SPSS: Between Groups t-test

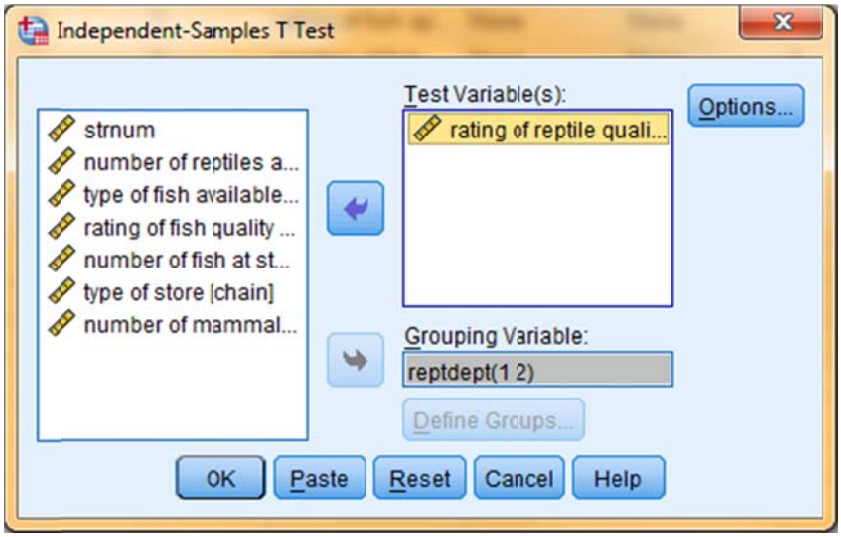
Application: Compare the means of a quantitative variable obtained from 2 independent groups.

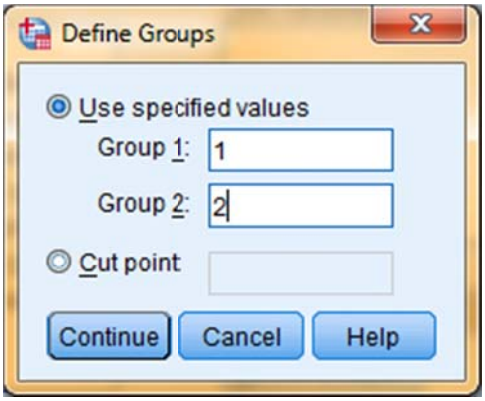
Research Hypothesis: The researcher hypothesized that stores with separate reptile departments would have reptiles of better overall quality than stores that did not have separate reptile departments.

H0: for this analysis: Pet shops which do not have separate reptile departments have the same mean reptile quality ratings as shops that do have separate reptile departments.

Analyze ➔ Compare Means ➔ Independent-Samples T-Test

- highlight the "Test Variable" (Dependent variable) you want (be sure it is quantitative) and click the arrow
- highlight the "Grouping Variable" (IV) you want (Be sure it is qualitative) and click the arrow
- click the "Define Groups" button
- enter the value of the lower-coded group in the "Group 1" window
- enter the value of the higher-coded group in the "Group 2" window





SPSS Syntax

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T-TEST GROUPS=reptdept(1 2)      ← Grouping variable (lowest & highest coded group values)
  /VARIABLES=reptgood.           ← Dependent variable(s)
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Why an F-test for the t-test? And, why are there two t-tests??

Levene's F-test is a test of whether the two groups have similar within-group variation (i.e., a test of the homogeneity of within-group variance assumption) .

- If you retain the H0: for this F-test and conclude that the two groups represent populations have similar variability ($p > .05$), then you will use the "Equal" variance t-test to compare the group means.
- If you reject the H0: for this F-test, and conclude that the two groups represent populations that have different variability ($p < .05$), then you will use the "Un-equal" variance t-test to compare the group means.

For these data, based on the results of Levene's test ($p; > .05$), we would use the "Equal" variance t-test, which reveals a significant difference between the means of the two groups.

Group Statistics

	type or reptile department	N	Mean	Std. Deviation	Std. Error Mean
rating of reptile quality - 1-10 scale	not separate	6	4.00	1.897	.775
	separate dept	6	7.33	1.862	.760

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
rating of reptile quality - 1-10 scale	Equal variances assumed	.000	1.000	-3.071	10	.012
	Equal variances not assumed			-3.071	9.996	.012

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:

Table 1. Summary of reptile qulaity for each type of pet store

Type of Reptile Department	Mean	Std	n
Without a Separate Reptile Dept.	4.00	1.90	6
With a Separate Reptile Dept.	7.33	1.86	6

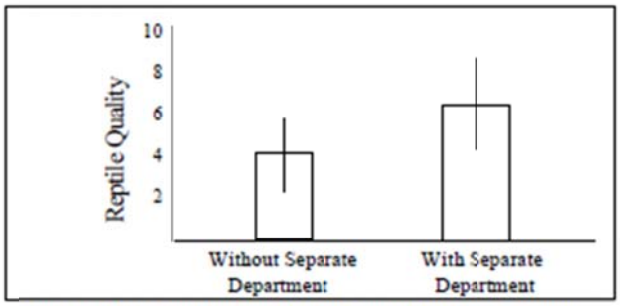

Figure 1. Mean reptile quality for each type of reptile department (+/- 1 std shown)

Table/Figure 1 shows the mean and standard deviation of Reptile Quality for each type of Reptile Department. As hypothesized, pet stores with separate reptile departments had significantly higher mean ratings than those without separate departments, t(10) = 3.071, p = .012.

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:

Those stores without separate reptile departments displayed reptiles with a mean quality rating of 4.0 (S = 1.90), whereas those that did have separate departments had a mean rating of 7.33 (S = 1.86). As hypothesized, pet stores with separate reptile departments had significantly higher mean ratings than those without separate departments, t(10) = 3.071, p = .012.

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