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BONNIE LIBBIN DESSAUER
1966

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

THE M COMPONENT OF THE RORSCHACH AS AN INDICATOR OF THE INTELLECT

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

BY

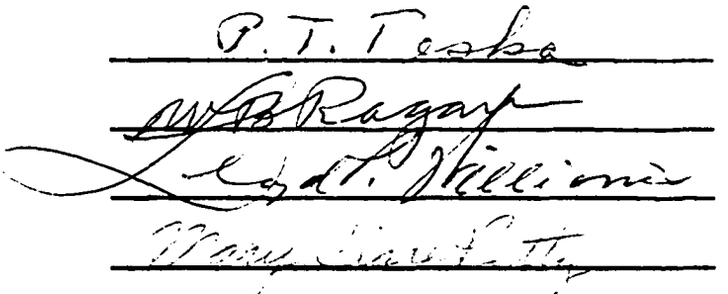
BONNIE LIBBIN DESSAUER

Norman, Oklahoma

1966

THE M COMPONENT OF THE RORSCHACH AS AN INDICATOR OF THE INTELLECT

APPROVED BY



DISSERTATION COMMITTEE

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THE M COMPONENT OF THE RORSCHACH AS AN INDICATOR OF THE INTELLECT

CHAPTER I

INTRODUCTION

The purpose of this study is to analyze the M (human movement) component of the Rorschach to determine if it can be relied upon as an indicator of the intellect. Anytime one attempts to investigate an instrument which supposedly measures the intellect, he inevitably encounters a dilemma. Although volumes have been written about the intellect, psychologists disagree about its nature. At best, the intellect is a hypothetical construct; the meaning of the term has never been clear. Thus, the following questions must be considered: What do we know about the intellect? What is the nature of the M determinant? Does the M determinant measure the intellect?

Binet and Simon (1916, p. 11) attempted to "discover exactly in what mental development consists, by what mechanism it is produced, and how superior intellect differs from an inferior one." Through observation of children they endeavored to answer these questions. In an effort to measure the manifestations of the intellect, they included a wide variety

of items on their test. Binet and Simon, like all test constructors who followed them, made the assumption that the test items which measure the manifestations of the intellect must be developmental in nature. This developmental process of the test items determines the validity or the degree to which the test measures what it says it measures. No matter how intellect is defined, the assumption must be made that any test item is passed by more subjects as the CA (chronological age), MA (mental age), and IQ (intelligence quotient) increase. Terman and Merrill pointed out that:

> Validity was judged by two criteria: (1) the increase in the percentage passing from one age (or MA-mental age) to the next and (2) a weight based on the ratio of subjects passing the test and the subjects failing it.

The Intellect and Its Development

Most authorities contend that the intellect as measured by a complete battery does not grow after the teens, but there is some disagreement on the exact terminal age. This apogee was reached at fifteen years of age in Terman and Merrill's revision of the Stanford Binet (1937); at 11-6 in Hiskey's standardization of the Nebraska Test for the Deaf (1955); and at twenty-five years of age in the Wechsler Adult Intelligence Scale (1955). Therefore, the intellect, whatever it is, apparently continues to develop to a certain period during the teens or mid-twenties.

There are many studies which deal with the concept that the intellect develops as the CA increases. Although

there are some differences because of the various conditions of these studies and differences in the subjects selected, there is a close agreement among authorities concerning the rate of growth. For example, according to Gesell (1940) the development of the intellect has a more rapid growth in infancy and early childhood and is followed by slower growth patterns until the maximum is reached during the teens or early adulthood. As a result, the curve is one of negative acceleration. One-half of the entire growth of the intellect of the individual has been reached between the ages of three and five. Terman and Merrill confirmed this idea when they explained that,

> The difference between one-year and two-year intelligence is so great that anyone can sense it, while even a psychologist might have difficulty discriminating between the mental levels of twelve years and thirteen years (1937, p. 26).

They further clarified this statement by pointing out that it would be unlikely that one twelve-month-old child in a million would have an MA of two years; whereas, approximately one-half of the fifteen-year-olds would score an MA of sixteen years.

In their studies at Gesell Institute, Ames, Métraux, and Walker (1959) noted week-to-week differences in the first year of life, but after five and one-half years, one year levels sufficed. They observed that the human organiam has a developmental rate which tends to become less and less rapid.

Garrison (1956) suggested that even though the mental growth curve of the superior, average, and dull children differs

in some respects, they all conform to the same general pattern. While the differences in the curves become greater as the CA increases, it is his contention that mental retardation is not a state of arrest but does have its developmental pattern.

The Intellect and Emotions

Garrison (1956) emphasized that not only must the pattern of each age range be considered but also the rate of development of each child as a result of many factors in his life. One's mental development is influenced both by basic potential and the environmental conditions during his lifetime. This, then, presents the second dilemma which confronts anyone who examines the intellect in conjunction with testing. How much does any test measure the intellect, and how much of the test reveals the emotional or experiential factors of the individual being tested? This question, regardless of what instrument is used, becomes even more difficult to answer when it concerns subjects who score in the high grade mentally defective range. The examiner must evaluate the accuracy of the score as the indicator of the subject's actual intellective level. Those who have worked in this field realize the necessity for differentiating the "garden variety" who are believed to be products of unfortunate combinations of genes from those who combine mental retardation and emotional problems.

Binet (1916) commented that the process is much more

complex than just one of measurement. The results depend partly on the school and partly on the family situation. Therefore, the ability to deal with items on tests of the intellect improves with education and is affected by one's cultural background. Terman and Merrill realized that many factors contribute to the results on any test of the intellect. They stated that:

> Abilities are always manifested and measured in relation to experiences and training, and the behavioral composite which we call intelligence is of necessity modified and moulded by these factors (1937, p. 65).

Many other writers have stressed the importance of experience and emotional development on mental test performance. Klopfer and Margulies (1941) pointed out that the interdependence of intellectual and emotional growth factors are so important in the early stage of development that any diagnosis of the intellect which does not take into account this interdependence is bound to be very unrealiable. Hutt and Gibby (1965, p. 24) expressed somewhat the same idea when they said, "Thinking cannot be separated from feeling. . . it is but one aspect of the total behavior of the child." Lund (1940) observed that the emotions can affect the quality and level of performance. Chidester and Menniger (1936) used a psychological approach when working with a mentally retarded boy. They reported a substantial improvement in his intellectual and social functioning. Neurer (1946) emphasized that most cases labeled familial or undifferentiated types of mental deficiency were socially handicapped. Thus, the question

should always be asked, "Is this the child's true intellective level, or is this a case of suppression resulting from emotional problems?"

Meanings of M

The problem involved in determining an individual's functioning on various tests is only one factor of this study. The M component of the Rorschach has long been considered complicated and controversial in nature. Many psychologists are interested in the M responses, for the ability or inability of a person to handle human movement on projective tests is believed to be both revealing of his interpersonal relationships and his level of intellective functioning. For this reason, clinical tools such as the Machover, the Kinget, and the Rorschach allow subjects to draw or see humans and human movement. Piotrowski (1957) noted that Rorschach considered the M factor his most important contribution. He viewed it as expressing the most developed aspect from the standpoint of the human race and the individual. According to Rorschach (1964) the M responses are those which are determined by form perception and kinesthetic factors. Caricatures, skeletons, pictures, or drawings are rarely scored as M responses. All responses that indicate overt movement as well as posture and muscular tension indicate M. Rorschach readily admitted that it was the thorniest problem in his entire experiment.

Many meanings and functions have been delegated to the M response. Various authors have suggested that it reveals

imagination over richness of inner life, inner creativity, introversion, delay of drive impulses, fantasy living, and the intellect. This study is concerned with the last factor.

Beck (1961), Shachtel (1950), Sarason (1954), and other writers view the M as affecting the mental life of the human organism. Rorschach (1964) believed that there is a negative correlation between motor behavior and fantasy or "inner living." Therefore, an increase in the number of M responses would indicate more internal living. Phillips and Smith (1957, p. 58) saw it as "an index of empathic participation." To them it is an extremely valuable diagnostic instrument. Piotrowski (1957, p. 179) stated that, "the prototypal role in life is developed at six." It appeared to him that the M response follows this prototypal role since fifty per cent of the six-year-olds produce at least one M. Piotrowski contended that it reveals the subject's concept of his role-in-life. Klopfer said,

> The M response touches upon all of the most important aspects of the well-functioning personality, bridging the gap between inner resources of drive and fantasy and the outward orientation of reality testing and object relation (1954, p. 255).

