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ABSTRACT

A pamphlet on how to make use of the results of the Illinois Statewide High School Testing Program in an individual school is presented. The 1973-74 testing program includes tests of academic aptitude, reading comprehension and knowledge, communication skills, and mathematical skills. The program reports contain the raw scores of the students in each school and State percentile scores. The reports also contain a frequency distribution of the scores in each school and some summary statistics. (CK)

AIDS TO INTERPRETATION

for

1973-74 ILLINOIS STATEWIDE HIGH SCHOOL TESTING PROGRAM

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CONTENTS

AIDS TO INTERPRETATION is written as a how-to-do-it pamphlet: how to make use of the results of the Illinois Statewide High School Testing Program in your school.

WHETHER YOU ARE A NEW OR AN OLD SUBSCRIBER to the Program, we are sure it will be worth your while to give this pamphlet a once-over since there are some changes in reporting this year. Also, keep it handy for ready reference.

IF YOU ARE NOT YET WELL-ACQUAINTED with the Program, you may want to know what functions we see it serving in the schools.

SCHOOLS ARE ENCOURAGED to reproduce any part of this pamphlet for use by or with teachers, counselors, students, or parents.

PREFACE

The Illinois Statewide High School Testing Program is intended to serve the needs of schools and students of our state. Therefore, we are interested in your comments and suggestions.

The 1973-74 Illinois Statewide Testing Program includes tests of academic aptitude, reading comprehension and knowledge, communication skills, and mathematical skills. The Program is also characterized by reduced administration time. Many schools have found that this makes administering the tests easier.

The Program reports contain the raw scores of the students in your school in addition to state percentile scores. The Program reports also contain a frequency distribution of the scores in your school and some summary statistics. These modes of reporting have been used to provide you with data which is descriptive of your school only and easily accommodated to other statistical treatment.

CHAPTER I

WHAT THE ILLINOIS STATEWIDE TESTING PROGRAM MEANS TO US

To us at the Center for Instructional Research and Curriculum Evaluation (CIRCE), the Statewide High School Testing Program means service. But good service means research and development. We try to keep our activities, varied as they are, focused on service to teachers, counselors, and administrators. We try to help with some of the many questions which teachers, counselors, and administrators inevitably ask themselves. Among the many questions which keep popping up, here are some which the Illinois Statewide Testing Program can help answer or clarify:

To what extent are we attaining our objectives with various groups of students?

Which of our students are "good bets" for test-controlled scholarship programs?

How well might our students be expected to perform in certain college courses?

What is the distribution of verbal-reasoning ability among our students?

With which students are our courses and classroom procedures most effective (or least effective) in developing the basic skills of scholarship?

How do our judgments of a student's abilities and skills compare with other estimates of the same things?

With how many of our students are there apparent discrepancies between skills and abilities?

Do any of our students appear to scatter their efforts by performing inconsistently from time to time and from test to test?

To what extent does it appear that our students are pursuing courses of study which are appropriate to their abilities and skills?

How effective is our class-grouping of students?

How accurate are students' ideas of their own abilities and skills?

How do the abilities and skills of our students compare with those at other schools?

How do the abilities and skills of students with certain backgrounds or origins compare with those of others?

The Illinois Statewide High School Testing Program can help toward answering questions like these by providing tests which

1. assess some of the more complex skills and abilities,
2. assess the more common objectives of general education,
3. provide statewide norms for purposes of comparison, and
4. provide information about the range and distribution of scores for the juniors in your school.

In addition to these primary purposes, we feel that it is important

1. to make these tests easily and economically available to all Illinois secondary schools and
2. to provide a scoring service and reporting which will free teachers from clerical work and allow them more time for using the test results.

In earlier instructions we requested that you retain a specimen set of the tests. YOU WILL FIND IT HELPFUL to examine your specimen set as you read this chapter.

CHAPTER II

THE TESTS IN THE PROGRAM

The tests used in the Program are of four types--academic aptitude, reading comprehension and knowledge, communication skills, and mathematical skills.

