Choosing an Appropriate Hypothesis Test

In many ways, the choice of a specific hypothesis test to address a given research question is the cornerstone supporting the entire Results section. Unfortunately, this is also an area of difficulty for many students. The difficulty arises for several reasons, primarily a lack of sufficient training in statistical methods, or training that focused to much on the specifics of each technique without addressing the big picture. Statistical tests are tools that allow one to make objective, empirically supported statements about data. Just as you would not be successful pounding a nail with a screwdriver, or turning a screw with a hammer, for the statistical tool to be useful it must be appropriate for the research question at hand. To facilitate an understanding of the particulars of this paper, a flowchart is provided at the end of this document.

The most important question that must be answered before the appropriate test can be selected is: *What level of measurement is the outcome measure* (dependent variable)?

The usual choices are:	Nominal	Ordinal	Interval/Ratio
These usually take the form of:	Counts	Ranks	Test Scores
and are represented by the colors:	Pink	Yellow	Green
in the flowchart			

For example, a typical nominal variable is a count of ‘number of people’ meeting some condition. Perhaps you are interested in the number of people who either pass or

fail a course, or the number of people who own their own home. A typical ordinal variable is usually either (1) rankings of some sort, such as when a teacher ranks the students in her class in terms of academic aptitude, or (2) single questionnaire items with only a few (3 or 4) possible responses, such as “not at all,” “sometimes,” “often,” and “always.” The most typical interval/ratio outcome variables are (1) numeric measurements such as height, weight, age, or number of visits to the doctor, or (2) composite test scores resulting from summing or averaging a number of questionnaire or test items (or units), such as ACT or SAT scores, mathematics achievement scores, GPA, or total scores on a depression or anxiety test. Once the decision regarding the nature of the outcome measure is made, the answers to the questions posed by the flowchart determine the statistical test to be employed. The only other questions in the flowchart are: (1) Number of groups, (2) Number of variables, (3) Paired data or not, and (4) Cross-classified data or not, each of which is easily answered.

It should be noted that the world of statistical methods is only partially represented in the flowchart. For example, methods such as logistic regression, structural equation modeling, path analysis, and factor analysis are not included. If your research question does not seem to fall within the flowchart, don’t force it. In that case, more research into which method to use, or the solicitation of the help of a statistician, is essential.

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Flowchart for Selecting the Appropriate Hypothesis Test