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A Comparison of Normal and Retardate Performance on the Mira Myokinetic Psychodiagnosis

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A COMPARISON OF NORMAL AND RETARDATE PERFORMANCE ON THE MIRA MYOKINETIC PSYCHODIAGNOSIS

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By

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ABSTRACT

The objective of the present study was to compare performance of normals and retardates on an expressive motor task. The test used was the Mira Myokinetic Psychodiagnosis. This test was selected because of its quality of objectivity and lack of use in the area of mental retardation. The need for such a study is evidenced by the speculation of various authors concerning the role of expressive motor behavior in personality development and its diagnostic value.

The test was administered to twenty normals and twenty retardates. The retardate sample was selected from the patient population of Parsons State Hospital and Training Center and the normal sample consisted of Juniors and Seniors at Parsons Senior High School. The samples were controlled for handedness, sex, age, and lack of gross physical handicaps. The test was administered to each subject once and then scored.

Scoring procedures followed the original instructions in Professor Mira's book. The data consisted of seventy-eight subtest scores on each individual. Each subtest of the retarded sample was compared with the same subtest of the normal population. A "t" test of significance was computed between each of the subtests to determine the

discriminative power of the test. It was found that the test discriminated between a normal and retarded performance on twenty-four of the seventy-eight subtests. This was significant at the .05 level of confidence.

The normal population was compared to a group of Uruguayan subjects who were the same age and sex. The Uruguayan norms were provided by Professor Mira in his book. However he only presents forty-four of the seventy-eight subtests, therefore forty-four "t" tests were computed between the group scores. Difference in performance was found at the .05 level of confidence.

Pearson r's were computed between the normal and Uruguayan groups on means and standard deviations. This was done to determine if the previously stated difference was related to variance or consistently different performances. Correlations were only moderately high, suggesting that difference was related to both reasons.

Development of a short form of the test was attempted to aid in the ease of scoring and administering the test. Criteria for inclusion in the short form consisted of those subtests which discriminated between a normal and retarded performance and did not discriminate between the performance of the two normal populations. It was found that only two of the subtests were able to meet these criteria.

The significance of the study is that retardates and normals perform differently on some expressive motor behavior tasks, the reliability of the test was shown to be poor, and a base line for further study was established.

The writer interpreted these findings in relation to the usefulness of the test, why certain differences occurred and made recommendations for further study.

CHAPTER I

INTRODUCTION

The Nature of Expressive Motor Behavior

Psychology in general and the testing movement in particular has generated a considerable amount of interest in the measurement of various aspects of human behavior. Examiners soon became aware of the many diverse expressions of mental ability and the many factors which might influence it. Today a wide variety of methods are available for evaluating human performance.

An area which has been relatively untouched by rigorous experimentation is expressive motor behavior. These behaviors can be readily observed in everyday experiences in terms of gestures, voice inflections, facial expressions and handwriting. However, it is a very difficult task to evaluate these behaviors in terms of what is expressive and what is adaptive. Handwriting can be individualized and expressive, but is still subject to adaptive control for the sake of communication. Most of the other previously mentioned expressive behaviors are also culturally controlled, usually in the form of visual cues from an

observer which give the necessary feedback that ones behavior is deviating from what is expected.[1]

The ability to use these visual cues appropriately often depends on age, physical condition and emotional stability.[2] A child, a person with physical limitations, or an emotionally unstable person is more likely to miss the cues and therefore exhibit expressive behavior with fewer cultural controls. Haggard[3] suggests that, since many of our behaviors are dictated by the culture we live in, cultural deprivation seems highly related to the appropriateness of expressive behavior. He further states that this has not been examined thoroughly by experimentation because measures of this type have not been included in most of our tests.

A retarded individual may fit all three of the previously stated criteria in terms of lacking in ability to pick up the necessary visual cues to exhibit appropriate expressive behavior. When this exists in an exaggerated form, the individual becomes visible in his environment

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1. Guilford, J. P. "Three Faces of Intellect," American Psychologist, 1959, 14: 469-479.

2. Allport, G. W. and Vernon, P. E., Studies in Expressive Movement, Macmillan, New York, 1933, Chapter 2.

3. Haggard, E. A., "What Do Tests Test?" Reflexes To Intelligence, Beck and Molish, The Free Press, New York, 1958. pp 181-190.

and draws an unusual amount of attention to himself.[4] His lack of ability to make the necessary discriminations may be due to cultural deprivation, organic limitations, or both. If it is of a cultural nature, he will not have sufficient information to function adequately, and if it is related to organic factors, there is probably a deficiency in receptive as well as expressive behavior.

In 1936, Dr. Mira y Lopez[5] became interested in measuring muscular memory and kinesthetic sense. From observations of candidates for the air force he noted that errors in kinesthetic estimation of space were not distributed according to the curve of normal probability. The errors were constant in certain directions. Experimentation and analysis of results indicated that the errors were due to variations in postural tonicity existing in the different muscular groups used during testing. The preliminary muscular attitude of the subject interfered with his ability to perform, and it was therefore suggested that a high correlation exists between a subject's characteristics and the nature of his errors.

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4. Leland, H. "What Is A Mentally Retarded Child?" Journal of Psychiatric Nursing, 2:1, 1964, pp 21-36.

5. Mira y Lopez, Myokinetic Psychodiagnosis, Logos Press, New York, 1958, pp 4-8.

This is the main hypothesis underlying the expressive motor behavior concept. This has been a difficult area to label quantitatively, because so few mediums lend themselves to the task. The two main types of observations which have been made are with a pencil and paper or motion picture apparatus.[6] If a sequence of pictures is used to record expressive behavior, it becomes very difficult to measure the magnitude of the behavior except in terms of frequency. On a pencil and paper task it is easier to quantify the results, however, the usual task of this nature provides the subject with visual feedback of his performance thus bringing the behavior back under adaptive control.

Although expressive behavior has not been quantified in most projective techniques, it is thought to play a significant role in understanding behavior. Freud[7] points out that expressive movement has a significant meaning in all persons, but becomes especially important in understanding the conflict in neurosis. He feels that every slip of the tongue, gesture and mannerism is a true expression of a person's feelings about a situation.

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6. Guilford, J. P., op. cit., p 274.

7. Freud, S., The Basic Writings of Sigmund Freud, (A.A. Brill, Ed.), Random House, New York, 1938, p 94.

The psychosomatic approach is very dependent on the expressive behavior construct. It is generally felt that psychic energy is transformed into somatic energy. It is the mission of psychosomatic medicine to discover the precise nature of the relationship of the emotions and body function.[8] This is also a subjective evaluation and has, therefore, not easily lent itself to experimentation.

In an attempt to further understand expressive behavior, Allport and Vernon have itemized several factors which they feel have a great deal of influence on the behavior:

1. The exigencies of the immediate goal.
2. Pathological or accidental deformation of the body.
3. Conditions of health and disease.
4. Individual peculiarities of muscular structure or bodily metabolism.
5. Constitutional make-up.
6. Age.
7. Sex.
8. Strain and fatigue.
9. Conditions of physical environment.
10. Transitory emotional states or moods.
11. Racial tradition.
12. Convention or fashion.
13. Special habits springing from special training.
14. Temporary social environment leading to artificial manner, or to a masking of normal expression. (pp 22)[9]

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8. Weiss, E. W. and English, O. S., Psychosomatic Medicine, W. B. Saunders Co., Philadelphia, Pa., 1957, pp 3-4.

9. Allport, G. W. and Vernon, P. E., op. cit., p 22.

All of these conditions would seem to play an important role in shaping expressive behavior, but with the exception of age and sex, none of them have been quantified. In other words, the problem still exists as to how much deviation one can exhibit until it becomes pathological.

The Mira Technique

In developing an instrument for the measurement of expressive motor behavior, Mira has made the hypothesis that, "Psychological space is not neutral; all the movements of the individual acquire a peculiar meaning according to the direction in which they are performed."[10]

Mira further postulates that mental activity may be considered a succession of acts implying postural changes. It is also felt that when mental equilibrium is disturbed, there is also a distortion of movements dependent upon the degree to which any voluntary attempt at compensation is eliminated. He has, therefore, included in his instrument a provision for not allowing visual feedback as the subject is performing. He feels that the differences that can be detected in this manner will signify the individual's habitual attitudes of reaction, providing they are sufficiently constant.

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10. Mira y Lopez, op. cit., p 9.

The actual testing technique requires subjects to trace lines and other figures while their vision is screened. The lines to be drawn are known as "kinetograms". They are drawn with the right and left hands in three different planes: horizontal, vertical, and sagittal (perpendicular) to the front of the body. Various forms of kinetograms are used to insure a variety of motor activities. These forms are referred to as: lineograms, zig zags, staircase, circles, chains, and parallels. Objective scores are derived from length of lines, directions of shifting, comparison of movements towards and away from the body, and size of angles. The subject is required to be screened from his work at all times and during the performance to keep his arms in the air, never in the resting position.

Statement of the Problem

The natural limitations in the measurement of expressive motor behavior have been previously stated. Mira feels that his technique avoids most of these limitations with his instrument by the use of meaningless lines, removal of all direct visual cues, no language responses, and no feedback of right or wrong. Mira's basic assumption is that psychic energy is transformed

into somatic activity and specifically into skeletal-muscular tonicity.[11] He suggests that the six sets of figures in the Myokinetic Psychodiagnosis require the necessary motor skills to present a complete picture of expressive motor behavior. With the objective scoring system defined in the instructions, it is postulated that it is possible to detect the different degrees of tonicity present and to make comparisons between individuals and groups or diagnostic categories.

The present study will examine the performance of retardates and normals and also indicate a comparison between the normals in the first comparison and the normals reported by Mira.[12] Although performance on the Myokinetic Psychodiagnosis by mental defectives is referred to, there are no quantitative results available. In a personal communication by letter, Mira indicates that he has never published his results on mental defectives.[13] A review of the literature indicates that there are no available norms for the performance of retardates on the Myokinetic Psychodiagnosis.

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11. Ibid.

12. Mira y Lopez, op. cit., pp 152-153.

13. Personal communication with Professor Mira y Lopez, translated by Dr. Luis Fernandez, dated Nov. 9, 1963.

The present study is mainly concerned with the objective scores of groups on individual subtests. The subjective interpretation of the test performance was not considered as a main issue, i.e. the direction of deviation, suggested as being indicative of personality characteristics, [14] was not considered at this time. Thus no attempt to attach labels such as "aggression, anxiety or passivity" has been made.

Definitions

To acquaint the reader with some of the terminology used in this phase of the study, the writer will list and define the terms which seem more nebulous.

