is a means of communicating with the child through tactile, auditory, visual and motor and also establishing inter-personal relations.

10) All the boys want to socialize but need outside help to get them started (no self starters). Society does not accept their abnormal way of socializing (hitting, pinching, selfishness, etc.)

11) Each child (6) has a different way of gesturing, non-verbally. It seems that he wants to communicate with us but we have difficulty in making the right interpretation, e.g. screeching when tired or wants help; grunting when satisfied, etc.

12) Motorized treadmill (.5 of mile to 1 mile per hour maximum speed) and 7° grade, is another tool in reinforcing the persistence technique by forcing the boy to walk or move in space. Once he is off balance, he must catch himself or he thinks he will fall down, but the safety belt prevents this, but he doesn't know it. From the past two experiments with persistence (geriatric middle-aged psychotic patients), all seem to like it the best, after the 1st week. It is also a good diagnostic tool regarding abnormal gait patterns. Two boys who walk on their toes walk flat-footed and normally for a 2 minute period.
13) Day-night nursing personnel state that they are better able to communicate and to get cooperation from these boys. It points out a very valuable clue. If persistence is to be successful, it must be carried out for the entire 24 hour period. All who come in contact with the boys must use this approach — "I'm here to help you but you must do what the doctor or I tell you as you are unable to take care of yourself, and I must help you."

14) Regarding diagnosis, most boys dragged right leg in crawling in the Crawl Box, but seem to be right sided (right handed, legged, but unable to determine auditory and visual dominance, yet).

15) We need to teach these severely retarded children on a 1-1 basis, at first, and then gradually progress to group activities, and recreational activation. Too many children are "lost by the way side."

16) Many severely retarded children walk on their toes, either manneristically or organically. We must provide some form of stretching exercises to ameliorate or habilitate, to some degree, if a more functional gait pattern will improve the child's condition.

17) Some of the boys (6) responded in a more difficult manner during the two day rest period. Classes were held Monday through Friday, with Saturday and Sunday as days of rest. Classes were resumed on Monday, with tenseness and hyperactivity, noticeable. It may be interesting to find out effect of 7 day teaching experience.

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**Monday, April 1, 1968 - Post Testing Day - Procedure:** Start with crawling, then K-W exercises, bean bag toss and Ring Around the Rosie in group, exercycle riding, treadmill walking, manuometer squeezing, and drinking water from fountain by self, ADL on ward.

1. **S₁**
   - Executed homolateral crawl—left arm, left leg; needs help with K-W exercises (passed 4 of 6 items); bean bag toss, RRR, exercycle—.3 mile for 83 seconds of 2 minutes; 20 steps in 30 seconds on non-motorized treadmill; manuometer (R) 8 lbs. (L) 4 lbs. per sq. in.; drinks by self. Went to portable toilet chair, 2 times; ADL improved (Pre-Post Testing Rater in gym—six other raters from nursing service will turn in ratings this week, also). On Activity Rating Scale he improved from Totally Inactive to Partially Inactive. Vineland Social Maturity Test given by psychologist, indicated that S.I.O. dropped 8 pts.

2. **S₂**
   - Executed homolateral crawl, fails K-W Test but needs only 1 of 6 items to pass (standing touch toes); exercycle riding .18 of a mile for 90 seconds; 11 steps on non-motorized treadmill; manuometer (R) 12 lbs. (L) 12 lbs per sq. in.; ADL
Improved (Pre-Post Testing Rater in gym). On Activity Rating Scale improved from Totally Inactive to Partially Inactive; Vineland Social Maturity Test given by psychologist, indicated that S.I.Q. dropped 4 pts.

3. $S_3$

Executed homolateral and cross pattern crawl; failed K-W test but missed only 1 of 6 items (lower back leg extension—flexes knees instead of extending legs straight with pillow under abdomen); exercycle .4 mile in allotted 2 minutes; 20 steps in 30 seconds on non-motorized treadmill; manometer (R) 10 lbs. (L) 18 lbs. per sq. in.; ADL improved (Pre-Post Testing Rater in gym); on Activity Rating Scale his score improved from Partially inactive to moderately active; Vineland Social Maturity Test given by psychologist, indicated that S.I.Q. dropped 7 pts.

4. $S_4$

Executed homolateral crawl; failed K-W Test but passed 3 items of 6; exercycle .1 mile for 76 seconds of 2 minutes allotted; walked 3 steps in 30 seconds on non-motorized treadmill—preoccupied with pedometer, which records each step; manometer (R) 6 lbs. (L) 4 lbs. per sq. in.; ADL improved (Pre-Post Testing Rater in gym); Activity Rating Scale indicated change from Totally Inactive to Partially Active; Vineland Social Maturity Test given by psychologist, indicated that S.I.Q. dropped 14 pts.