To the degree that the M determinant is a fantasy outlet, it is possible that there would be neither a need nor the capacity on the part of older subjects or persons with certain emotional problems to give M responses. Klopfer (1956, p. 171) pointed out that there is ". . . a scarcity of M in the records of the overwhelming majority of all cases of psychiatric disorder." To Klopfer those subjects who have a low count

show poor ego integration and lack of maturity. Would the nature of these emotional problems deter one from turning to fantasy and M? Could it be that only people with superior intellect would be capable of using M as a fantasy outlet? If this were the case, there would be no psychological need for M except with bright and more productive people. As a result, the M response would be present more abundantly in the protocol of those who are creative, contemplative, and intuitive.

The Quantitative Value of M

Another factor to be considered when working with the M component is the few degrees of difference which it yields. In other words, the numerical size of M as a determinant does not appear to be very revealing. According to Beck's (1961, p. 230) table which considers only human movement, there is an average of 3.5 M responses out of 32.65 total responses for the average adult. Any component with such a small range becomes difficult to measure. If normally the subject responded with 15 or 20 M's, the reliability and validity might be more accurately established. This, however, is not the case.

An important feature is that any item on a test which measures the intellect does not measure on as wide a scale as it at first appears from the total score possible. An excellent example of this is the Digit Span item on the Wechsler Intelligence Scale for Children which appears to allow a range

of seventeen points. Few subjects, however, will be able to repeat all seventeen digits correctly, nor will many subjects get less than four or five items correct. Thus, the spread is often on a scale from seven to nine.

Objectivity and M

Another area which needs to be examined concerns the lack of quantitative objectivity with any determinant on the Rorschach. On the Stanford-Binet the subject attempts to score as high as possible. Consequently, the larger the vocabulary or the more items that the subject answers correctly, the higher is the resulting score. This, however, cannot necessarily be held true on the Rorschach. It would be erroneous to assume that one hundred per cent F+ is better than eighty per cent, or that 8 W responses would always be more acceptable than 5 W responses, or that 15 M's would reveal a better integrated personality than 5 M's. Klopfer and Kelley explained it in the following way:

> Whereas most tests achieve their results by adding up the score of the different components such as vocabulary, repetition of digits, and so on, such a summative procedure is impossible in Rorschach method. For instance, in evaluating the different components contributing to the picture of a subject's 'intelligence' the Rorschach practitioner is concerned not with the sum of the components but with a configureation or 'Gestalt' (1946, p. 16).

Nevertheless, Rorschach investigators should not be discouraged from examining quantities when dealing with mass data. In fact, there is a positive need to set up normative

ranges. Herz (1951) in her survey of the literature emphasized this point. The methods of scoring often differ, and studies have been made on limited samples. Consequently. the literature presents gaps in coverage of all age groups and determinants. It is evident that much more work needs to be done in this area. The fact should not be overlooked that each protocol must be studied individually in order to understand the uniqueness of a particular subject; by the same token, all Rorschach technicians must be aware of the normative data and its implications. Therefore, when working with an emotionally disturbed child, it is useful for the clinician to know what the norms reveal about children in the same age group.

Studies of M and the Intellect

Most of the authorities in the field who have written about the M determinant accept that it is a measure of the intellect. Levine, Spivak, and Wight (1959) found that most of the studies revealed a positive relationship between human movement responses and the intellect. Nevertheless, the studies in recent years have left much to be desired. A survey of this literature points up the disparity of the findings.

Armitage, Greenberg, Pearl, Berger, and Daston (1955) tested 120 subjects forty of whom were psychoneurotics, forty paranoid schizophrenics, and forty unclassified schizophrenics. Four ranges of IQ were used on the Wechsler Bellevue: 120 and above, 110-119, 90-109, and 89 and below. The M determinant

suggested a curvillinearity with the other determinants, and since the Pearson Product Moment formula was employed in the correlations of the determinants, M was eliminated. Statistically, the authors were correct, but scientifically, this does not rule out the possibility that M might have been the best indicator of the intellect. The study, like many in the literature, utilized emotionally disturbed subjects, and this appears to be unwise when attempting to find out how well a particular test measures the intellect.

Neff and Lidz (1951) used one hundred subjects whom they considered representative of the male population. These tests were administered on overseas subjects during World War II. Half of the men had been overseas for two years, while the other half had just arrived. All of the subjects were enlisted men and were tested on a command basis. It is not surprising, then, under such adverse conditions of being overseas during war, separated from families for a short or long period of time, and tested on a command rather than a volunteer basis that the men appeared to be apathetic. The results showed that in the superior range of the intellect determined by the Army General Classification Group Test, twenty-eight per cent of these superior subjects had no M responses, and sixty per cent had two or less M responses. The authors arrived at no definite conclusions from this study concerning M and the intellect.

Altus and Thompson (1949) attempted to discover which of seven factors would be the best measure of intelligence.

They used 128 elementary psychology students for test-retest purposes. The first group was given the Altus Measure of Verbal Aptitude, and the second group was administered the Ohio Psychological Examination Form 21. The authors decided that for college students, the M response appeared to be the best indicator of intelligence. They concluded that a large number of M is prima facie evidence of relatively superior intelligence, but the converse is not true since some people of "quite adequate" intelligence show few or no M. The authors did not clarify what they meant by "quite adequate," and no IQ scores were discussed by them.

Sommers (1958) was interested in determining if a relationship between M and IQ would be found when the effects of R and H were held constant. Correlations and partial correlations were made between scores on the Wechsler Verbal Scale and the number of Rorschach M responses for 123 psychiatric patients. The correlation between M and IQ was significant when both R and H were held constant. The author was also interested in finding out if M responses of subjects at different IQ levels are qualitatively different. Three groups of judges (senior psychologists, interns, and secretaries) ranked M responses from psychiatric patients at IQ levels of 80, 100, and 120 according to intelligence. In one series of responses, all obvious cues of vocabulary level and poor grammar were removed. When these obvious cues were removed, only the psychologists were able to exclude chance expectancy.

Tanaka (1958) found a positive correlation between M and IQ with one hundred delinquent boys as subjects. He found this correlation to be higher with verbal IQ than with non-verbal IQ.

Abrams (1955) studied four hundred clinic patients who were veterans of World War II. There was no attempt to control the psychiatric classification of the subjects who varied from mildest psychoneurotics to severest of intracranial organic pathologies on an outpatient basis. Quite low correlations were revealed between IQ and M, and extremely low correlations were found between the other determinants and M. The investigator did not reach any definite conclusion about M as a revealer of intelligence.

Levine, Spivak, and Wight (1959) used 155 mentally retarded and emotionally disturbed children with IQ's from 41-135 and 209 adult male hospitalized schizophrenic veterans with psychoses other than schizophrenic with IQ's from 63-138. The authors found that the correlation between M and IQ was not high, especially on teenagers. The investigators did not administer the tests, and no mention was made concerning the conditions under which the testing took place. Rapaport (1951) stressed that in order to consider the presentation of an investigation complete, the method of gathering the data must be fully explained.

Singer and Herman (1954) found that high and low M groups did not differ significantly in age, diagnosis, education, or

IQ. They found, however, that more of the M people manifested longer motor delaying capacity.

Barron (1955) stated that psychologists tend to attribute greater intelligence to persons who introspect, who take thought rather than action. Could psychologists be guilty of labeling high M persons as more intellectual because they function more, but not necessarily better, in this sphere? Barron found no difference in problem solving between low and high M persons of like IQ range.

Rorschach Studies with Mental Retardation

Sarason (1959) noted that the Rorschach is being used increasingly more often in the study of mentally defective chidlren. However, more research with mentally retarded subjects is needed in order to provide more conclusive evidence concerning the use of the Rorschach with mental retardates. Obviously, one of the problems in determining the intellective level is the accurate diagnosis of subnormality, particularly at the marginal levels. The answer to this problem is often elusive.

Rorschach (1964) based his diagnosis of subnormality as revealed by his test on twelve patients. How these subjects were selected and what criteria were used in order to diagnose them was not discussed. Thus, the reliability of his findings concerning the retarded through Rorschach testing must be questioned.

Beck (1932) grouped his institutionalized mentally defective subjects by MA which allowed for a standard deviation in age of 14.10. His results showed a mean M response of 1.29 in the 54-65 MA group. His 114 to 125 MA group attained the same mean M response. To Beck, the low M in the brighter group indicated a psychosis; whereas, the high number of M responses in the low MA group suggested mental deficiency. Jolles (1947) questioned this double interpretation of the determinants.

Ogden and Allee (1959) attempted to improve Beck's study by using IQ's rather than MA's. However, their sample consisted of sixty institutionalized patients of the Missouri School for the Feeble Minded and Epileptic. They were examined by a psychiatrist and determined to be legally feebleminded by the courts. The only explanation that the authors made about the length of institutionalization of the groups was expressed as follows: "Mean lengths of institutionalization of the groups were not significantly different one from another." In the scoring of the Rorschachs there was a ten per cent disparity between the two psychologists. The number of M responses showed no significant relation with IQ.

