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ABSTRACT

This report provides information to indicate that the North York Self Concept Inventory is - (1) sensitive - 23 of the 25 items do discriminate highly between pupils with high and pupils with low self concept scores; (2) reliable - a test-re-test reliability coefficient of .81 indicates pupils' responses are consistent over a brief (10 day) time period; (3) valid - items were selected from three existing self concept inventories which had been used intensively. The Inventory can be easily administered and scored on a group basis to pupils in Grades 3 and up. The report includes norms tables, i.e. typical distributions of scores, for Grades 2-6 plus instructions on how to interpret them. It is suggested that the Inventory could be used to measure change in self concept on an individual basis. A copy of the Inventory is included. (Author)

RESEARCH REPORT

NORTH YORK SELF CONCEPT INVENTORY:

A PRELIMINARY SET OF NORMS

AND TECHNICAL ANALYSIS

Patricia Crawford

September, 1972

ABSTRACT

This report provides information to indicate that the North York Self Concept Inventory is -

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INTRODUCTION

During the summer of 1971, members of Educational Research Services developed a 30-item self concept inventory which was intended to provide a measure of the self concept of pupils with respect to their school environment.

This instrument was used at several grade levels in many schools throughout the North York system during the 1971 - 72 school year. This report presents preliminary norms on the North York Self Concept Inventory* for Grades 2 - 6 which includes descriptive statistics, i.e. means and standard deviations, and typical distributions for each grade level (2-6).

Description of the Inventory

The Inventory can be administered to groups of children in approximately fifteen minutes and is easily scored by the classroom teacher. It is comprised of 30 items including 25 statements about the school environment as well as five general statements. These items were selected on the basis of an item analysis of three existing self concept inventories that had been administered to North York pupils in two studies during 1970 - 71.**

Pupils are asked to indicate whether they feel each statement is "true" or "not true" for them. For each of the 25 statements about school, the pupil receives one point for the appropriate response indicating a positive self concept. The five items of general content are not scored. Therefore, the maximum score possible is 25.

To determine if the items selected continued to discriminate between pupils with high and low self concept scores, an item analysis was conducted during the summer, 1972 using the data collected during 1971 - 72. The results of this analysis are reported in Appendix B.

The test-retest reliability coefficient for the Inventory is .81 indicating a consistent response pattern over brief time periods. A detailed description of the procedure used to determine the reliability is presented in Appendix C.

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* A copy of the Inventory is presented in Appendix A.

** A more complete description of the development of the Inventory may be found in the following report: Shapson, S.M., Virgin, A.E., and Crawford, Patricia. Development of an Instrument to Measure Self Concept in Schools. October, 1971.

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Data Collection

Throughout the 1971 - 72 school year the Inventory was distributed upon request from individual schools with the provision that results be returned to Research Services for inclusion in a preliminary set of norms. In the majority of cases, it was administered during the spring of 1972, and it is these data upon which the following norms are based. However, in two studies, test administrations were conducted in the Fall, 1971 as well as the Spring, 1972. This pre-test/post-test data is discussed in a separate section of the report.

The number of pupils at each grade level from whom spring data were available is shown in Table 1.

TABLE 1

GRADE LEVEL

	2	3	4	5	6
Number of Pupils	78	218	103	400	213

The sample of pupils to be included in the norms was selected in the following manner:

1. At Grades 2 and 4, all pupils from whom data were available were included,
2. At Grades 3 and 6, a sample of 100 pupils was selected at random from those available.
3. At Grade 5, as well as having self concept data, achievement data were available for a large percentage of the sample of 400 pupils. The majority of pupils were administered two subscales, of the Canadian Tests of Basic Skills during the Spring, 1972, word usage and math problem solving. In the case of one school included in the Grade 5 sample, the pupils were administered all subscales of the CTBS. Therefore it was possible to provide norms for three groups of pupils in Grade 5, low, average and high achievers. Low achievers were defined as pupils whose Composite score on the CTBS was at least one standard deviation or more below the mean for their class; average achievers had Composite scores between plus and minus one standard deviation of the mean; and high achievers scored higher than one standard deviation above the mean score for their class.