Normals

This refers to twenty-five junior and senior high school male students from Parsons Senior High School. It also refers to the 600 Uruguayan male students from the Laboratorie Morey Otero de Montevideo whose scores have been tabulated by Mira.[15]

Retarded and Mental Defective

This refers to subaverage intellectual functioning which originates during the development period and is associated with impairment in adaptive behavior.[16]

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14. Mira y Lopez, op. cit., pp 37-38.

15. Mira y Lopez, op. cit., p 152.

16. Heber, R., "A Manual on Terminology and Classification in Mental Retardation," Mono. Suppl. AJMD, (sec. ed.), 1961, p 58.

In this particular study they were all resident patients of Parsons State Hospital and Training Center.

Expressive Motor Behavior

This refers to a dynamic relationship between organism and internal and external environment, with the individual as the nexus, displaying unity, consistency and continuity.[17] It is also defined as individual peculiarities in the manner of performing adaptive acts.[18]

Kinetograms

This refers to the line figures on the test which are to be reproduced by the subject. The figures are various shapes which require a variety of motor skills to complete them. The six different shapes are: straight lines, zig zags, staircases, circles, chains, and parallels.[19]

In summary, this chapter was designed to acquaint the reader with the problems in measuring expressive behavior. The general approach to the task, and the samples were outlined. The Myokinetic Psychodiagnostic technique was presented along with the limitations of

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17. Precker, J. A. & Wolfe, W., "Expressive Movement and the Methods of Depth Psychology," Projective Techniques, (Anderson & Anderson, Ed.), Prentice Hall, Englewood Cliffs, N. J., 1951, p 457.

18. Allport, G. W. & Vernon, P. E., op. cit., p 465.

19. Mira y Lopez, op. cit., pp 13-18.

this type of study. Finally, terms which are unique to this type of study were defined and other terms that will be presented in later chapters.

CHAPTER II

REVIEW OF THE LITERATURE

The Mira Technique

In 1936, Professor Mira y Lopez and some of his colleagues were instructed to build an instrument to measure muscular memory and kinesthetic sense in candidates for the Air Force of the Spanish Republic. Test performances indicated that the nature of an individual's errors were in a consistent direction. He did a follow-up study in 1939 which consisted of developing the various tasks which are now present in the Mira Myokinetic Psychodiagnosis.[20]

His findings were presented to the Psychology Section of the Royal Society of Medicine, 1940, in London, England. They were again reported at the 1942 Salman Lecture of the New York Academy of Medicine. It was at the latter presentation that Dr. Leopold Bellak became interested in Professor Mira's work. Drs. Leopold Bellak, Michael H. P. Finn, Leonard Small and Francis Bishop undertook the task of translating the original work from Spanish into English.

A review of the literature indicates that there have been only a few published studies using the Mira technique.

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20. Mira y Lopez, op. cit., pp 6-8.

This writer could only find one study published in the United States and none which used the complete test in its original form.

The use of the Mira technique in that one study published in the United States was part of a doctoral dissertation at the University of Utah by Max Talmadge. His report states:

> "A modification of the Mira technique is used as a test instrument. Mira's test has not been validated and his claims have not been substantiated; hence, little use is made of his original findings. In the present modified form of this test, only some of the quantitative scorable categories are used. Other measures not used by him are utilized." (p. 4)[21]

The results of the Talmadge study indicate that "(1) Graphic-motor movements are stable measures, and test-retest correlations will reveal a high degree of reliability. (2) Individuals are internally consistent in their graphic-motor movements. Similar movements will be highly correlated. (3) Certain types of graphic-motor movements go together and orderly relationships exist among the various movements."[22]

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21. Talmadge, "Expressive Graphic Movements and Their Relationship to Temperament Factors," Psychological Monographs, 1958, 72:16, p 4.

22. Idem., p 28.

The test has had a more widespread usage in psychiatry as indicated by its more frequent appearance in the French literature.[23] These studies have incorporated the complete Mira technique but have mainly concerned themselves with the dynamic projective qualities of the test. The paradigm which is usually used in designing a study in which the Mira technique is used, involved examining the test performances of previously diagnosed psychiatric cases. The examiners then try to isolate certain factors which are consistent for particular diagnostic entities. From this the general hypothesis was stated that, for right-handed subjects a consistent deviation with the right-hand was typical of a psychotic disorder, and a deviation in the left-hand performance was more consistent with a neurotic disorder.[24]

Another type of study which is often used is to obtain a large number of test performances and have them analyzed by a group of "experts". This is usually attempted only on one dimension of the test at a time,

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23. Translations from the French were done by Dr. Henry Leland, PSH&TC.

24. Coronel, Cesar G., "Le Psychodiagnostic Miokinetique du Professeur Mira considerations sur le Resultat Obtenu dans 5000 cas," Psychiatrie Clinique, Herman & Cie., Paris, 1952, pp 138-139.

i.e., aggressiveness. The purpose of this type of evaluation is to determine reliability in terms of agreement among the "experts". One such study reports approximately 75 per cent agreement in 152 cases.[25]

In an attempt to locate studies previously done with the Mira technique, the writer contacted Dr. Leopold Bellak. He indicated that he knew of no particular studies that had been done, but that he thought Dr. Michael H. P. Finn might have completed some work in the area.[26] Dr. Finn indicated that he had planned to use the test with groups of normals and retardates, but would not start the study until the summer of 1964.[27]

Professor Mira has in his original text, norms for various diagnostic groups. He frequently makes reference to the ability of the test to discriminate between normals and retardates.[28] However, there are none of these type norms available. In contacting Professor Mira it was

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25. Bustamante, J. A.,"Miokenetical Psychodiagnosis as a Test of Aggressiveness," Psychiatrie Clinique, Herman & Cie., Paris, 1950, pp 45-48.

26. Personal communication from Dr. Leopold Bellak, Sept. 18, 1963.

27. Personal communication from Dr. Michael H. P. Finn, Oct. 8, 1963.

28. Mira y Lopez, op. cit., p 125.

learned that, although he had used the test on retardates, he had not established norms. The material was used in a speech at a medical convention and was never treated statistically or formally recorded.[29]

Other Related Studies

Although there has been very little research done on the Mira Myokinetic Psychodiagnosis, the literature contains several studies on expressive motor behavior. The best known study in the area is that of Allport and Vernon in 1933.[30] They examined the intraindividual consistency of expressive movements by direct measurement using such measures of motor performance as estimation of distance with hands and feet, writing pressure, estimation of weights, intensity of voice, and number of lines on a page. For twenty-five male subjects, the repeat reliabilities in the same experimental session averaged .75; those at different sessions averaged .64.[31]

A number of books have been written about graphology and drawings as being indicative of personality and

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29. Personal communications from Professor Mira y Lopez, translated by Dr. Luis Fernandez, PSH&TC, Nov. 9 and Dec. 14, 1963.

30. Allport, G. W. and Vernon, P. E., op. cit., Chapter 3.

31. Allport and Vernon, op. cit., p 128.

individual differences. In 1924, it was claimed by Poffenberger and Barrow that:

> The moment we touch upon line form we are already, in strictness, beyond the elements. Form enters the motor factor, which cannot be separated from the motor innervations of the whole body. The impression of the lines involves expression, a meaning which we cannot escape. (p. 187)[32]

The lack of objective studies and the difficulty in determining specific measurable categories of expressive movements, has limited the validity of most techniques used in experimental investigations. Although it is difficult to measure, most authors consider it to be a definite part of an individual's personality. Expressive motor behavior plays a large part in distinguishing one individual from another:

> Given the same materials to work with each person approaches the situation in his own individual or characteristic way, handling the materials and organizing the situation differently. The movement patterns, the gestures, the rhythm, and the physiological bodily responses of each individual vary considerably. (p. 461)[33]

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32. Poffenberger, A. T., and Barrow, B. E., "The Feeling Value of Lines," Journal of Applied Psychology, 1924, 8, p 187.

33. Precker, J. A. and Wolfe, W., op. cit., p 461.

Related Tests

The concept of expressive motor behavior is used in many of the paper and pencil projective techniques that are used today. The concept influences performance on such widely used tests as the Draw-a-Man and the Bender Visual-Motor Gestalt. The concept of expressive motor behavior is included in the scoring of the DAP, but in terms of quality (presence or absence) not quantity (degree of error). In other words, failure to include an item on the Draw-a-Man Test, such as ears, does not earn a score for the subject. On the other hand, if ears are included in the drawing, it is given a score, and if the placement or size is appropriate, another score is earned.[34] As previously indicated, the scoring does not lend itself to descriptions of amount or type of deviation.

The Bender Visual-Motor Gestalt Test has essentially the same approach to the task of recording expressive motor behavior. It takes into consideration angulation and rotation, but only in terms of a general lack of exactness in reproduction which is then compared to normative drawings for particular age groups.[35] Again,

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34. Goodenough, Florence, Measurement of Intelligence by Drawings, New York: Harcourt, Brace, and World, Inc., 1954, p 90-110.

35. Bender, Lauretta, A Visual Motor Gestalt Test and Its Clinical Uses, New York; The American Orthopsychiatric Association, Ninth Printing, 1958, p 132.

actual degree of angulation and rotation is not measured. A scoring procedure has been developed by Pascal and Suttell[36] which is more objective than the previously stated method. The scores consist of amount of deviation, however the method falls under the criticism of giving the subject visual feedback. Professor Mira believes that not only does measuring the degree of deviation give us a linear measurement to compare, but it also seems important in making discriminations between particular diagnostic classifications.[37]

Finger painting is another modality which depends on expressive motor behavior when used to evaluate subjects. Although evaluation and interpretation is usually concerned with the content of the performance, it includes various other aspects which Professor Mira considers essential in measuring expressive motor behavior. For example, the test concerns itself with the use of both hands and physical motions used by the subject. Motions are usually considered in terms of whether they are away or toward the body.[38]

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36. Pascal, G. R., and Suttell, B. J., The Bender Gestalt Test: Its Quantification and Validity for Adults, New York: Grune and Stratton, 1950.

37. Mira y Lopez, op. cit., p 37.

38. Pennington, L. A. and Berg, I. A., An Introduction to Clinical Psychology, New York: The Ronald Press Co., 1948, p 427.

These, and nearly every performance test, are influenced by expressive motor behavior. Most of the tests are not designed specifically to measure this behavior. They are, therefore, susceptible to Gordon Allport's criticism that this is the most neglected area of personality evaluation and, with the exception of Professor Mira's test, there are no methods available for objectively measuring the various aspects of expressive motor behavior in terms of differentiating between diagnostic groups.[39]

Performance on most projective techniques is influenced by cultural convention and constraint, by visual and other sensory cues that tend to keep the expressive impulses within bonds, and by feedback from the observer that results in redirected movement.[40] The Mira method of Myokinetic diagnosis avoids most of these limitations. The subject is asked to draw a few meaningless lines and then all visual cues are removed and the drawings are to be completed blindly. There are no language responses, no feedback, no knowledge of right or wrong and, according to Professor Mira, "this leaves

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39. Allport, G. Forward in Mira y Lopez, op. cit., p xiv-xv.