Academic Aptitude

Academic aptitude relates to the ability to acquire knowledges, skills, and abilities commonly found in the school's curriculum. (No implicit assumption is made that such an ability is inherited.) The Verbal Reasoning score provides us with a measure of one component of academic aptitude.

Verbal Reasoning Test--This test gives a measure of the ability to understand concepts framed in words. Specifically it aims at evaluating the student's ability to abstract or generalize and to think constructively rather than at simple fluency or recognition of vocabulary. Verbal Reasoning scores will be helpful in predicting academic success and vocational level.

Reading Comprehension and Knowledge

The ability to comprehend what one reads depends in large measure upon the subject matter being read, the difficulty of the writing, the general knowledge of the person reading, and the intent of the person reading. We cannot measure, within anything like reasonable time limits, all different subject matters, difficulties, levels of general understanding, and reading purposes. We have tried to choose from each of these four aspects parts which are most relevant to school work. Thus, we have samples of reading matter from two major fields of the high school curriculum--the natural sciences and social studies. The level of difficulty of the subject matter in the samples varies although most of it is comparable to secondary-school textbook material. The nature of the reading behavior which is sampled is meant to be more like that of a classroom-learning situation than that of pleasure reading of fiction. The levels of general knowledge required to answer the questions at the end of each passage vary in depth and sophistication.

No diagnostic part scores are given on these reading comprehension tests. Truly reliable subscores on different aspects of reading would require considerably longer tests than we use. We felt that, in the time given, you would prefer a test which samples several aspects of reading and general knowledge and puts them together in a general ability score as opposed to a test which measures only one aspect out of the many. For instance, the way in which students perform on other reading tasks gives little prediction of how they will perform when

relating written material to graphical representation. There are a few items in the Natural Sciences Test and the Social Studies Test which depend in part on this ability--not enough for a reliable subscore but enough to sample this ability as part of an overall reading-comprehension ability.

In neither of the reading comprehension and knowledge tests is speed of reading tested. Our central concern in these tests is with ability to do the tasks, not with speed of doing them. However, there may be a few students who read so slowly that they fail to complete the tests.

1. Natural Sciences Test--This test samples the student's knowledge and comprehension of three reading passages at several levels. For instance, at a fairly basic level it measures the student's understanding of the key words in the passage. It also checks on his sensitivity to the particular meaning of words in context. At the higher level of understanding it tests his ability to recognize a correct restatement of key phrases or sentences. At the next level it tests his ability to recognize certain implications of the passage. Finally, it tests his ability to understand well enough the rules and principles described to apply them along with other knowledge he has acquired to new situations.

   We find that excellence of a general background in the sciences enhances one's ability to perform well on the test. This should be borne in mind in interpreting this as a knowledge and reading ability score. Such background alone, however, does not necessarily result in a high score. The student still must be able to comprehend these particular passages well enough to think with the material.

2. Social Studies Test--This test consists of several reading passages, graphs, and maps. It is designed to sample behaviors which relate to both a shallow and a deep, penetrating comprehension: (a) ability to determine the main idea, (b) ability to make reasonable inferences about the author's intent, (c) ability to recognize the general form of an argument, (d) ability to recognize relevant assumptions, (e) ability to relate general social studies knowledge to the particular material presented in a passage, (f) ability to discriminate between the appropriate and inappropriate implications of an article, and (g) interpretation of graphs and maps.

Communication Skills

The English Test yields three scores: grammar, usage, and a total score. Each of the tests samples many specific rules and principles of communication; hence, the scores alone do not "pinpoint" the student's strong or weak points in terms of particular rules or principles. However, they do give suggestions concerning the extent to which he needs help in two broad areas: knowledge of the rules of grammar and appropriate use of the English language in written communication. The total score may be viewed as an index of the student's "overall mastery of the English language."