All pupils designated as low or high achievers (i.e. approximately 50 in each case) were included in calculating the norms, while a sample of approximately 50 pupils was selected at random from among the pupils who were average achievers.

RESULTS

It is intended that the following results be used for reference and comparison purposes. They are guidelines indicating the expected performance level of pupils from Grades 2 through 6.

Section 1: North York Norms

The following norms table (Table 2) contains the mean and standard deviation for Grades 2,3, 4 and 6 respectively. These statistics provide an indication of the overall level at each grade.

TABLE 2

MEAN AND STANDARD DEVIATION ON THE NORTH YORK SELF CONCEPT INVENTORY FOR EACH OF GRADES 2, 3, 4 & 6

	2	3	4	6
Mean	16.2	14.7	15.0	16.6
Standard Deviation	4.5	4.7	4.4	3.9
Sample Size	78	100	103	100

The results of a one-way analysis of variance conducted on the four means indicated that there are statistically significant differences ($F = 4.86$, $df = 3,376$, $p < .01$) among the grades in terms of their average score on the Self Concept Inventory. An examination of the means indicates that this result can be attributed to the low mean scores in Grades 3 and 4 as compared with those for Grades 2 and 6. Pupils in Grades 3 & 4 seem to have somewhat less positive self-images with respect to the school environment than do pupils in Grades 2 and 6.

Table 3 presents the mean and standard deviation for each of the three groups of pupils at the Grade 5 level.

TABLE 3

MEAN AND STANDARD DEVIATION ON THE NORTH YORK SELF CONCEPT INVENTORY FOR LOW, AVERAGE AND HIGH ACHIEVERS IN GRADE 5.

	Low Achievers	Average Achievers	High Achievers
Mean	13.6	16.4	18.1
Standard Deviation	5.3	4.5	4.8
Sample Size	53	53	49

The results of o one-way analysis of variance conducted on the above three means indicated that there are statistically significant differences ($F = 11.4$, $df = 2,153$, $p < .001$) in terms of average self concept scare among the three groups of achievers at the Grade 5 level. Low achievers tend to have a poorer self-image than average achievers who, in turn, have a poorer self-image than high achievers.

Section II: North York Distributions

The distributions of self concept scores for each grade level are used to assess an individual pupil's relative position with respect to his classmates.

The interpretation of a Distribution Table is explained with the aid of an example presented in Table 4.

TABLE 4

EXAMPLE OF A DISTRIBUTION TABLE
GRADE "X"

(1) Intervol of Scores	(2) % of Sample in Intervol	(3) Cumulative %
above 23	4	100
21 - 23	12	96
18 - 20	19	84
* 15 - 17	23	65
12 - 14	22	42
9 - 11	11	20
6 - 8	7	9
3 - 5	2	2
0 - 2	-	-

* Indicotes the interval in which the mean folls.

Explonation of Table 4

(1) "Intervol of Scores" (Column 1).

Scores are generally grouped into intervals because of the range of possible results. In the example obove, the width of each interval is 3. If we examine the interval 12-14, we ore concerned with the following three scores: 12, 13, 14. The midpoint of this intervol is 13, the lower limit is 12, the upper limit is 14. Suppose we od-minister the Self Concept Inventory to a pupil named Bill in Grode "X", who obtoins a score of 13. In comporing Bill's performonce with the Distribution Table, we would exomine the intervol of scores 12 - 14.

(2) "% of Somple in Interval" (Column 2)

Often one is interested in determining the percentoge of students who

obtain a particular score on a test. Column 2 aids in finding such a percentage. In Table 4 above, if we again consider the interval 12 - 14, we find that 22% of the individuals had scores between 12 - 14. Since Bill obtained a score of 13 on the Self Concept Inventory, we can now say that 22% of the population in Grade "X" score in the same arbitrary range as Bill. (Note that we are actually comparing Bill's score of 13 to a range of scores, i.e. 12 - 14, rather than to an individual score and that this range is arbitrary. A smaller or a larger interval scale would give a different percentage of students scoring in the same range as Bill).