40. Ibid.

impulsivity in full command, though it likewise measures the control the subject tries to exert over his temperamental impulses."[41]

Physiological Aspects

It has been shown that emotional states influence expressive motor behavior.[42] It is also felt by various authors that expressive motor behavior is influenced by the physiological state of the organism and maturation.[43] This becomes extremely important when one is concerned with the performance of mental defectives. Heber defines mental retardation as "subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior."[44] He further indicates that an impairment in adaptive behavior is usually reflected in maturation, learning and/or social adjustment. Impairment in only one of these three aspects is necessary for a diagnosis of mental retardation.[45]

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41. Mira y Lopez, op. cit., p 38.

42. Allport, G. W. and Vernon, P. E., op. cit., Chapter I.

43. Mira y Lopez, op. cit., p 126.

44. Heber, R., op. cit., p 3.

45. Heber, R., op. cit., p 4.

Further support of the concept that expressive motor behavior is impaired in a defective organism is suggested by Fulton. He states:

> A slight deviation in movement is not checked as quickly by the defective cerebellum as it would be in a "normal". But once it is checked it tends to be overcorrected which results in an opposite deviation, which is checked again after a short lag and then overchecked. This leads to ever increasing oscillations of the movement progress. (p. 144)[46]

Bender points out that in studying the responses of defective subjects in which the motor reaction pattern appears mature, but in which the intellectual level is low, the responses resemble primitive patterns. Retardation in maturation seems to simplify the pattern reaction and the responses are childlike in nature.[47]

Bender suggests that the major cause of an inappropriate reproduction, by a mentally retarded subject, is a result of a perceptual difficulty.[48] The Mira technique cannot deny that this possibility exists and may result in an inadequate reproduction on the Mira test, but it is constructed in such a manner as to minimize this

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46. Fulton, J. F., Physiology of the Nervous System, New York: Oxford University Press, Second Ed., 1943, p 144.

47. Bender, op. cit., Chapter 3.

48. Idem., p 23.

effect, i.e., the original stimulus is seen only for a short period while the subject traces over it three times.

The performance of retardates would be further compounded if the retardation is associated with a psychiatric impairment. It has been noted that in the case of a psychiatric disturbance in which the subject is having a general adjustment problem, there is always the tendency for sensory motor patterns to revert back to more primitive principles and to express movement at that level.[49]

Perception and afterimage would seem to play a large role on a task such as the Mira Myokinetic Psychodiagnosis. Murchison states that "all experienced order in space is a true representation of a corresponding order in the underlying dynamical context of physiological processes."[50] In other words, what we see is defined by the adequacy of our physiological processes.

The actual brain functions which define how successful control of movement will be, consists of an interaction between the cerebellum, cerebral cortex and the muscles that execute the movements. The cerebellum receives

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49. Idem., p 25.

50. Murchison, C., Psychologies of 1930, Worcester, Mass., 1930, p 148.

impulses from both the cerebral cortex, particularly anterior to the fissure of rolando, and the muscles.[51] Ruch expands this theory as to what occurs in some cases of organic brain damage.

> Between the brain and the muscles, there is a circle of nerves; one nerve conveys the influence from the brain to the muscle; and another gives the sense of the condition of the muscle to the brain. If this circle is broken by the division of the motive nerve, notion ceases; if it be broken by the division of the other nerve there is no longer a sense of condition of the muscle, and therefore no regulation of it actively. (p. 199)[52]

Coronel presents a functional schema of man in terms of performance on the Mira test. He states that performance is influenced by inner tensions which accumulates from all exercise. All of the systems of integration play a part in determining the effectiveness of any one person's performance. He defines the systems of integration as: vision, tactile, balance, reflex, interpretation, voluntary and automatic movements. Various activities give rise to the functioning of these systems. This sets up the state of tension which defines a person's type of performance.[53]

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51. Ruch, T. C., "Motor Systems," Handbook of Experimental Psychology, (S. S. Stevens, Ed.), New York: London, John Wiley & Sons, Inc., 1962, pp 198-199.

52. Ibid., p 199.

53. Coronel, Cesar G., El Psicodiagnostico Miokinetico, Buenos Aires, Editorial "LA ERRE," Second Ed., 1962, pp 17-42.

Other Considerations

The various authors who have written on the subject of expressive motor behavior generally indicate (1) that it is a definite part of an individual's personality; (2) that they have not measured it very accurately, and (3) that they would like to see more work done in the area. Most authors agree that the Mira Myokinetic psychodiagnosis appears to have a potential for giving a more accurate description of expressive motor behavior, but there is not enough known about the technique at this time. Bell states about the test:

> In its present state of development, its results are so tentative that it cannot be applied immediately for discriminations between clinical groups or for analysis of the structure of the personality in individual cases. Standardized experiments with the technique should be relatively easy to develop, since the major analysis of the results of its use by various experimenters should be possible. (p. 340)[54]

In describing various project techniques, Precker and Wolfe give a summary of the various hypotheses underlying the Mira Myokinetic Psychodiagnosis. They make the following conclusions:

> Again, it must be emphasized that Mira's hypotheses are all in need of experimental study and validation. The empirical results look promising; nothing is known about the

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54. Bell, J. E., Projective Techniques, a New Approach to the Study of Personality, New York: Longmans, Green, 1948, p 340.

> psychological rationale nor do the test results give us any insight into the dynamics and structure of personality. (p. 534)[55]

After translating Mira's work into English and studying the method very closely, Dr. Bellak and his colleagues did not always agree with his theoretical formulations. They indicated that as the test now stands, it does not meet the American Psychological Association's standard for psychological tests. They also felt that in its present form the test is too cumbersome for the practicing psychologist and that the techniques of administration and scoring could be rationalized and thus shortened.[56]

Allport states that he realizes that the test is lacking in standardization and validation, but he feels that since Mira's original work has been translated into English, it opens up a wide horizon for technicians to tackle these problems. He views the further development of this test as giving incentive to examine afresh the composition of temperament and the significance of motor impulses.[57]

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55. Precker and Wolfe, op. cit., p 534.

56. Mira y Lopez, op. cit., (Editors Preface), p 19.

57. Allport, G. Forward in Mira y Lopez, op. cit., p xiv.

CHAPTER III

DESIGN OF THE STUDY

Description of the Test and Apparatus

A review of the literature reveals very little information about the Mira technique. There are no norms available on American subjects nor could this writer locate any studies which used the complete test. The present study was undertaken as an initial step in providing data about retarded and normal performances on all aspects of the test.

The Mira Myokinetic Psychodiagnosis technique was used in its original form. Administration and scoring procedures were done with rigid conformity to the standards presented in Professor Mira's book. "Proper administration of the test depends on the correct utilization of certain standardized materials."[58]

The actual materials necessary to administer and score the test are as follows:

(1) The test booklet. This consists of six numbered pages upon which are printed the models of drawings to be executed by the subject. (See Appendix III.) The order of the drawings are: lineograms; zig zags; stairs and circles; chains; egocifugal parallels and vertical U's;

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58. Mira y Lopez, op. cit., p 12.

egocipetal parallels and sagittal U's. The size of each page is $10\frac{1}{4}$ x $12\frac{1}{2}$ inches.

(2) The table. A special table is needed which is seventy-two centimeters high. The top of the table is fifty-seven centimeters long and forty-five centimeters wide. The top is arranged so that it can be placed in a vertical position for certain parts of the test. The test booklet is held to the table by a frame which holds the paper secure. (See Appendix V.)

(3) Chair. An armless chair is used because the subject is not allowed to rest his arms on anything.

(4) Pencils. At least two well-sharpened #2 pencils are recommended. The examiner should have a red pencil to mark the lines on the drawings which are used for scoring.

(5) Visual block screen. A strong cardboard screen of a solid light color is used to interpose between the subject's eyes on the test to block his vision. The screen is held vertically, being careful to never touch the subject.

(6) Cardboard covers. These are used to cover each of the subject's drawings as he completes them. This prevents feedback from the performance.

(7) Ruler in millimeters and a protractor. These are used because the final scores are represented in millimeters or angle size.

The entire test contains seventy-eight separate subtest scores. (See Appendix II.) For detailed information on administration and scoring procedure, the reader is referred to Professor Mira's book.[59] The scores consist mainly of length of lines, primary deviation, secondary deviation and angular deviation. There are unique applications of each of these dimensions which varies with the subtest and the plane in which it is drawn. The final score which is ascribed to a subtest is an expression of the amount of the subject's deviation from the model forms. These scores are assigned a plus or minus value according to the direction of the deviation.

The basic instructions for administering the test are for the subject to sit up straight and never rest his arms while performing. The subject is allowed to make three traces of model stimuli with vision, then ten traces without vision. The tenth trial is marked by the examiner for later scoring.

Description of the Populations

The study was designed to establish magnitude and significance of difference in retarded and normal performance. In selecting the retardate population a pilot study was used to determine what type of subject could

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59. Mira y Lopez, op. cit., pp 12-36.

successfully complete the task. The pilot groups consisted of three levels of measured intelligence, three subjects in each group. The levels were: I (IQ 70-84); II (IQ 55-69); and III (IQ 40-54).[60] Intelligence quotients used are those scored by the subject on the full scale of the Wechsler Adult Intelligence Scale. The subjects in the pilot study were right-handed males, sixteen to nineteen years of age, and with no gross physical anomalies which would impair functioning on the test. It was found that all of the subjects at levels I and II could complete every item of the test and none of the level III subjects could function on all seventy-eight tasks.

The retardate sample was then selected from the resident patient population of Parsons State Hospital and Training Center. Requirements for selection were that the subjects be male, right-handed, between sixteen and twenty years of age, and have no physical anomalies which would impair their functioning on the test.

The final population consisted of twenty-five subjects which met the previously stated qualifications. The group had a chronological age range from sixteen years, four months to nineteen years, ten months, with a mean age of eighteen years, four months. (See Table I.)

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60. Heber, R., op. cit., p 58, (using the Wechsler Adult Intelligence Scale).

Every patient at Parsons State Hospital and Training Center has an official etiological diagnosis.[61] These diagnoses for the twenty-five subjects in the present sample are presented to further clarify the parameters of the sample. (See Appendix IV.) The diagnoses presented contain etiology of retardation and type of psychiatric impairment. It should be noted that none of the subjects have severe organic limitations, nor do any of them have a diagnosis of a psychotic reaction.

