Understanding the "Normal Distribution Curve"

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Using the Bell Curve to Consider Normal Distribution

The bell curve helps us to understand **standard scores.**

The bell curve may include the **mean, percentile ranks, and scaled (or subtest) scores**.

Understanding standard scores is important in understanding how students are performing in comparison to same-age peers.

Standard Scores

Standard scores are used in norm-referenced assessment to compare one student's performance on a test to the performance of other students her age.
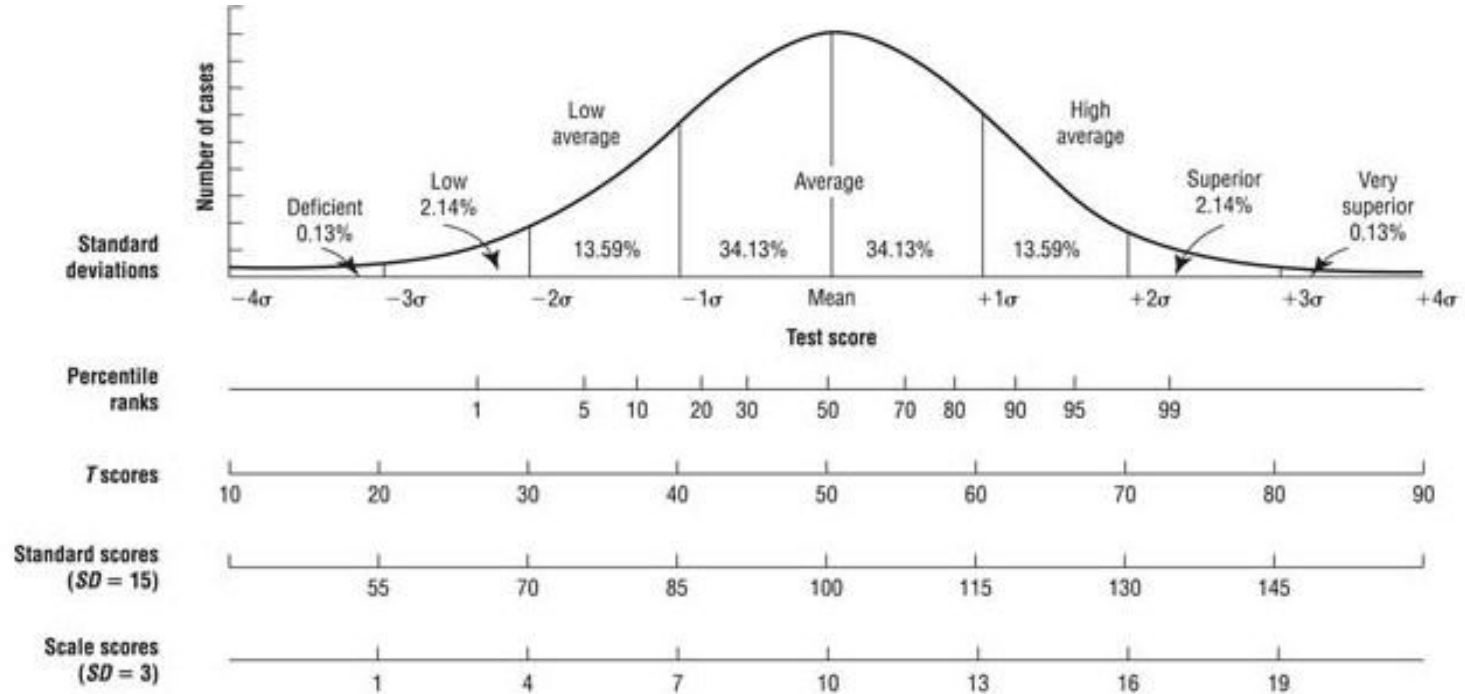
Standard scores estimate whether a student's scores are above average, average, or below average compared to peers.

Standard Scores enable comparison of a student's scores on different types of tests.

Test developers calculate the statistical average based on the performance of students tested in the norming process of test development

The Bell Curve

The Mean

On the bell curve, the Mean is in the middle, at the 50th percentile. The average or Mean score on most tests is 100 (Mean = 100).

Most test scoring systems have a Mean of 100 and a Standard Deviation of ±15.

Scores between 85 and 115 capture the middle two-thirds of the children tested.

Scaled Scores (Subtest Scores)

Scaled scores are standard scores that have a Mean of 10 and a Standard Deviation of ± 3.

Scores between 7 and 13 include the middle two-thirds of children tested.

Most subtest scores are reported as scaled scores.

The Percentile Rank (Versus the Standard Score)

Percentile ranks describe rank or position when compared to other children who are the same age or in the same grade.

Percentile ranks are not equal units. Percentile ranks cluster around the mean, and they stretch out at the high and low ends of the bell curve.

A standard score of 100 equals a percentile rank of 50. This means that the child performed as well as or better than 50 percent of children who are his age or in his grade.

What is a Standardized Assessment?

Standardized, norm-referenced tests are used to assess many areas, including intelligence and academic skills.

These tests are also used to measure specific skills required for reading, written language, and math.

A standardized test is given the same way to all children. Standardized, norm-referenced tests provide valuable information about a child's levels of functioning in the areas tested.

Norm Referenced Assessments

Norm-referenced tests are standardized tests that compare one child's performance with the performance of other children in the same age or grade. Norm-referenced tests use scoring systems that are designed to capture a child's skills with respect to the peer groups.

Criterion Referenced Assessments

Criterion-referenced tests are used to measure knowledge or skills. The child's score is based on mastery of the material and is usually expressed as a percentage.

This is not to be confused with a percentile rank.

A student who receives a score of 75% on a test got 75% of the questions right. He did not do better than 75% of his peers.

Age or Grade Equivalents

An age or grade equivalent is simply the median raw score for a particular age or grade level.

Standard scores are a more accurate representation of an examinee's ability because they are based not only on the mean at a given age level but also on the distribution of scores.

The Value of Considering Data and Assessments

Standardized assessments provide valuable information about student achievement: they help us to determine current skills as well as growth over a period of time.

In addition, standardized assessments help us to understand student strengths and weaknesses; by using this information we can use skills to enhance deficits.