

**Repeated measures vs. independent groups::** There are two kinds of t-tests and two kinds of Anova tests: one for independent groups and another for what is called "repeated measures" or "correlated measures." The distinction is very simple. In an independent groups test, the subjects in the 2 groups or conditions (t test) or 3 groups, 4 groups, 5 groups ... (or 3 conditions, 4 conditions, ...) are *different people*. In a repeated measures case, the same subjects are being tested under different conditions. They are the *same people*. (It doesn't have to be people; they could be ears of corn or even barrels of beer. This is not really important, but it was agronomists mainly -- but also folks such as brewers -- not behavioral scientists, who developed many of these methods. The genius who developed the t test was a chemist and quality control engineer named William Sealy Gossett, who worked for Guinness Brewing Co. Is there anything beer can't do? See the link below.)

[http://www.mlive.com/kalamabrew/index.ssf/2009/03/because\\_of\\_beer\\_1900s\\_guinness.html](http://www.mlive.com/kalamabrew/index.ssf/2009/03/because_of_beer_1900s_guinness.html)

t-test examples:

a. Hearing impaired listeners with: (1) sloping, high-frequency hearing loss are compared with (2) hearing impaired listeners showing a flat hearing loss. They're tested on their ability to identify words from a standard speech intelligibility test. Independent groups or repeated measures? Independent groups. They're different people. (Note: We need a t test because we're comparing two sample means.)

b. Children are tested prior to and following a language enrichment program. We want to know if the program worked, so language scores prior to the program are compared to those following the program. Independent groups or repeated measures? Repeated measures -- they're the same subjects tested under different conditions.

Anova examples:

a. Subjects are tested on their ability to transcribe sentences presented in noise under three conditions: (1) audio only, (2) video only, and (3) audio and video. Independent groups or repeated measures? Repeated measures-- they're the same subjects tested under different conditions. (Note: We need Anova because more than two means are being compared.)

b. A language test is administered to children with reading disabilities, ADHD, SLI, and children with no known disabilities. Independent groups or repeated measures? Independent groups. They're different kids.

The math under the hood is different in the case of independent groups or repeated measures, but we don't need to worry over that. The independent groups/repeated measures distinction is just as simple as the examples above indicate. If you have questions let me know, but try the problems first.