1965

An Exploratory Study of Repeated Administrations to Preschool Children of the Goodenough-Harris Drawing Test

Jyoti Randeri
University of Rhode Island

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AN EXPLORATORY STUDY OF REPEATED ADMINISTRATIONS TO
PRESCHOOL CHILDREN OF THE GOODENOUGH-HARRIS

DRAWING TEST

BY

JYOTI RANDERI

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

CHILD DEVELOPMENT AND FAMILY RELATIONS

UNIVERSITY OF RHODE ISLAND

1965

ABSTRACT

The Goodenough Draw-a-Man Test, published in 1926, was revised by Dale B. Harris in 1963. The present study was undertaken to have a better understanding of performance of preschool children over a period of time, on the revised Goodenough Draw-a-Man Test, now known as The Goodenough-Harris Drawing Test. The other purposes of the study were to find out the relationship between Man and Woman Scores of the Test, and to verify the statement by Goodenough concerning the inconsistency of test items whose concepts are not well integrated in a child's mind.

Thirty nursery school children were given the Goodenough-Harris Drawing Test for five times at every three weeks' interval. Since the standard scores given by Harris are at twelve months' age intervals, the raw scores were used in analyzing the results.

A high test-retest reliability was obtained. The mean score increased each time except one time, which might be due to the special activities which were going on in the nursery school at that time of testing. The significant increase in scores from Testing III onwards suggested a possibility of practice effect.

High correlations obtained between the Man and Woman Scales on all five testings indicated that the Woman Scale can be used successfully as an "alternate form" for the preschool children.

The average raw scores of the Drawing Test correlated substantially with IQ of the Stanford-Binet Intelligence Test; and highly with the Stanford-Binet mental age.

A tendency for initially low scorers to achieve greater change and initially high scorers to achieve lesser change, was observed. However, the statistically insignificant results call for further research.

The difficult test items showed inconsistent appearance on five testings, while the easy test items appeared consistently on five testings. These results suggested that the concepts of difficult items are not integrated in a child's mind, which led to the fluctuation in appearance; while on the other hand, the concepts of easy items are well integrated in a child's mind, which resulted in the consistency of appearance. Thus the study supported the statement by Goodenough.

ACKNOWLEDGEMENTS

The author wishes to extend her sincere appreciation to those who assisted with this thesis. A special thanks goes to her graduate committee: Dr. Russell C. Smart, Chairman of the Committee, for his guidance, assistance, and encouragement throughout the study, and to Mrs. Mollie S. Smart, and Dr. Frank M. Pelton for their helpful suggestions.

Gratitude is also expressed to Miss Sylvia Lapin, Director of the Nursery School and Miss Rosemary Kohut and Mrs. Barbara Eggert, the Nursery School teachers for their cooperation in carrying on the testing in the Nursery School, and to Professor Robert J. Meyer for statistical help.

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INTRODUCTION

The Goodenough Draw-a-Man Test occupies a unique place in the field of mental tests, possessing as it does a number of advantages which have made it particularly attractive both as a clinical and a research tool.¹ It has been widely used, to measure the intelligence of children, to study children with hearing handicaps and suspected neurological deficiencies. The test plays an important role in studying personality and adjustment problems and delinquent behavior. The test has been used as a projective technique after making some modifications.²

The 1960 revision of the Stanford-Binet, coming twenty-three years after the 1937 revision, contains many of the same items, some of which are placed at different year levels than they were in the earlier version. It is not clear whether this is due to the difference in intellectual development of children a quarter of century later. The fact remains the revision seems desirable.³ Stewart mentions that the Draw-a-Man Test measures intelligence primarily, and should be evaluated. It is likely that the mental age equivalences established would change during twenty-five years. She further suggests that a norm verification study would also be worthwhile, which would provide opportunity for checking upon

¹Dorothea McCarthy, "A Study of the Goodenough Drawing Test of Intelligence," J. Psychol., XVIII (October, 1944), p. 201.

²Dale B. Harris, Children's Drawings as Measures of Intellectual Maturity (New York: Harcourt, Brace and World, Inc., 1963), p. 1.

³Lewis M. Terman and Maud A. Merrill, Stanford-Binet Intelligence Scale (Boston: Houghton Mifflin Company, 1960), pp. 39-40.

possible changes in validity of any of the fifty-one scoring points used in the Goodenough Scale.⁴

Such considerations, among others, led Harris to undertake the project of restandardizing the test.⁵ Among many goals of revising the test, the primary ones were: to extend the Goodenough Scale to include adolescent years and to develop an "alternate form" to the Man Scale by deriving an analogous point scale for the figure of a woman. A drawing of the "self" was included as a potential third form and also with the view of studying the self-concept. Harris also establishes a basis for relating the drawing act to current theoretical developments in the study of perception and conceptual processes.⁶

Goodenough believed that for little children, drawing is a form of cognitive expression and its purpose is not primarily esthetic. The drawing of a young child is dependent primarily upon his concept of that object rather than upon immediate visual imagery or artistic appreciation. She further explained the fact that the developmental changes which take place in children's drawings do not remain fixed from the time of their first appearance. Although Goodenough did not study children's drawings longitudinally, she says that any new characteristic usually goes through a longer or shorter period of fluctuation, during which time it is sometimes shown, sometimes not. Gradually it becomes a consistent

⁴Naomi Stewart, "Goodenough Intelligence Test," Fourth Mental Measurement Yearbook by Bureau (New Jersey: The Gryphon Press, 1953), p. 292.

⁵Harris, loc. cit.

⁶Ibid., p. 8.

feature of all the drawings which the child makes.⁷ Goodenough summarizes:

It may thus be said that at any given time a child's drawing will consist of two parts--the first part embracing those characteristics which have already become an integral part of his concept of the object drawn, and consequently appear invariably; the second part including the elements which are in process of becoming integrated and are therefore shown with more or less irregularity. The frequency with which any given characteristic tends to appear is a function of the extent to which it has become integrated into the developing concept, and a measure of the weight which should be given to it as an index of concept development.⁸

Hypotheses of the Study. In the light of the consideration given above and of the review of literature contained in the next section, the following hypotheses have been formulated for the study: (1) it is hypothesized that the total scores will not vary between tests beyond the limits to be expected by chance; (2) as a drawing of a woman was developed as an "alternate form" to the Man Scale, it is hypothesized that a high correlation should be obtained between the Man and Woman Scores; (3) it is further hypothesized that some test items will show inconsistency in the appearance on five testings, done at regular intervals.