Rosenblatt and Solomon (1954) studied eighty adult mental defectives at Myles Standish State School in Massachusetts with CA's ranging from 19 to 55 years of age and IQ's between 28 and 81. The authors concluded that some mentally defective persons get good scores, but when taken as a group, they score lower than higher intellects.

Rorschach Studies with Children

Ames, Learned, Métraux, and Walker (1963) administered Rorschachs to 650 children between two and ten years of age in order to set up norms on various determinants for each age group. Children from two to six were tested at half year levels. From six to ten, yearly levels were recorded. Most of the children were in the high average to superior intellect with almost all of the parents in the above average and upper income brackets.

Ledwith (1952) did a five year longitudinal study with 160 children in the Pittsburgh area in order to obtain a normative analysis as well as a developmental study. She, also, included a control group of eighty children. Her population correlated well with Terman and Merrill's 1937 group. The M determinant exhibited a developmental process with her experimental group but dipped with her control group. Upon being retested, twenty-five per cent of the children had performance quotients which varied from fifteen to fifty-two points between the Stanford-Binet and the Grace Arthur Scale. How this was dealt with in the study was not explained by Ledwith.

Carlson (1952) criticized investigators who set up their norms while ignoring the importance of working with representative populations of children. His work with third grade children in the Seattle Public Schools was limited to the middle sixty-eight per cent range as determined by the Otis Group Intelligence Test. His eight years to eight years, eleven months group gave an average of 6.84 per cent human movement

responses. He compared these results with Ledwith's eight per cent M responses for her six-year-olds.

Ames, Métraux, and Walker (1959) based their study upon seven hundred Rorschach records of fifty boys and fifty girls at each yearly level from ten to sixteen. Only 398 different children were tested since some children contributed records at more than one age. The investigators pointed out that the subjects could not be considered a representative sample of the adolescent population since about half of the records were those of subjects whose fathers were professional workers. Also, the group showed above average IQ's. The authors found that M did not increase regularly with CA as it had in earlier studies. It fluctuated more at thirteen and fifteen years of age. The girls had more M responses than the boys at every age level with the exception of eleven.

Jolles (1947) studied sixty-six children above the age of ten with IQ's below 80. He avoided institutionalized subjects because only a small percentage of those judged mentally defective are institutionalized. Most of the children came from communities with populations exceeding 30,000. The conclusion on these subjects centered around the emotional disturbance which was present in every case. Jolles found subjects with anxiety neuroses, schizoid trends, and many with mixed symptoms of feelings of depression, compulsions, inferiority, and other personality disorders.

Hemmendinger (1953) found that immature perception of

children affects their Rorschach responses, and they resemble those of schizophrenics. He was able to discern great differences in the developmental perception from three years to ten years, eleven months.

Stein (1956) tested twenty native-born white children, ten males and ten females, at each of these age levels: 7-6 to 8-6; 11-6 to 12-6; and 15-6 to 16-6. These ages were selected to coincide with latency, puberty, and adolescence. Sixty students in two New York public schools made up the subjects. The IQ was determined from the number of words defined on the Stanford-Binet Vocabulary Test. The IQ was estimated from this one item. Those subjects with IQ's from 95 to 125 were included. Further questioning of movement responses was added. The M determinant showed a steady increase with an increase in CA.

M in This Study

The M determinant of the Rorschach still presents many unanswered questions concerning its value in measuring the manifestations of the intellect. Any examiner concerned with M as an indicator of the intellect must acknowledge that not only is M controversial and complicated, but also that the term intellect has never been adequately defined. Most authorities agree that the intellect through tests such as the Stanford-Binet and the Wechsler exhibits a developmental process. Thus, if the M response measures the manifestations of the intellect, it, too, should be developmental by increasing in number as

the CA, MA, and IQ increase. Test constructors must make the assumption that there will be this increase with CA, MA, and IQ. If this does not happen with M, then all those who make the claim that M reveals the intellect could be wrong. It is the purpose of this study to investigate the M determinant of the Rorschach in order to determine if it meets this criterion of validity. This becomes the sine qua non of M's validity as a measure of the manifestations of the intellect.

Summary

The M determinant of the Rorschach still presents many unanswered questions concerning its value in predicting the intellect of the subject. Since diagnosticians have placed so much emphasis on the human movement response, it is important that more research be carried on in order to understand it better. It is hoped that this study will contribute further information about the nature of the M component as an indicator of the intellect and add to the normative data which have already been collected.

CHAPTER II

THE PROBLEM

The purpose of this study was to investigate the M component of the Rorschach to determine if it could measure the manifestations of the intellect. The assumption was made that M would show a developmental trend if it revealed intellective level. Thus, this developmental trend was the most important aspect of the study.

A secondary problem concerned subjects who produced no M responses during the administration of the Rorschach. The technique known as testing the limits was then employed. The reason for its use was explained by Klopfer in these words:

> The more blocked and reticent a subject is in the performance proper and in the inquiry, the more important testing the limits becomes as an additional means of clarifying the subjects reaction pattern (1946, p. 52).

Klopfer went on to explain:

> One of the obvious features of the cards may be completely neglected in the subject's concept formation. The examiner must find out why he has failed to respond to it and to what degree he remains unresponsive under specific pressure (1946, p. 54).

Certainly, one would have to wonder why a subject could see human movement after being instructed to do so, but would not include it in the initial responses.

Another major concern of this investigation was the method of selecting the retarded subjects. Almost all of the studies which were reviewed utilized emotionally disturbed individuals or those who had been committed to institutions for the mentally retarded. Greenberg, Pearl, Berger, and Daston (1955), Neff and Lidz (1951), Beck (1932), Abrams (1955), Levine, Spivak, and Wight (1959), and Ogden and Allee (1959) used disturbed or institutionalized subjects.

Goldfarb (1949) found that "institution children" have patterns, of anxiety, history of aggression, and are self-inhibited. Gesell (1940, p. 321) supported this idea when he said, "The institution delimits the scope of the infant's behavior by paucity of inpacts. This paucity has nothing less than impoverishing effects." Goldfarb and Klopfer (1944) pointed out that children who spend the first three years in an institution tend to be retarded socially and intellectually causing their school performance to be inferior. Jolles (1947), Sloan (1947), and Despert and Pierce (1946) contended that responses of institutionalized children are similar to those of schizophrenic patients. Sarason (1959) concluded that institutionalized children cannot be considered representative of defectives in general. Thus, all subjects in this study were selected from the public school setting.

In order to determine whether or not M can be relied upon as an indicator of the intellect, the following hypotheses were tested:

1. There is a concomitant increase in the number of M responses as measured by the Rorschach with an increase in the CA.

2. There is a concomitant increase in the number of M responses as measured by the Rorschach with an increase in the MA.

3. There is a concomitant increase in the number of M responses as measured by the Rorschach with an increase in the IQ.

4. There is a concomitant increase in the percentage of M responses as measured by the Rorschach with an increase in the CA.

5. There is a concomitant increase in the percentage of M responses as measured by the Rorschach with an increase in MA.

6. There is a concomitant increase in the percentage of M responses as measured by the Rorschach with an increase in the IQ.

CHAPTER III

METHOD

Subjects

The subjects were randomly selected from the three CA groups with a six month's spread in each group. These three groups matched the median age of the three CA groups of children in Beck's Table (1961, p. 230).

CA Groups

7-3 to 7-9 (CA_1)
11-3 to 11-9 (CA_2)
15-3 to 15-9 (CA_3)

IQ Groups

In order to avoid overlapping between the IQ groups, a twenty point spread was allowed between each IQ group. The following groups were used:

50-75 IQ, high grade mentally defective (IQ_1)

95-110 IQ, normal range (IQ_2)

130-above IQ, very bright (IQ_3)

The dull normal and very bright ranges were excluded.

Setting

Children were randomly selected from randomly selected public schools. The subjects were chosen from three elementary

schools and one secondary school in Norman, Oklahoma, and five elementary schools and four secondary schools in Oklahoma City, Oklahoma. The ninety children who participated fit the criteria of CA and IQ range. Thirty subjects each in the 7-3 to 7-9, 11-3 to 11-9, and 15-3 to 15-9 CA ranges were tested. The sexes were equally distributed so that there were five boys and five girls in each of the IQ and CA groups.