After completing the study, it was noted that five of the original twenty-five subjects in the retardate sample could not successfully complete all seventy-eight items on the test. These five were withdrawn from the sample. Further considerations of why they were thrown out and what implications this might have, will be discussed in a later chapter.

The normal population was selected from the students of Parsons (Kansas) Senior High School. The sample originally consisted of twenty-five subjects, however, five were dropped from the study to maintain the same size sample as the retardate group. A table of random numbers was used to determine which five of the twenty-five subjects were to be omitted.

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61. Heber, R., op. cit., pp 10-19.

The physical requirements of the sample were essentially the same as for the retardate population. This consisted of male subjects between sixteen and twenty years of age. They were all right-handed, had no physical handicaps. In addition they were reported by the school as being of at least average or above scholastically.

The final sample included subjects with an age range from sixteen years, six months to seventeen years, eleven months. The mean age of the group was seventeen years, three months.

TABLE I

AGE COMPARISONS BETWEEN NORMAL AND RETARDED SUBJECTS

Subjects	N	Age Range	Mean Age
Normal	20	16 years, 6 months-17 years, 11 months	17 years, 3 months
Retarded	20	16 years, 4 months-19 years, 10 months	18 years, 4 months

Design

Each subject in both groups was individually given the test in the same manner. All seventy-eight subtests were scored for each subject. The subtests were treated as individual scores to be compared between groups. Since Professor Mira's method does not allow for the combining of scores to obtain a composite score, the subtests had to be considered as separate and unrelated tasks.

The scores for any one subtest were then added together within the two groups. Since it is possible to receive a minus score on an item, a constant of 100 was added to all scores. It was found necessary to do this to be able to treat the data statistically. This resulted in a composite score for each subtest of each group which was then compared to the same subtest of the other group.

The purpose of the study was to determine if the test could discriminate between a normal and retarded performance, and particularly which of the subtests are the best discriminators. To determine this, a test of significance was computed between each subtest score of both groups. The mean and standard deviation for each seventy-eight subtests, by groups, was compared by the use of a "t" test to determine significance of the

difference between each groups' scores. An uncorrelated "t" test was used because data met the following criteria: different samples, homogeneity within samples, one treatment for both samples, and hypothesis concerned difference between two means.[62]

A second part of the study was to compute the same type of analysis between the normal group in the present study and a set of norms supplied by Professor Mira.[63] These norms are on 600 subjects at the Laboratorie Morey Otero de Montevideo. They are Uruguayan male and female adolescent students. The age range is from twelve to eighteen years of age.

Professor Mira only presents scores and standard deviations for forty-four of the seventy-eight subtests for the Uruguayan group. Therefore, the comparison between the normals of the present study and Professor Mira's normative group could only be compared on forty-four variables.

It should be noted that the comparison between these groups required matching the same subtests. The only subtests from the normal population in the present study

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62. Winer, B. J., Statistical Principals in Experimental Design, New York: McGraw-Hill Book Company Inc., 1962, pp 24-31.

63. Mira y Lopez, op. cit., pp 152-153.

which were used, were the forty-four that coincided with the forty-four that Professor Mira reports in the Uruguayan subjects.

Professor Mira reports norms on both male and female Uruguayan subjects, however, only the male norms were used for comparison in the present study. There is no mention of the percentage of handedness of the Uruguayan population. The present study used only right-handed males for maximum consistency between the first comparisons.

Finally, an over-all comparison was made between normals in the present study and the Uruguayan population. This was examined by using product moment correlations (Pearson r.).[64] The correlations were computed separately for the means and standard deviations of all forty-four subtests.

The null hypothesis was made concerning the comparison between normals and retardates in the present study. Acceptance or rejection of this hypothesis was made at the .05 level of confidence. The subtests which discriminate between the groups at this level will be considered in Chapter IV as a possible method of developing an abbreviated form of the Mira Myokinetic Psychodiagnosis. (See Table II, Page 41.)

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64. Edwards, A. L., Experimental Design in Psychological Research, New York: Rinehart & Co., Inc., 1960, pp 77-82.

The null hypothesis was also made for the comparison of normals in the present study and the Uruguayan population presented in Professor Mira's book. This hypothesis was also to be accepted or rejected at the .05 level of confidence. To determine reliability, the data were examined to note if the subtests which failed to discriminate between the normal and retardate samples were related to the subtests which did show a significant difference between the normals and the Uruguayan subjects. (See Table III, Page 50.)

A further examination of the data was required to strengthen the quality of a proposed abbreviated form of the test. It was decided to include only those subtests which successfully discriminated between the normal and retardate populations, and did not indicate significant difference between normals and the Uruguayan students. (See Table IV, Page 55.) The subtests which could meet this criteria would therefore be more reliable and valid.

The subtest analysis, and the over-all comparison of the normals in the present study and the Uruguayan population, was included in the study to test the reliability of the instrument and provide norms for further study.

In summary, the study compared the performance of twenty retardates and twenty normals on each subtest of the Mira Myokinetic Psychodiagnosis. The normals were also compared to a set of norms provided by Professor Mira on similar subjects. An abbreviated form of the test was proposed using the subtests which discriminated between normals and retardates and did not indicate a difference in performance between normals and the normative material in Professor Mira's book.

The null hypothesis was made for all comparisons. The .05 level of confidence was used as the criterion for acceptance or rejection. This level was used because of the universality of agreement that it reduces the possibility of making Type I and II errors.

CHAPTER IV

ANALYSIS OF THE DATA

Description of Statistical Procedure

The purpose of this study was to compare the performance of retardates and normals on the Mira Myokinetic Psychodiagnosis. A further evaluation of the normal performance consisted of comparing the obtained sample to a set of norms supplied by Professor Mira. Also an attempt was made to develop a short form of the test based on the subjects' performance in the present study.

The Mira Myokinetic consists of seventy-eight subtests. Each subject has to produce a scorable performance on all seventy-eight tests. The scores are then added together for any one subtest, thus giving seventy-eight total scores per group. These scores could only be directly compared to scores from the same subtest of another group.

This was the only method of analysis that could be used, because Professor Mira did not provide a method of combining subtest scores or even subcategory scores. Since one of the objectives of the study was to use the Mira Myokinetic Psychodiagnosis in its original form, it was decided to rigidly adhere to Professor Mira's scoring system.

For statistical examination of the data, a "t"[65] test of significance was chosen on the basis that there had to be seventy-eight separate comparisons made, each of which would indicate whether or not one group's performance significantly differed from the other, although other statistical procedures were considered, it remained obvious that, since seventy-eight separate computations would have to be made, a "t" test would serve the data adequately. Other procedures which would indicate significance of difference and level of confidence, would require considerably more computation and would not greatly increase the accuracy.

It was determined that the level of confidence should be set at .05 for accepting significance to reduce the chances of making Type I and Type II errors. P values, which reached the .01 level were also reported, but only as more information about the level of significance. In using the .05 level, it is assumed that significant results will be obtained five times in 100 chances. Therefore, one would expect significance approximately four times in the present study, because seventy-eight variables were used. The null hypothesis is to be accepted or rejected on this basis.

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65. Idem., pp 111-112.

Normals versus Retardates

The performance of normals and retardates was evaluated in terms of the previously stated statistical procedure. (The results are shown in Table II) It was found that twenty-four of the seventy-eight subtests were able to discriminate between the normal and retarded performance. On each of these twenty-four subtests, the performance of normals and retardates differed significantly, at the .05 level of confidence. The "t" test was used in a two tailed manner, because the direction of deviation or difference became important, since it is possible to receive a score with a minus value. Therefore, to insure over-all significance at the .05 level, it was decided to use only those P values which were greater than the .025 level of confidence. In the present comparison, with seventy-seven degrees of freedom, P value at the .05 (.025) level was 1.99, and at the .01 (.005) level P had to be greater than 2.64.[66] (Table II)

Since the test is able to discriminate between normal and retarded performances on twenty-four of the seventy-eight subtests, the null hypothesis is rejected in terms of previously stated criteria. These twenty-four subtests then become the possible parts of the test to be considered

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66. Edwards, A. L., op. cit., p 361.

TABLE II

COMPARISON OF MEANS, STANDARD DEVIATIONS
AND P VALUES BETWEEN NORMALS AND RETARDATES

	Normals		Retardates		
Subtest No.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	P
1	8.15	14.17	-.10	10.38	2.05*
2	5.35	7.40	8.70	11.10	1.09
3	-7.00	8.19	-7.00	9.25	0
4	37.20	4.30	37.70	7.08	.26
5	-.60	4.27	-1.45	6.23	.49
6	2.40	9.46	3.40	8.40	.34
7	4.40	6.94	7.00	12.17	.81
8	-10.95	9.07	-11.05	10.05	.03
9	35.00	4.57	37.15	7.67	1.05
10	-.70	3.85	-.55	3.23	.13
11	21.35	8.51	27.70	8.40	2.32*
12	10.50	5.41	13.60	6.23	1.64
13	10.85	4.14	14.10	5.86	1.97
14	49.60	15.68	42.10	16.63	1.43
15	26.60	10.86	20.25	11.02	1.79
16	23.00	16.02	21.85	12.53	.25
17	8.35	5.79	7.85	4.81	.29
18	6.20	22.92	-2.00	24.66	1.06
19	21.75	7.82	33.30	12.51	3.42**
20	10.85	5.62	17.60	8.79	2.82**

TABLE II-cont.

Subtest No.	Normals $\bar{X}$	Normals S.D.	Retardates $\bar{X}$	Retardates S.D.	P
21	10.90	4.24	15.70	7.50	2.44*
22	45.65	13.53	40.75	19.15	.71
23	17.00	10.76	22.40	14.29	1.32
24	28.65	16.38	18.85	11.37	2.14*
25	7.35	5.72	10.80	9.96	1.31
26	19.65	6.41	33.95	12.22	4.52**
27	10.25	4.41	19.85	8.03	4.57**
28	9.40	3.31	14.10	6.36	2.86**
29	46.35	11.88	29.30	6.18	5.55**
30	26.30	9.56	16.05	6.73	3.82**
31	20.05	9.51	13.25	7.63	2.43*
32	6.90	5.00	6.20	4.79	.44
33	4.65	20.41	-1.95	23.94	.91
34	20.10	7.90	34.50	12.38	4.27**
35	12.05	6.39	20.65	11.92	2.77**
36	8.05	2.67	13.85	7.41	3.20**
37	45.10	13.89	33.30	13.42	2.66*
38	25.00	13.14	18.65	10.43	1.65
39	19.60	11.22	14.65	7.18	1.62
40	5.85	4.46	10.20	5.47	2.68**
41	7.30	32.48	2.40	45.84	.38
42	5.15	14.35	9.65	13.05	1.01

TABLE II-cont.