Reasons for the Study. The purpose of this study is to have a better understanding of performance of young children over a period of time on the Goodenough-Harris Drawing Test. It is also aimed at finding out the relationships between Man and Woman Scores between the initial scores and the amount of gain at the end of five testings, and between

⁷ Florence L. Goodenough, Measurement of Intelligence by Drawings (New York: World Book Company, 1926), p. 74.

⁸ Ibid., p. 75.

the Goodenough-Harris Drawing Test and the Stanford-Binet. This study is undertaken to verify the statement by Goodenough regarding the inconsistency of test items, whose concepts are not well integrated in a child's mind. ✓

REVIEW OF THE LITERATURE

The Goodenough Draw-a-Man Test was published in 1926, to measure the intelligence of a child. Harris thought it would be desirable to revise and extend the test. He attempted to extend the scale into the adolescent years and explore new items, which might increase the reliability and validity of the scale. For testing new points and the development of new scales, a sample of urban and rural children in Minnesota and Wisconsin was selected to represent the 1940 occupational distribution according to the categories of the Minnesota Scale for Paternal Occupations. More than 300 children were tested at each grade level from kindergarten through the ninth grade.¹

Harris compared the old and new scales on a sample of Canadian Indian children. The correlations resulting were very high, in the .90's, because the old scale is largely contained in the new scale.²

In order to determine the relationship between the Man and Woman Scales, Harris correlated the point scales of two scales for the even-numbered age groups. He obtained the correlation of .76 for boys and .77 for girls.³ He concluded:

A correlation of .75 between two reliable forms of the same test seems rather low and suggests perhaps different

¹Dale B. Harris, Children's Drawings As Measures of Intellectual Maturity (New York: Harcourt, Brace and World, Inc., 1963), pp. 72-73.

²Ibid., p. 99.

³Ibid., p. 106.

abilities are measured by the Man and Woman Scales. However, each scale may measure several abilities, represented by different kinds of items, which are in fact only modestly intercorrelated-----A detailed study, including factor analyses, of both scales' items might be instructive.⁴

A drawing of the self was included as a potential "third" form. However, Harris felt that the drawing of the self might, possibly, be more useful in studying non-intellectual psychological factors. Children do attempt, increasingly with age, to portray juvenile and idiosyncratic features. In other words, they try to present themselves as they characteristically appear in dress, with favorite possessions and the like.⁵

In reporting the re-standardization of the Goodenough test, Harris thought that it would be desirable to replace the notion of intelligence with the idea of intellectual maturity, and perhaps more specifically, conceptual maturity.⁶ Bell recognizes the change and says:

The utility of the test in measuring mental growth fades out around age 14. Harris brings the test into line with current psychometric practices and places it in the context of current theories of cognitive development.⁷

Harris defines intellectual maturity as the ability to form concepts of increasingly abstract character. He maintains:

Intellectual activity requires 1) the ability to perceive, i.e. to discriminate likeness and differences; 2) the ability to abstract, i.e. to classify objects according to such likenesses and differences; and 3) the ability to generalize, i.e. to assign an object newly experienced to a correct class,

⁴ Ibid., pp. 106-107.

⁵ Ibid., p. 226.

⁶ Ibid., p. 5.

⁷ Richard Q. Bell, "Developmental Psychology," Annual Review of Psychology, XVI (1965), p. 16.

according to discriminated features, properties or attributes. These three functions, taken together, comprise the process of concept formation.⁸

Harris further states that the processes which include perception, conceptualizing and knowing, as well as judging and reasoning, are called cognition.⁹

In reviewing the research pertaining to concept formation, Vinacke distinguishes the activities of abstraction and generalization, which are the essentials for concept formation. He says that abstraction signifies linking one sensory experience to another so that some details are left out and others become dominant. In this sense, a concept is a response which stands for these dominant details. The term generalizing signifies that the dominant details or group of details are used as a basis for responding similarly to the separate objects linked by abstraction and for responding to other objects similarly linked.¹⁰

Harris states that a child's drawing of an object is an index to his conception of that object, that is, of his grasp of the essential features which permit him to form a class concept including that object as a member. As a child draws familiar objects or describes them in words, he includes the elements he finds essential to his class concept.¹¹

McFee supports the statement by saying that:

Art is a language with which a child communicates his experience. His behavior in art is not a separate activity

⁸ Harris, loc. cit.

⁹ Ibid., p. 6.

¹⁰ W. Edgar Vinacke, "The Investigation of Concept Formation," Psychol. Bull., XXXVIII (January, 1951), p. 6.

¹¹ Harris, loc. cit.

unrelated to all his other behavior. He uses his intellect, his perceptions, his creativity in order to organize what he is learning from his expanding activities.¹²

In discussing the interrelationship between perceptual activities and drawing development, Bell maintains that one of the functions which the drawing serves is perceptual development. The level of the drawing is the product of the particular level of perceptual development in the child and the exercise of drawing operates as an experiment for him in the integration of perceptual process into his total functioning.¹³

Goodenough believed that for little children drawing is a language-- a form of cognitive expression. According to her, "the child draws what he knows and not what he sees."¹⁴ She supports her argument by citing the research done by Clark, who asked children to draw an apple with a hat-pin run through it. He found that children six years and under demanded that the total part of the pin show all the way through the apple. As the pin did go through it, it was not two pieces of pin sticking into the apple, but a whole pin going through the apple.¹⁵

However, many investigators have noted that the child does not draw all that he knows. Goodenough remarked that the child selects those items

¹² June King McFee, Preparation for Art (San Francisco: Wadsworth Publishing Company, Inc., 1961), p. 71.

¹³ John Elderkin Bell, "Perceptual Development and the Drawings of Children," Amer. J. Orthopsychiat., XXII (April, 1962), p. 386.

¹⁴ Florence L. Goodenough, Measurement of Intelligence by Drawings (New York: World Book Company, 1926), p. 72.

