EXPLORATORY STUDY OF THE
DRAW-A-MAN TEST FOR JORDANIAN
CHILDREN

by

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ABSTRACT

The Goodenough scale is a drawing test. It measures mental abilities of small children up to puberty. The test has many advantages over other tests of intelligence. It is interesting to the child, non-verbal, easy to administer and score. Its reliability and validity as an intelligence measuring tool have been established by numerous studies.

The purpose of this study was to standardize this test on Jordanian children ranging in age between 5 and 10 years. The 5- and 6-year-old subjects were drawn exclusively from the nursery schools of two Jordanian cities, Irbid and Ramallah. The other subjects were drawn from the government schools of Irbid and three neighbouring villages, Al-Barha, Hakama, and Maro. The number of drawings used in the standardization of the scale was 350. They were classified in such a manner so that the drawings of children falling within two consecutive mid-years were grouped together and considered as one age group.

The drawings were then scored using the Goodenough scoring key. The average scores for the different age groups were calculated. The smoothed values were considered as age norms. The Jordanian normative data were found to be lower than those obtained by Goodenough for corresponding American groups. Two reasons were proposed to account for this: (1) the small number of

subjects taken to represent each age group, and (2) the relative

deficiencies of books, fashion magazines, paintings, and other

pictures, which represent the human figure, in the Jordanian

environment.

The study evaluated the reliability of the test by the

degree of consistency of the child's performance on the test. The

drawing test was administered twice to 30 children. The test-

retest period was three months. The drawings were scored, and the

two sets of scores were then correlated. A correlation coefficient

of .81 was found.

The validity of the test has been tested in three ways:

(1) the increase in performance with age, (2) the variability of

performance within the same age, and (3) the relation between per-

formance on the test and school achievement. The study showed a

progressive improvement in test score with age, and that children's

performance within a specific age level are spread on a continuum.

The study, however, failed to show any significant relationship

between performance on the test and school achievement ($r = -.10$).

Quantitative as well as qualitative differences were

observed between both sexes. Girls scored systematically higher

than boys at all age levels, and did better on clothing and hair

items. On the other hand, boys included heels, uniforms of

soldiers, and portrayed action in the limbs. The relative

superiority of girls relative to performance on the test was explained by two main factors: (1) girls are more interested in and more familiar with drawing and decorative work, and (2) they are docile and pay more attention to details. The qualitative differences were attributed to the difference between both sexes relative to the figure of identification.

Urban boys seemed to do consistently better than rural boys on the test. The relative superiority of urban boys was attributed to two reasons: (1) books, magazines, masks, and dolls which represent the human figure are more accessible to urban children than they are to rural children, and (2) urban children, in most of the cases, come from higher socio-economic groups.

The study, as far as the writer can see, had two main limitations: (1) the number of subjects who were taken to represent each age group was too small, and (2) the sampling method did not take account of the subjects, grade and socio-economic status. Therefore, the obtained age norms should be taken as tentative values which have to be interpreted with much caution.

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CHAPTER I

INTRODUCTION

Purpose of the Study

The purpose of the present study is to establish age norms for the Goodenough "Draw-a-man" test in Jordan. This test is used as a tool for the assessment of mental abilities of children five to ten years of age. The 51 scoring points listed by Florence Goodenough were used in the current study. Establishment of age norms for Jordanian children will make this test available for use with appropriate age groups.

Why Choose the Goodenough Drawing Test as an "Intelligence" Measuring Tool

There are various intelligence tests, more reliable and valid, available. But the reasons behind standardizing this test, hoping that it will be used in Jordan, are the following:

1. Drawing in general, and human figure drawing in particular, is interesting to the child. He will perform the test as if it were a game and with the greatest amount of motivation and enthusiasm. We may assume that what the child performs indicates his maximum ability.

2. "Man" is an item that is familiar to all children irrespective of their environment - their socio-economic status, and

the educational level of their parents, etc.

3. The test is non-verbal. It has the advantage over verbal tests which put children from a poor environment and children with special defects, such as auditory or delayed speech, at a disadvantage.

4. The time needed to give the test for the individual child is short. The result is that loss of zeal and motivation, which are characteristics of other tests (the Binet for example) is absent.

5. The test can be given to a large group of children at the same time. Thus it adds to the points listed above the advantage of a group test.

6. It does not need special qualifications on the part of the examiner. The average elementary teacher can, after a short period of training, satisfactorily administer the test and reliably score it.

7. Its correlation with other good intelligence tests is found to be fairly high which suggests its usefulness in assessing what other tests try to do, namely measure general intelligence or level of conceptual maturity.

Educational Uses of Intelligence Tests

The school, more than any other social institution, is in a bad need of a tool to assess the mental ability of its children, specially in the kindergarten and primary stage. The following

facts are worthy of knowing in this respect:

1. Retarded children, who cannot benefit from the normal class activities, can be detected.

2. The mental lack of children with special auditory or speech defects can be determined and they can be differentiated from those whose poor work in school is due to retardation. For example, a child who gets a high score in a mental test but shows a poor school work, can be suspected of having special defects, other than retarded mental ability.

3. Mental tests are used as a basis for grouping. Retarded children can be detected early. To avoid their presence with other children in the same class special classes have to be provided. In this way the presence of over-age children is avoided.

4. Poor teaching and unsuitable curriculum may be suspected if there is a discrepancy between school achievement and mental ability, as revealed by a mental test.

5. The need of the school counselling program for an intelligence test cannot be overemphasized. When teachers know about the mental standing of their pupils they can understand their problems and be in a better position to help them.

The Goodenough Drawing Scale

Goodenough, following the lead of the literature, believed

that children's drawings could serve as indication of their mental development. The object which was chosen as the subject of her drawing test was the human figure, a familiar object to all children in a normal environment. Among all possible human figures the figure of a "man" was chosen.