Subtest No.	Normals $\bar{X}$	Normals S.D.	Retardates $\bar{X}$	Retardates S.D.	P
43	12.60	10.41	11.40	8.09	.40
44	9.10	21.01	8.10	28.65	.12
45	-6.85	10.17	-7.60	13.21	.20
46	9.70	8.22	16.35	14.29	1.76
47	13.80	11.14	12.90	13.58	.22
48	15.90	12.83	19.05	13.12	.75
49	36.85	24.63	8.10	42.43	2.55*
50	11.90	8.52	15.00	13.50	.85
51	13.50	9.45	18.10	15.78	1.08
52	5.55	39.48	15.10	39.49	.80
53	13.35	8.06	20.70	12.96	2.10*
54	8.15	6.40	14.20	9.68	2.27*
55	10.45	35.48	-1.40	26.64	1.11
56	12.95	8.78	15.40	12.80	.69
57	9.50	7.76	17.90	14.86	2.19*
58	-22.15	27.96	-5.15	29.61	1.82
59	54.40	9.37	58.75	13.15	1.18
60	37.10	8.06	36.00	8.26	.42
61	-5.45	29.27	-10.40	23.92	.57
62	13.35	9.63	13.70	7.68	.12
63	55.15	8.96	64.90	6.41	3.85**
64	38.95	7.37	40.70	6.06	.80

TABLE II-Cont.

Subtest No.	Normals $\bar{X}$	Normals S.D.	Retardates $\bar{X}$	Retardates S.D.	P
65	52.25	7.05	56.55	13.21	1.25
66	33.75	7.23	36.10	8.41	.93
67	-8.75	27.29	-9.50	22.84	.09
68	13.65	7.02	16.55	8.84	1.12
69	53.05	9.96	59.65	9.21	2.12*
70	36.95	5.55	40.00	9.06	1.25
71	-10.90	14.50	-12.50	23.24	.25
72	10.55	7.98	15.00	8.72	1.64
73	.85	9.28	2.65	13.38	.48
74	9.70	7.38	18.60	13.08	2.58*
75	-13.20	14.59	-12.30	13.52	.20
76	9.00	8.10	15.05	17.03	1.40
77	7.55	13.40	7.05	12.98	.17
78	9.50	8.02	13.45	10.80	1.28

* significance at the .05 level

** significance at the .01 level

in the construction of a short form of the Mira Myokinetic Psychodiagnosis. These considerations will be discussed later in this chapter.

The discriminating subtests were further evaluated in terms of the types of expressive motor behavior required to perform them. Judging linear distance seemed to be the most difficult task. Fifteen of the twenty-four subtests required that the subject reproduce a line that was of a specific length. The retardates fluctuated in both directions in terms of making the lines too long and too short. The actual test measurement consists of measuring the lines which are longer than the model or shorter than the model. The retardates tended to make short lines at first, then began to draw progressively longer lines. This seems to be consistent with Fulton's theory that the defective brain checks a response, then tends to overcheck it.[67]

A third type of measurement which involves length of lines, is the linear difference. This consists of subtracting the length of the shortest line from the longest line. Again, the retardate had a consistently higher score, because of their tendency to overexaggerate and underexaggerate the length of the original model. It is interesting to note that deviations on this type of task occurred in the right hand as frequently as the left hand.

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67. Fulton, J. F., Loc. Cit.

The other nine discriminating subtests consisted of errors in primary deviation, axial deviation, and angulation. Primary deviation and axial deviation are essentially the same processes. These measures consist of evaluating the amount of deviation, in terms of direction, from the model, e.g., when the task is continued tracing over the model, the primary deviation would be the distance above or below the center of the model of the last drawing made. Axial deviation would then be the degree of angular deviation from the vertical axis.

In measuring angulation, the process is similar to length of lines. Some of the tasks require that repeated angles be reproduced that are the same size as the model angle. The measurements that are recorded are of the largest angle, smallest angle, and the difference between the two. The retardates again began by drawing very small angles which progressively became larger until they were totally out of proportion.

Sixteen of the twenty-four discriminators came from one general test category. These were in test number two (zig zags). This is possibly because the zig zags contain all of the previously stated qualities with which the retardates seem to have difficulty. Again, the number of significant deviations was approximately the same for the right and left hands.

The test is performed in three planes: horizontal; sagittal; and vertical. The horizontal and sagittal planes are both drawn when the table top is resting flat and parallel with the ground, (see Appendix V), the only difference being that horizontal refers to left or right and sagittal refers to drawings which require moving away from, or toward the subject. The vertical plane is defined as being when the table top is tilted up so that it is perpendicular to the ground. These various planes are scattered through most of the subtests. Analysis of the discriminating subtests indicates that only two of these required performance in the vertical plane.

A possible explanation of why the retardates were able to perform better in the vertical plane may be related to inability to judge distances noted on the other tests. In the vertical plane, the distance one has to draw away from the body is defined by the distance of the table top from the subject. In other words, once the subject has placed the pencil on the test, he can no longer reach forward and, therefore, can make only up and down movements.

Normals versus Uruguayan Subjects

The normals in the present study were compared with a set of norms provided by Professor Mira. His population consisted of subjects whose qualifications resembled the present normal sample very closely. However, there are variations including lack of information about handedness; an age range of twelve to eighteen as compared to sixteen to eighteen; a larger sample; and measurement of only forty-four of the seventy-eight subtests.

The statistical treatment of the data was essentially the same as the type used in comparing normals and retardates. A "t" test of significance was used to determine which of the forty-four subtests discriminated between the groups. Theoretically, there should be no difference between the performance of the normals in the present study and the Uruguayan subjects. A null hypothesis was made which was to be accepted or rejected at the .05 level of confidence.

An examination of each of the forty-four subtests was made to determine which discriminated, and at what level. As previously indicated, to be defined as a discriminator, the test had to indicate significance at the .05 level of confidence. The .01 level was reported, but only as additional information about the degree difference in performance. In order to be significant at

the .05 level of confidence, with 43 degrees of freedom, the P value had to be greater than 2.02. To be significant at the .01 level, P had to be greater than 2.69.[68] (Table III)

The "t" test was again used in a two tailed manner to insure that only over-all deviation was at the .05 level. This required using the .025 level to determine the .05 level, and the .005 to determine the .01 level of confidence.

It can be noted from Table III that twenty-three of the forty-four subtests discriminated between the normals and Uruguayan subjects. At the .05 level of confidence, one could expect two significant results in a sample of forty-four. Therefore, the null hypothesis must be rejected. Essentially, this means that the test does make discriminations between two groups of normals, and therefore from this data the reliability of the instrument seems to be poor.

The data provided by the normal and Uruguayan subjects was further examined to determine the reason for the two groups performing differently. A Pearson r[69] was computed between the mean scores of both groups and between the standard deviations of both groups.

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68. Edwards, A. L., Loc. Cit.

69. Idem., pp 78-79.

TABLE III

COMPARISON OF MEANS, STANDARD DEVIATIONS
AND P VALUES BETWEEN "NORMALS" AND URUGUAYAN POPULATION

	Normals		Uruguayans		
Subtest No.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	P
1	8.15	14.17	1.58	16.00	1.84
2	5.35	7.40	19.50	13.60	4.70**
3	-7.00	8.19	.13	15.50	2.08*
4	37.20	4.30	35.49	7.85	.98
5	-.60	4.27	9.82	4.53	1.03
6	2.40	9.46	.90	14.08	.48
7	4.40	6.94	22.50	14.20	5.76**
8	-10.95	9.07	-3.00	14.40	2.49**
9	35.00	4.57	33.70	7.15	.82
10	-.70	3.85	8.89	4.56	9.50**
11	21.35	8.51	17.56	5.01	3.27**
12	10.50	5.41	5.37	2.51	8.69**
14	49.60	15.68	71.90	23.10	4.35**
15	26.60	10.86	5.55	23.60	4.03**
17	8.35	5.79	9.55	6.33	.85
18	6.20	22.92	1.00	27.90	.84
26	19.65	6.41	18.98	5.73	.52
27	10.25	4.41	7.05	3.05	4.64**
29	46.35	11.88	56.40	19.00	2.39*
30	26.30	9.56	11.00	17.50	3.95**

TABLE III-cont.

Subtest No.	Normals $\bar{X}$	Normals S.D.	Uruguayans $\bar{X}$	Uruguayans S.D.	P
32	6.90	5.00	9.79	6.33	2.05*
33	4.65	20.41	-1.30	27.30	.99
41	7.30	32.38	3.50	15.00	1.15
42	5.15	14.35	-1.20	14.20	2.00
43	12.60	10.41	11.00	8.35	.85
44	9.10	21.01	3.20	14.70	1.76
45	-6.85	10.17	-2.00	13.50	2.08*
46	9.70	8.22	11.25	7.65	.90
49	36.85	24.63	17.90	24.00	3.52**
52	5.55	39.48	6.30	22.70	.14
55	10.45	35.48	23.40	24.00	2.36*
58	-22.15	27.96	5.90	24.00	5.18**
61	-5.45	29.27	8.00	32.10	1.88
62	13.35	9.63	13.30	8.40	.13
67	-8.75	27.29	17.70	33.10	3.59**
68	13.65	7.02	13.15	8.60	.26
71	-10.90	14.50	8.50	19.50	4.47**
72	10.55	7.98	15.90	12.50	1.93
73	.85	9.28	14.41	19.80	3.10**
74	9.70	7.38	21.00	13.10	3.90**

TABLE III-cont.

Subtest No.	Normals $\bar{X}$	Normals S.D.	Uruguayans $\bar{X}$	Uruguayans S.D.	P
75	-13.20	14.59	2.40	24.40	2.88**
76	9.00	8.10	12.85	12.00	.46
77	7.55	13.40	15.60	22.60	1.61
78	9.50	8.02	14.85	11.65	2.06*

* significance at the .05 level

** significance at the .01 level

If the correlation between the means was high, it could be assumed that the reason for the difference in performances was due to a large variability within each group. If the correlation of the standard deviations was high, it could be assumed that each group tended to score consistently, but at different levels.

The actual correlation between the means of both groups was .73. The correlation for the standard deviations was .74. Since these correlations are moderately high, it suggests that not only was there a considerable amount of variability within groups, but that there was also variability between the groups. In general, the performance of either group had little resemblance to the other group.

