

WHAT STUDENTS SHOULD KNOW TO PASS PSY 302

[last updated Fall 2012]

Students of Psychology 302 (Statistical Methods) learn a variety of statistical terms and procedures. To successfully apply their knowledge to new situations and master the content of Psychology 303 (Research Methods), students also need to acquire a more abstract level of understanding that underlies specific skills.

Here we specify both these abstract principles and the more specific skills:

PRINCIPLES:

1. One goal of statistics is measuring the strength of a potential effect, such as the size of any difference between groups/conditions or relationship among variables. This is done by assessing the size of an effect in a sample (e.g., the difference between two groups) in relation to the total variability in the sample (e.g., the standard deviation around means). Students need to understand how this principle applies to different designs and data sets (e.g., correlation, analysis of variance).

2. Inferential statistical tests allow us to make yes/no decisions about hypotheses by identifying the "range of data situations" that is plausible if the null hypothesis (i.e., no difference among groups or relationship among variables) is correct. For example, under the null hypothesis the distribution of sample differences between two groups has a mean of zero with a standard error determined by variance and sample size. For an analysis of variance the null hypothesis sampling distribution is defined by the ratio of between-group and within-group variance.

SPECIFIC SKILLS

3. Upon reading the description of a study, infer the research question, hypotheses, and study design, and identify the nature of variables involved (dependent vs. independent, scales of measurement).
4. Determine which statistical tests are appropriate for a given research question and data structure.
5. Complete statistical analyses in SPSS, including entering data in the appropriate format, selecting options to get the data needed, and running appropriate tests.
6. Extract key information from the output of SPSS analyses to assess the plausibility of test assumptions, make decisions about hypotheses, and create tables or figures to illustrate the results.
7. Summarize the results of data analyses within an APA-style report, using appropriate statistical terminology and providing an interpretation in light of the research question. This includes presenting the results of hypothesis tests along with appropriate measures of effect size or confidence intervals and relevant descriptive statistics.