Interpreting Percentile Scores

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A widely used score from commercially published standardized tests is the percentile. This is perhaps the easiest score for parents to understand, or at least it seems to be the easiest one to explain to a parent. The concept of the percent of students equaled or exceeded by a particular student is straightforward—or is it? Try the following examples. Indicate whether the stated interpretation of the percentile score is sound, true or false. The correct answers and brief explanations appear on Page 30. This "test" may be reproduced without written permission. Please cite *Educational Measurement: Issues and Practice* as the source.

Hills' Handy Hints: Percentiles

Please circle either T or F for each question. Mark a response for each question as there is no penalty for guessing. This is an untimed test.

T F 1. Tim is a sixth grader. He obtained a percentile score of 70 in reading on a published standardized test. This means that Tim got 70 percent of the items correct.

T F 2. Mary got a raw score (not a percentile score) of 70 correct on reading. She is in Tim's sixth grade class. This score and Tim's percentile score of 70 indicate that Mary and Tim both are good readers.

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T F 3. Susie, a third grade student, scored at the 30th percentile in arithmetic at the end of the school year. Scores this low are regarded as failing, and therefore Susie should be retained for another year in arithmetic instruction so that she will not be handicapped in the future.

T F 4. Bill received a percentile score of 90 at the beginning of the year and moved up to a percentile score of 99 by the end of the year. Jim, similarly, moved from the 50th percentile to the 59th. They made about equal progress.

T F 5. There is little difference between Sally's score of the 98th percentile and Jeanne's score of the 99.9th percentile, but there is a large difference between Rebecca's 84th percentile and Sally's 98th percentile.

T F 6. Mrs. Henderson is the new Principal at Hartford Elementary. She set as her goal getting every pupil up to the 50th percentile within 4 years of her arrival at Hartford Elementary. With diligent effort and full cooperation from the staff and administration, this is a reasonable goal for most modern schools.

T F 7. Mrs. Henderson wants to evaluate the standing of each grade in Hartford Elementary by comparing Hartford students' achievement with the average achievement in a representative sample of elementary schools in the nation. She obtains the percentile scores for each second grade pupil in reading and averages them. The average of these percentiles is the percentile rank for her school's second graders.

T F 8. Mr. Brown learns that Mrs. Henderson wants to compare the performance of each grade in Hartford with other schools. He is correct in claiming that unless the test publisher provides norms on school means, comparisons of Hartford means with the mean performances in other schools cannot be made.

T F 9. While Rebecca scored at the 84th percentile on the reading test, Helmut scored only at the 75th percentile. Clearly Rebecca is a better reader than Helmut.

T F 10. Miss Spolano is the school counselor at Hartford. She claims that scores on the reading test should not be reported as percentiles, but as percentile bands. However, the percentile bands are so wide for Gretchen, from the 37th percentile to the 58th percentile, that only by getting the percentile score itself do you have an accurate measure of how well Gretchen reads.

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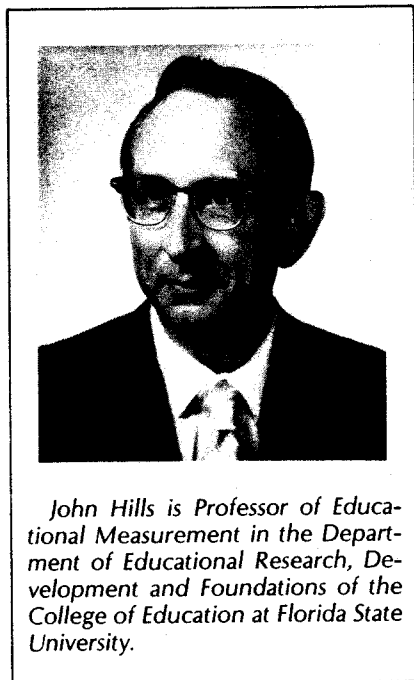
Hills' Handy Hints: Percentiles

Question 8 is true. The others are false. Explanations:

1. Percentile scores indicate the relative standing in a group, not the percent of items that are correct.

2. Mary's score is a number correct score. One cannot tell whether this is a good score without knowing the performances of others or having a carefully justified cutoff score which reflects mastery. In fact, one cannot be sure that Tim's score, which was a percentile, reflects better than average reading without at least knowing the norm group from which his percentile score is obtained.

3. Scores of the 30th percentile are really not far below average. Usually no more than a few percent of a class are failed, say 3 or 4 percent, not anywhere near 30 percent. Besides, a nationally standardized test may not accurately sample the arithmetic skills covered in Susie's class.

4. An increase of 9 percentile units at the top or bottom of the scale represents an improvement of many more items than the same increase near the middle of the scale. On that basis, one could conclude that Bill made much more progress than Jim.

5. Rebecca's score is one standard deviation above the mean, Sally's score is two standard deviations above the mean, and Jeanne's score is three standard deviations above the mean. In terms of score scales such as standard scores, which more accurately reflect the distribution of test scores and differences between them, these students are equally far apart in achievement. The percentile scale distorts the distances between scores.

6. The 50th percentile is near the center of the distribution. If it is to be near the center, some scores must be below it and some above. It is unrealistic to try to get everyone up to the center. If everyone does improve, or if only the bottom half improve, the median (50th percentile) also increases. While the change in median will not appear on the form of the test now being used, the next time the test is standardized, the median will move up if enough of the students below the median nationally show substantial improvement.

7. The average of percentile ranks is not itself a percentile rank. To get percentile ranks for averages of percentile ranks, one would have to rank the average percentile ranks and get a new set of percentiles for these average ranks.

8. The scores for a class cannot be averaged to evaluate the average score in terms of the norms table for scores of individuals. Class averages can only be evaluated in terms of a norms table for class averages. Some publishers do not provide norms for class averages. In such cases, a comparison between the average score of a class and the average scores of other classes cannot sensibly be made. The spread of class averages is much less than the spread of individual scores.

9. When one considers the standard error of measurement for scores such as those of Rebecca and Helmut, it is possible that those scores could be reversed in position on another testing. The percentile band concept is used to keep from overinterpreting small differences between scores.

10. On most tests the percentile bands near the middle of the score distribution are wide. That signifies that we do not know precisely what a student like Gretchen's reading level really is. Obtaining the percentile rank of her score instead of the percentile band gives the appearance of greater accuracy, but this is only an illusion. There is no practical way to obtain Gretchen's true score, of course. ■