(3) "Cumulative %" (Column 3).

Often one is interested in knowing the percentage of the population who obtain a score lower than or equal to a particular pupil. The cumulative percent (%) column gives a close estimate of this percentage. If we again consider the interval 12-14 (in Table 4 above), we find that 42% of the individuals had scores equal to or less than 14. It is important to note that cumulative percentages are based on the Upper Limit of the Interval (i.e. 14).

To more closely approximate the cumulative percent for Bills' score (i.e. 13) proceed as follows:

1. 13 is 1/3 away from the upper limit (14) of this particular interval (12 - 14).

2. 22% of the sample score in this interval (see column 2 of Table 4 for the interval 12– 14).

3. 1/3 of 22 = 7.3% (we assume that scores are normally distributed across intervals).

4. Therefore 42% over-estimates the cumulative percent for a score of 13 by 7.3%.

5. Therefore the cumulative % for a score of 13 is 34.7% (42 - 7.3 =34.7).

We can now conclude that 34.7% of the population (similar to Bill in terms of grade) score below or at the level Bill attained.

The distribution tables for Grades 2 – 6 are on the following pages.

TABLE 5

GRADE 2

Interval Of Scores	% of Sample in Interval	Cumulative %
above 23	5.1	100.0
21 - 23	9.0	94.9
18 - 20	25.6	85.9
* 15 - 17	28.2	60.3
12 - 14	17.9	32.1
9 - 11	9.0	14.2
6 - 8	2.6	5.2
3 - 5	2.6	2.6
0 - 2	-	-

* Indicates the interval in which the mean falls.

TABLE 6

GRADE 3

Interval Of Scores	% of Sample In Interval	Cumulative %
Above 23	4	100
21 - 23	10	96
18 - 20	12	86
* 15 - 17	26	74
12 - 14	20	48
9 - 11	22	28
6 - 8	4	6
3 - 5	2	2
0 - 2	-	-

* Indicates the interval in which the mean falls.

TABLE 7

GRADE 4

Interval of Scores	% of Sample in Interval	Cumulative %
Above 23	1.0	100.1
21 - 23	7.8	99.1
18 - 20	21.4	91.3
* 15 - 17	23.3	69.9
12 - 14	26.2	46.6
9 - 11	14.6	20.4
6 - 8	3.9	5.8
3 - 5	1.9	1.9
0 - 2	-	-

* Indicates the interval in which the mean falls.

TABLE 8

GRADE 5

LOW ACHIEVERS

Interval of Scores	% of Sample in Interval	Cumulative %
Above 23	-	100.1
21 - 23	11.3	100.1
18 - 20	17.0	88.8
15 - 17	17.0	71.8
* 12 - 14	17.0	54.8
9 - 11	18.9	37.8
6 - 8	13.2	18.9
3 - 5	5.7	5.7
0 - 2	-	-

* Indicates the interval in which the mecn falls.

TABLE 9

GRADE 5

AVERAGE ACHIEVERS

Interval of Scores	% of Sample in Interval	Cumulative %
Above 23	3.7	99.9
21 - 23	18.5	96.2
18 - 20	25.9	77.7
* 15 - 17	18.5	51.8
12 - 14	20.4	33.3
9 - 11	9.3	12.9
6 - 8	1.8	3.6
3 - 5	1.8	1.8
0 - 2	-	-

* Indicates the interval in which the mean falls.

TABLE 10

GRADE 5

HIGH ACHIEVERS

Interval of Scores	% of Sample in Interval	Cumulative %
Above 23	8.2	99.9
21 - 23	28.6	91.7
* 18 - 20	26.5	63.1
15 - 17	22.4	36.6
12 - 14	6.1	14.2
9 - 11	-	8.1
6 - 8	6.1	8.1
3 - 5	2.0	2.0
0 - 2	-	-

* Indicates the interval in which the mean falls.