¹⁵ Studies in Education by Barnes, Vol. I, pp. 283-294, cited by Florence L. Goodenough, Measurement of Intelligence by Drawings (New York: World Book Company, 1926), p. 72.

which to him are so essential or characteristic that they occur to him spontaneously without suggestion from outside sources.¹⁶

Mott's study of 1212 drawings made by four- to seven-year-old children revealed that when children are asked to draw a particular type of man such as policeman or a cowboy or a farmer, it serves to involve them relatively unsuccessfully with special details. The drawings of a "man" were invariably superior to the drawings of a specified man.¹⁷

The problem which the child has to meet is primarily one of selection, of determining which ones of a vast number of items really furnish the key to the situation. Knowledge of a fact does not in itself guarantee that this fact will be shown in a drawing. Its importance must also have been evaluated. Goodenough gives an example that a three-year-old child will point to his hair when asked to do so, but 50 per cent of nine-year-old children are content to draw the human figure without a vestige of hair.¹⁸

Harris brings out an important point that the function of drawing changes as the child matures. He maintains:

Drawing is first a means of expression wherein perceptual and motor aspects are inextricably bound with rudimentary concept formation. In time the motor expression aspect of drawing becomes less and less important; the conceptual and communicative aspects more and more significant. As concepts become more sharply defined and controlled by visual percepts, the child's drawing of the human figure becomes more definite, more indicative of a class, type or particular individual,

¹⁶ Ibid., p. 76.

¹⁷ Sina M. Mott, "The Growth of an Abstract Concept," Child Developm., X (March 1939), pp. 21-23.

¹⁸ Goodenough, loc. cit.

until his ideas outrun his technical skill and self-criticism increasingly intervenes to discourage drawing.¹⁹

In the Goodenough Draw-a-Man Test, a child is asked to draw a picture of a man, because the drawing of a human figure is taken as an index to the other complex concepts in general. It is considered that the child's conceptualization of the human figure is not much different, in process, from his conceptualization of other animate or inanimate objects in his experience. The human figure is so important for a child, affectively as well as cognitively, that it is probable that the human figure is a better index of concept development than a horse or automobile.²⁰

Goodenough believed that the developmental changes which take place in children's drawings do not remain fixed from the time of their first appearance. Any new characteristic whose concept is not well integrated in a child's mind undergoes a period of fluctuation, during which time it is sometimes shown and sometimes not.²¹

Graham et. al. made a study about the development in preschool children of the ability to copy forms. The study involved 108 children, with the age group of two and a half years to six years. They suggest that rises and falls in types of operations represent indirect consequences of the gradual improvement in accuracy of performance. The interpretation that three-year-olds close a partial circle because they are at a stage of development where there is a closure tendency is belied by the fact

¹⁹ Dale B. Harris, Children's Drawings As Measures of Intellectual Maturity (New York: Harcourt, Brace and World, Inc., 1963), pp. 209-210.

²⁰ Ibid., p. 7.

²¹ Goodenough, Op. Cit., p. 72.

that opening the partial circles occurs just as frequently in three-year-olds. An interpretation which does accord with the facts is that in the course of learning to reproduce distances they err in both directions--they both under and overestimate.²²

Reliability of the Goodenough Draw-a-Man Test. A number of studies have been done to investigate the reliability and validity of the Draw-a-Man Test. Goodenough reports the reliability of .937 for 194 first-grade children, retested the following day, scored by the same examiner. The average reliability computed by the "split-scale" method (using the Spearman-Brown formula) was found to be .77 for ages five to ten taken separately.²³

Yepsen carried out an experiment on feeble-minded subjects to find out whether the Goodenough Test can be successfully applied with feeble-minded individuals. He gave the test to 37 boys between the ages of nine and 18.2. The experiment was carried out over a two weeks period, being administered three times with a four days interval between each trial.

The results are as follows:

Between 1st and 2nd administrations	the correlation	.89
Between 2nd and 3rd administrations	the correlation	.91
Between 1st and 3rd administrations	the correlation	.91

These results indicate the close agreement between the results obtained on three administrations.²⁴

²²Francis K. Graham et al., "Development in Preschool Children of the Ability to Copy Forms," Child Developm., XXXI (June, 1960), pp. 339-359.

²³Goodenough, Op. Cit., p. 48.

²⁴Lloyd N. Yepsen, "The Reliability of the Goodenough Drawing Test with Feeble-minded Subjects," J. Educ. Psychol., XX (September, 1929), pp. 448-457.

Williams made a study of scoring reliability, by giving the test to 100 children of suitable ages, whose drawings were scored by five upper division students in education. The intercorrelation of total scores ranged from .80 to .96.²⁵

Brill carried out a study whose purpose was to determine the reliability of the Goodenough Test by the retest method. The subjects for this study were the school children at the New Jersey State Colony for Feeble-minded Males at New Lisbon, New Jersey. The test was administered in the regular classrooms three times, 18 days interval between the first and second administrations, and the third administration was done 25 days after the second one. The correlation of scores between the administrations are as follows:

	R	N
Between 1st and 2nd administrations	.77	73
Between 2nd and 3rd administrations	.80	65
Between 1st and 3rd administrations	.68	67 ²⁶

Smith gave the test and retest to 2,600 pupils, ranging from six to sixteen years of age. He found that the correlation ranged from .91 to .95 for all the age groups, except for the oldest one, which was .84.²⁷

²⁵J. Harold Williams, "Validity and Reliability of the Goodenough Intelligence Test," School and Society, XXXI (May, 1935), pp. 653-656.

²⁶Moshe Brill, "The Reliability of the Goodenough Draw-a-Man Test and Validity and Reliability of an Abbreviated Scoring Method," J. Educ. Psychol., XXVI (December, 1935), p. 701.

²⁷Franklin O. Smith, "What the Goodenough Intelligence Test Measures," Psychol. Bull., XXXIV (November, 1937), pp. 760-761.

