

### Purpose

Understanding the basic idea of what a statistical test is doing can make it much easier to understand the results of an evaluation

### Key Points

- Identify the test that was used
- Determine what it compares or predicts
- Figure out what that test can tell you
- Interpret the result in plain English

### Why read statistics?

When reading evaluation or research reports, reading the statistical results can be like reading a foreign language. There is a vocabulary and a system of writing (symbols) that are used as shorthand for bigger concepts. However, the more you learn that language, the more deeply you can understand the results and decide for yourself how you the findings apply to your work.

### How can I begin to read statistics?

You can grasp at least the basic concept of the most commonly used statistics. You need to know two things: (1) what is that particular test trying to tell you, and (2) is the difference or relationship it is testing statistically significant.

To understand what different tests tell you, see the table on the next page.

To understand how to know if a difference or relationship is statistically significant, see the tip sheets on “p-Values” and “Hypothesis Testing”.

### Recommended Reading

Urdan, T. C. (2010). Statistical significance, effect size, and confidence intervals. *Statistics in plain English*. Routledge: New York.



<b>Test</b>	<b>What It Compares or Predicts</b>	<b>What It Tells You</b>	<b>Example</b>
<b>Independent Samples t-Test</b> (2 groups) <b>One-Way ANOVA</b> (2+ groups)	Group Means	If group means are significantly different from each other	Is there a difference between intent to pursue post-secondary education when measured on 1-10 scale?
<b>Factorial ANOVA</b>	Group Means	If group means are significantly different from each other & if the effect of one independent variable depends on the effect of the other independent variable	Is there a difference in intent to pursue post-secondary education based on whether students are male vs. female <u>and</u> an English language learner or not when measured on a 1-10 scale?
<b>Paired Samples t-Test</b> (2 groups) <b>Repeated Measures ANOVA</b> (2+ groups)	Group Means	If group means change significantly over time or from pre-test to post-test	Do students' intent to pursue post-secondary education change from before a career exploration course to after when measured on a 1-10 scale?
<b>Mann-Whitney U</b> (2 groups) <b>Kruskal-Wallis</b> (2+ groups)	Group Medians	If group medians are significantly different from one another	Is there a difference between girls' vs. boys' intent to pursue post-secondary education when intent is measured as Low, Medium or High?
<b>Wilcoxon signed ranks</b> (2 time points) <b>Friedman</b> (3+ time points)	Group Medians	If group medians significantly change	Does likelihood of intervening change from a pre-test to a post-test when it is measured as Low, Medium or High?
<b>Chi-squared</b>	Percentage of cases that fall in a group	If membership in one group is depends on membership in another group	Do more girls or boys report "Yes" or "No" to whether they plan to pursue post-secondary education?
<b>Linear Regression</b>	Scaled Outcome	If all your predictor variables can predict the outcome & if each predictor variable significantly contributes	Can age, family income, and GPA predict how likely students are to pursue post-secondary education on a 1-10 scale?
<b>Logistic Regression</b>	Likelihood of belonging to a group	If all your predictor variables can predict the outcome & if each predictor variable significantly contributes	Can age, family income, and GPA predict whether students plan to pursue post-secondary education when measured as Yes or No?
<b>All types of correlations</b>	Strength of the association between two variables		Is there an association between GPA and intent to pursue post-secondary education?