Testing Procedure

Administration of Tests other than the Rorschach

The Stanford-Binet (1960 Revision) or the Wechsler Intelligence Scale for Children (1949) had been administered all of the mentally defective subjects in the past two years by the Psychological Services at the Board of Education of the Oklahoma City School System. Students in regular classes in ages 11-3 to 11-9 and 15-3 to 15-9 in the Norman and Oklahoma City Schools had been administered the California Test of Mental Maturity (1957 Revision, Form A, Non-Language and Language Sections). The children in the 7-3 to 7-9 CA group in the normal and very bright range did not have available test scores. Thus, the Otis Quick-Scoring Mental Ability Test (1954 Revision, Alpha Test) was administered. Group tests of intelligence were considered adequate since the investigator was not concerned with the pinpoint accuracy of the score. The main intent was to avoid overlapping between the IQ ranges.

Administration of the Rorschach Test

Each child was tested in a room of the school building with only the subject and the examiner present. The Rorschach was administered in a face-to-face relationship since children appear to be more comfortable and respond more freely in this setting. All ten cards of the Rorschach were used and were placed face down until presented one at a time to the child. Authorities differ on how to administer the initial response and on the inquiry periods. Ames, Learned, Métraux, and Walker (1963) suggest following each initial response with the inquiry period with young children because they tend to forget where they saw an object or become restless and bored with the inquiry. This same argument is often raised when testing the mentally retarded. Klopfer (1956) proposes, on the other hand, that if the subject's percept is a distinct one and not a "guess," he is as capable as an adult in remembering what he saw. For this reason Klopfer's method was followed.

The following verbal instructions were given:

(1) You will be shown ten cards one at a time.
(2) There are no right or wrong answers.
(3) Look at each card and tell what you see.
(4) If the first card was handed back without a response or after one response, the following instructions were given: Most children see more than one thing in each card. Look carefully to see if you can find something. If the child did not respond further, no more urging took place.

A silent stop watch was used to record the time of the initial response and the total time for each card. The card

was withdrawn after ten minutes. This procedure is suggested by Beck, and it has been observed by this examiner that few subjects are productive on a card after this period of time has elapsed.

The inquiry is perhaps the most important part of Rorschach administration. It is during this period that the percept must be located on the Rorschach Location Chart, and the examiner must question the subject until he satisfies himself that he knows how to score each response. On the other hand, the examiner must be careful to question insuch a manner that he does not suggest ways to respond. The directions during this period were: "How could you tell it was a _____? or "What about it made it look like a _____?"

Beck's (1961, pp. 72-73) method of scoring M was used. He explains the essentials for scoring as follows, "It is an activity within the normal anatomic repertoire of human beings." He further clarifies, "I like to have the subject say that the 'clowns' or whatever the humans perceived, are doing something, and any doubt can usually be resolved in inquiry." Beck, also, scores as M, percepts which include any of a human being and the part's normal activity. Thus, a pointed finger is scored as M.

Testing the Limits

For subjects who had no M in their protocol, Cards II, III, VII, and IX were chosen to test the limits. These particular

cards most frequently illicit human movement responses according to Phillips and Smith (1953, p. 66).

The directions given were:

> Most children can see people doing something.
> Take this card and see if you can find people.
> Tell me what they are doing.

CHAPTER IV

RESULTS

The individual results of the testing of the ninety subjects used in the study are recorded in the Appendix for examination. Tables 9 through 17 in the Appendix show the CA, MA, IQ, Sex, T/IR (average time of initial response), #R (total responses), #M (human movement responses), %M (percentage of M responses), and Testing the Limits for each subject in each IQ range (50-75, 95-110, and 130-Above) and in each CA group (7-3 to 7-9, 11-3 to 11-9, and 15-3 to 15-9).

The question which needed to be answered was: "Do the number of M responses and the percentage of M responses increase significantly in a linear fashion with an increase in CA, MA, and IQ?" In order to test this question, Linear Orthogonal Polynomials were run according to the method described in Ferguson (1966). The results obtained are found in Table 1 which shows the source of variance, MS, df, F, and P for CA and number of M responses, MA and number of M responses, IQ and number of M responses, CA and percentage of M responses, MA and percentage of M responses, and IQ and percentage of M responses.

In Hypothesis 1 it is stated that there will be a

concomitant increase in the number of M responses as measured by the Rorschach with an increase in CA. Table 1 reveals that the results were not statistically significant. Table 2 shows that the number of M responses for CA_1 is 50, for CA_2 is 79, and for CA_3 is 51. CA_1 and CA_2 reveal a linear trend, but CA_3 dips sharply. Thus, Hypothesis 1 is not supported since the number of M responses did not significantly increase with an increase in CA.

In Hypothesis 2 it is stated that there will be a concomitant increase in the number of M responses with an increase in the MA. Table 3 shows that the number of M for MA_1 is 21, for MA_2 is 77, and for MA_3 is 82. Therefore, the number of M increased with an increase in MA. Table 1 shows the linear trend to be statistically significant at the .0001 level. Thus, the hypothesis that the number of M will increase with an increase in MA is confirmed.

In Hypothesis 3 it is stated that there will be a concomitant increase in the number of M responses with an increase in IQ. Table 4 shows the number of M for the three IQ ranges: IQ_1 has 24; IQ_2 has 49; IQ_3 has 107. The linear trend analysis of the data in Table 1 shows that this trend is statistically significant at the .0001 level. Thus, the hypothesis is accepted, for the M responses increased concomitantly as the IQ increased.

In Hypothesis 4 it is stated that there will be a concomitant increase in the percentage of M responses as the

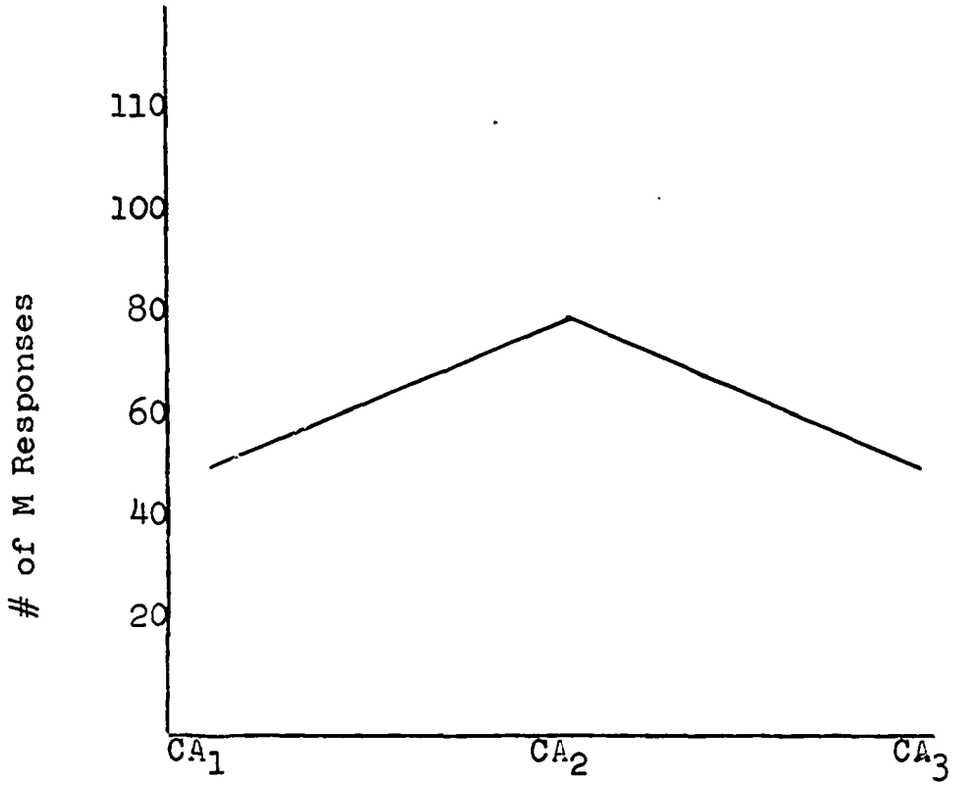
TABLE 1

Linear Orthogonal Polynomials for Hypotheses 1, 2, 3, 4, 5, and 6

Hypotheses	Source	MS	df	F	P
1. CA-#M	CA	.01	1	-	N.S.
2. MA-#M	MA	62.01	1	17.72	.0001
3. IQ-#M	IQ	114.81	1	32.8	.0001
4. CA-%M	CA	224.26	1	2.8	.10
5. MA-%M	MA	944.07	1	12.12	.001
6. IQ-%M	IQ	1242.15	1	15.95	.001