In 1944, McCarthy conducted a study in order to shed further light on the problem of reliability. She mentioned that the highest retest reliability obtained in the previous research resulted when the drawings were made on the same day or successive days. She thought the memory might be a strong factor for similarity. In her investigation, she gave the test to 386 third and fourth grade children on two occasions, a week apart. The correlation between self-scoring was .94, between scoring by different persons was .90. The correlation for retest reliability was .68, and the correlation of .89 was obtained for the odd-even reliability. ²⁸

McCurdy's study was aimed at finding out the nature of individual variability, and the relationship between the variability of the individual and that of a group over a period of three months time. The subjects were 59 children from first grade. He found the correlation of .69 between the two sets of scores. The study also consisted of a collection of over a thousand drawings made by a child between the ages of two and a half and seven years. Fifty-six drawings were selected. The mean IQ score of these drawings was 171 with a SD of 11.9, which is not significantly different from the SD's of 20.8 and 19.4 for the group of 59 children on their first and second tests. Two drawings made by this boy at school differ somewhat in IQ scores but correspond roughly with values obtained from drawings made at home at about the same time. McCurdy raises the question whether this particular similarity between the group and individual be found to hold true generally. He concludes that the considerable variation in performance level occurs on the Goodenough Test after a lapse of

²⁸ Dorothy McCarthy, "A Study of the Reliability of the Goodenough Drawing Test of Intelligence," J. Psychol., XVIII (October, 1944), pp. 201-206.

several days or more. The behavior measured by the Binet test shows greater stability, which might be due to the fact that physical coordination contributes to the Goodenough results. The simple functions like motor skills involved exhibit more variability in general than do complex ones like memory and reasoning tasks in the Stanford-Binet Test.²⁹

In the process of restandardizing the Draw-a-Man Test, Harris gave the test on each of ten consecutive school days to kindergarten children. The results indicate that the variance accounted for by variation within the sequence of ten drawings was insignificant.³⁰

These results of the reliability of the Goodenough Draw-a-Man Test are summarized in Table I.

These studies prove high scoring reliability, r 's in the .90's, because of the simplicity and objectivity of scoring. The correlations for the test-retest reliability ranged from .68 to .95, usually falling into .80's and .90's. It is observed that the shorter the duration of time between two tests, the higher the correlation and vice versa. However, neither age, nor intelligence level of children affect the correlation coefficient.

Validity: Relationship to the Stanford-Binet Test. The Goodenough Draw-a-Man Test has been correlated with many Intelligence Tests, such as the Stanford-Binet, the Primary Intelligence Scale for children, etc.

²⁹ Harold McCurdy, "Group and Individual Validity on the Goodenough Draw-a-Man Test," J. Educ. Psychol., XXXVIII (November, 1947), pp. 428-436.

³⁰ Dale B. Harris, Children's Drawings as Measures of Intellectual Maturity (New York: Harcourt, Brace and World, Inc., 1963), p. 91.

TABLE I
RELIABILITY OF THE GOODENOUGH
DRAW-A-MAN TEST

Author(s)	Description of Subjects	Interval Between Tests	Correlations
Goodenough (1926)	194, first-grade children	One day	.937
Yepsen (1929)	37, feeble-minded boys aged nine to eighteen years	Four days	.89
		Four days	.91
Brill (1935)	73, feeble-minded males	Eighteen days	.77
	65, feeble-minded males	Twenty-five days	.80
	67, feeble-minded males	Six weeks	.68
Smith (1937)	2,600, children aged six to sixteen years		Between .84 and .95
McCarthy (1944)	386, third- and fourth-grade children	One week	.90
McCurdy (1947)	59, first-grade children	Three months	.69

Goodenough reported that 334 children were given both the Draw-a-Man Test and the Stanford-Binet. The average correlation between the drawing scores and Stanford-Binet mental ages was .763 for ages four to twelve taken separately.³¹

In 1929, Yepsen gave the test to 37 feebleminded boys between the ages of nine and 18.2, and found a correlation of .60 (IQ values) between the Goodenough and the Stanford-Binet Tests.³²

McElwee administered the test to 45 subnormal children in the ungraded class of New York City, who were 14 years of age. Both, the Draw-a-Man Test and the Stanford-Binet, were given at the same time. A correlation of .72 (mental ages) was found, using the product-moment formula.³³

Williams' study of 100 children, aged three to fifteen, yielded the correlation of $.80 \pm .024$ (mental ages) between the Draw-a-Man and Binet Tests. The corresponding correlation of IQ between the two tests was $.65 \pm .038$.³⁴

In 1945, McHugh gave the Draw-a-Man Test to 90 kindergarten children,

³¹ Florence L. Goodenough, Measurement of Intelligence by Drawings (New York: World Book Company, 1926), p. 50

³² Lloyd N. Yepsen, "The Reliability of the Goodenough Drawing Test With Feebleminded Subjects," J. Educ. Psychol. XX (September, 1929), pp. 448-457.

³³ Edna Willis McElwee, "The Reliability of the Goodenough Intelligence Test Used With Subnormal Children Fourteen Years of Age," J. Appl. Psychol., XVI (1932), pp. 217-218.

³⁴ J. Harold Williams, "Validity and Reliability of the Goodenough Intelligence Test," School and Society, XXXXI (May, 1935), pp. 653-656.

in order to find out the relationship with the 1937 revised Stanford-Binet Test. The correlation between Goodenough MA and Binet MA was .45, and the correlation between Goodenough IQ and Binet IQ was .41. He mentions that the reason for a low correlation was the use of the two forms of the 1937 Revision of the Binet. McHugh also observed a definite tendency for 83 kindergarten subjects who scored initially high on the Goodenough Test to make lower scores on the second Goodenough Test and for initially low scorers to improve considerably on the second.³⁵

Estes et al. correlated the Draw-a-Man Test with the 1937 Stanford-Binet and the 1960 Stanford-Binet Form L-M. The group, consisting of 82 children, attending the University of Kentucky School in grades 1 through 8, were of above average intelligence. The resulting correlation was .43 for the 1960 Stanford-Binet. The correlation is significant, but relatively small.³⁶

In 1963, Thompson and Finley made a study on children referred for School Guidance Services. The study was concerned with the relationship between the Goodenough Draw-a-Man Test and the Stanford-Binet Form L-M Test. The subjects were 81 boys and 83 girls, enrolled in kindergarten through grade 3 and had a mean age of 75.4 months with a range from five years to nine years. A correlation of .67 was found between the IQ's of

³⁵ Gelolo McHugh, "Changes in Goodenough IQ at the Public School Kindergarten Level," J. Educ. Psychol., XXXVI (January, 1945), pp. 17-30.

³⁶ Betsy Worth Estes et al., "Relationship between 1960 Stanford-Binet, 1937 Stanford-Binet, WISC, Raven and Draw-a-Man," J. Consult. Psychol., XXV (October, 1961), pp. 388-391.

the Stanford-Binet and Goodenough Draw-a-Man Test.³⁷

Kennedy and Lindner made a study on the Negro population of the Southeast United States. The purpose was twofold: 1) to establish badly needed normative data for routinely used clinical instruments on Negro population; and 2) to determine the effectiveness of the Goodenough Draw-a-Man Test in relation to other IQ scores. The subjects were 1,800 Negro elementary school children. The correlation between the two tests, Binet and Goodenough ranged from a high of .59 at grade I to a low of .29 at grade 4.³⁸

The results of the relationship between the Goodenough Draw-a-Man Test and the Stanford-Binet Test are summarized in Table II.