1. Grammar Score--This score is based on the number of right answers the student gives on the first 35 items in the English Test. If

you examine the test, you will note that the items sample many aspects of good sentence construction. These aspects vary from grammar and usage to word choice and idiom. This score is, therefore, an index of the student's ability to use the conventions of correct and formal English.

2. Usage Score--This score is based on the number of right answers the student gives on items 36 through 65 in the English Test. If you examine the test, you will note that the items sample many aspects of correctness and effectiveness of expression. These aspects vary from acceptable usage in grammar and punctuation to sentence construction and word choice. This score indicates the student's ability to communicate effectively.

3. Total Score--This score is a combination of the grammar and usage scores. The total score may be viewed as an index of the student's overall mastery of the English language. It is an index of the student's ability to express his thoughts in writing in a correct and clear manner.

We are not in a position of suggesting to you that one of these areas should be more important than the other in your school. Our belief is that "good" writing must include proper grammatical form and appropriate utilization of the language. We do feel that it is appropriate to direct the attention of all teachers to any disparity in averages among these scores so that the staff as a whole may be encouraged to think through the implications. English teachers alone should not be held responsible for skills and abilities which permeate almost all of our learning situations.

Mathematical Skills

The Mathematics Test yields three scores: problem solving, mathematics reasoning, and a total score. Each of the tests samples many mathematical principles and operations; hence, the scores alone do not identify exactly the student's strong and weak points in terms of particular areas of mathematics. However, they do give suggestions concerning the extent to which he needs help in two broad areas which are involved in each area of mathematics: problem solving and mathematical reasoning. The total score reflects the ability of the student to make use of mathematical knowledge and skills.

1. Problem-Solving Score--This score is based on the number of right answers the student gives on the first 36 items in the Mathematics Test. If you examine the test, you will note that the items sample many aspects of mathematical problem solving. These aspects include arithmetic calculations, algebraic manipulations, and the application of Euclidean geometric principles to problems.

2. Mathematics Reasoning Score--This score is based on the number of right answers the student gives on items 37 through 60 in the Mathematics Test. If you examine the test, you will note that the items sample many aspects of mathematical reasoning, including application of mathematical principles to data interpretation, set theory, and coordinate geometry.

3. Total Score--This score is a combination of the problem-solving and reasoning scores. The total score may be viewed as an index of the student's ability to make use of mathematical knowledge and skills. It may be viewed as an index of the student's overall mathematical knowledge and his ability to apply that knowledge.

We are not suggesting that one of these areas should be more important than the other in your school. Our belief is that mathematical skills should be developed in both of these areas. We feel that it is appropriate to direct the attention of all teachers to any disparity in averages so that the staff as a whole may be encouraged to think through the implications. Mathematics teachers alone should not be held responsible for skills and abilities which permeate other learning situations in the school.

Although percentiles have become widely used in educational measurement, we include for ready reference this brief description of how to interpret the percentile scores in which the results of the Statewide Testing Program are reported.

CHAPTER III

SOME BASIC TERMS: PERCENTILE SCORES AND STANDARD DEVIATIONS

Percentile Scores

State Percentile Scores

If the scores of a pupil on several tests were presented simply as the number of correct responses (called a raw score) on each of the tests, you would have no way of comparing his standing on one test with his position on the others. Neither could you look at his results alone and compare his performance with the performances of other pupils. These two types of comparisons are of major importance in interpreting results of tests. Percentile scores are of such a nature that these comparisons are built into the pupil's scores.

A percentile score for a given person on a given test expresses that person's standing on the test in terms of the percentage of individuals in his total group who scored lower than he did on the test. (In this Program the "total group" consists of all juniors or of all seniors who participated in the Statewide Program. The percentile scores for juniors are different from those for seniors.) Percentile scores range from 1 to 99 regardless of the raw-score range. For instance, although there are many more items in the English Test than there are in the Social Studies Test, the percentile range in each case is 1 to 99.