TABLE 2

Linear Trend for CA and Number of M



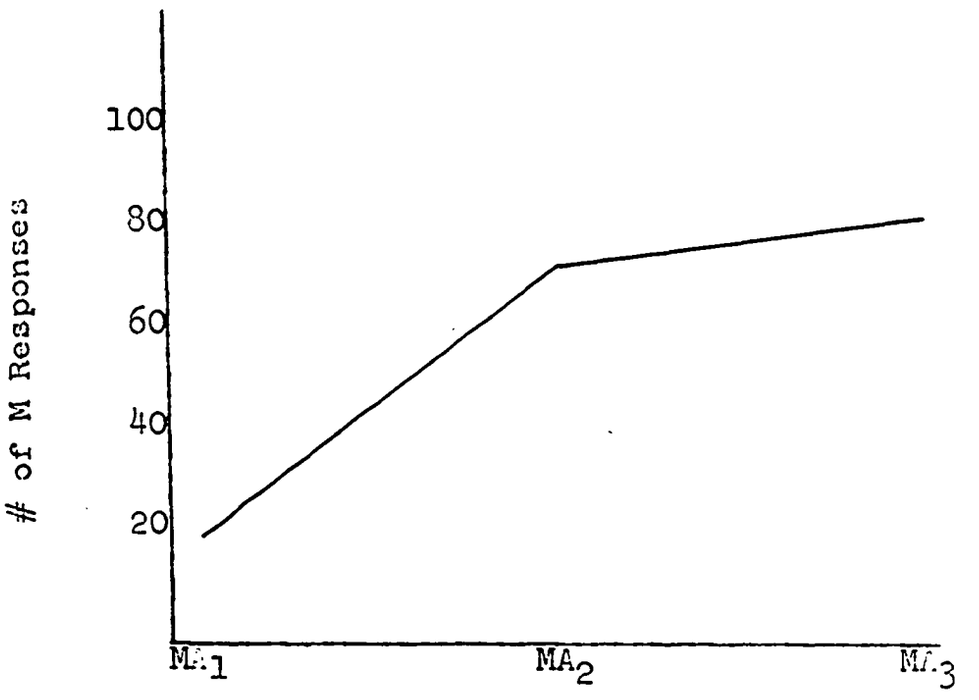
CA_1 = 7-3 to 7-9

CA_2 = 11-3 to 11-9

CA_3 = 15-3 to 15-9

TABLE 3

Linear Trend for MA and Number of M



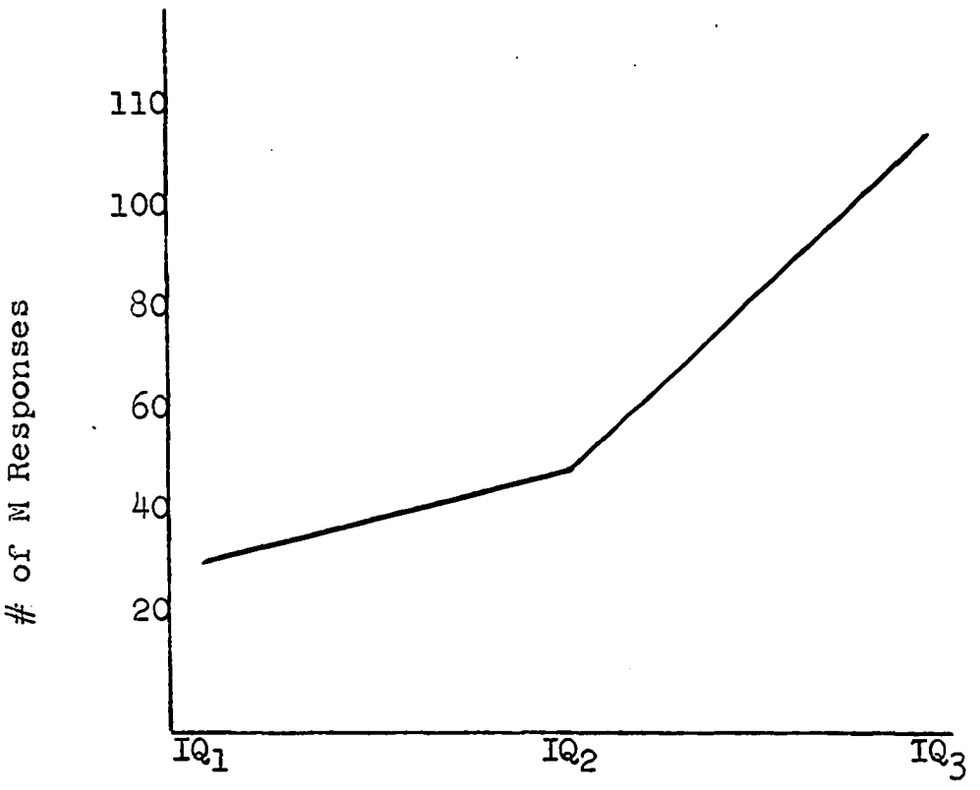
MA_1 = 4-9 to 8-1

MA_2 = 8-2 to 12-8

MA_3 = 12-9 to 21-6

TABLE 4

Linear Trend for IQ and Number of M



IQ_1 = 50-75

IQ_2 = 95-110

IQ_3 = 130-above

CA increases. The percentage of M was tabulated for each subject by dividing his total number of responses into his total number of M responses. These were each multiplied by a constant of 100. The results for each subject are found in the Appendix in Tables 9 through 17. Table 5 shows that the total percentage of M for CA_1 is 204, for CA_2 is 289, and for CA_3 is 300. Table 1 shows the linear trend to be statistically significant at the .10 level. Thus, the hypothesis is partially supported since there was a concomitant increase in the percentage of M responses with an increase in CA.

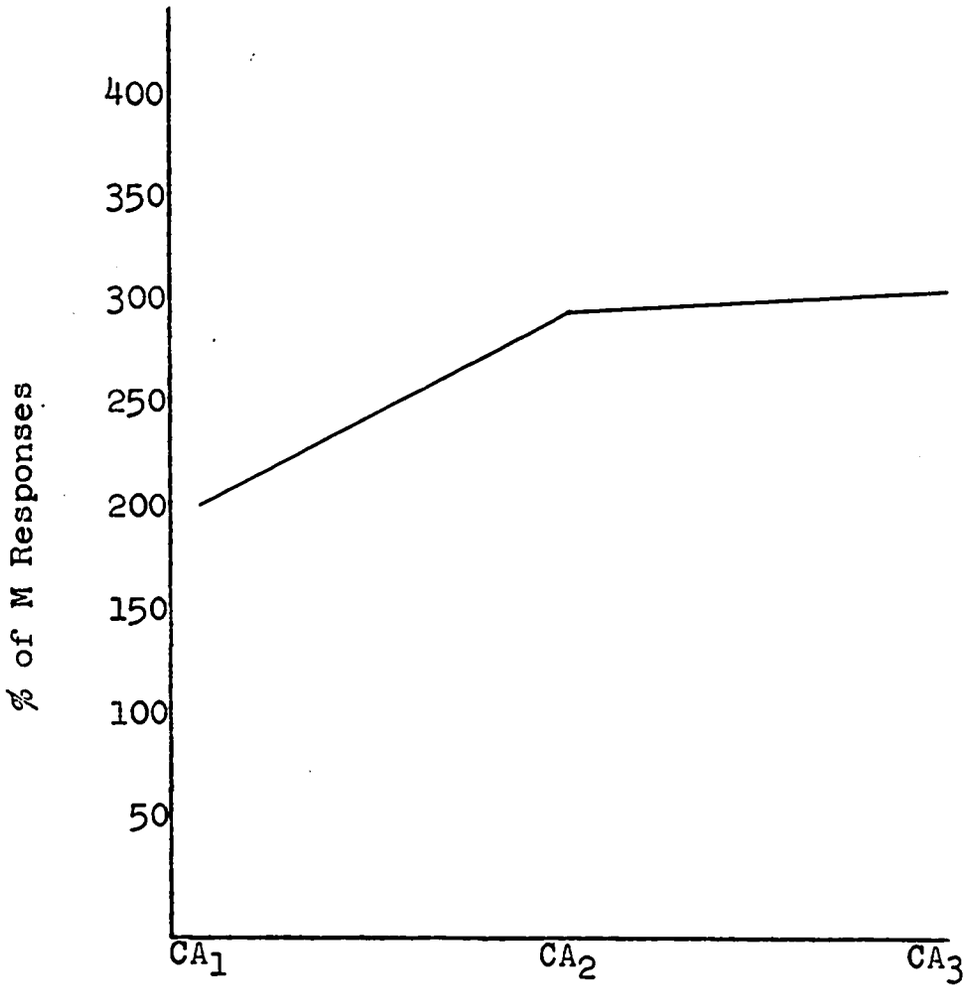
In Hypothesis 5 it is stated that there will be a concomitant increase in the percentage of M responses with an increase in MA. Table 6 shows that the total of the percentage of M for MA_1 is 136, for MA_2 is 275, and for MA_3 is 382. Table 1 shows the linear trend to be statistically significant at the .001 level. Thus, the hypothesis is confirmed since the percentage of M responses increased with an increase in MA.