The studies show that higher correlations were obtained when the correlations were computed with Stanford-Binet mental age, than the correlations computed with Binet IQ. The correlations ranged between .40 and .80, and sometimes as low as .29 as an exception. Thus, in general, the Draw-a-Man Test correlates as well with the Stanford-Binet as other tests of intelligence.

All the studies mentioned regarding reliability and validity of the Goodenough Draw-a-Man Test are done for the 1926 version of the Draw-a-Man Test. No study has been found for the 1963 Revised Goodenough-Harris Drawing Test.

³⁷ Jack M. Thompson and Carmen J. Finley, "The Relationship between the Goodenough Draw-a-Man Test and the Stanford-Binet Form L-M in Children Referred for School Guidance Services," Calif. J. Educ. Res., XIV (1963), pp. 19-22.

³⁸ Wallace A. Kennedy and Ronald S. Lindner, "A Normative Study of the Goodenough Draw-a-Man Test to Southern Negro Elementary School Children," Child Developm., XXXV (March, 1964), pp. 33-62.

TABLE II
VALIDITY: RELATIONSHIP TO THE
STANFORD-BINET TEST

Author(s)	Description of Subjects	Correlations
Goodenough (1926)	334, children aged nine to twelve years	.763 (MA values)
Yepsen (1929)	37, institutionalized mentally retarded boys, aged nine to eighteen years	.60 (IQ values)
McElwee (1932)	45, fourteen- and fifteen-year olds, ungraded class	.72 (MA values)
Williams (1935)	100, children aged three to fifteen years, subnormal to gifted	.80 (MA values) .65 (IQ values)
McHugh (1945)	90, Kindergarten children	.45 (MA values) .41 (IQ values)
Estes, et.al. (1961)	82, children, above average in intelligence, in grades one through eight	.43 (IQ values)
Thompson and Finley (1961)	164, children aged five to nine	.67 (IQ values)
Kennedy and Lindner (1964)	1,800, Negro children in grades one through four	Between .29 and .59 (MA values)

The Goodenough Draw-a-Man Test has proved to be reliable and valid.

Since the Goodenough-Harris Drawing Test is so new, this study is an exploratory one to determine its characteristics.

III

SUBJECTS AND PROCEDURE

In this section, the subjects studied and the procedure followed for this study will be discussed.

Subjects. The subjects for the present study were the nursery school children enrolled at the Laboratory Nursery School of the University of Rhode Island, Kingston, Rhode Island in the Fall of the academic year 1964-1965. The total number of the subjects was thirty, with equal numbers of boys and girls. The ages at the first testing ranged from 39 months to 59 months. The mean age was 51.66 months for boys and 49.13 months for girls. All the subjects had previously been given the Stanford-Binet Form L-M by the psychometrician of the nursery school. The mean IQ for boys was 111.66 and 121.86 for girls.

Testing. The investigator, being a student assistant in the nursery school, was familiar with all the children. Each child was approached individually and was asked to go and play a game with the investigator in the testing room of the nursery school. Each child was given the Goodenough-Harris Drawing Test in the first and second weeks of November, 1964. Thereafter, the same test was repeated at every three weeks' interval for four times, until the first week of February, 1965. Thus, the testing period covered thirteen weeks.

Procedure for the Goodenough-Harris Drawing Test. The instructions

given by Harris in the revised Test Manual were followed.¹ Each child was provided with 8½" X 11" manila paper and a pencil. Sometimes pastel colored paper was given for variety in order to maintain interest and to avoid the boredom of playing the same game every three weeks.

Each child was told, "I am going to ask you to make two pictures for me today. First, I want you to make a picture of a man. Make the very best picture that you can make. Be sure to make the whole man."

The drawing was praised, and the child was encouraged to draw a picture of a woman. He was told, "This time I want you to make a picture of a woman, a mommy. Make the very best picture that you can; take your time and work very carefully. Be sure to make the whole woman."

After the drawing was completed, it was praised lavishly. Thus, all the children were asked to draw two pictures, one of a Man and one of a Woman. They were not asked to draw a picture of "self," because it was felt that Harris included this drawing more with the view of studying the self-concept and to use as a projective device for the study of affect and interest.² Moreover, the reliability of the drawing of a "self" is not evaluated by comparing it with Man and Woman drawings.

Reliability of Scoring. In order to establish the reliability of scoring, twenty drawings, ten of Man and ten of Woman, were taken at random. These were scored by two persons--the Chairman of the Child Development Department and the investigator.

¹Dale B. Harris, Children's Drawings as Measures of Intellectual Maturity (New York: Harcourt, Brace and World, Inc., 1963), pp. 239-240.

²Ibid., p. 8.

Two approaches were taken in evaluating the reliability. In the first approach, the disagreement was counted item by item, which resulted in 3.5 per cent of total disagreement on all twenty drawings.

Another approach to evaluating reliability is through correlating the total score scored by two examiners. The rank correlation was used. The rho obtained for the Man Scale was .99 and for the Woman Scale .98.

The results indicated that a high level of agreement was obtained. Therefore, the rest of the drawings were scored by the investigator.

TABLE III

RESULTS OF THE GOODENOUGH-HARRIS SCORES ON FIVE TESTINGS
(AVERAGE OF MAN AND WOMAN RAW SCORES)

	Testing I	Testing II	Testing III	Testing IV	Testing V
Testing II r =	.898				
Testing III r =	.870	.936			
Testing IV r =	.813	.826	.819		
Testing V r =	.766	.815	.820	.927	
Range	0-19.5	0-21.0	0-22.5	2-20	3-19.5
Mean	8.2	9.0	8.6	10.0	11.3
SD	4.9	5.0	4.4	4.6	4.4

research resulted when the drawings were made on the same or consecutive days.¹ There is evidence that when Goodenough gave the retest on the following day, the correlation of .937 was obtained.² The study of McCurdy yielded the correlation of .69 because the retesting was done after three months.³ The results of this study supports the fact pointed out by McCarthy.⁴

The SD's of the scores on five testings range from 4.4 to 5.0. The test of homogeneity of variance showed that the difference between the SD's of scores on five testings is insignificant.

