

STAT 8620 — Categorical Data Analysis and Generalized Linear Models
Homework 5 – Due Thursday, Nov. 8
SHOW ALL WORK

- Homework is due by 4:30 on the due date specified above. You may turn it in to me during class, or place it in my mailbox in the Statistics Building. I will post homework solutions shortly after all homeworks have been collected. **No late homeworks will be accepted without permission granted prior to the due date.**
- Use only standard (8.5×11 inch) paper and use only one side of each sheet.
- Homework should show enough detail so that the reader can clearly understand the procedures of the solutions. This is **absolutely essential** for you to receive full credit for your answer.
- Problems should appear in the order that they were assigned.

Assignment:

1. Problem 6.7 in Agresti.
2. Problem 8.19 in Agresti.
3. Problem 9.16 in Agresti.
4. Problem 9.21 in Agresti.
5. Problem 13.8 (parts a–c only) in Agresti.
6. Refer to problem 13.12 in Agresti.
 - a. Fit loglinear models to these data that allows for different monthly rates of sexual intercourse for males and females using (i) maximum likelihood estimation under a Poisson assumption for the error distribution, (ii) quasi-likelihood estimation assuming $\text{var}(y) = \phi\mu$ for ϕ a free parameter to be estimated, and (iii) maximum likelihood estimation under a negative binomial assumption for the error distribution.
 - b. Summarize the evidence that there is overdispersion in these data relative to the Poisson model you fit in part (a).
 - c. Using all three models, compute an approximate 95% confidence interval for the rate ratio for males to females using the Wald approach. Compare and interpret these intervals? Which would you use?