To decide on what criteria the child's drawing of a "man" be judged, Goodenough collected 4000 drawings from children in the kindergarten and the four primary grades of the schools of Perth Amboy in New Jersey. From these, a group of 100 drawings were selected for primary study. The selection was made on age-grade basis. She and a group of persons studied those drawings to determine what characteristic changes take place in children's drawings as they grow older and develop mentally.

After many revisions a final scale of 51 points, for scoring the child's drawing of the human figure, was established. Every point that was included in the final scale passed the three requirements of (1) regular and (2) fairly rapid increase in the percentage of children who include it in their drawings at successive ages, and (3) a clear differentiation between the performances of children of the same age but in different school grades (Goodenough, 1926).

Although this scale was standardized on American children between 4 and 13 years of age, its usefulness as a tool for the measurement of mental development has been recognized in different countries and cultures.

Psychological Interpretations of Children's Drawings

The interest of psychologists in the drawings of children is not new. The idea of their being a reflection of mental development of small children was recognized prior to 1920. Most studies prior to this date were descriptive and no attempt was made to study children's drawings quantitatively until 1921 when Burt indicated the developmental stages of these drawings.

Goodenough's contribution was her demonstration that a large component of children's intellectual ability can be revealed through their drawings of the human figure. She also pointed to the possibility of using the human figure, drawn by small children, as a diagnostic test of their mental disturbances. The human figure, she maintained, reveals a lot of the emotional and maladjustive behavior of the child who drew it. With the development of the "projective technique," the human figure was extensively used for clinical purposes. Treatment of this subject is beyond the scope of this brief introduction. Our concern, here, with the human figure is limited to the use we can make of to assess children's mental abilities.

The child's drawing of any object such as a horse, a train, a tree, or a man reveals the concept the child has about the class of objects to which it belongs. Harris (1963) maintains that the concept the child has of a familiar object is a useful index of

his concepts generally. Studies have shown that the human figure is among the most preferred objects which children draw (Harris, 1963). Thus, the child's drawing of a "man" is a good and valid indication of his conceptual maturity.

The child's drawings of the human figure increases in complexity with age. Studies have shown that children's drawings reflect sequential developmental stages. Intelligence, as measured by mental tests, shows also this tendency. The conclusion is that intelligence and what is reflected in the children's drawings is correlated. In the final analysis three conclusions can be drawn from the previous discussion: (1) the child's drawing of any object is a good indication of the level of his conceptual maturity, (2) the child's concept of any object gets more complex and detailed as he matures chronologically and gains new experience, and (3) at any age we can assess the general mental ability of a child by analyzing his drawings at that age.

Although the last conclusion can be drawn easily, there is a warning against its overemphasis. Goodenough's findings showed that her drawing test ceases to show age increment by early adolescence. But the Goodenough findings were exposed to many investigations. These investigations have shown that the usefulness of the drawing test can be extended far enough beyond the age for which it was originally designed (Berdie, 1945; Birch, 1949). Upon reviewing such studies one concludes that the scale can be

used with subnormal adults but by no means with normal and gifted
adults.

Goodenough upon reviewing the literature concluded that the
following mental processes are involved in her "Draw-A-Man" test:

1. Association by similarity.

2. Analysis into components of the object to be drawn.

3. Evaluation of these parts and selection of those which
appear to be essential - This process is unconscious on the part
of the child.

4. Analysis of spatial relationships.

5. Judgement of quantitative relationships and relative
proportions.

6. Through further process of abstraction, reduction and
simplification of the several parts into graphic outlines.

7. Coordination of eye and hand movement.

8. Adaptability, which is essentially the ability to adjust
the drawing scheme to the new features which are added as the draw-
ing proceeds.

9. Perception of details and discrimination of objects.

Sex Differences in the Performance of the Drawing Test

In her original study Goodenough (1926) noticed a slight
difference between the performance of both sexes. The difference

was in favor of girls. Goodenough's findings was in contrary to previous studies which made her minimize such a difference and to attribute it to the method of standardizing the items rather than to true sex difference. She noticed that the difference between both sexes is more of a qualitative rather than quantitative nature. For example, girls emphasized eye detail, cheeks, curly hair, and arms not longer than head length. Boys were more likely to draw profiles, to put in the heels, to represent the figure in motion, and to draw arms reaching below the knee. She suggested that such differences may be due to different mental processes involved in the drawing of these parts or to a difference in the interests of both sexes (Goodenough, 1926).

Dennis (1942) studied the drawings of Hopi children among whom graphic art held a prominent place and was chiefly practiced by males. He found a marked sex difference between the performance of both sexes in the drawing test. The mean IQ for boys was found to be 117 while that for girls was 100. The study showed that the relative standing of boys tends to increase with age while that of girls tends to decrease. Similar results were found by other studies among primitive Indian tribes.[1]

Harris (1963) found a significant sex difference in favor

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[1] For further details the reader is referred to the review article by Goodenough and Harris (1950).

of the girls both quantitatively and qualitatively. He noticed that girls do better on eye detail and proportion items. He found also that girls solved the problem of transparencies or clothing earlier than boys, but did not otherwise do better on clothing items. Girls do better on coordination items, but boys are more likely to portray action in the arms. In most of these observations Harris confirms Goodenough's findings.

These findings may be explained by assuming that both sexes differ in their interests and personality dynamics. Therefore, different mental processes are involved in the drawing act. The quantitative superiority of girls reared under the influence of western cultures may be due to the fact that they are more used to and more familiar with the drawing art and decorative work. The evidence in favor of the cultural influence on the performance of the drawing test is found in the relative superiority of males in cultures where the drawing art is a male concern.

Influence of Special Instruction and Artistic Talent on the Performance of the Goodenough Test

A number of studies and observations have been done in answer to the following two questions:

1. What is the influence of specific drawing instruction and training on the performance of the Goodenough drawing test?

2. Is it likely that children having good artistic ability do an exceptionally good performance on the test?

The early enlightening studies and observations have been
made by Goodenough herself. She compared the drawings of children
under two school systems. Under one system drawing was taught and
under the other no drawing was taught formally. She found that
there was no systematic difference between the drawings of both
groups. However, she found that direct training in drawing the
human figure did affect the result to some extent in the majority of
cases. But she pointed out that the effect of training in drawing
the human figure diminishes remarkably with age and also when the
drawing test is given by persons other than the teacher who ordinary
gives the children their drawing lessons (Goodenough, 1926).