TABLE 11

GRADE 6

Interval of Scores	% of Sample in Interval	Cumulative %
Above 23	2.0	100.1
21 - 23	12.9	98.1
18 - 20	28.7	85.2
* 15 - 17	29.7	56.5
12 - 14	14.9	26.8
9 - 11	9.9	11.9
6 - 8	2.0	2.0
3 - 5	-	-
0 - 2	-	-

* Indicates the interval in which the mean falls.

Section III: Pre-test/Post-test data

Two studies were conducted during 1971-72 in which the North York Self Concept Inventory was administered on a pre-test/post- test basis.

In one study, data were gathered from two groups of students:

(i) students in their first year at a Vocational School.
(ii) students in their first year of a vocational program at a regular secondary school.

The means and standard deviations for each of these groups on the two administrations are shown in Table 12.

TABLE 12

MEANS AND STANDARD DEVIATIONS ON THE NORTH YORK SELF CONCEPT INVENTORY

		Fall '71	Spring '72
Vocational School	$\bar{X}$	16.3	16.3
	Sd.	4.2	3.7
	N	79	79
Vocational Program Regular Secondary	$\bar{X}$	17.7	18.9
	Sd.	3.5	3.2
	N	19	19

In the second study, an evaluation of a daily physical education program, Grade 3 and Grade 5 pupils were administered the Self Concept Inventory in the Fall, 1971 and Spring '72. These results are shown in Table 13.

TABLE 13

	Fall '71	Spring '72
$\bar{X}$	15.7	16.2
Sd.	4.2	5.0
N	208	174
$\bar{X}$	15.2	16.3
Sd.	4.6	5.3
N	215	195

The results from these two studies indicate that on a group basis there are no dramatic changes in self concept scores over the course of a school year. An examination of the scores for individual pupils, however, indicates that there are pupils whose scores change more than plus or minus one standard deviation. An informal discussion in June with the staff of the Vocational School involved in the first study indicated that for pupils with dramatic changes in score from Fall to Spring, the staff could provide evidence in terms of the pupils' day to day behavior to support the change in score. It is suggested therefore that the Inventory might be used to select individual pupils who have a poor self image and who might benefit from more individual attention. The nature and extent of such attention could be planned in co-operation with the staff of Psychological Services.

APPENDIX A

APPENDIX A

NAME: _____

SCHOOL: _____ TEACHER: _____

GRADE: _____ DATE: _____

DIRECTIONS:

ON THE FOLLOWING PAGES ARE A SERIES OF STATEMENTS PEOPLE SOMETIMES USE TO DESCRIBE THEMSELVES. PLEASE READ EACH STATEMENT CAREFULLY AND DECIDE WHETHER OR NOT IT IS TRUE FOR YOU.

IF YOU THINK A STATEMENT IS TRUE FOR YOU OR DESCRIBES HOW YOU FEEL MOST OF THE TIME, CHECK THE TRUE SQUARE. IF YOU THINK A STATEMENT IS NOT TRUE FOR YOU OR DOES NOT DESCRIBE HOW YOU FEEL MOST OF THE TIME, CHECK THE NOT TRUE SQUARE.

THERE ARE NO RIGHT OR WRONG ANSWERS, ONLY YOU CAN TELL US HOW YOU FEEL.

Board of Education for the Borough of North York

Department of Education Research Services

		TRUE	NOT TRUE
1.	OTHER STUDENTS SEEM HAPPIER THAN I AM	☐	☐
2.	PEOPLE BOSS ME AROUND TOO MUCH	☐	☐
3.	I FIND IT HARD TO TALK IN FRONT OF THE CLASS	☐	☐
4.	I LIKE GOING TO SCHOOL	☐	☐
5.	I AM A GOOD PERSON	☐	☐
6.	I HAVE ONLY A FEW FRIENDS IN SCHOOL	☐	☐
7.	I AM GOOD IN MY SCHOOL WORK	☐	☐
8.	MY CLASSMATES THINK I AM A GOOD STUDENT	☐	☐
9.	MY TEACHER MAKES ME FEEL I AM NOT GOOD ENOUGH	☐	☐
10.	I LIKE TO WATCH TELEVISION	☐	☐
11.	MOST PEOPLE ARE BETTER LIKED THAN I AM	☐	☐
12.	THERE ARE LOTS OF THINGS ABOUT MYSELF I'D CHANGE IF I COULD	☐	☐
13.	I WISH I COULD GO TO SOME OTHER SCHOOL	☐	☐
14.	BOTH BOYS AND GIRLS LIKE ME	☐	☐
15.	I AM A CHEERFUL PERSON	☐	☐
16.	I AM NOT DOING AS WELL IN SCHOOL AS I WOULD LIKE TO	☐	☐