In Hypothesis 6 it is stated that there will be a concomitant increase in the percentage of M responses with an increase in IQ. Table 7 shows that the total of the percentage of M responses for IQ_1 is 161, for IQ_2 is 192, and for IQ_3 is 440. Table 1 shows the linear trend to be statistically significant at the .001 level. Thus, the hypothesis is supported as the percentage of M responses increased concomitantly with an increase in IQ.

An anaylsis of variance was run to determine if sex differences could have influenced the results obtained concerning

TABLE 5

Linear Trend for CA and Percentage of M_t



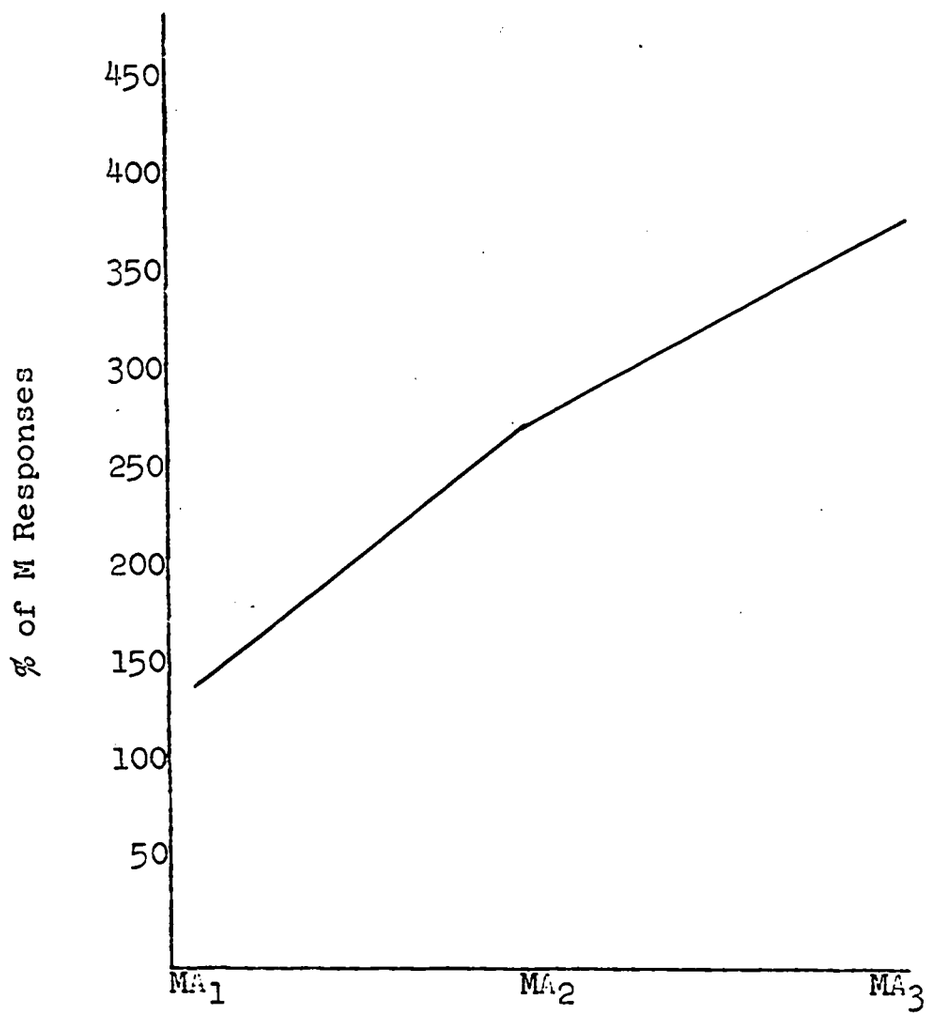
CA_1 = 7-3 to 7-9

CA_2 = 11-3 to 11-9

CA_3 = 15-3 to 15-9

TABLE 6

Linear Trend for MA and Percentage of M



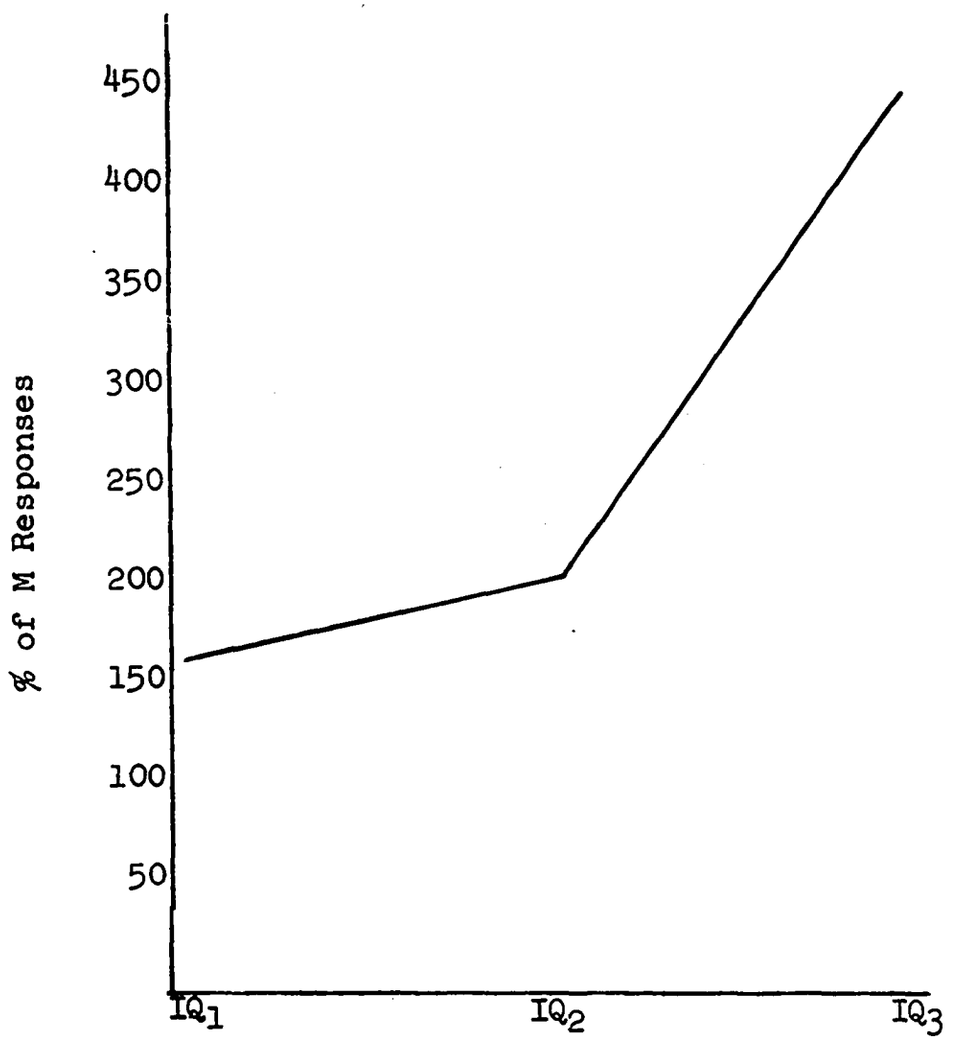
MA_1 = 4-9 to 8-1

MA_2 = 8-2 to 12-8

MA_3 = 12-9 to 21-6

TABLE 7

Linear Trend for IQ and Percentage of M



IQ_1 = 50 to 75

IQ_2 = 95 to 110

IQ_3 = 130 - Above

the M determinant as the CA and IQ increased. This statistical analysis was just one attempt to be sure that M was affected by the IQ and CA and not the sex of the subject. The number of male and female subjects in each IQ and CA group were equally distributed. There were always five boys and five girls to each group. Table 8 shows that there was no significant interaction between CA or IQ and sex. Thus, the increase in M and percentage of M was influenced by an increase in CA, MA, or IQ and not by sex differences.

TABLE 8

Analysis of Variance
for
CA for IQ and Sex

Source	MS	df	F	P
Chronological Age (C-1)	9.03	2	2.58	.10
Intelligence Quotient (I-1)	67.64	2	19.33	.0001
Sex (S-1)	4.44	1	1.27	N.S.
(C-1) x (I-1)	4.62	4	1.32	N.S.
(S-1) x (C-1)	.08	2	.04	N.S.
(S-1) x (I-1)	0	2	0	N.S.
(C-1) (S-1) (I-1)	16.23	4	4.64	.01
Error	3.25	72		

CHAPTER V

DISCUSSION AND CONCLUSION

This study was an investigation of the M component of the Rorschach to find out if it could be relied upon as an indicator of the intellect. Six hypotheses were tested in order to determine whether or not the number of M responses and percentage of M responses would increase concomitantly with an increase in CA, MA, and IQ.

