Centering Strategies

true

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Notation

In these notes I use

- x to denote an independent variable
- $\bar{x}_{\cdot\cdot}$ to denote the grand mean
- $\bar{x}_{\cdot j}$ to denote a group mean

Then

- $x - \bar{x_{\cdot\cdot}}$ is a grand mean centered variable.
- $x - \bar{x}_{\cdot j}$ is a group mean centered variable.

  All of the approaches listed below seem plausible to me. I think that they are simply different regression sentences, or substantive questions, that one could pose of the data.

Uncentered x

$$y_{ij} = \beta_0 + \beta x + e_{ij} + u_{0i}$$

Grand Mean Centered x

$$y_{ij} = \beta_0 + \beta(x - \bar{x_{\cdot\cdot}}) + e_{ij} + u_{0i}$$

Group Mean Centered x and Group Mean of x

$$y_{ij} = \beta_0 + \beta(x - \bar{x}_{\cdot j}) + \beta\bar{x}_{\cdot j} + e_{ij} + u_{0i}$$

x and Group Mean of x

$$y_{ij} = \beta_0 + \beta x + \beta\bar{x}_{\cdot j} + e_{ij} + u_{0i}$$