

Nov 19

Idea: exploring different df adjustments

Nonnormality + methods of calculating df (KR df, Satterthwaite's, between-within, etc.)

Evaluating: tests for a treatment effect
a trend (continuous time)



are estimates of β unbiased? ~~X~~
for a test of $H_0: \beta = 0$,

- do we maintain a nominal Type I error rate?
- coverage probability for CIs?
- $E[\hat{\text{Cov}}(\hat{\beta})] = \text{Cov}(\hat{\beta})$

$\text{Cov}(Y) =$

Reading:

Look into methods of computing df
Get original KR, Satterthwaite (etc) papers
Pay attention sim study set ups

$$\hat{\beta} = (X'X)^{-1}X'y$$

$\text{Cov}(\hat{\beta})$

$\nwarrow \underline{XB} + \underline{Zb}$

Simulation study:

- Generate data under different circumstances (in all cases, simple model and $H_0: \beta = 0$)
 - * ideal situation $Y_{ij} \sim N(\mu, \sigma^2)$ \rightarrow one random intercept?
 - distribution of Y_{ij} { discrete, continuous, center, scale params)
 - number of individuals $\sum Y_i \sim \text{Exp}(\mu)$
 - number of measurements per individual $\sum Y_i \sim \text{Gamma}(\alpha, \beta)$
 - covariance/correlation structure (ICC) $Y_i \sim \text{Poisson}(\lambda)$
- $\sigma_b^2, \sigma_e^2 \parallel \rho = \frac{\sigma_b^2}{\sigma_b^2 + \sigma_e^2}$

Fit models, do inference, and evaluate!

\downarrow

default	}	$\hat{\beta}, SE(\hat{\beta})$ p-values
Satterthwaite's		
KR df		