

Answer on Question #84957 – Math – Statistics and Probability

Reading comprehension test scores of elementary school children randomly assigned to one of two teaching methods have the following summary statistics:

	# of Children	Mean	Standard Deviation
Method 1	13	64	5
Method 2	13	69	8

We would like to conduct a hypothesis test to determine whether the true mean test score differs for the two teaching methods. Suppose that all necessary assumptions have been satisfied.

Question

What type of test should be used?

- A) unpooled (conservative) independent two-sample t test
- B) matched pairs t test
- C) pooled independent two-sample t test

Solution

	<i>N</i>	<i>Mean</i>	<i>St dev</i>
Method 1	13	64	5
Method 2	13	69	8

The *matched pairs t-test* (or *paired t-test* or *paired samples t-test* or *dependent t-test*) is used when the data from the two groups can be presented in pairs, for example where the same people are being measured in before-and-after comparison or when the group is given two different tests at different times).

We determine whether to apply "pooled" or "unpooled" procedures by comparing the sample standard deviations.

RULE OF THUMB: If the larger sample standard deviation is MORE THAN twice the smaller sample standard deviation then perform the analysis using unpooled methods.

$$\frac{St\ dev_2}{St\ dev_1} = \frac{8}{5} < 2$$

Pooled methods are applied since the comparison of the largest to smallest sample standard deviation is ≤ 2 .

Answer: C) pooled independent two-sample t test.

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