Four hypotheses were significantly supported. It was found that the number of M responses increased significantly with an increase in MA and IQ, and the percentage of M responses increased significantly with an increase in MA and IQ. The percentage of M responses increased slightly with an increase in CA, and this hypothesis was partially supported. These results strongly indicate that the M component does reveal the intellect.

Hypothesis 1 which assumed that the number of M responses would increase with an increase in CA was the only hypothesis not supported. CA_2 showed an increase over CA_1, but CA_3 dipped sharply. In fact the responses of the CA_3 group were interesting to examine. As a group the subjects appeared hesitant to give positive responses, and they seemed

reluctant to name a definite object or animal. Their responses were paraphrased with: "It might be" or "It kinda looks like" or "It's sorta like." Instead of giving one definite response, they often became vague about what their percepts were. For example, it was not unusual to receive the following responses: "It might be a fox or a cat or some other animal." "It's some sort of animal or insect." "If it were filled in more it could be a cliff or a mountain." And, finally, in order to let the examiner know that he was aware of what the cards really were, one subject said, "More than anything it looks like an ink-blot."

Because the fifteen-year-old appeared to want to "play it safe," he limited his responses; this took the spontaneity out of both the testing situation and his responses. Ames, Metraux, and Walker discussed these signs of blocking by this age group:

> From twelve to fifteen there is a gradual dropping off of the movement and color responses that reaches the low point at fifteen. Fewer responses are given and the total record of both girls and boys is shorter. There is less desire to clarify and the cards are studied carefully only to be rejected or gone over without seeing anything (1959, p. 225).

The fifteen-year-olds were concerned with anatomy, microscopic animals, smashed bugs, and explosions. The responses were sparse, and the subjects used few descriptive adjectives.

The human movement response seems to be more threatening than the animal or object percepts. Fifteen-year-olds

had few M. Therefore, the M responses did not increase concomitantly with an increase in CA. Ames, Métraux, and Walker (1959, p. 225) pointed out in their study, "There are fewer human movement responses here (fifteen years) than at any other ages." This was borne out in this study since CA_2 had more M responses than CA_3.

The CA_1 group gave only one less total number of M responses than CA_3. Ames, Learned, Métraux, and Walker (1963, p. 220) found that, "M occurs here (seven years) more than at any age to date, and also more than at the following age." They further clarified this statement, "Also more children give M responses than at any other age in the first ten years." Thus, CA_3 as a group limited their M and total responses; whereas, the CA_1 group produced an abundance of M for their age.

Another important factor of this study which should be discussed concerns the wide differences in the number of M responses made by subjects within a CA and IQ group as well as the wide differences in the number of M responses produced by subjects between CA and IQ groups. For example, it is commonly accepted by those who work with the Rorschach that since M is a manifestation of the intellect, the retarded will not have an abundance of M in their protocol. An examination of the results of this study as found in Table 9 in the Appendix reveals that one of the CA_1 subjects in IQ_1 range produced 3 M's, while five others produced 1 M. On the other hand, Table 10 in the Appendix shows that no subjects in CA_1 and IQ_2 had 3

M's, and only four subjects had 1 M. Table 11 in the Appendix shows that five subjects in the CA_1 and IQ_3 had 5 or more M's. Still, four subjects had no M. Thus, it is important to realize that subjects from any IQ range may produce many M or no M. For this reason, when working with individual cases the Rorschach examiner must be cautious about concluding that an abundance of M will indicate a very bright person, and few M will indicate one who is dull. There is obviously overlap between IQ ranges. It cannot be said that the retarded will be incapable of producing M responses while the very bright will have an abundance of M. Only on mass data can it be said that the very bright subjects will produce a greater number of M responses than the retarded.

A secondary problem included in this study was the Klopfer Method of Testing the Limits. This technique was used only on subjects who failed to produce M responses in any of the ten cards of the Rorschach. In the CA_1 group, Tables 9, 10, and 11 show that fourteen of the subjects failed to produce an M response. After testing the limits was used, all with the exception of four of the subjects produced at least 1 M, and three of the subjects had 4 M's. In the CA_2 group in Tables 12, 13, and 14, eight subjects did not produce any M responses in their original protocol. Of this number, only two failed to produce M after testing the limits was utilized. Of the eight subjects who did not produce M responses, six were in the IQ_1 range. In the CA_3 group, Tables 15, 16, and 17 show

that four subjects, none in the IQ_3 range, failed to produce M responses initially. After testing the limits, all four subjects had at least 1 M. Only six subjects when told to "see people doing something" still failed to produce any M.

In conclusion, the findings in this study support earlier studies which maintain that M reveals the manifestations of the intellect. The results of this investigation give evidence that the number of M will increase concomitantly with an increase in MA and IQ and that the percentage of M will increase concomitantly with an increase in CA, MA, and IQ. Furthermore, this increase is statistically significant.

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APPENDIX

TABLE 9

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 7-3 to 7-9 Chronological Age Group in the 50-75 IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
7-5	89	5-9	69	75	M	13.2"	18	3	.17	
7-5	89	4-11	59	64	M	13.4"	16	1	.06	
7-3	87	5-3	63	70	F	8.9"	16	1	.06	
7-4	88	5-3	63	69	M	14.0"	17	1	.06	
7-9	93	4-9	57	58	F	8.5"	12	1	.08	
7-8	92	4-11	59	61	F	23.0"	13	1	.08	
7-4	88	5-8	68	75	M	6.8"	14	0	.0	0
7-3	87	5-2	62	69	M	13.2"	19	0	.0	0
7-3	87	5-2	62	68	F	23.9"	12	0	.0	2
7-8	92	5-7	67	70	F	45.0"	11	0	.0	1
$\bar{X}$ CA		$\bar{X}$ MA		$\bar{X}$ IQ						
7-5		5-3		67.9						

*Times a constant of 100.

TABLE 10

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 7-3 to 7-9 Chronological Age Group in the 95-110 IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
7-8	92	7-11	95	102	M	12.3"	14	1	.07	
7-8	92	7-8	92	98	F	13.4"	20	1	.05	
7-4	88	8-1	97	109	M	29.2"	18	1	.06	
7-6	90	8-0	96	106	F	35.6"	23	1	.04	
7-6	90	8-2	98	108	M	27.1"	22	0	.0	1
7-8	92	7-8	92	100	M	41.9"	14	0	.0	4
7-6	90	7-11	95	104	F	11.5"	15	0	.0	1
7-5	89	7-5	89	99	F	29.1"	15	0	.0	1
7-3	87	7-3	87	99	F	57.8"	15	0	.0	0
7-4	88	8-1	97	109	M	12.3"	14	0	.0	1
$\bar{X}$ CA 7-5		$\bar{X}$ MA 7-8		$\bar{X}$ IQ 103.9						

*Times a constant of 100.

TABLE 11

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 7-3 to 7-9 Chronological Age Group in the 130-above IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
7-8	92	10-6	126	137	F	12.4"	32	10	.30	
7-4	88	9-6	114	130	M	11.3"	17	8	.47	
7-3	87	9-5	113	130	F	12.8"	47	8	.17	
7-4	88	10-3	123	140	M	12.5"	37	6	.16	
7-9	93	11-0	132	142	F	8.3"	33	5	.15	
7-8	92	10-2	122	133	F	18.6"	17	1	.06	
7-5	89	10-6	126	142	M	41.0"	11	0	.0	1
7-6	90	9-9	117	130	M	12.1"	21	0	.0	4
7-4	88	10-0	120	137	M	29.5"	17	0	.0	0
7-7	91	10-5	125	139	F	9. "	22	0	.0	4
$\bar{X}$ CA 7-5		$\bar{X}$ MA 10-1		$\bar{X}$ IQ 136						

*Times a constant of 100

TABLE 12

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 11-3 to 11-9 Chronological Age Group in the 50-75 IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
11-3	135	6-9	81	62	M	25.3"	15	2	.13	
11-5	137	7-2	86	65	F	17.1"	15	2	.13	
11-7	139	7-2	86	64	F	17.5"	14	1	.07	
11-5	137	8-6	102	75	M	20.7"	13	1	.08	
11-5	137	7-9	85	69	M	10.0"	22	0	.0	2
11-3	135	7-1	93	65	M	18.1"	17	0	.0	2
11-7	139	7-9	83	69	M	12.9"	12	0	.0	2
11-4	136	8-5	101	75	F	24.8"	16	0	.0	0
11-9	141	7-9	93	68	F	20.3"	15	0	.0	3
11-8	140	5-7	67	52	F	17.0"	14	0	.0	0
X CA		X MA		X IQ						
11-6		7-5		66.4						

*Times a constant of 100.

