

FLORIDA STATE UNIVERSITY  
COLLEGE OF ARTS AND SCIENCES

INCORPORATING OUT-OF-SAMPLE ERROR  
DIRECTLY INTO BAYESIAN HIERARCHICAL MODELS  
THROUGH CONSTRAINTS AND SUBSAMPLING

By  
QINGYING ZONG

A Dissertation submitted to the  
Department of Statistics  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

2023

Qingying Zong defended this dissertation on April 10, 2023.

The members of the supervisory committee were:

Jonathan R. Bradley  
Professor Directing Thesis

Kevin Speer  
University Representative

Qing Mai  
Committee Member

Rongjie Liu  
Committee Member

The Graduate School has verified and approved the above-named committee members, and certifies that the dissertation has been approved in accordance with university requirements.