Change of Scores Between Consecutive Pairs of Testings and Between the First and Last Testings. Table IV presents the change of scores between tests and retests. The mean difference between each consecutive pair

¹ Dorothea McCarthy, "A Study of the Reliability of the Goodenough Drawing Test of Intelligence," J. Psychol. XVIII (October, 1944), pp. 201-206.

² Florence L. Goodenough, Measurement of Intelligence by Drawings (New York: World Book Company, 1926), p. 48.

³ Harold McCurdy, "Group and Individual Validity on the Goodenough Draw-a-Man Test," J. Educ. Psychol., XXXVIII (November, 1947), pp. 428-436.

⁴ McCarthy, loc. cit.

of tests and between the first and last test was computed. Each time there was an increase in the mean score except between Testings II and III, when there was a mean decrease of .4. The 't' test was computed in order to find out whether the change was statistically significant.

The table of 't' distribution indicates that the increase between Testings I and II, and the decrease between Testings II and III are insignificant at the .05 level. But the differences yielded between Testings III and IV, Tests IV and V and Testings I and V are significant at the .01 level.

TABLE IV

CHANGE OF AVERAGE RAW SCORES BETWEEN CONSECUTIVE
PAIRS OF TESTINGS AND BETWEEN THE
FIRST AND LAST TESTINGS

	Between Testings I and II	Between Testings II and III	Between Testings III and IV	Between Testings IV and V	Between Testings I and V
Mean difference	0.83	-0.40	1.4	1.3	3.1
't'	2.0	-1.21	2.9	4.0	5.4
	Non-sig- nificant	Non-sig- nificant	Significant at the .01 level	Significant at the .01 level	Signifi- cant at the .01 level

A mean decrease of .4, between the Testings II and III, even though insignificant suggests the possibility that this might have been because the third testing was done during two weeks prior to the Christmas Vacation. At that time, many new activities, like making Christmas cards and decorations, were going on in the nursery school. This attracted the children's interest and the children were less interested to go and play a game with the investigator.

The significant rise in scores from Testing III onwards suggests the possibility of practice effect. It seems that as the children made the pictures of Man and Woman three times, they improved with practices, and therefore were able to make better pictures.

The individual scoring on five testings showed that five children showed stability on the scores of four testings out of five. Their score did not vary more than ± 1.5 each time. On the other hand, five children showed instability on the scores. Their scores varied more than ± 1.5 on four testings. Some of the information regarding these children is provided below:

Morning Group of Children:

Children With Stable Scores

	Sex	Age in Months	S-B IQ
1	F	42	104

Children With Unstable Scores

	Sex	Age in Months	S-B IQ
1	F	46	136
2	M	58	128
3	M	48	86

Afternoon Group of Children:

Children With Stable Scores

	Sex	Age in Months	S-B IQ
1	F	44	140
2	F	49	121
3	M	48	119
4	M	57	97

Children With Unstable Scores

	Sex	Age in Months	S-B IQ
1	F	58	116
2	F	48	136

From the above data, it seems that stability and instability of scores do not have any relationship with IQ or age or sex. The two head teachers of the morning and afternoon groups were asked whether they found any difference in the personality of these children. The teachers did not know the

scores of these children. The morning group teacher could not see any difference. But the teacher in the afternoon group thought that the two girls who showed instability on the scores are unsure of themselves and feel insecure at times. On the other hand, children who showed stability on the scores, all but one are sure of themselves and feel secure. It is important to point out that this is just a quick judgement on the spot, given by the teachers. Perhaps a study of the personalities of children in relation to stability and instability on scores would throw more light.

Relationship Between Man and Woman Scales. The product-moment correlations were calculated by the computer for Man and Woman Raw Scores on all five testings. The results are presented in Table V. It is seen that all the correlations are high, over .85. The mean of all the correlations is .88. All the results were significant at the .01 level.

TABLE V
CORRELATION BETWEEN MAN AND WOMAN RAW SCORES
ON THE FIVE TESTINGS

	Testing I	Testing II	Testing III	Testing IV	Testing V	Mean
r	.86	.90	.88	.85	.91	.88

Significant at the .01 level

The results show a high relationship between the Man and Woman Scales. Harris found out the correlation of .75 when he administered the test to 1,400 subjects, 6, 8, 10, 12 and 14 years old. He concludes that a correlation of .75 between two reliable forms of the same test seems rather low, which suggests that perhaps different abilities are measured by the Man and Woman Scales. A detailed study, indicating factor analyses of both scales'

items might be instructive.⁵

The higher correlations obtained in this study than Harris's might be due to the difference in the age groups of the subjects. There is a possibility that in the drawings of younger children there is not much difference between the figures of Man and Woman and therefore, the correlation between two scales tend to be higher in this study. The results suggest that the "Woman" Scale can be used as an 'alternate' form for the preschool age group.

Relationship With Stanford-Binet. The product-moment correlation of Raw Scores of the Drawing Test and the Stanford-Binet IQ and mental age were calculated by the computer. The scores of Test I and V of the Drawing Test were used. The results are shown in Table VI.

TABLE VI
CORRELATIONS BETWEEN RAW SCORES OF DRAWING
TEST AND IQ AND MENTAL AGE
OF STANFORD-BINET

		Binet IQ	Binet MA
Test I	Raw Scores	.554	.798
Test V	Raw Scores	.551	.761

Significant at the .01 level

The results show that a higher relationship is obtained when the raw scores are correlated with Stanford-Binet mental age than Stanford-Binet IQ, as was expected. The correlation of .798 is on the similar lines

⁵Dale B. Harris, Children's Drawings as Measures of Intellectual Maturity (New York: Harcourt, Brace and World, Inc., 1963), pp. 106-107.

with the results of the previous studies done by Goodenough⁶ and McElwee.⁷ The correlation of .554 between the average raw scores of the Drawing Test I and IQ of Binet and the correlation of .551 between the average raw scores of the Drawing Test V and the IQ of Binet are not high, although they are similar to the results of the previous research done with this age group or the age group closer to this. Perhaps, a higher correlation would have been obtained, if both the tests--Stanford-Binet and the Drawing Test were given at the same time.

Relationship Between the Scores on the Initial Test and the Amount of Change at the End of Five Tests. The median score on the initial test and the median amount of change between the first and fifth tests were calculated. These figures were 7.75 and 2.5, respectively. The median test was performed.⁸ The results are presented in Table VII.

