Comments on hwk4

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G6103 BDA: October 14, 2014

Theory Problem

- A sequence of Bernoulli trial with success prob θ, stop until 13 zeros appeared.
- Likelihood principle, inference about θ unchanged.
- Posterior Prediction changes

Theory Problem Cont'd

- Most of people got this problem right. The distn is more spread out.
- But graphs can improve.

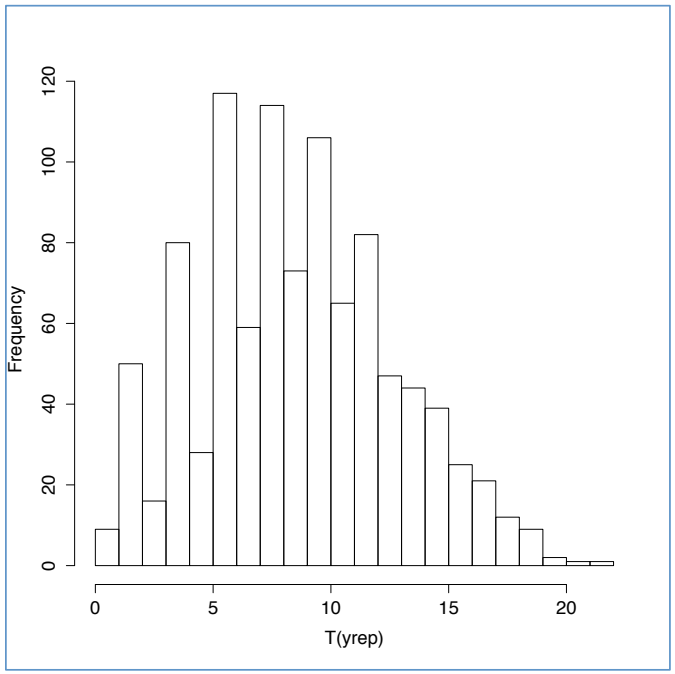

Figure 1: y^{rep} from the alternative measurement protocol.

Computation Problem

- Simulate data from true model $y = 3 + 0.1x_1 + 0.5x_2 + \epsilon$, where ϵ follows a t-distribution. Fit a normal error model and a t-error model, and find coverage probabilities of the regression coefficients.
- Some people didn't calculate coverage probs, but give average estimates and 50% interval...
- Some people got extremely low coverage, most likely due to bugs in their code.

Applied Problem

- NAES 2004 data set, how knowing gay people is related to age, gender and race.
- How to parametrize categorical variables $\text{logit}(\theta) = \alpha + \beta_{\text{age}} * \text{age} + \beta_{\text{male}} * I_{\text{male}} + \beta_{\text{black}} * I_{\text{race}} + \beta_{\text{hisp}} * I_{\text{hisp}} + \beta_{\text{other}} * I_{\text{other}}$

Applied Problem Cont'd

- No pooling: fitting a linear model on age for each combination of gender and race.

  $$\text{logit}(\theta) = \alpha + \beta_{\text{age}}^{g,r} * \text{age} + \text{all gender and all race and all interaction}$$

- Complete pooling

  $$\text{logit}(\theta) = \alpha + \beta_{\text{age}} * \text{age} + \text{main effects}$$

- Partial pooling

  $$\begin{aligned} \text{logit}(\theta) &= \alpha + \beta_{\text{age}}^{g,r} * \text{age} + \text{main effects} + \text{interactions} \\ \beta_{\text{age}}^{g,r} &\sim \text{prior distributions} \\ \text{interactions} &\sim \text{prior distributions} \end{aligned}$$

Applied Problem Cont'd