

Paired Sample T-test, Method 1

Objective: Compare means between two dependent samples.

A researcher is interested in the effectiveness of a new drug to reduce LDL levels in men with high cholesterol. LDL levels of participants will be measured at the start of the study and after 3 months. Average LDL level is expected to be about 3 with a standard deviation of 1. A reduction of LDL levels of 10% (i.e., 0.3) would be considered a clinically-meaningful change. Baseline and 3 month LDL levels are expected to be highly correlated, with a correlation coefficient of 0.7. Power of 90% with a significance level of 5% is desired for the test.

Required Information	Inputs
What is the desired power for the test?	90%
At what significance level do you want to test your hypothesis?	5%
What is baseline the mean of the response variable?	3.0
What is the standard deviation of the response variable?	1.0
What difference do you want to be able to detect?	0.3
What is the correlation between measurements on the same subject?	0.7
Is your hypothesis one-sided or two-sided?	Two-sided

The screenshot shows the G*Power 3.1.9.2 interface. The 'Analysis' window displays the following output:

Input:	Value
Tail(s)	= Two
Effect size dz	= 0.3872983
α err prob	= 0.05
Power (1- β err prob)	= 0.9

Output:	Value
Noncentrality parameter δ	= 3.2863351
Critical t	= 1.9939434
Df	= 71
Total sample size	= 72
Actual power	= 0.9000093

Callouts in the image provide the following information:

- Left Callout:** Select "t tests" and "Means: Difference between two dependent means (matched pairs)".
- Bottom-Left Callout:** Use "Determine=>" to get effect size.
- Bottom-Middle Callout:** "Determine=>" pulls up this side bar.
- Right Callout 1:** Mean LDL at baseline (Group 1) and 3 months (Group 2).
- Right Callout 2:** Correlation between time points.

A total sample size of at least 72 is necessary