TABLE VII

RELATIONSHIP BETWEEN THE SCORES ON THE
INITIAL TEST AND AMOUNT OF CHANGE

	Above Median Change in Scores	Below Median Change in Scores	
Above Median Score on Initial Test	6	9	Chi ² = 1.2 Not Signifi- cant
Below Median Score on Initial Test	9	6	

⁶ Goodenough, op. cit., p. 50.

⁷ Edna Willis McElwee, "The Reliability of the Goodenough Intelligence Test Used With Subnormal Children Fourteen Years of Age," J. Appl. Psychol., XVI (1932), pp. 217-218.

⁸ Virginia L. Senders, Measurement and Statistics (New York: Oxford University Press, 1958), pp. 446-448.

From the above table it is seen that eighteen children show a negative relationship. Nine children who were below the median on the initial test gained an amount above the median; and nine who were above the median on the initial test, showed an amount of change below the median.

Twelve cases showed a positive relationship, that is six who were higher on the initial test showed above average change and six who were low on the initial test showed change, which was below the median.

The Chi square test of significance indicates that the results are insignificant at the .05 level.

McHugh⁹ observed a definite tendency for 83 kindergarten subjects who scored initially high on the Goodenough Test to make lower scores on the second Goodenough Test and for initially low scorers to improve considerably on the second. He did not use the median test but the tendency of this negative relationship is so strong that he would have obtained significant results if he had used the median test.

Consistency of Test Items. The data indicated that when a particular test item was easy, the consistency of that item on all five successive tests was greater; and the frequency of non-appearance of that item was less. Conversely, when the item was difficult, the consistency of that item was less, and the frequency of the non-appearance of that item was more. Tables VIII and IX present the frequencies of the test items which appeared on all five tests and those which did not appear on any of the five tests, for the Men and Woman Scales, respectively.

⁹Galolo McHugh, "Changes in Goodenough IQ at the Public School Kindergarten Level," J. Educ. Psychol., XXXVI (January, 1945), pp. 17-30.

TABLE VIII
 APPEARANCE AND NON-APPEARANCE OF THE
 TEST ITEMS ON FIVE TESTINGS
 (FOR MAN SCALE)

Name of the Item	No. of the Item	Frequency of Non-Appearance	Frequency of Appearance on all Five Testings
Head	1	2	19
Neck	2	20	3
Eyes	4	0	24
Brow or Lashes	5	16	0
Eye detail, pupil	6	28	0
Eye detail, proportion	7	28	0
Nose	9	3	15
Nose: two dimension	10	29	0
Mouth	11	1	16
Forehead and chin shown	14	8	4
Hair	18	7	3
Hair II	19	26	0
Ears	22	12	2
Ears proportion	23	28	0
Fingers present	24	15	2
Hands	28	19	1
Arms	30	5	11
Arms at side	33	28	0
Elbow joint shown	34	28	0
Legs	35	2	21
Feet	39	7	10
Feet proportion	40	26	1
Feet III heel	41	29	0
Feet V detail	43	28	0
Attachment of arms and legs	44	15	3
Trunk	46	6	7
Trunk proportion	47	11	1
Head proportion	48	19	1
Face proportion	50	4	5
Arms proportion	51	25	0
Legs proportion	53	26	0
Limbs two dimension	54	24	2
Clothing I	55	18	0
Clothing II	56	29	0
Motor Coordination: lines	63	29	0
Modeling technique	71	29	0

TABLE IX
APPEARANCE AND NON-APPEARANCE OF THE
TEST ITEMS ON FIVE TESTINGS
(FOR WOMAN SCALE)

Name of the Item	No. of the Item	Frequency of Non-Appearance	Frequency of Appearance on all Five Testings
Head	1	0	19
Neck	2	22	2
Eyes	4	1	22
Brow or lashes	3	16	0
Eye detail, pupil	6	26	0
Eye detail, proportion	7	29	0
Nose	9	4	14
Nose; two dimension	10	26	0
Bridge of nose	11	27	0
Nostrils	12	27	0
Mouth	13	3	19
Chin and forehead	17	7	0
Hair I	19	5	9
Hair II	20	25	1
Arms	24	4	7
Fingers	28	13	1
Correct number of fingers	29	23	0
Hands	32	21	1
Legs	33	3	19
Feet I	35	8	12
Feet II, proportion	36	26	1
Feet III, detail	37	29	0
Placement of feet	40	25	0
Attachment of arms and legs	41	18	2
Clothing	43	18	2
Sleeve I	44	28	0
Sleeve II	45	29	0
Neckline I	46	29	0
Neckline II, collar	47	29	0
Waist I	48	26	0
Skirt "modeled" to indicate pleats	50	29	0
Garb, feminine	52	28	0
Garb, a definite type	54	29	0
Trunk	55	7	9
Trunk, proportion	56	12	2
Head Trunk, proportion	57	21	0
Head, proportion	58	5	6
Limbs, proportion	59	27	0
Arms in proportion to trunk	60	28	0
Motor coordination: junctures	63	28	0

Table X presents the correlation between the frequencies of non-appearance and the frequencies of consistency of the test items. For the Man's Scale the correlation of $-.806$ and for the Woman's Scale the correlation of $-.819$ were obtained. The negative relationship indicates that as the frequency of non-appearance of the items is greater, the consistency of appearance of the item is less and vice versa.

TABLE X

CORRELATION BETWEEN THE FREQUENCIES OF
NON-APPEARANCE AND APPEARANCE OF TEST
ITEMS ON ALL FIVE TESTINGS

	Man Scale	Woman Scale
r	$-.806$	$-.819$

The results show that there is a definite tendency for the difficult items to show inconsistency in appearance and easy items to show consistency. This shows that the concept of the difficult items is not well integrated in a child's mind. On the other hand, the easy items whose concepts are perfectly integrated in a child's mind show consistency on all five tests.

SUMMARY AND CONCLUSIONS

The fundamental concern of this study has been to have a better understanding of performance of preschool children over a period of time on the Goodenough-Harris Drawing Test, which has been revised recently.

The subjects of the study were preschool children enrolled at the Laboratory Nursery School, run by the University of Rhode Island, Kingston, Rhode Island. Thirty children with the age range of 39 to 59 months at Testing I, were given the Goodenough-Harris Drawing Test, at every three weeks' interval for five times. It was decided to ask the children to make only the two pictures of a Man and a Woman, and not the drawing of a self. For all the results, average raw scores of Man and Woman Scales were used.