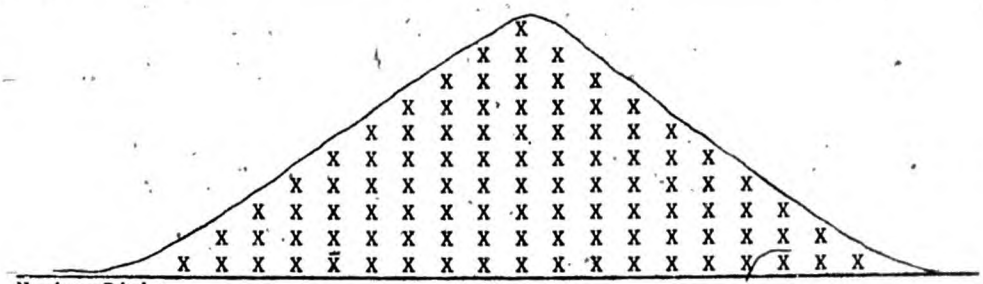
The following examples show how one interprets percentile scores. If a junior pupil has a percentile score of 28 on the Social Studies Test, it means that 28 percent of the juniors in the Statewide Program scored lower than he did on that test. If he also has a percentile score of 59 on the English Test, it means that his raw score (number correct) was such that 59 percent of the juniors in the Program made lower scores than he did on that test. It is important to remember that we are comparing him with juniors. If we were dealing with a senior pupil, the comparison would be with seniors in the Statewide Program. It should be noted also that, since 28 percent of the juniors had lower scores on the Social Studies Test, then 72 percent had higher scores than did this junior pupil. On the English Test we would say that 41 percent of the juniors made higher scores since 59 percent made lower scores than the score of our example pupil.

The scores themselves, then, give us the comparisons we wanted:

1. His score on one test with his score on another (in the example he did much better in English than in Social Studies).

2. His performance on a test with the performance of all other pupils of his group in the Program.

You probably know that the distribution of raw scores on these tests, as on most of your own, will be peaked in the center. Suppose, as an example, we would design a 25-item test and give the test to 100 students. If we let each "X" in the diagram represent one of the students, we might set the following distribution:



Number Right	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Percentile	1	1	1	1	1	2	4	8	12	18	24	32	40	50	59	68	76	82	87	92	95	98	99	99	99	99

In computing percentiles for this test, a raw score of 10 is equivalent to a percentile score of 24, as indicated by the table. The percentile is arrived at by finding the percent of students whose scores are below* the raw score in question. In this case, 24 of the 100 students (24 percent) received scores below 10. Similarly, a raw score of 16 would represent the 76th percentile since 76 percent of the students had raw scores below 16.

One of the things to notice about the distribution is that the distances between percentiles are different from those between raw scores. Thus, the distance between raw scores of 5 and 8 is 3 raw-score points (i.e., 8 minus 5) and 10 percentile points (i.e., 12 minus 2). A difference of 10 percentile points is also found between raw scores of 12 and 13 (i.e., 50 minus 40), only a 1-point raw-score difference. This characteristic of the percentile scale may be stated as a general rule--namely, that any specific difference in percentiles (e.g., 10) is comparable to a much larger difference in raw scores at the very high or very low percentiles (e.g., 8-18 or 82-92) than in the middle of the percentile range (e.g., 40-50).

*For computational purposes the results are treated as though half of the students at any one raw-score point fall below that number and half are above it. For example, using the raw score of 9, we have 6 points in that position. Considering half of them (3) as being below the point, we add 3 to the 15 scoring 8 or below and say that 18 pupils (18 percent) are below the raw score of 9.

After your tests are scored, we send your school a variety of materials. There are six reports which give information about the scores made by the pupils in your school. Each of these reports is useful in a particular way.

CHAPTER IV

THE PROGRAM REPORTS

The materials which your school receives after the tests are scored are as follows:

Report of Scores--This is a gray folder containing sheets on which are listed the names of all pupils tested in your school and their raw and percentile scores. Each school receives two of these folders.