Abbreviated Form

Ideally, the instrument would produce results that would allow discrimination on all subtests between normals and retardates. Also, it would indicate that there were no differences in performance between one group of normals and another matched group. Since this was not the case, an attempt was made to develop a shortened form of the test using only those tests which were significant. This could be accomplished by using the twenty-four subtests listed in Table IV.

It was felt that to give the abbreviated form more strength, lack of discrimination between the two normal groups should be included. In developing the short form both criteria had to be met for a subtest to be included. The particular subtest had to have indicated that it could discriminate between a normal and retarded performance and not between the normal and Uruguayan subjects' performance. (Table IV)

As it can be seen in Table IV, several of the subtests which were significant for the normal and retarded groups were not included in Professor Mira's norms for the Uruguayan subjects. There is no rationale given in his book for only using forty-four of the seventy-eight measures present in the original Mira Myokinetic Psychodiagnosis.

Only eight of the measures could therefore be directly compared. Just two of these measures were able to meet the previously stated criteria for inclusion in an abbreviated form (see Table IV). These two measures on which the retardates' performance differed from the normals and the Uruguayan subjects consisted of a primary deviation with the left hand in the horizontal plane and maximum length of a line with the right hand. This is hardly enough information to develop an abbreviated form as previously stated.

TABLE IV

COMPARISON OF SUBTESTS WHICH INDICATED SIGNIFICANCE BETWEEN "NORMAL" AND "RETARDATE" PERFORMANCE AND NOT BETWEEN "NORMALS" AND THE URUGUAYAN SUBJECTS

Subtest No.	Significant Difference Between Retardate & Normal Subjects	No Significant Difference Between Normal & Uruguayan Subjects
1	yes	yes
11	yes	no
19	yes	-
20	yes	-
21	yes	-
24	yes	-
26	yes	yes
27	yes	no
28	yes	-
29	yes	no
30	yes	no
31	yes	-
34	yes	-
35	yes	-
36	yes	-
37	yes	-
40	yes	-
49	yes	no
53	yes	-
54	yes	-

TABLE IV, cont.

Subtest No.	Significant Difference Between Retardate & Normal Subjects	No Significant Difference Between Normal & Uruguayan Subjects
57	yes	-
63	yes	-
69	yes	-
74	yes	no

(- means the subtest was not included in the norms provided by Professor Mira)

The other six subtests which indicated a difference between normals and retardates and also between normals and Uruguayan subjects were further examined. All of the tasks seemed to be unrelated and there was no consistency in error making. If these were the only subtests on which agreement could not be had, the test would be reliable and valid. However, since only twenty-four of the seventy-eight tasks indicated difference in normal and retardate performance and only two of these indicate reliability between normals in the present study and the Uruguayan subjects, it is suggested that the test is not practical for use as described in the present study.

Further considerations for modification and development of norms will be considered in the next chapter. Although the test will discriminate between a normal and retarded performance, it remains too cumbersome for practical use. Possibilities for lack of agreement between performances of the two groups of normals will also be considered in the following chapter.

CHAPTER V

Final Considerations

Historically, expressive motor behavior has been difficult to measure. Because of its nature, it is involved in nearly every type of activity in which humans engage. Various authors feel that it is a definite reflection of an individual's personality, but to date the methods of evaluation have been inadequate.

The Mira Myokinetic Psychodiagnosis has been viewed as a technique with definite potential for measuring expressive motor behavior. Other approaches to the problem have not been sufficiently objective, and are designed in such a way that the expressive behavior is brought under adaptive control. The Mira technique is supposedly void of these limitations. The potential is present for the development of a wide range of norms which could be objectively compared.

The present study attempted to evaluate the test in terms of its discriminative ability between normal and retarded performances and also to examine its reliability. The results indicate that some of the subtests were able to distinguish between normal and retarded performance, but the use of the entire test remains a cumbersome method for evaluating expressive motor behavior.

The actual administration of the test takes from twenty to thirty minutes with normal subjects, and from thirty to forty minutes with retarded subjects. Scoring is extremely complex and requires an additional thirty minutes. This test is still the only method available to measure expressive behavior that meets the criteria of reducing adaptive control. Therefore, it seems important that further research should be done with the instrument to improve the technique.

An attempt was made to develop an abbreviated form of the test. There were twenty-four of the subtests which seemed to discriminate between the retarded and normal performances. However, only two of the twenty-four subtests were able to meet both criteria defined in Chapter III. These twenty-four subtests could probably be developed further in terms of a baseline for further study. This will be discussed further later on in this chapter.

The lack of reliability between the normals in the present study and the Uruguayan subjects may be due to several factors. The Uruguayan population had a wider age range, and the school they were attending probably consisted of only select students of the highest caliber. Professor Mira provides norms for this group on only part of the subtests, and he does not indicate handedness.

Handedness seems to be an important concept which influences a subject's score on the test. Norms for the right and left hand performance are available, but without information concerning the dominant hand of the subject it is very difficult to compare groups. If the sample contains any subjects which differ in handedness, it changes the average score which is used as a norm.

A part of the administration technique which could alter the subject's performance is the method of holding the visual-block screen. This writer noted that holding the screen has two important qualities. The distance which the screen is held from the subject's face determines the amount of visual feedback that can be received. If the screen is too far away, the subject can check his movements by watching the relationship of his arms to the table. If the screen is too close, it tends to be a blur which appears to be uncomfortable as the subject will close his eyes or fixate on something out of the corner of his eye. The distance the screen is to be held is apparently not standardized as Professor Mira makes no reference to it. It is presently felt that holding the screen approximately eight inches from the subject's face is an optimal distance.

The other important aspect holding the screen, is concerned with movement. If the subject has fixated on a particular part of the screen, a slight movement will

cause his drawings to deviate in the direction of the movement. This is not emphasized in Professor Mira's instructions for administration but should be noted in further studies.

Although the instructions seem to be ambiguous, most of the subjects in the final population were able to understand what was expected. The subjects who did not successfully complete the task in the pilot study and the ones which were dropped from the sample, appeared, however, to have a major difficulty in understanding the instructions. This writer felt that a mock demonstration, using a finger or the blunt end of a pencil to copy the model, would have helped the lower level subjects to understand the task. This particular adaptation may be useful in administering the test to younger and lower level subjects. If this was done, a control group should be used to note differences in performance.

The retarded subjects in the present study are all classified by diagnostic category (see Appendix I and IV). There was no relationship between etiology or psychiatric impairment and success in completion of the task. Individual differences did occur, but there did not seem to be constant error within a particular diagnostic group. Since only mildly retarded subjects were used, it is possible that the test could not pick up the subtle differences between diagnostic groups. If more grossly

organically impaired subjects could be used, there may be a relationship with type or organicity and performance.

Recommendations For Further Study

The most obvious difficulty with the Mira technique is the cumbersome administration and scoring procedures. Further research should be mainly concerned with improving the technique. This would probably be facilitated if the test could be abbreviated.

In the present study it has been demonstrated that some of the subtests can discriminate between a normal and retarded performance in the area of expressive motor behavior.

The twenty-four discriminating subtests could be used as a starting point. If they can be shown to consistently discriminate between a retarded and normal performance, they could be used as an abbreviated form which would significantly increase the strength of the test.

Further study also needs to be done to determine why the test was not reliable between the two groups of normals. A study similar to the present one could be done comparing the normals' performance with a matched group of high school students. This would indicate something about the reliability of the test without concerning cultural factors.

Professor Mira places a considerable amount of emphasis on the projective quality of the test. This could be objectively evaluated by comparing two groups which had psychiatric impairments that were consistent within groups and different between groups. The subjective interpretation noted in most of the literature would not be necessary, as a technique indicating significance of difference between scores could be used.

It would be much easier to evaluate the reliability and validity of the instrument if scoring provided a composite score. In its present state there are six general tests and seventy-eight subtests. If it could be shown that the subtests in any one general area could be combined to provide an over-all score, a more sophisticated type of statistical analysis could be used to treat the data.

If the concept of developing a composite score was combined with abbreviating the test, it could very well become a more useful tool. Ease in administration and scoring would facilitate the development of norms on various diagnostic categories. The information in the present study would provide a base line for further study. Before many generalizations can be made, similar studies would have to be done with females, left-handed subjects, different age groups, and various diagnostic types.

Summary and Conclusions

In general, the present study indicates that the Mira Myokinetic Psychodiagnosis is a technique which will discriminate between normal and retarded performances on an expressive motor task. Subjects performed significantly different on twenty-four of the seventy-eight measures. This is sufficient to warrant significance in the present study, however, reliability of the instrument has not been shown. It is cumbersome to administer the complete test and, a short form has been proposed. Further research is needed to determine validity and reliability of this abbreviated form.

Precise details of the selection of Uruguayan subjects in Professor Mira's norms are unclear. The test did not show reliability between two groups of normals. Correlations between the two groups concerning variability and consistency were moderately high in both areas, however this does not allow assumptions about the basis of difference in performance.

Subjects did not seem to perform differently as a result of being in a different diagnostic category. There was a relationship between IQ level and ability to successfully complete the task, as no subject below IQ 55 was able to qualify for inclusion in the study.

The general conclusions are that retardates differ from normals in some types of expressive motor behavior. The present study indicates twenty-four of these areas. Reliability of this information will have to be shown by further research. If the test can be developed according to previously proposed criteria, it would probably be a more useful technique for evaluating expressive motor behavior. Further development in this area would be an important addition to psychological testing, as the concept of expressive motor behavior is thought to play an important role in an individual's adjustment pattern.

APPENDICES

APPENDIX I

NUMBER OF RETARDED PARIENTS AND TYPE OF PSYCHIATRIC INVOLVEMENT[70]

Number	Type of Psychiatric Impairment
5	No Impairment indicated
4	Unspecified
5	Behavioral Reaction
11	Neurotic Reaction

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70. Heber, R., op cit., p 18.

APPENDIX II

SCORING SHEET

Patient: _____

Date: _____

LINEOGRAMS

	Code
Left Hand	
Primary Deviation-Horizontal	1
" " -Sagittal	2
" " -Vertical	3
Average Length of Lines	4
Average of Secondary Deviations	5
Right Hand	
Primary Deviation-Horizontal	6
" " -Sagittal	7
" " -Vertical	8
Average Length of Lines	9
Average of Secondary Deviations	10

ZIG-ZAGS

Left Hand	
Egocifugal	
Maximum Length	11
Minimum Length	12
Linear Difference	13
Maximum Angle	14
Minimum Angle	15
Difference between Angles	16
Axial Deviation	17
Primary Deviation	18

Zig-Zag, con't.