		TRUE	NOT TRUE
17.	I LIKE GOING TO SCHOOL A LOT	☐	☐
18.	KIDS USUALLY FOLLOW MY IDEAS	☐	☐
19.	SCHOOL WORK IS TOO HARD FOR ME	☐	☐
20.	I OFTEN FEEL UPSET IN SCHOOL	☐	☐
21.	I ENJOY SUMMER VACATIONS	☐	☐
22.	I FORGET MOST OF WHAT I LEARN	☐	☐
23.	SCHOOLWORK IS FAIRLY EASY FOR ME	☐	☐
24.	IT TAKES ME A LONG TIME TO GET USED TO ANYTHING NEW	☐	☐
25.	I CAN GIVE A GOOD REPORT IN FRONT OF THE CLASS	☐	☐
26.	I CAN BE DEPENDED ON	☐	☐
27.	TEACHERS EXPECT TOO MUCH FROM ME	☐	☐
28.	THINGS USUALLY DON'T BOTHER ME	☐	☐
29.	IT'S PRETTY TOUGH TO BE ME	☐	☐
30.	I FIND IT HARD TO STICK TO ONE PROJECT FOR VERY LONG	☐	☐
31.	I AM SLOW IN FINISHING MY SCHOOL WORK	☐	☐
32.	SOMETIMES I WISH I COULD GO TO SOME OTHER SCHOOL	☐	☐

APPENDIX B

Results of Item Analyses

In developing the North York Self Concept Inventory, items were selected from three existing self concept inventories that had been administered to North York pupils in two studies during 1970 - 71. The items were selected in accordance with the following two criteria:

1. The content of the items dealt mainly with aspects of self concept related to the school environment and partly with "general-self". Therefore, items associated with family or home interactions were not included.

2. The items showed a high degree of discriminating power between pupils with high and pupils with low self concept scores.

To determine whether the 25 items which comprise the North York Self Concept Inventory continued to discriminate between pupils with high and low self concept scores, item analyses were conducted on the sample of pupils at each of Grades 2, 3, 4 and 6 who were included in the development of preliminary norms. The results of these analyses indicated that with two exceptions, the items were still highly sensitive. The two exceptions were the following items:

- I like going to school.
- I wish I could go to some other school.

Although in the case of both items the results were in the direction predicted at all grade levels, they were not strong enough for the items to be considered good discriminators. Accordingly, the items were re-worded as follows:

- I like going to school alot.
- Sometimes I wish I could go to some other school.

Both the revised as well as the original versions of these items are included in the current instrument to provide data as to whether the revised items are more sensitive than the original ones.

APPENDIX C

Procedure for determining Reliobility

An estimate of the reliability of o test provides an indication of the extent to which the test measures consistently. Since test scores can be influenced by a number of extraneous conditions, e.g., conditions under which the test is administered, and the mood, health, attention and fatigue of the individuals taking the test, it is important to have an estimate of the degree of consistency that can be expected in o set of test scores from one administration to another. From a knowledge of the degree of consistency (the reliability) of a set of scores, it is also possible to estimate how much an individual's score will vary.

The reliobility of o test can be estimated in several ways:

(1) by administering the same form of the test twice (test-retest reliobility).
(2) by administering equivalent forms of the test to the same sample of people, (equivalent forms reliobility) or
(3) by artifically splitting the test into two subtests and comparing performance on the two portions (split-half reliobility)

Two of these methods (1 and 3) were used to derive measures of the reliability of the North York Self Concept Inventory.

