

1135-VT-1365 **Dilli Bhatta*** (dbhatta@uscupstate.edu), 800 University Way, Spartanburg, SC 29303.
Bayesian Analysis of Contingency Tables With Covariates Under Cluster Sampling.

We implement a Bayesian approach of testing independence between two categorical variables presented in a two-way contingency table with covariates for a two-stage cluster sample. Under this approach, we convert the cluster sample with covariates into an equivalent simple random sample without covariates which provides a surrogate of the original sample. Then, this surrogate sample is used to compute the Bayes factor to make an inference about independence. We apply our methodology to the data from the Trend in International Mathematics and Science Study (2007) for fourth grade U.S. students to assess the association between the mathematics and science scores represented as categorical variables. We show that if there is strong association between two categorical variables, there is no significant difference between the tests with and without the covariates. We also performed a simulation study to further understand the effect of covariates in various situations. We found that in borderline cases (moderate association between the two categorical variables) there are noticeable differences in the test with and without covariates. (Received September 21, 2017)