Left Hand, con't.
Egocipetal

Maximum Length	19
Minimum Length	20
Linear Difference	21
Maximum Angle	22
Minimum Angle	23
Difference between Angles	24
Axial Deviation	25

Right Hand
Egocifugal

Maximum Length	26
Minimum Length	27
Linear Difference	28
Maximum Angle	29
Minimum Angle	30
Difference between Angles	31
Axial Deviation	32
Primary Deviation	33

Egocipetal

Maximum Length	34
Minimum Length	35
Linear Difference	36
Maximum Angle	37
Minimum Angle	38
Difference between Angles	39
Axial Deviation	40

STAIRS AND CIRCLES

Left Hand

Stairs	
Primary Deviation	41
Circles	
Primary Deviation	42
Secondary Deviation	43

Right Hand

Stairs	
Primary Deviation	44
Circles	
Primary Deviation	45
Secondary Deviation	46

CHAINS

Left Hand
- Sagittal
  - Axial Deviation (Egocifugal) 47
  - Axial Deviation (Egocipetal) 48
  - Primary Deviation 49
- Vertical
  - Axial Deviation (Ascending) 50
  - Axial Deviation (Descending) 51
  - Primary Deviation 52

Right Hand
- Sagittal
  - Axial Deviation (Egocifugal) 53
  - Axial Deviation (Egocipetal) 54
  - Primary Deviation 55
- Vertical
  - Axial Deviation (Ascending) 56
  - Axial Deviation (Descending) 57
  - Primary Deviation 58

PARALLELS

Left Hand
- Egocifugal
  - Maximum Length 59
  - Minimum Length 60
  - Primary Deviation (Linear Difference) 61
  - Average Axial Deviation 62
- Egocipetal
  - Maximum Length 63
  - Minimum Length 64

Right Hand
- Egocifugal
  - Maximum Length 65
  - Minimum Length 66
  - Primary Deviation (Linear Difference) 67
  - Average Axial Deviation 68
- Egocipetal
  - Maximum Length 69
  - Minimum Length 70

U's

Left Hand
- Vertical
  - Primary Deviation — 71
  - Secondary Deviation — 72
- Sagittal
  - Primary Deviation — 73
  - Secondary Deviation — 74

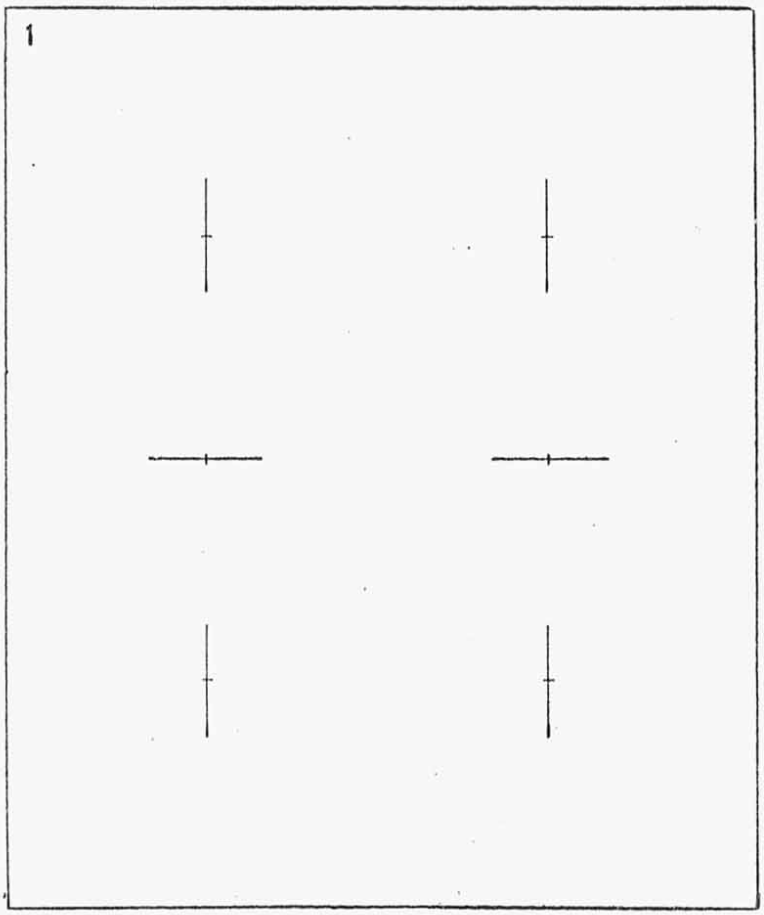
Right Hand
- Vertical
  - Primary Deviation — 75
  - Secondary Deviation — 76
- Sagittal
  - Primary Deviation — 77
  - Secondary Deviation — 78