Gridly (1938) made a study on four-year-old subjects and
compared the results of nine prescribed drawing situations. The
children were instructed to: (1) "Draw-a-man," (2) "Draw a little
man," and (3) "Draw a big man." They were told to repeat (1), (2),
and (3) in that order. Next they were asked to draw a man from a
model, and then to draw a man from dictated instructions given one
at a time while drawing the different parts. Finally they were
given instruction to draw a man in advance of the drawing. The draw-
ings were scored using Goodenough scoring method. It was found that
the average for most of the drawing situations were similar. Of
course, as might be expected, the dictation of what is to be drawn
brought about a very marked increase in the score.

Another study was done by Mott (1939) in which the drawings

of fifty-eight children between the ages of four and seven years, under three types of instruction, were taken. In one situation they were asked to "Draw a man," in the second they were asked to "Draw a soldier," and in the third to "Draw a cowboy." All the drawings were scored using Goodenough drawing technique. The result was that the majority of children did best under the first instruction. In evaluating this study Harris (1963) expressed the view that the result might be due to the fact that the children's attention was diverted from the essential details of the figure to the features of the costume.

As far as the second question is concerned the pertinent studies are meager. Besides, talented children are difficult to locate at an early age. Goodenough, through her observations, expressed the view that drawing talents are not likely to appear in children before the age of 12. If this is true, then the effect of talent on the drawings of small children is negligible.

Cultural Influence Upon Performance on the Goodenough Drawing Test

Cross-cultural studies have shown clearly that the level of performance on the drawing test is affected by the cultural background of the subjects taking it. From the drawings collected in 1911 among primitive Indians in North America, Rouma observed that the drawings made by adults in these primitive groups are hardly

distinguishable from the drawings made by European children under the age of six. Pagget studying the drawings made by children of various parts of Africa, India, China, and elsewhere declared that the difference between the art of primitive children and the art of children reared under the influence of western civilization is a matter of manner of development rather than level of development (Goodenough and Harris, 1950).

Dennis (1957) using the Goodenough technique in studying the drawings made by Near Eastern children concluded that there are cultural handicaps to draw-a-man performance but these handicaps affect children most strongly after age 6. In another study (1960) made on the drawings of Bedouin subjects in the Syrian desert, Dennis found similar results. He proposed two reasons to explain the relative low performance of his subjects on the drawing test:

1. The deficiencies in the child's experience relative to the representation of the human figure, as by dolls, masks, paintings, and other pictures.

2. The taboo against representation of the human figure which is enforced by the Islamic beliefs.

The studies cited above indicate that what is believed by Goodenough in 1926 to be a culture - free test is not really so. Goodenough herself changed her position after reviewing the literature in an article written with the collaboration of Harris. The authors stated: "The present writers would like to express the

opinion that the search for a culture-free test, whether of
intelligence, artistic ability, ... or any other measurable trait
is illusory, and the naive assumption that the mere freedom from
verbal requirement renders a test equally suitable for all groups
is no longer tenable." (Goodenough and Harris, 1950, p. 399).

The use of the test in comparing the level of performance
of groups in different cultural backgrounds is not a wise under-
taking. To determine the relative standing of children in similar
backgrounds, the test is a useful crude measure of general ability.

Statistical Evaluation of the Goodenough Drawing Scale

The reliability and validity of the draw-a-man technique has
been exposed to a number of investigations. McCarthy (1944) carried
out a study where she administered the test to 386 children on two
occasions with an interval of one week. The scoring was done twice
by the same person and a third time by a trained graduate. The
correlation between self-scoring was .94; and between the scoring of
different persons, .90. The reliability by the split-half method
was .89; by the retest method, .68. The study by William (1935) on
100 drawings scored by five independent people showed an inter-
correlation ranging between .80 and .96.

Smith (1937) test-retest reliability for 100 subjects at
each level from six to fifteen years showed a correlation above .91

except for the oldest children. Brill (1935) found that the
correlation between two tests, administered two and a half weeks
apart, was .77; between two tests of six-weeks interval it was .68.
A reduced scale correlated with the full scale above .90. Harris
(1963) found a scoring reliability between two independent scorers,
for his revised "Man Scale," to be .92 for boys and .97 for girls
at the age of 8. At age 9 the correlation was .98 for boys and
.97 for girls.

As to the validation of the Goodenough scale against other
intelligence scales the literature is full of pertinent studies.[1]
Goodenough (1926) observed a significant correlation between test
scores and grade placement. She found a correlation with the Binet
ranging between .56 and .86 at all age levels between 4 and 10
years.

William (1935) found a correlation of .80 between Goodenough
and Binet IQ's for children aged three to fifteen, subnormal to
gifted. Harris (1963), in an unpublished study, found a correlation
ranging between .17 and .46 between Goodenough and the "Primary
Mental Ability" raw scores of kingergarten children.

Upon reviewing these studies and other similar studies, one
concludes that the Goodenough drawing test is a moderately reliable
and valid instrument for a crude and quick measurement of child-
ren's mental ability.

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[1]
For more details the reader is referred to Harris's book
(Children's Drawings as Measures of Intellectual Maturity, 1963,
p. 96).

CHAPTER TWO

PROCEDURE AND RESULTS

Subjects

The subjects of the present study are Jordanian children rang-
ing in age from 5 to 10 years. Five and six-year-old subjects were
exclusively drawn from two private nursery schools in Irbid, a city
of about 50,000 population, and one private nursery school in
Ramallah, a city of about 29,000 population. All other subjects were
drawn from Irbid and three neighbouring villages. The total number
of subjects taken was about 500. The drawings of only 350 children
were used in the final standardization of the scale.

