Comparing two means using a Linear Model

- In 809 you discuss how to compare two means
- We will see now how this can be done using a linear model
- Recall the simple linear regression model

$$y_i = \mu + x_i\beta + \varepsilon_i$$

- Suppose x_i is a 'Male' dummy variable, that is x_i={1, if Male, 0 if Female}
- Conditional expectations:

$$E[y_i|Female] = \mu \qquad E[y_i|Male] = \mu + \beta$$

- Then, β can be interpreted as the Female $-$ Male difference.
- And testing H0: $\beta = 0$ $vs.$ Ha: $\beta \neq 0$ is equivalent to test whether there is a mean diff. between male and female.

Example: https://github.com/gdlc/EPI809/blob/master/TWO_MEANS_WITH_LINEAR_MODEL.md