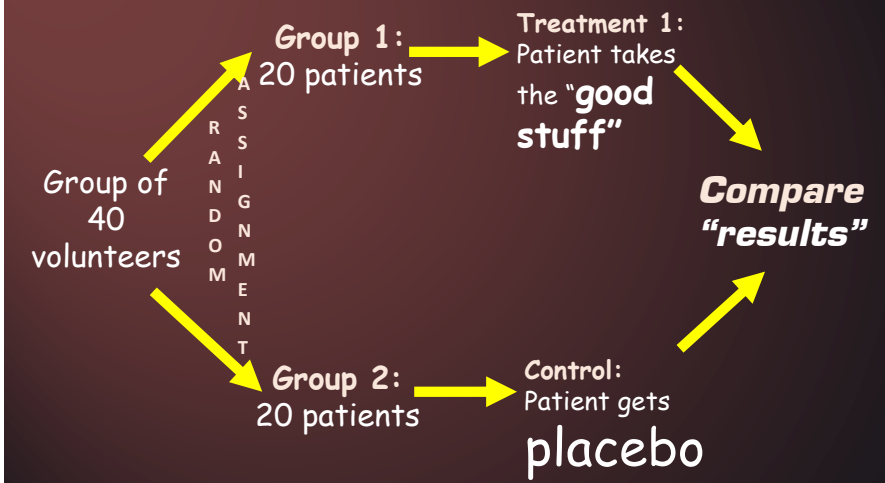
Inference with Means

(two samples)

AP Statistics
Chapter 24

where 2-sample procedures fit it...



Conditions for inference with 2-sample means

- **INDEPENDENT & RANDOM SAMPLES**
  (but for an experiment, check for random assignment of subjects to treatments)
- **(10% Condition)**
- **Normality**
  - Both populations are normally distributed
  - Have large enough sample sizes (n > 30)
  - Graph BOTH sets of data (outliers?)

Do these situations display *independence*?

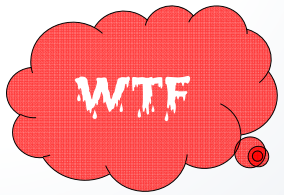
1) Thirty sets of sisters were asked to respond to a survey on food allergies.
Nope!

2) A group of 10 students were given the SAT before a special 6-week prep-class, and then took the SAT again after the class to determine how much they had learned.
Nope!

3) A group of 10 students at school "A" took the SAT, and another group of 10 students at school "B" took the SAT at about the same time. Schools "A" and "B" are in different cities. The scores between the two groups were measured to see if there is a significant difference between the scores from the two schools.
Yes!

Degrees of Freedom…

Calculator method:



Calculator does this automatically! Just copy it down at end…

$$df \approx \frac{\left(\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1-1}\left(\frac{s_1^2}{n_1}\right)+\frac{1}{n_2-1}\left(\frac{s_2^2}{n_2}\right)}$$

2-sample *t*-intervals:

statistic ± crit. value × standard error

$$(\bar{x}_1-\bar{x}_2)\pm t^*_{df}\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}$$

Using a calculator to do the procedure? Then just leave this blank.

2-sample *t*-test:

$$H_O\colon \mu_1-\mu_2=0$$

$$H_A\colon \mu_1-\mu_2 \gtrless \neq 0$$

$$t=\frac{(\bar{x}_1-\bar{x}_2)-0}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}}$$

Pooled??

Just say no!

No!

No!!!