The subjects were chosen in such a manner as to correspond
to the rural-urban distribution of population in the 1961 census
except for the 5- and 6-year age groups. These two groups were
drawn from urban population only. The number of cases which sampled
each age group was about 60 except at age level 5 where only 44
cases were taken.

Although no attempt was made to take the socio-economic
status of the subjects into consideration, there is every reason
to believe that the subjects are fairly representative of the
general population.

Administration of the Test

In preparation for administration of the test in a particular school, the writer paid a visit to the headmaster or headmistress of that school. During the visit the purpose of the study was made plain. The object to be drawn was not revealed to the enthusiastic teachers in order to offset any possible effect of training which children might undergo before the test is given.

The names and date of birth of children to be tested were obtained beforehand. Each child was given a paper 31 x 21 cm. on which his name and date of birth appeared. Children were asked not to write anything on the papers until they are told to do so. A distance of approximately 50 cm. separated every two children so that no copying would occur. A pencil was provided in case the child did not have one.

The classroom teachers helped in the distribution of the papers and in keeping order in the room. They were requested by the examiner to leave the examination room shortly after the papers were distributed and before the children were told to make their drawing test.

The children were given the following instructions: "On the paper now in front of you draw the picture of a man in whatever way you like. Take your time and draw the best picture you can." Some children asked if they could draw the picture of a boy. Those children were reminded to draw the picture of a man but by no means

were told not to draw the picture of a boy. Other children were noticed drawing the picture of a flower or a bird. To these children the instruction to draw a man was repeated. Some other children were seen drawing the picture of a girl. These children were not interrupted or asked to change their drawings.

A time of 10-15 minutes was sufficient for the child to finish his drawing, except for some children whose frequent erasing and their insisting on drawing a "perfect" picture took considerably long time. In such cases the examiner encouraged the child not to erase and to complete his drawing as soon as possible.

Children were told from the beginning to give their papers and leave the examination room as soon as they finish their drawings. This was done for two reasons: (1) to keep order in the examination room, and (2) to prevent any possible copying or any attempt from the faster children to help the slower ones.

It was noticed that small children are faster in drawing than their older classmates who seemed to be aware of the task set before them and to insist on perfecting their drawings.

It should be mentioned in passing that the drawing test was administered to all of the subjects by the writer himself. This precaution was taken to offset any possible influence that the classroom teacher might have on the child's performance and also to make it possible for all children to work under the same set of standard conditions.

Scoring

All the scoring was made by the writer. The Goodenough scoring key and instructions were followed as faithfully as possible. In the opinion of the writer, all the points could be scored very reliably except the coordination points where considerable subjectivity is involved.

Every point included in the child's drawing was given a credit of + 1. Half points were not given any credit. The number of credited points constituted the total score the child had on the drawing test. The highest score the child could possibly earn was 51, but none of the subjects of this study obtained a score higher than 36.

Whenever a child's paper carried two or more drawings the one making the highest score was selected. It was not permissible to combine parts of two drawings for the total score.

To confirm the scoring reliability of the test a set of about 50 drawings, taken from boys of ages seven through ten years, were scored independently by the writer and a graduate student who had been trained for this purpose. The correlation between the two independent scoring was found to be .89. This result and other similar results (reported in Chapter I) indicate that a high level of agreement is found among people scoring the drawing test. This makes the present test an easy tool which elementary teachers of limited experience in mental testing can use in grouping their pupils.

RESULTS OF THE STUDY

Reliability of the Test

The reliability of a measuring scale depends on the consistency with which it measures whatever it claims to measure. In the current study reliability is evaluated by the degree of consistency in the child's performance of the drawing task as evaluated by the scale.

In evaluating the consistency of the child's performance on the drawing test, the writer administered it on two occasions, separated by a three-month period, to a group of 30 boys and girls of ages 8 through 10. The drawings were scored and the two sets of scores were correlated. The test-retest reliability was found to be .81. This result is in line with the results of other studies reported previously.

Thus, the present study shows, as other studies have, that the Goodenough drawing test has a relatively high reliability which characterizes good intelligence tests.

Validity of the Test

The validity of a tool of measurement is established by showing the degree to which it measures what is supposed to measure. Most experts in the field of intelligence testing agreed on a set of criteria by which they evaluate the validity of an intelligence

test. Some of these criteria are:

1. Increase in performance with age. This refers to the progressive improvement in test scores from age to age.

2. Variability of scores. That is, if children at a specific age level distribute themselves on a continuum with respect to their performance on the test.

3. The relation of the test to other intelligence tests of previously established validity.

4. Its relation to other external criteria which supposedly reflect intelligence, such as school achievement.

The present study made an attempt to evaluate the test by three of the above criteria: (1) Increase in performance with age, (2) variability of performance, and (3) its relation to school achievement.

Table 1 shows the distribution of scores, the means, and the standard deviations of scores for different age levels. The standard deviation of scores in a specific age level shows the degree to which the performances of children are spread. The score between brackets below each figure is the corresponding score reported by Goodenough. Figure 1 shows also the same thing.

The mean score for the different age groups were found to increase significantly from age to age.[1] Statistical treatment of

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[1] The t - formula, $t_{\text{f}} = \dfrac{M_1 - M_2}{\sqrt{\dfrac{\sigma_1^2}{N_1} + \dfrac{\sigma_2^2}{N_2}}}$, was used to test for significance.

the data obtained in this study showed that the average performance of a specific age group is significantly higher than the average performance of the younger age group.[1]

TABLE I

Means and Standard Deviations of Total Scores by Age

Age	5	6	7	8	9	10
Number of cases	44 (375)	65 (515)	60 (457)	60 (298)	60 (329)	60 (213)
Scores	2-13 (0-20)	3-18 (0-26)	2-22 (6-35)	5-26 (9-41)	8-33 (12-44)	10-37 (15-50)
Means	6.06 (9.8)	8.93 (13.3)	10.95 (18.0)	15.35 (21.8)	18.43 (25.7)	21.10 (30.8)
S.D.	2.65 (3.9)	3.85 (4.3)	5.23 (4.3)	5.36 (5.3)	5.79 (7.1)	7.68 (6.7)

This indicates that there is an increase in the mean score from age to age. Intelligence, as measured by valid standardized tests, shows this trend also. This amounts to saying that one criterion of good intelligence tests is also met in the case of the Goodenough drawing scale.