Test-Retest Reliability

Test - retest reliobility provides a measure of the stability of the test over time. To determine the test-retest reliobility of the North York Self Concept Inventory, two classes of Grade 5 pupils were administered the Inventory on two occasions 10 days apart. On each occasion, the Inventory was administered by the researcher in the pupils' regular classroom just after lunch. The two sets of scores obtained from the 52 pupils who participated were correlated and yielded a reliobility coefficient of .81.

The question which immediately comes to mind is - what does this mean? The following illustrations will help to answer the question.

One way of examining a correlation coefficient is by plotting the paired measurements on graph paper, each point representing one pair of scores (see Figure 1). If the correlation between the two administrations of the test is 1.00, all of the points will fall exactly on a straight line, indicating a perfect relationship, i.e. there is no error of measurement. An examination of Figure 1 indicates that the points tend to be clustered around the straight line so that pupils who obtained o high score on the first administration of the Inventory tend to obtain a high score on the second administration of the test. The extent to which the set of scores departs from the straight line provides an indication of error.

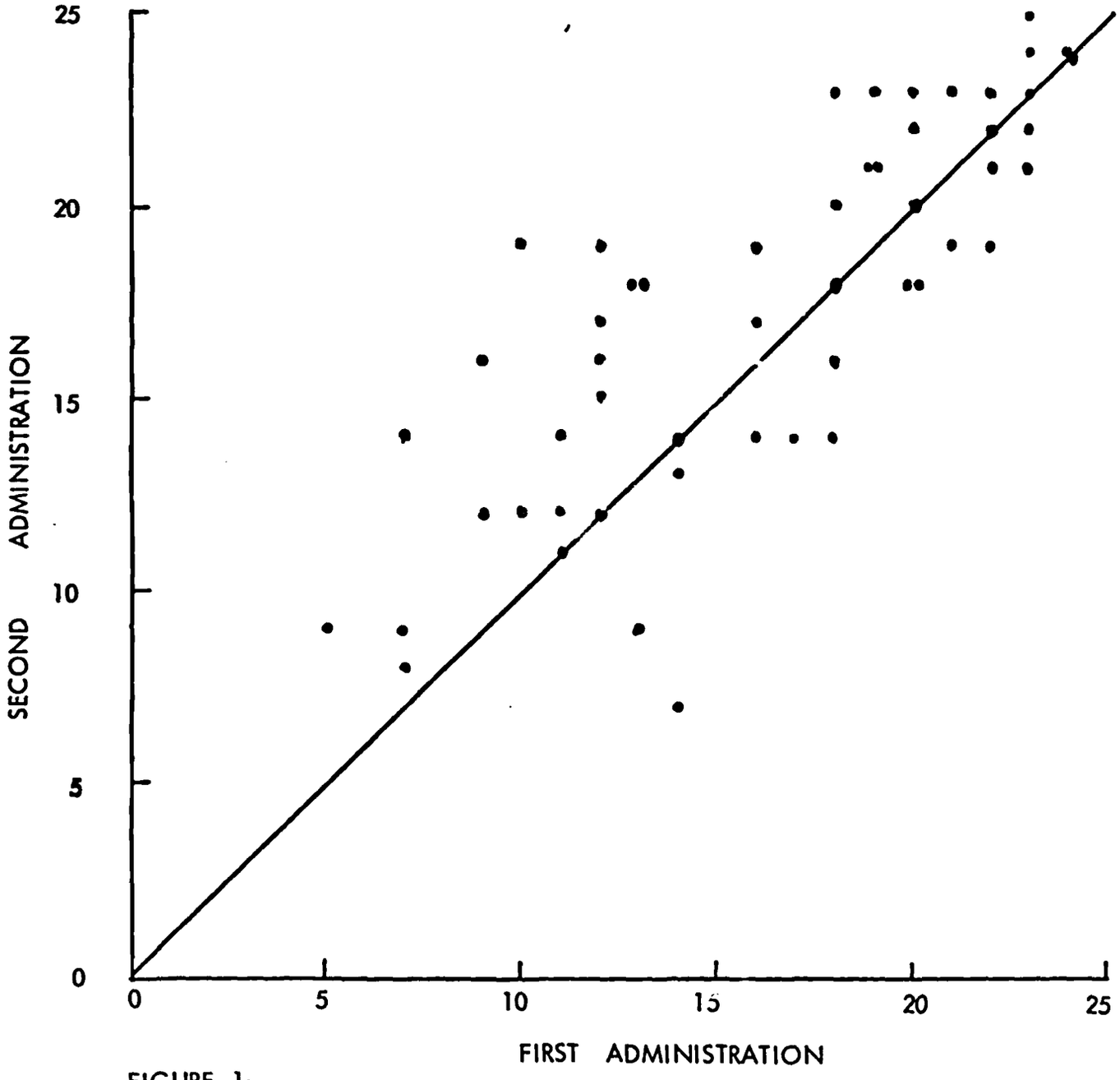

FIGURE 1:
Scatter diagram showing pairs of self concept scores for two administrations of the Inventory 10 days apart.

This idea can also be illustrated by examining the rank order of pupils on the two administrations. If the test measured without error (i.e. r = 1.00) then every individual would have the same ranking on each administration of the test. However, if the reliability coefficient is less than 1.00 there will be some changing of ranks between the testings.

A sample of the 12 pupils having the highest self concept scores plus the 12 having the lowest scores was selected from the sample of 52 Grade 5 pupils. Their scores and rank on each of the administrations are shown in the following table.

These two illustrations provide at least two ways of examining the reliability coefficient for a set of scores. They indicate that the obtained value of .81 provides a good estimate that pupil self concept is fairly stable, at least over a short period of time.

