

Florida State University Statistical Consulting Center Annual Report

2017-2018

Overview

Florida State University's Statistical Consulting Center is provided to assist students, faculty, and staff at FSU with their research activities. The Consulting Center is staffed by graduate students within the Department of Statistics and provides free service to members of the FSU community. Upon request, clients from outside of the FSU community are given at least one hour of consultation. The Center provides walk-in hours to assist clients on a first-come first-serve basis. Those in need of more assistance or those who cannot make it to the scheduled walk-hours are also able to schedule appointments to see consultants. Services include but are not limited to:

- Translating research questions and hypotheses into precise statistical terms
- Designing sampling Procedures
- Choosing appropriate statistical methods
- Interpreting computer output
- Referrals to other statistical help
- Assistance learning various statistical packages
- Aid in data formatting, processing, etc.
- The Statistical Consulting Center does not perform actual analysis

Walk-in hours for the 2017-2018 academic year were held on Monday, Tuesday and Thursday afternoons in Strozier Library Consultation Room A. Additional appointments were set up to accommodate both the consultant's and clients specific scheduling needs. The majority of appointments were held in person during walk-in hours, though some questions were answered through email or skype if the client was out of town.

Summary of Business Activity

The consulting center was staffed by the graduate students Apurva Bhingare, Lizhe Sun, RuiyiZhang and Shuang Zhou.

On average, each consultant met 2-3 clients each week during the walk-in hours and handled 2-3 appointments outside the walk-in hours per semester, for a total of about 50-60 cases over the course of the two semesters. The demand was relatively consistent across the months, with slight increases at the beginning and end of the semester, and close to important dates such as submission deadlines for research proposals or dissertations.

Consulting Appointments and Walk-ins

The majority of clients this year were graduate students seeking assistance for the quantitative aspect of their research/dissertations. Faculty members came for help occasionally as well. Quite a few undergraduate students came in requesting tutoring, the majority of whom were referred to the Department of Statistics for their problem. The most frequently asked questions were about t-tests, ANOVA test, linear regression, generalized linear model, factor analysis, power analysis, sample size

calculations, and survey data analysis. The most commonly used Software included SAS, SPSS, R, and Excel. Most clients came in for help in selecting the right model according to the data and experiment design, explanation of the Software output, or how to use the statistical software.

Now, a typical consulting process is as follows:

1. The client provides a brief summary of their problem via email prior to meeting;
2. 30-60 minutes in-person consulting with client;
3. A follow-up email is sent to the client.
4. Additional meetings are scheduled as needed.

Statistical services have been offered to clients from departments including but not limited to those below.

Departments

Business
Chemistry
Communication Science & Disorders
Criminology and Criminal Justice
Education
Family and Child Sciences
FAMU
Interior Architecture and Design
Mechanical Engineering
Modern Languages and Linguistics
Nutrition Science
Oceanography
Public Administration and Policy
Psychology
Sociology
Urban and Regional Planning

Typical Cases

A master student from the Department of Urban and Regional Planning had approached us some advice in the selection of an appropriate statistical method for an analysis of short panel data (data collected at two time points T_1 and T_2). He was studying the number of road accidents- before and intervention was introduced (Time T_1) and after the intervention was introduced. His dependent variable (number of road accidents) is composed of count data with a considerable number of true 0 values. He was advised to use Zero Inflated Poisson model for the data. He was also given assistance in R programming for the same.

A doctoral student in Department of Communication Science and Disorders was studying the responses from total 123 trainees from in four training groups- Online Training 1, In-person Training 1, Online

Training 2 and In-person Training 2. The goal of the training was to help the trainees recognize early symptoms of autism in children. Demographic data including- race, gender, age, level of education (categorical variables) was available. The trainees were asked to take a test before the training (pre-training) and after the training (post-training). Also, a Learner Assessment was conducted after the training. The response of interest was the scores of the pre-training, post-training and the learner assessment. Another response of interest was the answer to the question “Was the training useful?” The client was asked to run exploratory analysis like summary statistics, histograms, boxplots to check if any patterns are apparent in the data. She was advised to conduct Chi-square test of independence to check if the responses depend on race, gender, age, level of education. It turned out the responses were dependent on the variable education level. She was also advised to perform logistic regression to model the binary response (Yes / No) to the question “Was the training useful?” given a set of independent variables. Since she had pre and post scores, she was asked to check if the assumptions for paired t-test hold and if they do then she was advised to perform paired t-test.

A doctoral student in Clinical Psychology needed to use zero inflated Poisson and zero inflated negative binomial regression models in the dissertation. A priori power analyses were conducted based on linear regression and the question was how much the power may be reduced with these new models. The clients provided two articles on simulating datasets for power analysis but was having difficulty in implementing those formulas through a stats program. The consultant explained the formulas to the client and also contacted the author of the reference papers for the code. The client was asked to make a promise that she would not distribute the code online or to anyone else.

A doctoral student in Oceanography asked help in estimating A Bayesian dynamic linear model through R package ‘dlm’. The client never used R before. The consultant showed the client a few basic operations of R, explained the instruction documentation of ‘dlm’ and pointed out several commands that was useful in her study.

A doctoral student from the Department of Education wanted to study whether the online course can change people’s attitude to racial problems. She conducted the same survey to experiment group and control group before and after the online course. A paired t-test was recommended to test on the significance of the difference before and after the online course of each group. And a two-sample t-test was advised to test on the significance of the difference of the experiment group compared to the difference of the control group.

Reflections

One of the most enjoyable aspects of working in the statistical consulting center is being able to help faculty and students from throughout the University. This year, our 4 consultants assisted our clients better understand the world in more than 60 different ways- from ocean to spectroscopy signals in molecules.

The experience in the Statistical Consulting Center is also very helpful in preparing graduate students from the Department of Statistics for consulting-based careers, interdisciplinary collaboration, application of statistical knowledge and a lot of other aspects. Our consultants would like to sincerely thank the faculty and staff in the FSU Department of Statistics, especially Dr. Steven Ramsier, for continuing to support the consulting center.