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[1] The difference between the mean scores of the successive age groups was found to be significant at the (.05-.01) level of confidence.
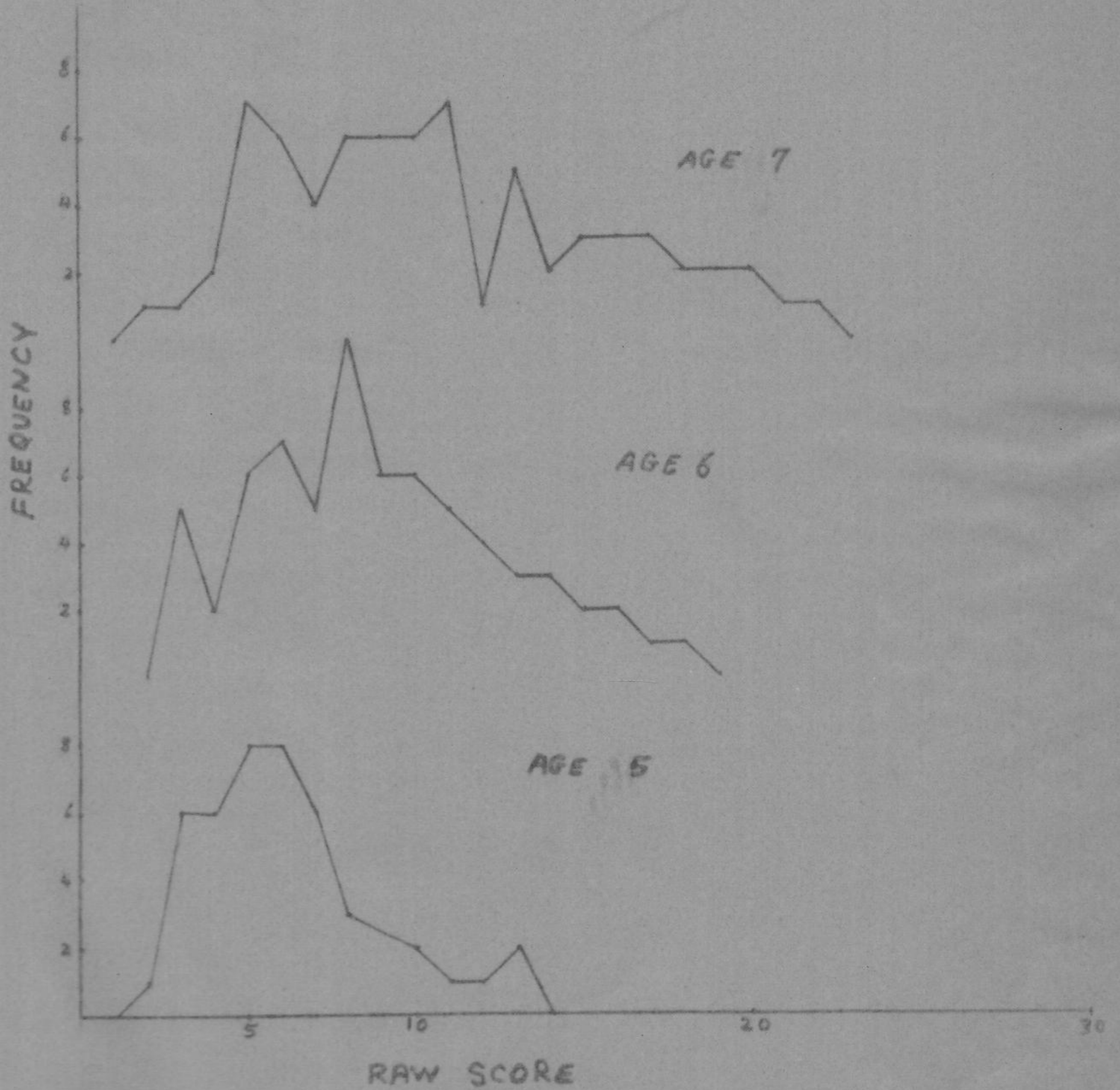
Figure 1

