

## SPSS: Within-Groups t-test

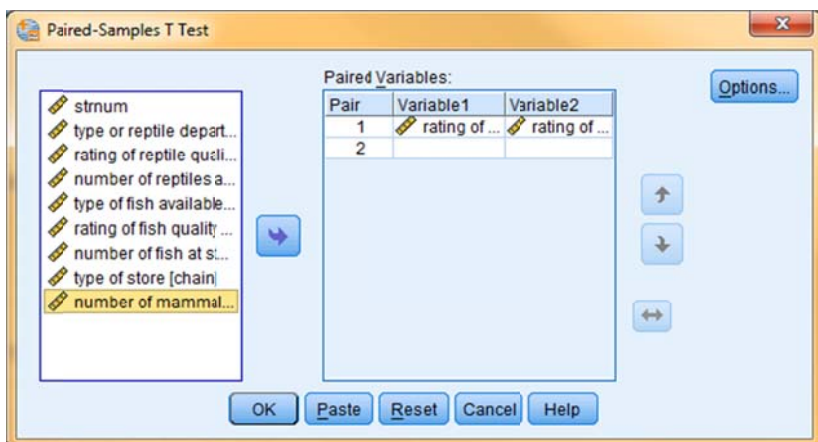
**Application:** To compare the means of two quantitative variables obtained from dependent samples (repeated measures or matched groups). The two scores might be the same variable measured at two different times or under two different conditions, two comparable variables measured at the same time, or some combination.

**Research Hypothesis:** The researcher hypothesized that a store's fish would be of higher quality than its reptiles, because of the greater difficulty obtaining and maintaining healthy reptiles.

**H0: for this analysis:** The quality ratings of reptiles and fish displayed by pet stores have the same means.

### Analyze → Compare Means → Paired-Samples T-Test

- highlight the **two** variables that are the DV for the two IV conditions and click the arrow



### SPSS Syntax

T-TEST PAIRS=reptgood WITH fishgood (PAIRED)

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	rating of reptile quality - 1-10 scale	5.67	12	2.498	.721
	rating of fish quality - 1-10 scale	6.67	12	2.146	.620

**Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	rating of reptile quality - 1-10 scale & rating of fish quality - 1-10 scale	12	-.311	.325

### Why a correlation for a t-test?

Data from a repeated measures design can be used to ask two different types of research questions. The paired (repeated measures, within-group, within-subject) t-test is used to ask if there is a significant difference between the means of the repeated measures. Correlation can be used to ask if there is a linear relationship between the repeated measures.

Be sure you looking at the right statistic for the specific research question or hypothesis you have!!!

### Paired Samples Test

		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	rating of reptile quality- 1-10 scale - rating of fish quality- 1-10 scale	-1.000	3.766	1.087	-.920	11	.377

The p-value of .377 means that there is about a 37.7% chance that this result is a Type I error.

Remember, even if the printout shows it, never report  $p = .000$ , because that would suggest there is no possibility of a Type 1 error. Instead, report " $p < .001$ "

### Reporting the Results:

Type of Reptile Department	Mean	Std	n
Reptile Quality	5.67	2.50	12
Fish Quality	6.67	2.17	12

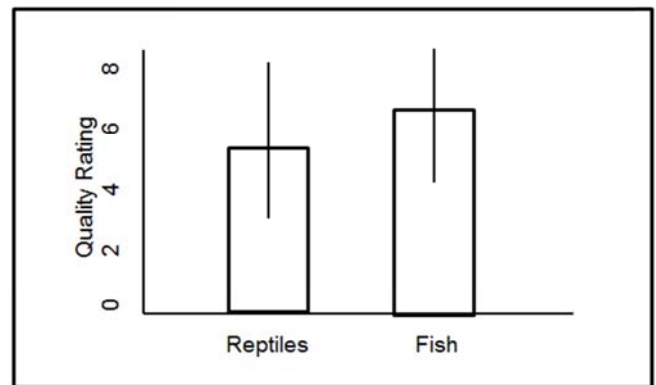


Figure 1 Mean reptile and fish quality ratings (+/- 1 std shown)

Figure/Table 1 shows the mean Reptile and Fish quality ratings. Contrary to the research hypothesis, there was no difference between the mean quality ratings given to fish and those given to reptiles in these stores,  $t(11) = .92$ ,  $p = .377$ .

It is important to report the univariate statistics for the dependent variable for both groups before presenting the ANOVA results. Often these are presented in a table or a figure.

As in the example, be sure to communicate:

- The research hypothesis (if there is one)
- The statistical results
- Whether or not those results support the research hypothesis

### Reporting the Results:

Contrary to the research hypothesis, there was no difference between the mean quality ratings given to fish (mean = 5.67,  $S = 2.50$ ) and those given to reptiles (mean = 6.67,  $S = 2.15$ ) in these stores,  $t(11) = .92$ ,  $p = .377$ .

Sometimes, the univariate statistics are presented in text, along with the correlation results.