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# MULTILEVEL MODELS

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- Multilevel models introduce structure to the parameter distribution
- Allows us to model several common processes
  - Repeated measures of the same individual
  - Block designs (some observations more similar than others)
  - Pseudo-replicates
  - Correlated observations
- Even in the absence of this type of structure, multilevel models can improve model performance

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# BASEBALL EXAMPLE

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- Batting averages
- $p$  is the probability that an attempted hit is successful.
- We can estimate the season long avg. of a player using a small sample in the beginning of the season.

ML estimate:

$$\hat{p} = N_{hits}/N_{attempts}$$