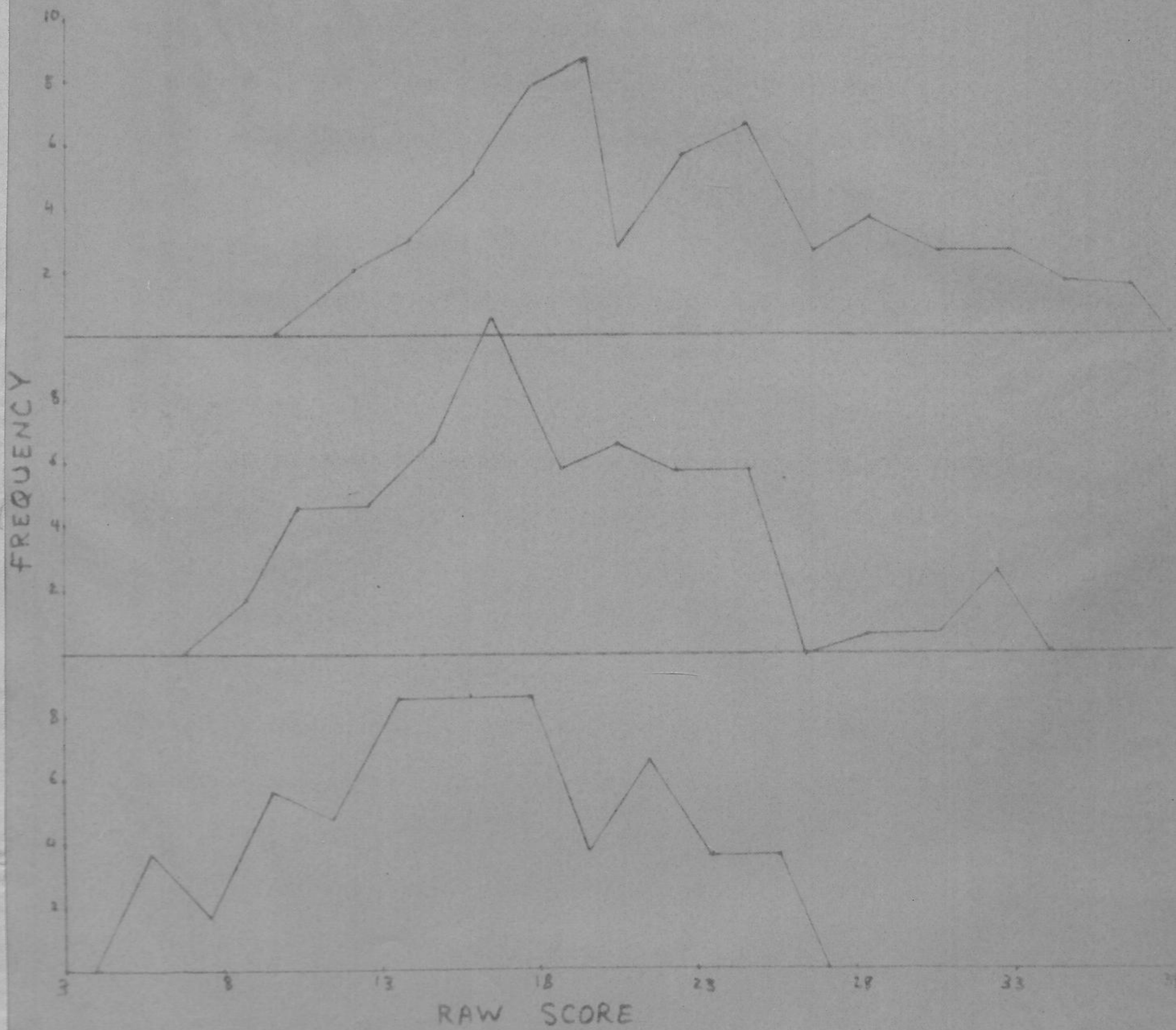DISTRIBUTION OF SCORES IN VARIOUS
AGE LEVELS

RAW SCORE

Figure 1 (Continued)

To find if there is any relation between performance on the Goodenough drawing test and school achievement, 4 teachers from two different schools we asked to rate 30 of their pupils, ranging in age between 8 and 10 years, on a 5-point scale. The ratings were made on the basis of academic achievement. The ratings were then correlated with the corresponding scores of those pupils on the drawing test. A correlation of -.10 was found as compared with a correlation of +.25 in a similar study by Goodenough.

This finding may be attributed to the following reasons:

1. Teachers do not have a common ground on which to base their ratings.

2. Whenever a teacher rates a particular child, the rating is made relative to a class the members of which are not equal in age.

3. Sometimes teachers base their rating on factors that are irrelavent to school achievement.

4. Goodenough proposed that the drawing test measures some aspect of intelligence that is overlooked by teachers when they rate their pupils.

Derivation of Age Norms

As was previously mentioned, the number of drawings used in the final standardization of the scale was 350. The drawings

of children falling within the range of two consecutive mid-years were grouped together and considered as one age group. The mean scores for the successive ages were calculated to the nearest whole numbers, they are as follows:

Age	Mean Score
5	6 (10)*
6	9 (13)
7	11 (18)
8	15 (22)
9	18 (25)
10	22 (31)

after smoothing the curve, using the method of running averages, the following figures were obtained:

Age	Average Score on the Test
5	6 (10)**
6	9 (14)
7	12 (18)
8	15 (22)
9	19 (26)
10	22 (30)

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*

    The figures in brackets are the corresponding values obtained by Goodenough.

**

    Figures in brackets are the age norms obtained by Goodenough.

If we can assume that our subjects are representative of their age population in Jordan we can then apply these norms to all Jordanian children between the ages of 7 and 10 years. The norms for the 5- and 6-year groups are applicable only to the urban population.

The mental age of a child can be obtained by finding the age equivalent for the score he earned on the test. The IQ is then obtained by dividing the mental age by the chronological age.

Example: If an 8-year old child obtained a total score of 13, his mental age is calculated as follows: score 12 is equivalent to a mental age of 7 years. The additional 1 point score is equivalent to 4 months. So his mental age becomes 7 years and 4 months. His IQ is $\frac{(7 \times 12 + 4)}{8 \times 12} \times 100 = 91.7$.

