

MATH 205: Statistical methods

Lecture 34: Comparing the mean of two populations (cont.)

Announcements

- Homework 5 due on 12/02
- Final exam:

12/15/2022, Thursday
3:30PM - 5:30PM
Gore Hall Room 304

- Plan for the rest of the semester
 - Linear regression
 - Review of materials + Practice exam
- **There will be no lab next week**
- Course evaluations will be available 12/01 through 12/08

Example

Example

Let μ_1 and μ_2 denote true average tread lives for two competing brands of size P205/65R15 radial tires.

(a) Test

$$H_0 : \mu_1 = \mu_2$$

$$H_a : \mu_1 \neq \mu_2$$

at level 0.05 using the following data: $m = 45$, $\bar{x} = 42,500$, $s_1 = 2200$, $n = 45$, $\bar{y} = 40,400$, and $s_2 = 1900$.

(b) Construct a 95% CI for $\mu_1 - \mu_2$.

Example

The article “Gender Differences in Individuals with Comorbid Alcohol Dependence and Post-Traumatic Stress Disorder” (Amer. J. Addiction, 2003: 412–423) reported the accompanying data on total score on the Obsessive-Compulsive Drinking Scale (OCSD).

Gender	Sample Size	Sample Mean	Sample SD
Male	44	19.93	7.74
Female	40	16.26	7.58

Formulate hypotheses and carry out an appropriate analysis. Does your conclusion depend on whether a significance level of .05 or .01 was employed?

Example

Research has shown that good hip range of motion and strength in throwing athletes results in improved performance and decreased body stress. The article “Functional Hip Characteristics of Baseball Pitchers and Position Players” (Am. J. Sport. Med., 2010: 383–388) reported on a study involving samples of 40 professional pitchers and 40 professional position players.

For the pitchers, the sample mean trail leg total arc of motion (degrees) was 75.6 with a sample standard deviation of 5.9, whereas the sample mean and sample standard deviation for position players were 79.6 and 7.6, respectively.

Assuming normality, test appropriate hypotheses to decide whether true average range of motion for the pitchers is less than that for the position players (as hypothesized by the investigators).