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I

PERCENTILE NORMS FOR SOME EDUCATIONAL TESTS FOR SOUTHERN CHILDREN

Standardized tests are so firmly fixed in our educational scheme that no one need make apology for offering data to be used by those who are working with these tests. The purpose of the present article is to present data in such a form that they can be used by teachers and other school workers for comparative purposes. During the past two years the writer has been collecting the scores made by southern children when given certain educational tests. The results are presented here in the form of percentile norms. These percentile norms are based on the results of testing in all the southern states. Slightly more scores were secured from Alabama and Tennessee than from either of the other states. Approximately the same number of scores were used from each of the other southern states (including West Virginia, Kentucky, Oklahoma, and Missouri).

The testing and scoring from which these results were secured were practically all done by students or former students of the writer. These students had all received training in giving and scoring tests. All had had at least some practical experience with tests. Only scores have been used which were based on mid-year testing.

The scores are arranged in the form of percentile tables because the writer feels that the median (or norm) is not enough for the teacher to know. We have done a great deal of testing in the past which has had little or no value, either because the individuals doing the testing did not know how to handle their results or because they did not have enough

data with which to make a comparison. In these tables the 50-percentile is the median.

It should be held in mind that the percentile scores presented in this article are only tentative grade standards for southern children. However, sufficient scores have been used in developing the grade standards to make them accurate enough for all practical purposes. The writer is attempting to collect a large number of scores from all sections of the South with the hope of later publishing definite norms. He will be grateful for any aid in this undertaking.

The percentile tables were made in the way illustrated in Table I below. First, all the scores made by the pupils in a grade were tabulated so as to show the number of pupils making each score, as 37 pupils made a score of 20; 37 a score of 19 and so on. Next, the total number of pupils for the grade was found. The high and low scores were then determined by inspection and a column arranged as in Table II. "High" means the highest score made by any pupil and not necessarily the highest possible score, although it does mean that in most cases. In the same way "Low" may not mean the lowest possible score, but the lowest score made. Zero was the lowest score made and 20 the highest. Since there are 1553 pupils we find the 10-percentile by taking 10 per cent (155) of the pupils and counting up the column headed "Pupils" until we find the 155th pupil. The score made by this pupil is the 10-percentile. In most cases it is necessary to interpolate between scores to find the true percentile. In this case 115 pupils made a score of 6 or less. However, we need 155 pupils, so we take 40 of the 46 pupils making a score of 7, or $40/46$ of one (the distance from score 7 to score 8), and add this to 7. Thus the 10-percentile is 7.9. In the same way the other percentiles were found.

TABLE I

Showing Distribution of Scores in the Ayres Spelling Scale, Column "U" for

Seventh Grade Pupils. (20 words were used).

Score	Pupils
20	37
19	37
18	89
17	98
16	159
15	123
14	180
13	165
12	148
11	111
10	96
9	100
8	49
7	46
6	34
5	23
4	17
3	17
2	7
1	5
0	12

TABLE II

Showing Percentile Norms for Buckingham's Extension of the Ayres Spelling Scale, Column "U"

Percentile	Scores for Grade VII
High	20
90	18.1
80	16.6
70	15.6
60	14.6
50	13.7
40	12.7
30	11.5
20	10.
10	7.9
Low	0

Using the eighth grade column of Table III as an example, percentile norms should be read in the following manner: The highest score made by any eighth grade pupil was 34, the lowest 7. Ten per cent of eighth grade pupils, as a rule, make a score of less than 21 (20.6). Twenty per cent make a score of less than 24 (23.4). And so on for the rest of the column when read from the bottom to the top. If we read from the top, we find that 90 per cent of eighth grade pupils make a score of 32 or less. This means of course that 10 per cent make a score of 32 or more and the table can be read in this manner from the top. Likewise 20 per cent make a score of 31 (30.6) or more. In other words, by the use of a percentile table we are able to determine what the best 10 per cent (or any multiple of 10 up to 100) of any grade should do.

TABLE III—PERCENTILE SCORES FOR WOODY-MCCALL MIXED FUNDAMENTALS IN ARITHMETIC

Percentile	Grade				
	IV	V	VI	VII	VIII
High	27	31	34	34	34
90	20	25.5	29.3	30.1	31.8
80	17.6	23.4	27.7	29.3	30.6
70	15.7	21.7	26.5	28.9	30
60	13.9	19.4	25	28.1	29.3
50	11.9	18	22.7	26.7	28.4
40	10	15.1	20.4	24.9	26.9
30	8.4	12.9	18.3	23.4	25.1
20	6.6	10.8	16.2	21.3	23.4
10	4.2	8.5	14.4	18.4	20.6
Low	0	0	5	8	7
No. of pupils	2377	2208	1982	1550	1284

TABLE IV—PERCENTILE SCORES FOR BUCKINGHAM'S EXTENSION OF THE AYRES SPELLING SCALE

(Column "W" for the 8th grade, "U" for the 7th, "S" for the 6th, "Q" for the 5th, and "O" for the 4th).