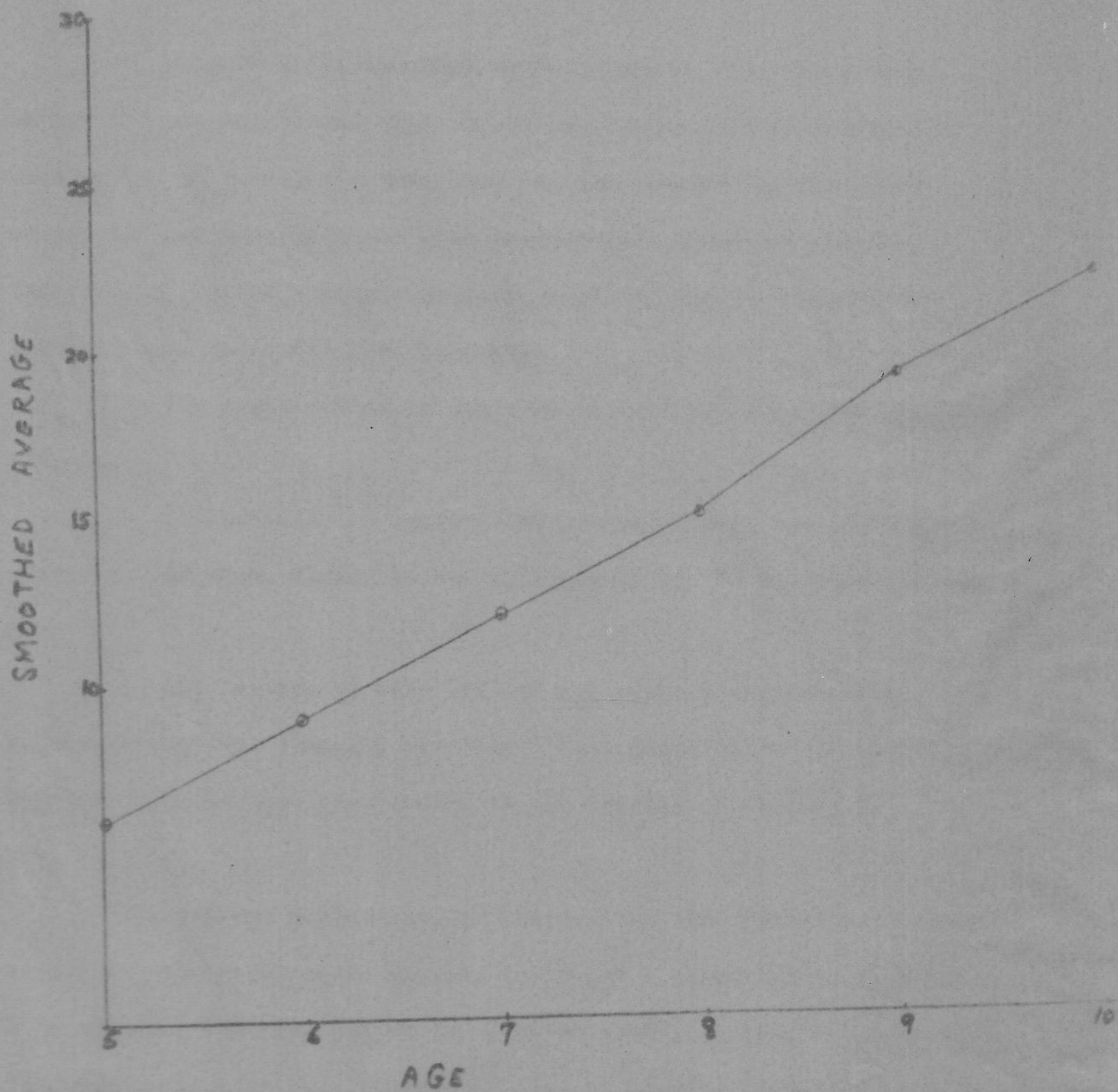Mental ages can also be read directly from figure 2.

Figure 2

DEVELOPMENT OF PERFORMANCE BY AGE

CHAPTER THREE

DISCUSSION OF SOME RESULTS

Comparative Study of Normative Data

By comparing the smoothed means (Chapter II), which themselves are the age norms, with the corresponding values obtained by Goodenough, it is clearly seen that the age samples in this study performed consistently lower than Goodenough's American samples. This result, in the writer's opinion, might be due to a number of reasons among which are the following:

1. The small number of subjects at each age level in our samples.

2. The scarcity of comics, fashion magazines, and masks which represent the human figure in the environment of the Jordanian children.

3. The failure to take the age _and_ grade placement into consideration when sampling was done. This might cause the retarded population to be over represented in the samples of various age groups.

The average performance of children on the "Draw-a-man" test, as far as this study could reveal, increases systematically from age 5 to age 10. The findings of the present study, in this respect, are in contradiction to the findings of similar studies conducted by Dennis on comparable age groups (1957). His findings seem to

indicate that the test ceases to show age increment after 6.

Sex Differences

Table 2 shows the means and standard deviations for boys and girls of each age group on this test. From this table and from figure 3 we can see a consistent tendency for girls to score higher than boys. Statistical treatment of the data obtained in the present study showed that the average performance of girls is significantly higher than that of boys at various age levels except at age 9. In this respect our findings confirm the results arrived at by other studies (Goodenough, 1926; Harris, 1963).

TABLE 2

Means and Standard Deviations for
the Standardization Group

	Boys		Girls		
Age	Mean	S.D.	Mean	S.D.	Level of Sig. of M_2-M_1
5	5.09	1.78	7.04	3.00	.05
6	7.51	3.48	10.40	3.65	.01
7	9.46	4.75	12.80	4.84	.01
8	13.96	5.83	16.73	4.43	.05
9	17.60	5.75	19.26	5.70	Not Sig.
10	19.90	6.71	23.86	5.99	.05

