**BIOST 2049**

**Spring 2023**

**Research Article Dissection 5B – Multinomial Logistic Regression**

**Due 3/29/23 by 11:59 via the Assignment Link posted to Canvas**

Please read the article “Multinomial logistic regression to estimate and predict perceptions of bicycle and transportation infrastructure in a sprawling metropolitan area” by Coughenour et al. found on Canvas and answer the questions below.

This is an individual assignment. You can discuss the article with your classmates, but the answers you submit should be your own.

Please be brief but write in complete sentences with appropriate interpretations (a yes or no answer will not get full credit). A few sentences is all that is necessary to answer each question.

1. What is goal of this paper?

Predict which transporation infrastructures people feel are safest in order to promote physical activity through active transportation (e.g., biking).

1. Briefly describe the statistical methods used.

Survey participants about different transportation infrastructure configurations, then use a multinomial logistic regression to predict choice probabilities, such as agreement with adequate signage in a configuration, likelihood of biking in a configuration, and likelihood of using.

1. Was the use of multinomial logistic regression appropriate?

Yes, because there were seven classes to predict.

1. Describe how the predicted probabilities were computed. Did the interpretation of these make sense in the context of the question? Explain.

The “predicted” probabilities were proportions of survey answers that “agree” to certain statements such as adequacy or being most likely to use. This was confusing, because by fitting a multinomial logistic regression model they should have been talking about how covariates affected odds of agreeing with or using infrastructure configurations.

1. Do you agree with how they assessed model fit? Would you have done something differently? Why or why not.

They seem to have used acceptable metrics, however if I were them I would’ve said more about model comparison. The only information they shared was that Logit models provided better goodness of fit than Probit models, but I’m not entirely clear which models they tested.

1. Did this paper help solidify how and why a multinomial logistic regression would be used?

Yes, though their lack of discussion of odds ratios was somewhat confusing.