Gibbs Sampling with Data Augmentation for Bayesian Analysis of Binary and Polychotomous Response Data

STAT 230 Final Report

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1 Abstract

Here's the abstract.

2 Introduction

We cite Albert and Chib (1993)

Here's the introduction.

3 Methodology

Here's the methodology.

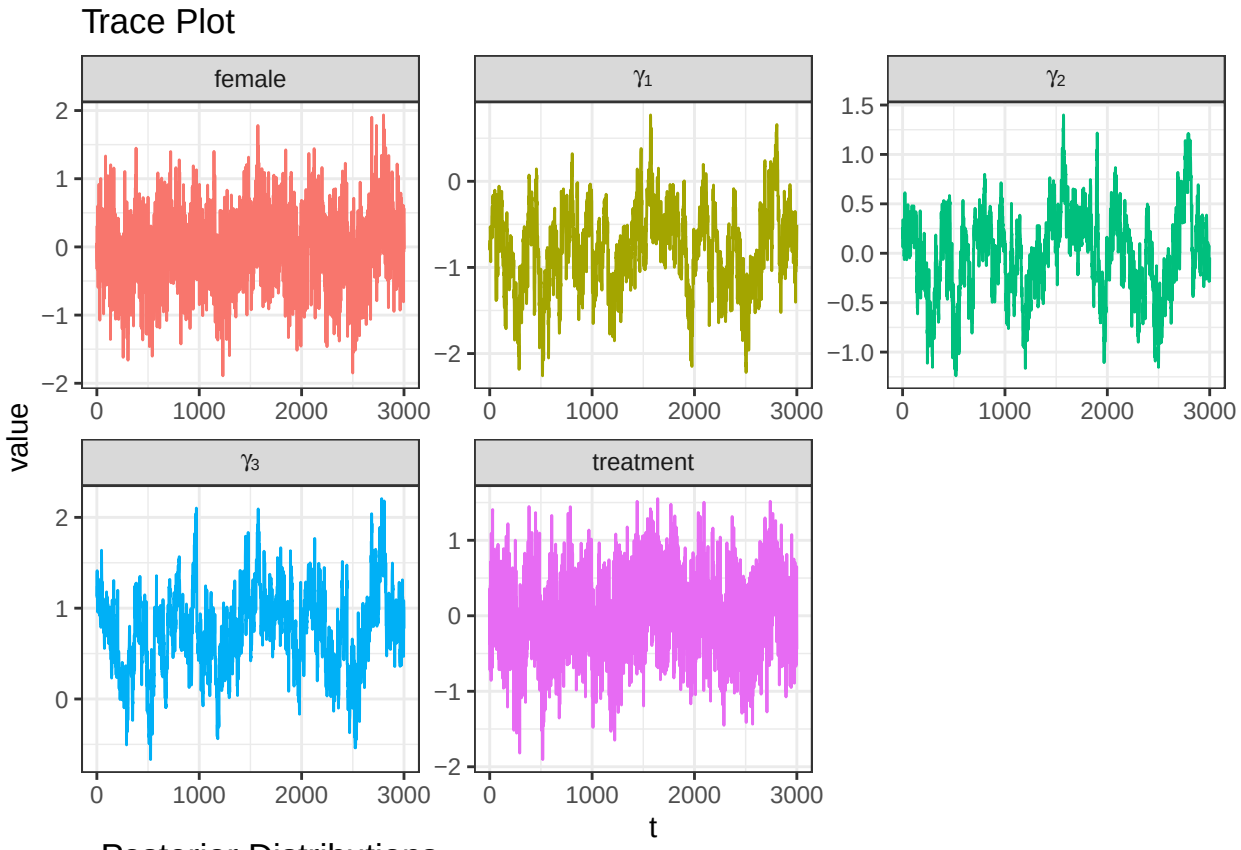
4 Results

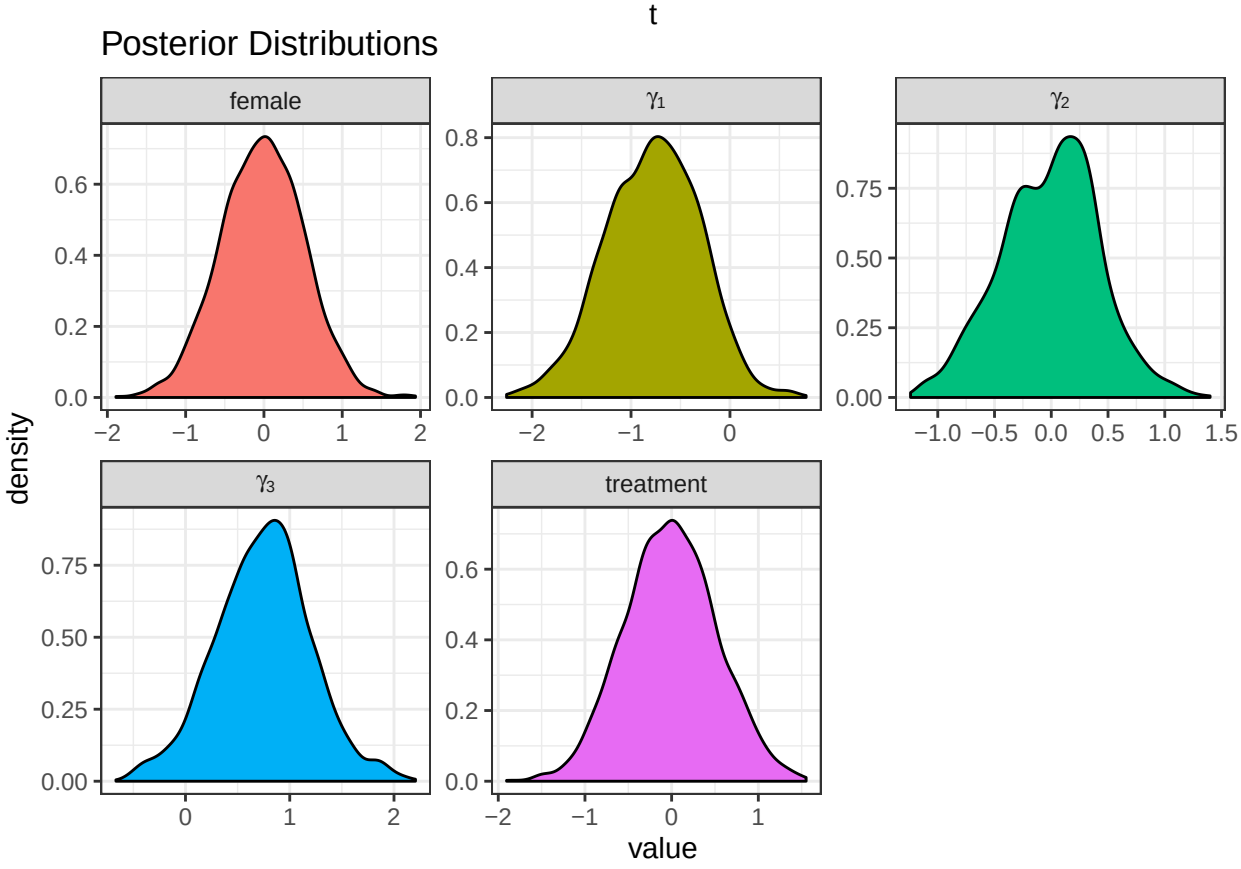
For three datasets, we apply the appropriate previously discussed model as well as standard maximum likelihood estimation and custom models written in Stan (Carpenter et al. 2017) and impelemented in the RStan package (Stan Development Team 2019).

Here's the results.

4.1 Small-cell Carcinoma

Variable	mean	sd	2.5%	50%	97.5%
female	-0.0218627	0.5322155	-1.0544119	-0.0152256	1.0121554
gamma[1]	-0.7778705	0.4760492	-1.7384145	-0.7650641	0.1049532
gamma[2]	-0.0114831	0.4342196	-0.8896768	0.0244243	0.8406642
gamma[3]	0.7447002	0.4572596	-0.1875459	0.7586709	1.6652474
treatment	-0.0115654	0.5304874	-1.0356178	-0.0103759	1.0426626


Trace Plot
female
γ1
γ2
γ3
treatment
value
t


Posterior Distributions
female
γ1
γ2
γ3
treatment
density
value

5 Discussion

Here's the discussion.

6 References

Albert, James H., and Siddhartha Chib. 1993. "Bayesian Analysis of Binary and Polychotomous Response Data." *Journal of the American Statistical Association* 88 (422). Taylor & Francis: 669–79. https://doi.org/10.1080/01621459.1993.10476321.

Carpenter, Bob, Andrew Gelman, Matthew Hoffman, Daniel Lee, Ben Goodrich, Michael Betancourt, Marcus Brubaker, Jiqiang Guo, Peter Li, and Allen Riddell. 2017. "Stan: A Probabilistic Programming Language." *Journal of Statistical Software, Articles* 76 (1): 1–32. https://doi.org/10.18637/jss.v076.i01.

Stan Development Team. 2019. "RStan: The R Interface to Stan." http://mc-stan.org/.

7 Appendix