TABLE 13

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 11-3 to 11-9 Chronological Age Group in the 95-110 IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
11-9	141	12-2	146	108	F	7.2"	60	10	.17	
11-3	135	12-8	151	110	F	12.5"	21	5	.24	
11-5	137	10-9	129	95	F	20.3"	28	5	.18	
11-6	138	12-2	146	104	F	9.9"	46	4	.09	
11-4	136	11-8	140	103	F	8.3"	24	2	.08	
11-4	136	10-11	131	196	M	9.5"	27	2	.07	
11-6	138	12-2	146	106	M	16.6"	29	2	.07	
11-3	135	11-8	140	102	M	33.1"	28	1	.04	
11_3	135	12-3	147	109	M	4.2"	35	1	.03	
11-9	141	11-5	137	97	M	12.3"	26	0	.0	2
$\bar{X}$ CA 11-5		$\bar{X}$ MA 11-10		$\bar{X}$ IQ 103						

*Times a constant of 100.

TABLE 14

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 11-3 to 11-9 Chronological Age Group in the 130-above IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
11-9	141	16-7	199	136	M	11.2"	26	8	.31	
11-7	139	18-0	216	158	F	25.3"	31	7	.23	
11-8	140	15-9	189	130	M	8.8"	30	5	.17	
11-7	139	16-6	198	136	M	3.7"	25	5	.20	
11-4	136	15-4	184	135	M	7.0"	44	5	.11	
11-3	135	15-0	180	133	M	52.1"	25	4	.16	
11-5	137	15-5	185	135	F	22.2"	17	3	.18	
11-7	139	15-8	188	130	F	16.5"	26	3	.12	
11-5	137	16-9	201	143	F	10.3"	29	1	.03	
11-3	135	15-9	189	141	F	4.3"	14	0	.0	3
$\bar{X}$ CA		$\bar{X}$ MA		$\bar{X}$ IQ						
11-6		16-0		137.3						

*Times a constant of 100.

TABLE 15

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 15-3 to 15-9 Chronological Age Group in the 50-75 IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
15-3	183	8-1	97	53	F	13.9"	15	3	.20	
15-3	183	8-0	96	52	M	44.6"	10	1	.10	
15-3	183	10-10	130	75	M	14.6"	18	1	.06	
15-5	185	9-7	115	66	M	24.2"	19	1	.05	
15-9	189	10-1	121	67	F	24.4"	11	1	.09	
15-5	185	10-6	126	72	F	12.9"	14	1	.07	
15-3	183	10-10	130	75	F	18.8"	16	1	.06	
15-3	183	9-8	116	68	M	32.2"	18	1	.06	
15-6	186	11-0	132	75	M	49.7"	15	0	.0	1
15-7	187	9-6	114	64	F	43.9"	8	0	.0	1
$\bar{X}$ CA 15-5		$\bar{X}$ MA 9-7		$\bar{X}$ IQ 66.7						

*Times a constant of 100.

TABLE 16

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 15-3 to 15-9 Chronological Age Group in the 95-110 IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
15-5	185	14-11	179	100	F	26.9"	15	3	.20	
15-6	186	15-7	187	104	F	12.1"	14	2	.14	
15-8	188	15-11	191	105	M	32.2"	14	2	.14	
15-5	185	16-3	195	106	M	19.0"	39	2	.05	
15-8	188	16-0	192	102	F	14.6"	20	1	.05	
15-9	189	15-11	191	101	F	14.8"	34	1	.03	
15-9	189	17-4	208	110	M	16.8"	15	1	.07	
15-8	188	15-11	191	102	F	12.9"	21	1	.05	
15-3	183	16-1	193	108	M	8.1"	13	0	.0	3
15-5	185	15-1	181	101	M	17.4"	18	0	.0	4
$\bar{X}$ CA		$\bar{X}$ MA		$\bar{X}$ IQ						
15-7		15-10		103.9						

*Times a constant of 100.

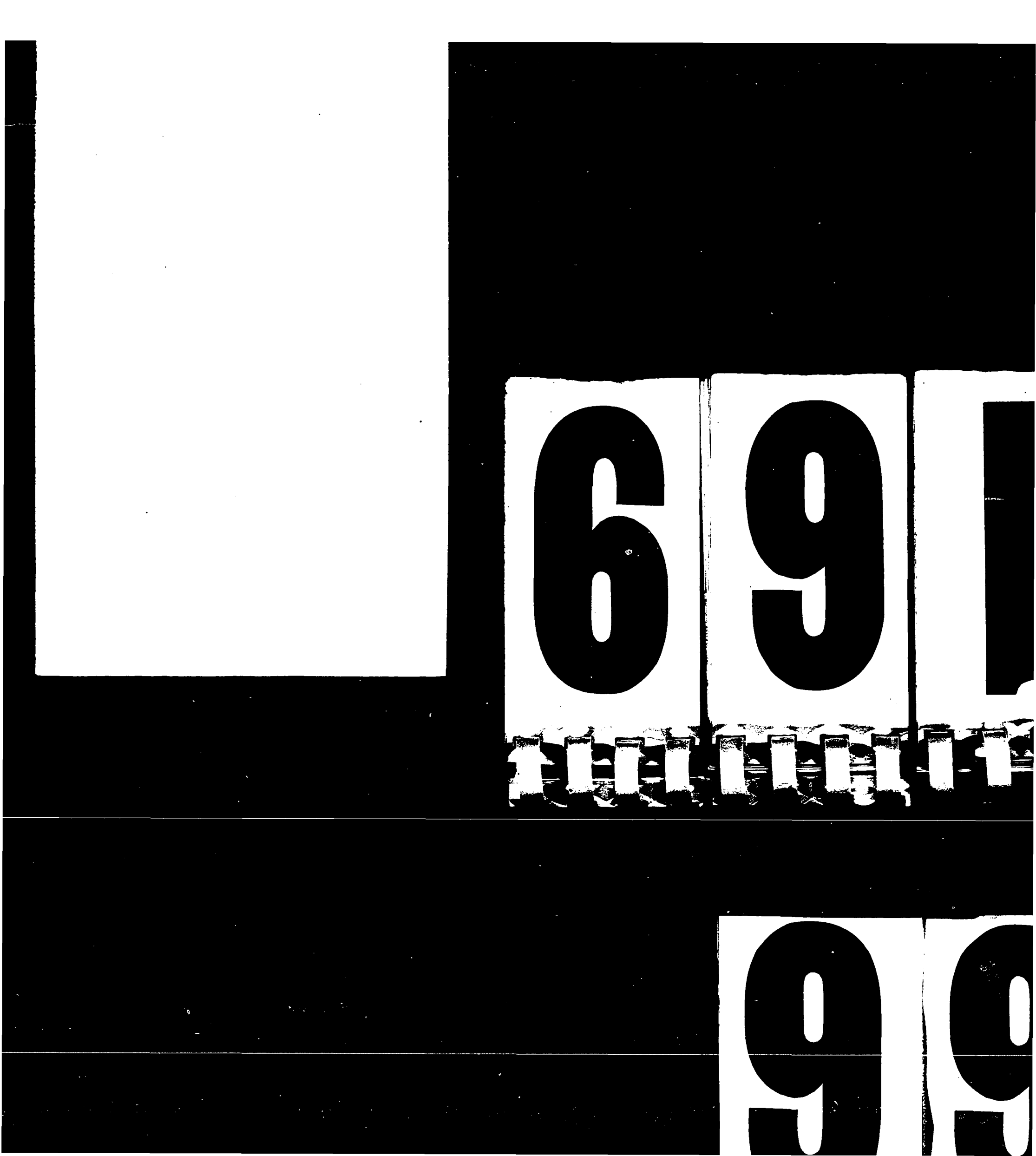
TABLE 17

CA, MA, IQ, Sex, T/IR, #R, #M, %M, Testing the Limits for the 15-3 to 15-9 Chronological Age Group in the 130-above IQ range

CA	(mos.)	MA	(mos.)	IQ	Sex	T/IR	#R	#M	%M*	Testing the Limits
15-9	189	21-4	256	130	M	15.8"	11	4	.36	
15-3	183	19-6	234	130	M	27.9"	13	4	.31	
15-6	186	21-6	258	134	F	8.8"	28	4	.14	
15-9	189	20-10	250	136	F	7.2"	17	3	.18	
15-3	183	19-6	234	130	F	8.1"	31	3	.10	
15-5	185	20-1	241	130	M	10.9"	44	3	.07	
15-4	184	20-9	249	140	F	23.6"	13	3	.23	
15-6	186	20-5	245	131	M	16.6"	23	2	.09	
15-4	184	20-1	241	133	F	10.8"	16	1	.06	
15-8	188	19-11	239	130	M	24.3"	24	1	.04	
$\bar{X}$ CA		$\bar{X}$ MA		$\bar{X}$ IQ						
15-6		20-5		132.4						

*Times a constant of 100.




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99