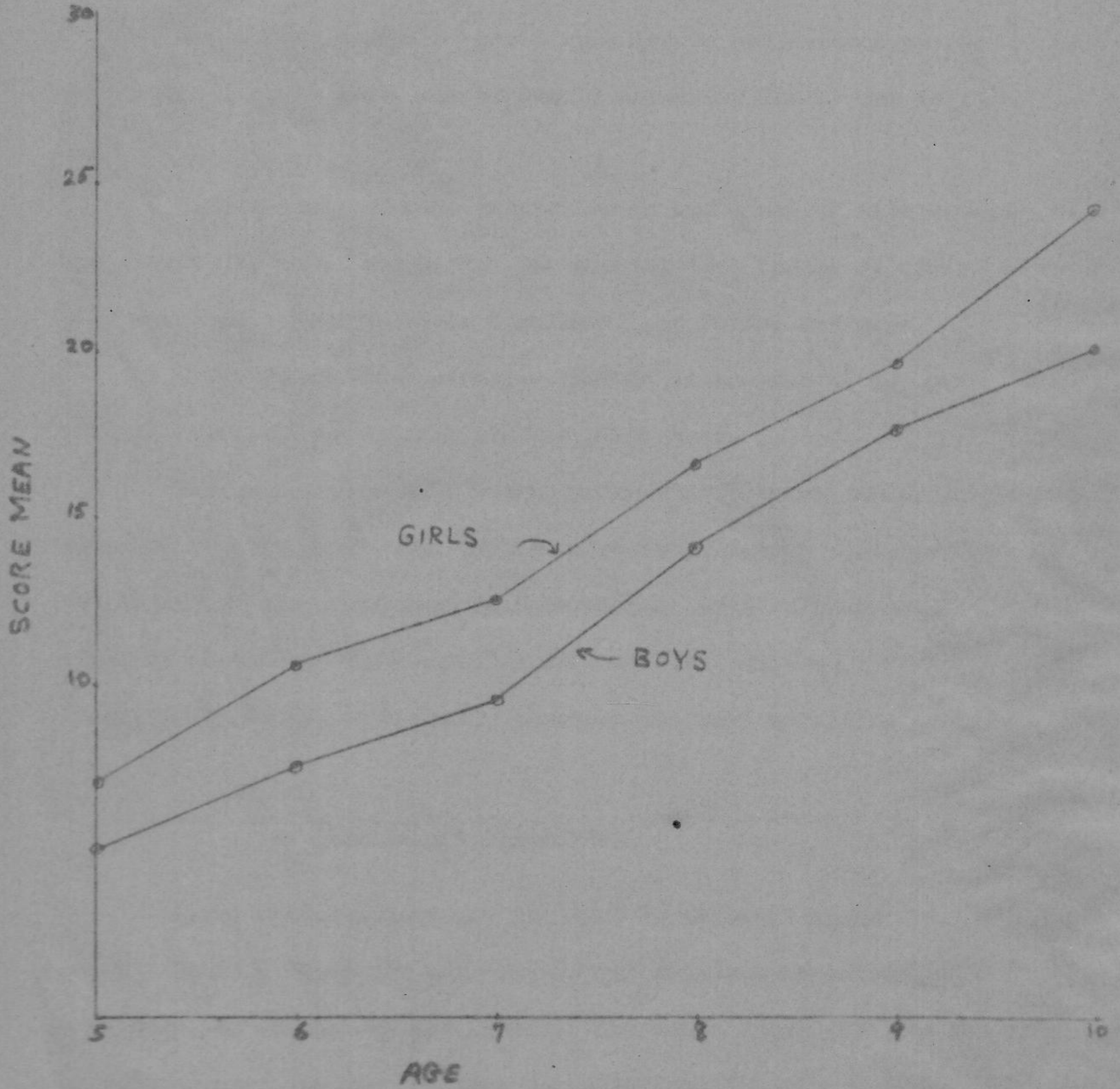DEVELOPMENT OF RAW SCORE MEANS
FOR BOYS AND GIRLS

Figure 3

DEVELOPMENT OF RAW SCORE MEANS
FOR BOYS AND GIRLS

Qualitative differences between the drawings of both sexes were also observed. Girls seem to do better on clothing and hair items. Boys, more than girls, seem to include heels, uniform of soldiers, and to portray action in the limbs.

The higher scores of girls relative to performance on the Goodenough drawing test, may be partly accounted for by the following:

1. Girls may be more interested in and familiar with drawing and decorative work than boys. The greater familiarity of girls with decorative work reflects a cultural and school practice.

2. Goodenough's hypothesis that girls are docile and pay greater attention to details has its place here.

The qualitative differences between both sexes, which were observed in this study, may reflect a cultural aspect relative to the figure of identification of both sexes. Boys at school age identify themselves with soldiers and athletes, while girls identify themselves with female teachers who have beautiful hair.

Rural-Urban Differences

Rural children were not included in the age samples of 5 and 6. Table 3 shows the mean scores and standard deviations of both sexes at successive age levels. The table shows that the urban boys, from age 7 to age 10, tend to score significantly higher than the rural boys.

TABLE 3

Means and Standard Deviations of the
Standardization Group by Age and Residence

| | Boys | | | | Girls | | | |
| | Rural | | Urban | | Rural | | Urban | |
Age	M	S.D.	M	S.D.	M	S.D.	M	S.D.
7	7.43	3.31	11.78	5.08	15.87	3.72	9.28	3.34
8	11.46	4.85	16.46	5.66	19.18	3.81	13.92	3.28
9	14.43	3.79	21.21	5.49	20.56	4.82	17.78	6.24
10	16.75	3.88	23.50	7.42	23.75	5.46	24.00	6.55

The relative superiority of urban boys might be attributed to two
main factors: (1) books that carry pictures, magazines, and dolls
representing the human figure are more accessible to urban children
than they are to rural children, and (2) urban boys, in most of the
cases, come from relatively higher socio-economic groups than rural
children of similar ages.

Surprisingly, rural girls scored higher than urban girls at
age 7 and 8. The difference between the mean performance of both
groups tends to level up at age 9 and practically to diminish at age
10.

The relative superiority of the rural girls at ages 7 and 8
is difficult to explain or account for at the present time. The
levelling up of the difference between the two groups at ages 9 and
10 seems to be attributed to the fact that a great proportion of the
retarded girls drop out as they go through the grades.

Conclusions and Results

The conclusions and results arrived at in this study

may be summarized as follows:

1. Performance on the test increases with age through
out the test span.

2. The study failed to show a relation between perfor-
mance on the test and school achievement as judged by

teachers.

3. The reliability of the scoring method has been
confirmed.

4. The relative consistency of the child's performance
with a relatively short period between test and retest has
been confirmed.

5. Girls at all ages do better on the test than boys.

6. Urban boys at all age levels are superior to rural
boys relative to performance on the test. While rural girls
do better on the test at the lower age levels, this diffe-
rence disappears at higher ages.

7. The Jordanian normative data for age levels 5
through 10 are lower than the corresponding normative
data for Goodenough's American groups.

Limitations of the Study

As far as the writer can see, the present study has
two main limitations:

1. The number of subjects taken to represent various
age groups are too small for the derivation of reliable
norms.

2. The sampling method did not take account of the subjects' grade and socio-economic status.

The above two considerations suggest that the obtained age norms have to be taken as tentative values and to be interpreted with much caution.

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