As was mentioned previously, reliability refers to consistency within a set of scores. A knowledge of the degree of consistency within a set of scores can be useful in interpreting an individual pupil's score, i.e., in determining how many points the score would be expected to vary if the pupil took the test again. This estimate of the magnitude of error in an individual's score is called the standard error of measurement.

To calculate the standard error of measurement, two pieces of information are required: (a) the standard deviation of the scores for the group of which the individual is a member, and (2) the reliability of the test.

Let's look at an example. The reliability of the test for our group of 52 Grade 5 pupils is .81. The standard deviation for this group on the second administration was 4.8. The formula for standard error of measurement is as follows:

$$\text{Standard error of measurement (SM)} = \text{standard deviation} \sqrt{1 - \text{reliability}}$$

$$= 4.8 \sqrt{1 - .81}$$
$$= 4.8 \ (.44)$$
$$= 2.1$$

Calculation of this statistic now allows us to make statements regarding an individual pupil's score. For example, if a pupil obtained a score of 14 on the Inventory, 68% of the time his score would probably fall between 14 ± 2.1, i.e. 11.9 - 16.1 if he took the test again.

	PUPIL	ADMINISTRATION 1		ADMINISTRATION 2		
		Score	Rank	Score	Rank	
	A	24	1	24	2	
	B	24	1	24	2	
	C	23	2	22	4	
TOP	D	23	2	23	3	
	E	23	2	25	1	
	F	23	2	21	5	
12	G	23	2	24	2	
	H	22	3	19	7	*
	I	22	3	22	4	
SCORES	J	22	3	21	5	
	K	22	3	23	3	
	L	21	4	23	3	
	M	12	12	15	11	
	N	11	13	14	12	
BOTTOM	O	11	13	12	14	
	P	11	13	11	15	
12	Q	10	14	19	7	*
	R	10	14	12	14	
	S	9	15	16	10	*
SCORES	T	9	15	12	14	
	U	7	16	8	17	
	V	7	16	9	16	
	W	7	16	14	12	*
	X	5	17	9	16	

*

Students whose rank changed quite substantially from the first to the second administration.

Split-half Reliability

In addition to calculating the test-retest reliability for the Self Concept Inventory, a split-half reliability coefficient was calculated which provides a measure of the extent to which all items in the Inventory are measuring one common characteristic, i.e. whether the test is homogeneous.

The Inventory was split into two halves, odd and even numbered items. Each half was scored separately and the scores from the two halves correlated. The split-half correlation coefficient obtained was .80.