Percentile	Grade				
	IV	V	VI	VII	VIII
High	20	20	20	21	20
90	17.6	17.9	16.7	18.1	17.6
80	16.3	15.6	15.6	16.6	16.3
70	15.3	14.6	14.4	15.6	15.9
60	14.4	13.6	13.5	14.6	15.3
50	13.6	12.7	12.8	13.7	14.4
40	12.6	11.7	11.9	12.7	13.1
30	11.5	10.6	10.8	11.5	11.9
20	10	8.9	9.5	10.	10.3
10	8.22	6.0	8.1	7.9	7.9
Low	0	0	0	0	0
No. of pupils	1959	2070	1561	1553	1242

TABLE V—PERCENTILE SCORES FOR TRABUE'S NASSAU COUNTY SUPPLEMENT TO THE HILLEGAS SCALE FOR MEASURING THE QUALITY OF ENGLISH COMPOSITION

Percentile	Grade				
	IV	V	VI	VII	VIII
High	6.6	6.9	8.5	8.5	8.5
90	4.2	5.5	5.8	6.2	6.2
80	3.6	4.4	5	5.3	5.4
70	3.2	3.4	4.3	4.7	4.9
60	2.9	2.9	3.8	4.3	4.4
50	2.6	2.5	3.4	3.9	4.1
40	2.3	2.1	3	3.5	3.7
30	1.9	1.6	2.5	3	3.3
20	1	.66	1.9	2.4	2.8
10	.15		.86	1.7	2.2
Low	0	0	0	0	0
No. of pupils	1806	1605	1425	1429	1137

TABLE VI—PERCENTILE SCORES FOR MON-ROE'S STANDARDIZED SILENT READING

Percentile	RATE				
	TEST				
	Grade				
	IV	V	VI	VII	VIII
High	140	140	149	149	150
90	107.1	122.2	134.7	141.5	142.6
80	93.5	110.5	118.5	128.8	130
70	84.3	102.7	108.1	118.3	119.9
60	76	93.7	99.4	110.7	113.3
50	66.3	85.5	90.3	101.2	107.2
40	56.6	80.1	82.9	93.8	100.9
30	49.1	70.8	72.7	85.8	92.5
20	42	56.6	61.8	73.5	84.6
10	31.4	43	49	60.6	70.1
Low	0	0	0	10	10
No. of pupils	2116	1664	1519	1365	1163

TABLE VII — PERCENTILE SCORES FOR MON-ROE'S REASONING TEST IN ARITHMETIC

Percentile	FORM I				
	CORRECT PRINCIPLE				
	Grade				
	IV	V	VI	VII	VIII
High	32	35	29	30	32
90	18.3	26.2	20.5	24.1	23.5
80	14.8	22.8	18.2	22.1	21.1
70	12.6	20.6	15.7	20.6	18.9
60	10.9	18.7	15.2	19.4	17.1
50	9.7	17.3	13.6	17.7	15.7
40	8.3	15.5	11.7	15.6	13.8
30	6.3	13.5	9.1	12.8	11.8
20	4.1	11.3	5.7	9.6	9.1
10	1.9	7.2	2.9	5.6	5.8
Low	0	0	0	0	0
No. of pupils	1749	1964	2184	2183	2038

Percentile	CORRECT ANSWER				
	Grade				
	IV	V	VI	VII	VIII
High	24	30	27	29	20
90	14.7	19.3	19.9	22.8	14.8
80	11.1	15.5	16.3	18.8	12.8
70	8.8	13.2	15.5	16.9	10.9
60	7.7	11.8	11.8	15	9.5
50	6.6	10.2	10.4	13.6	8.2
40	5.6	8.9	9.1	12	7
30	4.5	7.7	7.5	10.2	5.3
20	3.2	6.1	6.3	8.3	3.1
10	1.8	3.9	3.1	5.8	2.2
Low	0	0	0	0	0
No. of pupils	1756	1963	2180	2169	2057

TABLE VIII—PERCENTILE SCORES FOR THORN-DIKE'S HANDWRITING SCALE

Percentile	RATE				
	Grade				
	IV	V	VI	VII	VIII
High	100	110	120	140	130
90	67.3	85.7	88.4	97	99.5
80	60.5	77.2	78.5	88.3	90.3
70	55.6	69.8	71.3	82.6	85
60	50.9	65.6	66.3	77.5	80.7
50	48.5	61.3	61.4	73.1	76.4
40	46.1	50.1	57.1	68.4	72.7
30	43.7	45.8	52.9	63.4	68
20	41.3	41.6	39.6	57.5	62.2
10	34.3	33.2	33.5	50.1	52.4
Low	0	0	0	10	1
No. of pupils	1481	1240	1782	1390	1155