INTRA-PSYCHIC COHERENCE

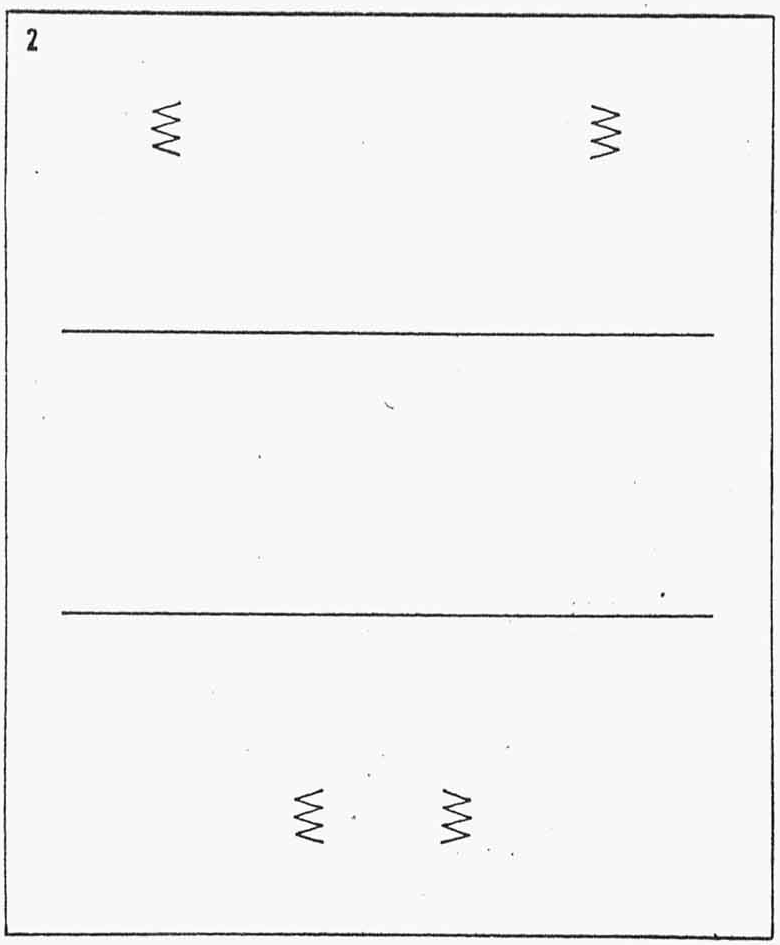
APPENDIX III

TESTING FORMS

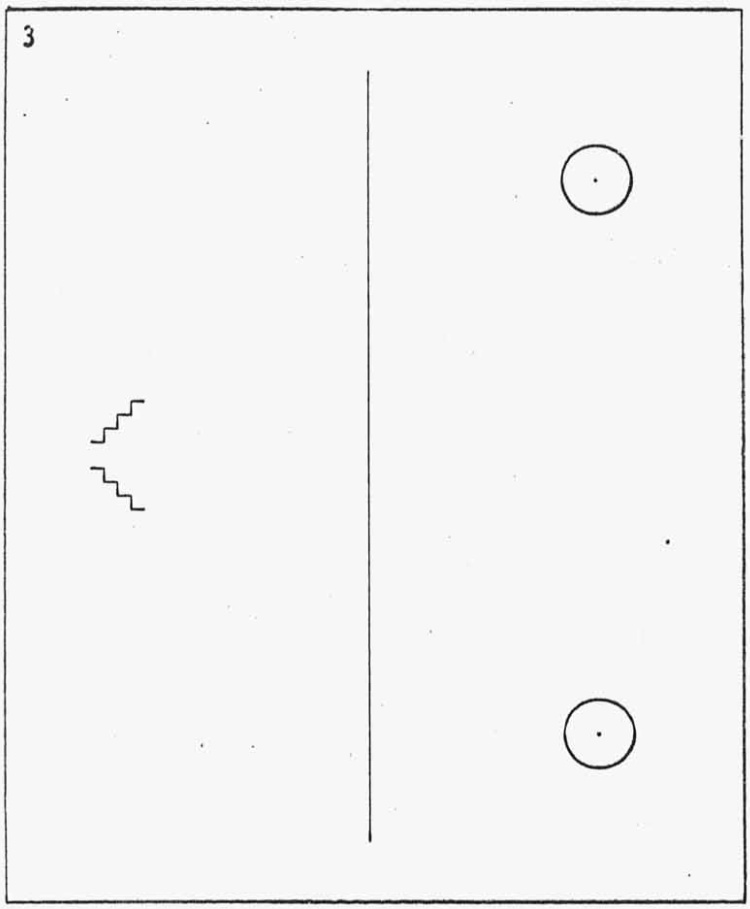
Lineograms



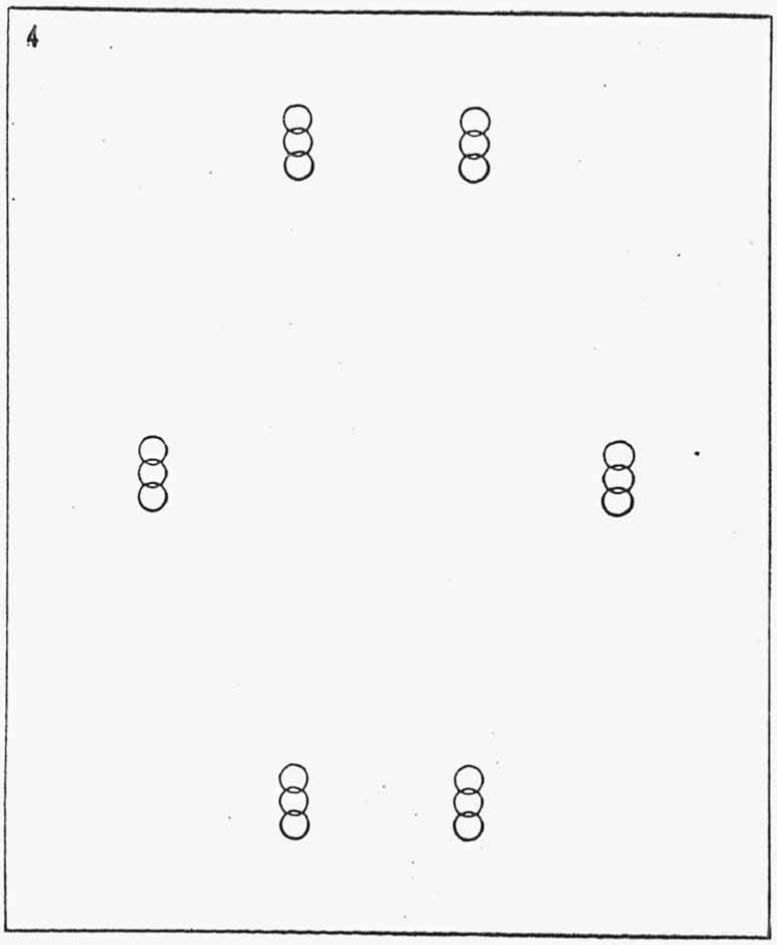
Zig-Zags



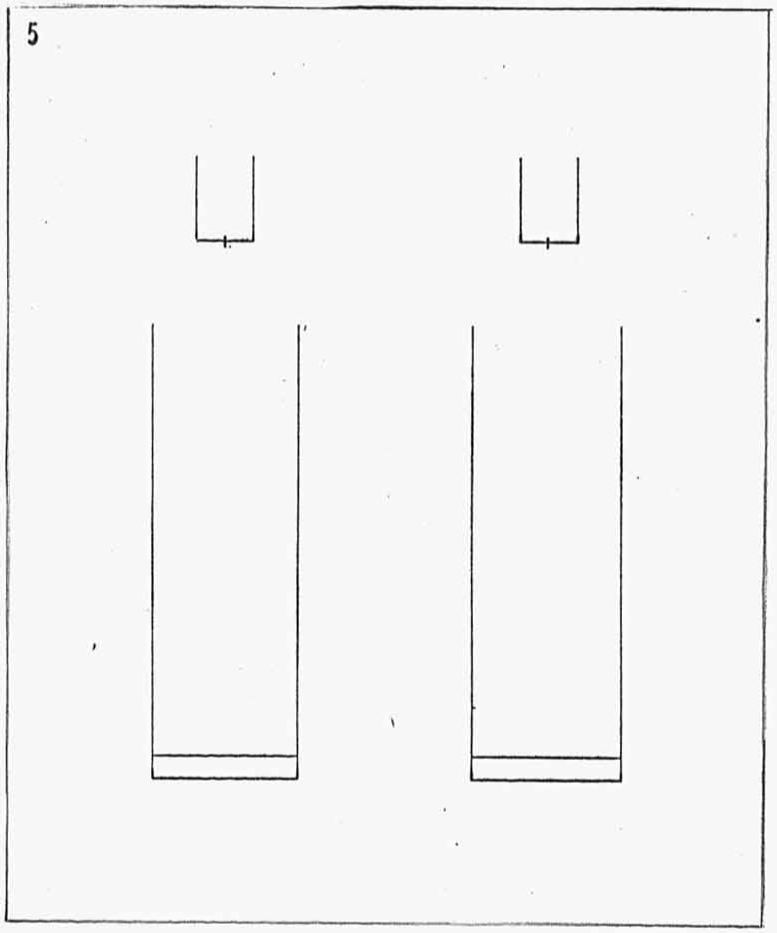
Stairs and Circles



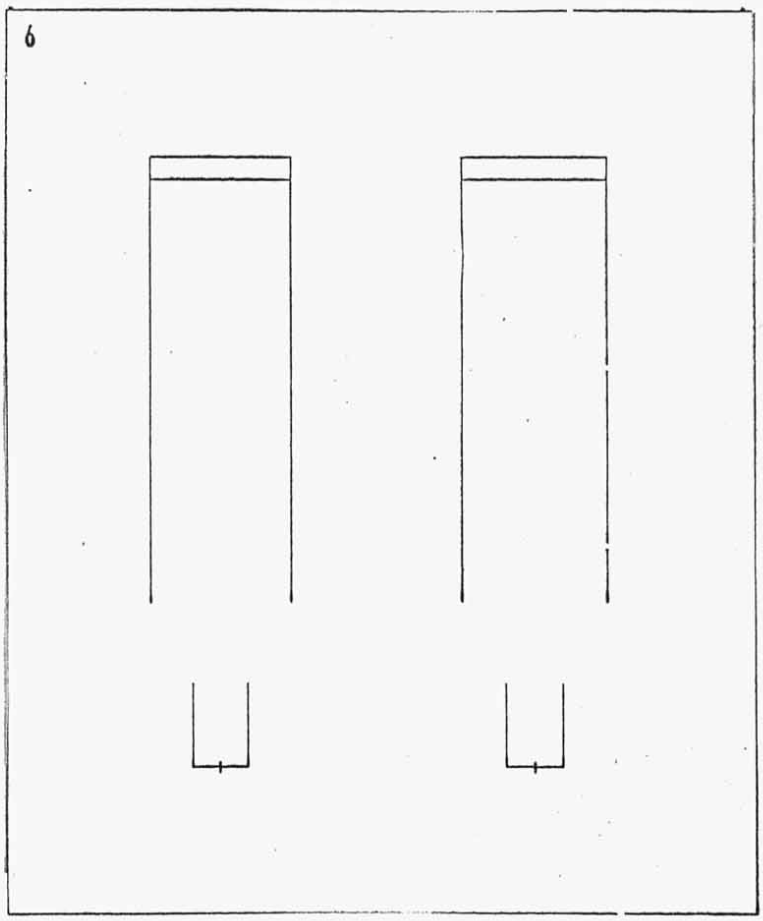
Chains



Parallels and U's



Parallels and U's



APPENDIX IV

NUMBER OF RETARDED PATIENTS, ETIOLOGY OF RETARDATION, AND CLASSIFICATION CODE [71]

Number	Etiology of Retardation	Code
6	Unknown	89
5	Cultural Familial	81
5	Psychogenic	83
2	Physical Trauma	34
2	Anoxia	33
2	Birth Injury	32
1	Endocrinal Disorder	49
1	Intoxication	29
1	Postmeasles Encephalopathy	12

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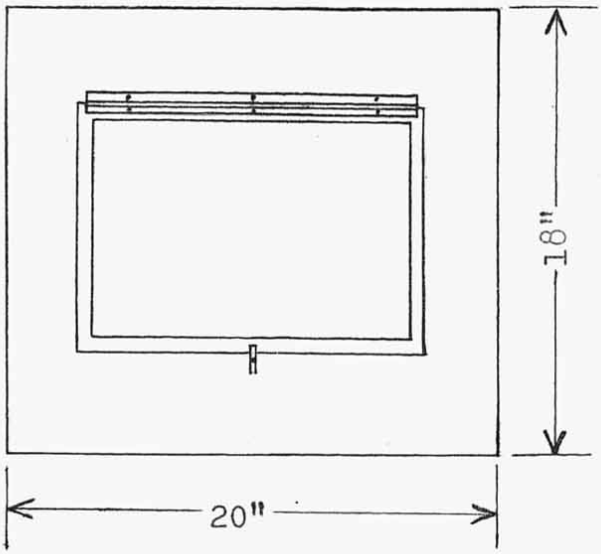
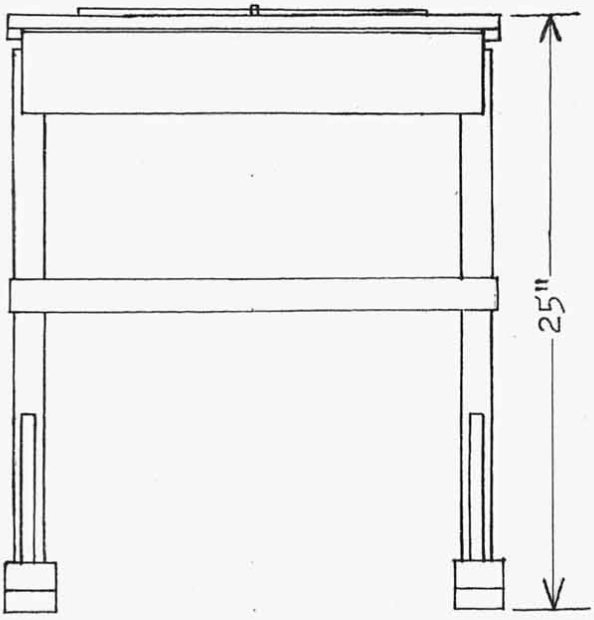
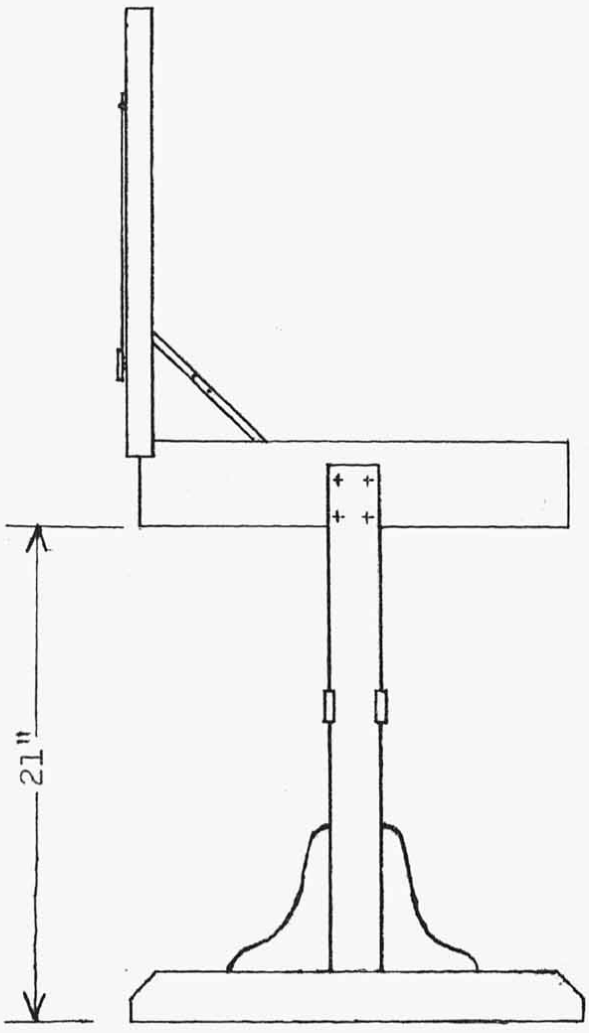
71. Heber, R., op. cit., pp 10-17.

APPENDIX V

TESTING TABLE







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