Student Record Card--This is a card which is approximately 3½ inches by 7½ inches with the percentile scores and other information for one pupil. There is one for each of your pupils.

Student Profile Card--This card is the same size as the Student Record Card; but it contains only the pupil's name, brief descriptions of the tests, and the pupil's decile scores. There is one for each of your pupils. Some schools order additional sets of these cards.

Adhesive Label--This is a pressure-sensitive (no moisture necessary) label on which student name is identified and all nine percentiles are printed. There is one for each student. (See directions for handling on the summary information sheet inside the folder containing the Report of Scores.)

School Mean Scores--A school mean score on each test appears after the last name on your roster Report of Scores.

Frequency Distribution--This report is printed on computer-output paper. It contains information about the raw-score distribution for the juniors in your school.

Report of Scores--the Roster

The name of the school is printed in the upper left-hand corner of the first page in the folder. A school code number which we use in processing appears at the far right of the first line of scores on each sheet. Next to the code number is the designation for juniors and seniors, "JRS" and "SRS," respectively. The names of the pupils tested appear in alphabetical order at the left-hand edge of the report. Juniors are listed first, then seniors.

The Report of Scores, considered as a complete list of test scores for your juniors or seniors, can have many uses. Because it provides a means of getting

an overall impression about a number of aspects of the scores, it is particularly helpful where the data can contribute to decisions affecting an entire class or a large portion of it. This will be discussed further in Chapter VI on "The Analysis of Group Results."

Student Record Card

This card contains personal data about the student, his test scores in percentile form, and a profile of his test scores in decile form. The percentile scores are in the upper right-hand corner. The Student Record Card is intended to provide an easily used permanent record of the student's test scores and other pertinent information which should help you to check on his development. The descriptions given on the back of the card are for the purpose of refreshing the memory of one who has read the fuller description in Chapter III and studied the specimen tests which each school has. They are not sufficiently detailed to be really meaningful by themselves to students, parents, or teachers who have not seen or heard additional descriptions.

We hesitate to mention filing--some schools do only that with test records--but it is true that these individual cards are convenient for filing in a variety of ways. We hope they are filed for the purpose of making them accessible. Some schools file them in the student's record folder, others send them to the homeroom teachers, while still others give them to the appropriate class adviser for filing with class records. We hope you find the best way to get the most use of them.

Note that each student has filled in eight items of information--beyond name, age, sex, and class--about himself. At the time the student answered these questions he was given more detailed explanations of most of them than appears on the card. In order to interpret his replies more accurately, you should reread pages 4 and 5 of the Manual of Instructions. This is especially important for items 6, 10, 11, and 12. Since the personal data were written by the student himself, caution must be used in interpreting the information. It may represent a "spur-of-the-moment" wish or perception. In part the usefulness of the results will depend upon how well you prepared and motivated the students to answer the questions. His "occupational choice" may involve little understanding of what the occupation entails or much thought about other possibilities. It also may be that for some students the answers to personal questions are what they think adults want--not what they themselves feel or desire. Hence, whatever questions you may have, it may be wise to check with the student's perception of the situation. This may offer an excellent basis for a starting point for discussion with the student. Further, although you may have little "faith" in the student's responses, the information given is still valuable for it might give you an idea of how the student perceives things.

Student Profile Card

This card contains the student's name, the school's code number, and a brief (memory stimulator) description of each test with a reference to the column in the "profile box" in which the test is represented. Each school has a set of Student Profile Cards--that is, one card for each pupil. Some schools order additional sets.

students in your own school. Does his percentile profile with respect to the students in your school look like the percentile profile with respect to the whole state? The data also allow you to look at the group as a whole. The frequency distribution will give you at a glance the range of scores in your school. You will also be able to tell whether there are any distinct groups of students on any one of the tests. This will be further discussed in Chapter VI on "The Analysis of Group Results."