Percentile	QUALITY				
	IV	V	VI	VII	VIII
	IV	V	VI	VII	VIII
High	17	16	18	18	18
90	9.8	12.1	14.7	15.7	16.3
80	8.8	10.7	12.9	14.2	15.5
70	8.4	9.9	12.4	13.2	14.4
60	8	9.6	11.7	12.1	13.2
50	7.7	9.2	10.9	11.5	12.4
40	7.5	8.8	9.9	10.6	11.8
30	7.2	8.5	9.3	9.7	11.2
20	7.1	8.1	8.5	9.2	10.3
10	6	7.5	8.2	8.5	9.1
Low	4	4	4	4	5
No. of pupils	1291	1603	1395	1214	1130

Through the use of percentile norms the teacher is able to study and compare her pupils in a much more definite way than by means of the median norms alone. For example the 31 children in a 6th grade made the following scores when tested with the Woody-McCall mixed fundamentals in arithmetic test: 33, 31, 30, 30, 30, 29, 29, 28, 27, 27, 25, 25, 24, 23, 22, 22, 22, 21, 21, 21, 21, 21, 20, 20, 20, 20, 19, 19, 19, 18, 18. Since there are 31 scores here, the middle or median one is the 16th. The median then is the 16th score or 22. Our median for southern children is nearly 23. So when medians are compared, the sixth grade with a median of 22 appears to be below normal. However, if we compare the scores individually with the percentile norms, we find that the grade is one of unusual attainment. Seven or a little more than 20 per cent of the scores in this grade fall above the 90-percentile. As a rule only 3 scores out of 30 could be expected to be as high as 29. Again it will be noticed that no child in the grade made a score of less than 18 while according to the percentile table we would expect 30 per cent or 9 scores to be 18 or less.

By the use of a percentile table the teacher is able to see just where the pupils stand

when compared with a large number of pupils in the same grade. Furthermore the teacher ought to be able to use these comparisons for purposes of motivation. The writer has tried the experiment of pointing out to pupils just where they stand when compared with other children of the same grade and finds this a very powerful incentive. Children like to try to improve so that they will stand in a higher percentile at the next testing.

Again we find plenty of sixth grades doing only fifth grade work, while on the other hand there are sixth grades doing or capable of doing seventh grade work. With percentile tables the teacher can compare the work of her children with that of higher and lower grades as well as with that of children in the same grade. Seven pupils in the grade mentioned before were doing work equal to that done by the best 20 per cent of the seventh grade.

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II

GROWING FLOWERS IN THE SCHOOLROOM

It is difficult to find a more unattractive place than the average schoolroom at the beginning of the school year. Perhaps nothing else tends to discourage the new teacher quite so much as does that cheerless, vacant, undecorated room. It is a challenge to initiative, industry, and self-respect. No matter what other means may be used to make it more homelike, the use of flowers is necessary to add a touch of plant life and beauty during that time when the outdoor flowers are dormant. It is in the heart of every teacher to have growing flowers in the schoolroom. But few are successful in this; many know so little about the matter that they are afraid to make the attempt; many, not being familiar with their culture, secure only imperfect results. Since most teachers want to succeed in all projects conducted under the observation of the pupils and with their co-operation, it is the purpose of this article to give such simple and safe directions as will make this possible.

It is very important that hardy, well known, quick growing flowers be selected.

Descriptions of plants in seed catalogues are written primarily to sell what they advertise. The description of the rose may be rosy, but it seldom says that roses are poorly suited for house culture. Many flowers might be grown successfully in the classroom, but I am going to discuss those that I know will succeed even when conditions are not ideal. For this purpose, hardy bulbs and fleshy rooted plants are usually best, as they have a storehouse of reserve food that will start them off with a vigorous growth. Seedling plants on the other hand are too slow for the teacher who wants immediate results. A few exceptions will be noted later.

Among the bulbs that are satisfactory for forcing are Dutch hyacinths and Roman hyacinths; single and double early tulips; Sir Watkin, Poet's, Von Sion, Par White, Double Roman, Emperor, Empress, Golden Spur, Maximus, Trumpet Major, and Chinese Sacred Lily narcissi; and Lily of the Valley. Of the fibrous rooted plants, perhaps pansies and native ferns, such as the Christmas Fern, would prove most satisfactory. If the buildings are kept constantly heated, of course this list could be considerably enlarged. A safe rule is to plant only what will live out of doors all the winter in your locality.

After the selection has been made your order should be placed with a reliable seed man early in September for large size bulbs. Small bulbs are not likely to produce flowers and it is poor economy to order them. As soon as bulbs arrive they should be put in the pots or boxes where they are to grow. Boxes of suitable length and width and 4 inches deep are very satisfactory. A good substitute for a flower pot can be made from an empty fruit can which can be draped with crepe paper when brought to the room. The size of pot or distance apart in the box will depend largely on the size of the bulb. As a rule too small a container should not be used; it is better to place several bulbs in a larger box or pot, as they are then subject to less rapid changes of temperature and moisture.

A good soil is very necessary, such as a mixture of sandy loam and well rotted leaf mold in equal parts, to which is added a little well rotted stable manure or bone meal fertilizer. If the latter is used, do not add more than a teaspoonful of it to the quart of soil. A good clay soil can be used if mixed with equal parts of sand and thoroughly rotted