5. $S_5$

Executed homolateral and cross pattern crawl; failed K-W Test but passed 3 of 6 items; exercycle .3 mile in 110 seconds or 2 minutes allotted; walked 10 steps in 30 seconds on non-motorized treadmill; manometer (R) 7 lbs. (L) 3 lbs. per sq. in.; ADL improved (Pre-Post Testing Rater in gym); Activity Rating Scale indicated change from Totally Inactive to Partially Active; Vineland Social Maturity Test given by psychologist, indicated that no change was made in S.I.Q.

6. $S_6$

Executed homolateral crawl; failed K-W test but passed 4 of 6 items; exercycle .075 mile for 62 seconds of 2 min.; walked 6 steps in 30 seconds on non-motorized treadmill; manometer (R) 18 lbs. (L) 12 lbs. per sq. in.; ADL improved (Pre-Post Testing Rater in gym); Activity Rating Scale indicated a change from Totally Inactive to Partially Active; Vineland Social Maturity Test given by psychologist indicated that the S.I.Q. dropped.

Comments: 1) Physical appearance and Social Intelligence Quotient's do not seem to be a reliable indices of child's ability to perform in adapted physical education.
2) Day personnel in Nursing Service rated children as being lower in improvement than afternoon personnel. Investigation indicates that more time was spent in the afternoon than morning with the persistence technique.

3) A modified Kraus Weber Test for minimal fitness may have to be used with severely mentally retarded boys as they are too preoccupied to digest sophisticated or complicated muscular activity, e.g., knees not extended in lower back extension from prone position with pillow under abdomen.

4) Some have poor posture with imbalance of neuromuscular coordination due to loss of reciprocal inervation, e.g., lordosis, equinus foot position—walks on balls of feet.
APPENDIX C

EDUCATION DEPARTMENT PLACEMENT FORM SUMMARY SHEET
ABSTRACTED FILE
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APPENDIX D

Vineland Social Maturity Psychogram Form and
Comparative S.I.Q. Pre-Post-Testing Scores
VINELAND SOCIAL MATURITY PSYCHOGRAM

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<th>GOODENOUGH H-T-P</th>
<th>RAVEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>V.IQ</td>
<td>P.IQ</td>
<td>IQ</td>
</tr>
<tr>
<td>F.S.IQ</td>
<td>MA</td>
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<table>
<thead>
<tr>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>15</th>
<th>18</th>
<th>20</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>16</td>
<td>19</td>
<td>21</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

The psychogram refer to scale items numbers, i.e., 19, 22, 24, under year 2 and opposite to items 19, 22, and 24, at Year 2 on the Social Maturity Scale.
Comparative S.I.Q. Test Pre-Post Testing Scores
(Vineland Social Maturity)

<table>
<thead>
<tr>
<th>Subject</th>
<th>C.A.</th>
<th>S.M.A.</th>
<th>S.M.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test (March 1, 1968)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S_1</td>
<td>10-1</td>
<td>3 years</td>
<td>30</td>
</tr>
<tr>
<td>S_2</td>
<td>8-10</td>
<td>3 yrs-1 mo.</td>
<td>35</td>
</tr>
<tr>
<td>S_3</td>
<td>9-8</td>
<td>2 yrs-3 mo.</td>
<td>26</td>
</tr>
<tr>
<td>S_4</td>
<td>11-3</td>
<td>3 yrs-5 mo.</td>
<td>30</td>
</tr>
<tr>
<td>S_5</td>
<td>8-7</td>
<td>2 yrs-5 mo.</td>
<td>28</td>
</tr>
<tr>
<td>S_6</td>
<td>8-1</td>
<td>2 yrs-5 mo.</td>
<td>30</td>
</tr>
<tr>
<td>Post-Test (April 1, 1968)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>S_1</td>
<td>10-2</td>
<td>2.2 y</td>
<td>22</td>
</tr>
<tr>
<td>S_2</td>
<td>8-11</td>
<td>2.5 y</td>
<td>28</td>
</tr>
<tr>
<td>S_3</td>
<td>9-9</td>
<td>2.1 y</td>
<td>22</td>
</tr>
<tr>
<td>S_4</td>
<td>11-4</td>
<td>1.77 y</td>
<td>16</td>
</tr>
<tr>
<td>S_5</td>
<td>8-8</td>
<td>2.4 y</td>
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</tr>
<tr>
<td>S_6</td>
<td>8-2</td>
<td>1.62 y</td>
<td>20</td>
</tr>
</tbody>
</table>

Note* Each subject dropped a mean of 8.6 I.Q. points with S_4 decreasing his M.A. 19 points and also 14 I.Q. points. The entire group showed a decrease in M.A. scores upon completion of the study. This test, then was dropped due to apparent bias, as per psychologists request.
BIBLIOGRAPHY


(6) American Jmnl of Mental Deficiency, 1959, The American Association on Mental Deficiency.


(38) Peterson, L. and Smith, L.L. "The Post School Adjustment of Educable Mentally Retarded Adults with that of Adults of Normal Intelligence." Exceptional Children, 1960. 26: 404-408.