This study shows a high test-retest reliability. The mean score increased each time except one time, when special activities were going on in the Nursery School. It would be interesting to discover whether the performance of children on tests would be affected when some special activities are going on.

There was a significant increase in scores from Testing III onwards. The hypothesis one is rejected, because the total scores do vary between tests, after Testing III, beyond the limits to be expected by chance. These results suggest the possibility of practice effect after Testing III. It would be worthwhile to know, how much influence practice can have. If more testings had been done after the fifth one, it could have been investigated whether the practice effect reaches a certain point, beyond which a child

does not increase in his scores.

On the repeated testings, some children showed stability on the scores, while some showed fluctuations. The study of the personalities of children in relation to their scores might throw some light on the subject.

On all five testings, high correlations were obtained between the Man and Woman Scales, which affirm the hypothesis two, that the Woman Scale can be used as an "alternate form" to the Man Scale for the pre-school children.

The average raw scores of the Drawing Test correlated substantially with IQ on the Stanford-Binet, and highly with Stanford-Binet mental age. The results were on the similar lines with the previous research done on the Goodenough Draw-a-Man Test. Perhaps, a higher correlation would have been obtained if the two tests were given at the same time.

The results showed that there was a tendency for the initially low scorers to change more on their scores on subsequent tests and for the initially high scorers to change less.

A definite tendency was observed for the difficult items to have inconsistent appearance and the easy items to have consistent appearance on all five testings. These results affirm the hypothesis three, that some items will show inconsistency in appearance and thereby it supports the statement by Goodenough that those items, whose concepts are not well integrated in a child's mind show fluctuation in appearance, until the concept is well formed. Since difficult items are those that are likely not to be well integrated at any given age, the inconsistency of the difficult items leads to the conclusion that, in general, the concepts of the difficult items are not well integrated in a child's mind.

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APPENDIX

SEX, AGE, STANFORD-BINET IQ AND AVERAGE RAW SCORES
ON THE GOODENOUGH-HARRIS DRAWING TESTS

Number	Sex	Age in Months At Testing I	Stanford- Binet IQ	Average Raw Scores on the Goodenough- Harris Drawing Test				
				Testing I	Testing II	Testing III	Testing IV	Testing V
1	M	59	118	14.5	15.0	13.0	14.0	15.0
2	M	58	128	7.0	12.0	9.0	15.0	16.5
3	F	58	116	12.5	17.5	14.5	16.5	17.5
4	M	58	133	18.0	18.0	14.0	15.0	17.5
5	F	57	116	15.0	15.5	15.0	19.0	18.0
6	M	57	97	8.0	9.5	8.5	9.5	10.0
7	M	56	88	5.5	4.5	4.0	3.0	6.5
8	F	56	95	8.5	10.5	8.0	7.0	9.5
9	M	54	126	12.0	8.5	9.0	10.5	13.0
10	F	53	144	19.5	21.0	22.5	20.0	19.5
11	M	53	97	2.0	2.5	4.0	2.0	6.5
12	M	51	121	8.5	7.0	8.5	10.5	13.0
13	M	50	123	0	5.0	5.5	4.0	9.5
14	F	50	121	12.0	13.0	13.0	14.5	15.5
15	F	50	119	5.5	6.5	8.5	9.5	10.5
16	M	49	115	2.5	0	0	12.0	12.0
17	F	49	121	7.5	7.5	8.0	8.5	8.5
18	F	48	121	6.5	8.5	9.0	7.5	10.5
19	M	48	119	5.5	5.0	6.0	5.5	6.5
20	F	48	113	7.5	9.5	8.5	11.0	11.0
21	M	48	86	2.0	5.5	7.5	8.5	11.5
22	F	48	136	11.5	8.0	9.5	11.5	14.5
23	M	47	109	10.0	9.5	7.5	12.5	12.0
24	F	46	136	11.5	15.5	11.5	13.5	16.5
25	M	46	124	4.5	4.0	3.0	4.5	5.0
26	F	45	135	8.5	7.5	7.5	10.0	9.5
27	F	44	140	11.0	10.5	10.0	10.5	9.0
28	M	43	91	3.5	4.5	2.5	4.5	3.0
29	F	43	111	3.0	5.5	8.0	9.0	10.0
30	F	42	104	1.5	3.0	3.0	3.0	3.0

RAW SCORES OF THE GOODENOUGH-HARRIS DRAWING-TEST ON MAN AND WOMAN SCALES

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Number	Man Scale					Woman Scale				
	Testing I	Testing II	Testing III	Testing IV	Testing V	Testing I	Testing II	Testing III	Testing IV	Testing V
1	15	14	12	14	15	14	16	14	14	15
2	7	13	10	16	18	7	11	8	14	15
3	13	15	12	16	17	12	20	17	17	18
4	17	19	14	13	18	19	17	14	17	17
5	16	16	17	20	19	14	15	13	18	17
6	9	9	9	10	11	7	10	8	9	9
7	3	4	3	3	6	8	5	5	3	7
8	7	11	10	8	8	10	10	6	6	11
9	12	9	9	8	13	12	8	9	13	13
10	21	18	21	19	12	18	24	24	21	17
11	3	3	5	2	7	1	2	3	2	6
12	6	7	7	9	12	11	7	10	12	14
13	0	6	4	2	9	0	4	7	6	10
14	11	11	12	12	15	13	15	14	17	16
15	4	5	6	8	11	7	8	11	11	10
16	5	0	0	12	13	0	0	0	12	11
17	8	8	8	9	9	7	7	8	8	8
18	6	10	10	10	11	7	7	6	5	10
19	3	6	6	6	8	8	4	6	5	5
20	8	9	7	14	11	7	10	9	8	11
21	2	5	7	10	12	2	6	8	7	11
22	10	7	9	12	14	13	9	10	11	15
23	11	10	7	12	12	9	9	8	13	12
24	11	18	11	14	18	12	13	12	13	15
25	5	5	4	4	5	4	3	2	5	5
26	11	7	9	10	9	6	8	6	10	10
27	13	10	10	11	9	9	11	10	10	9
28	4	5	3	6	2	3	4	2	3	4
29	3	5	9	10	10	3	6	7	8	10
30	1	3	3	3	3	2	3	3	3	3