Statistical Consulting Center Annual Report

Glen H. Laird September 17, 1999

INTRODUCTION

The Statistical Consulting Center (SCC) at Florida State University is a research assistance facility for the students, faculty, and staff at FSU. While clients outside of FSU are sometimes charged a fee, the consulting center is completely free of charge for FSU students, faculty, and staff. We are staffed by one or more experienced graduate students with faculty oversight. Services include, but are not limited to:

☐Translating hypotheses into statistical terms

☐Designing sampling procedures

☐Choosing appropriate statistical methods

☐Interpreting computer output

☐Phrasing statistical results

☐Referrals to other statistical help.

☐The Consulting Center generally does not perform actual analyses. However, clients are free to reschedule further consultation appointments if an initial visit is insufficient.

My appointment hours for the fall of 1999 are Tuesday from 9 A.M. to 11 A.M., Wednesday from 3 P.M. to 5 P.M., and Thursday from 11 A.M. to 1 P.M. However, if those hours are inconvenient, arrangements can sometimes be made for different hours or another consultant. Appointments are generally made for two hour blocks, but the entire time does not have to be used.

If you are a potential client and believe you may need statistical assistance, we recommend getting assistance at the earliest possible stage of your research. For more on how to make an appointment, Consulting Center policy, and FAQ, call the main office of the FSU Statistics Department at 644-3218 or visit our website at http://stat.fsu.edu/consult/index.php. I can be reached at 644-8437 or laird@stat.fsu.edu .

SUMMARY OF BUSINESS ACTIVITIES

In the past year, I have seen approximately 60 separate clients in person. Approximately 10 additional clients were handled by phone, email or FAX. Most of our clients, perhaps 85%, were graduate students at FSU working on their thesis or dissertation. About 10% were faculty at FSU. Most of the rest were from outside of FSU, although at least one undergraduate was also assisted. There was also overlap in the above categories, such as FSU faculty members working on a degree from another university. Clients

from FSU have come from a wide variety of schools/departments including (with approximate number of clients for the past year):

- Anthropology (1 client)
- Biology (3 clients)
- Business (1 client)
- Classics (1 client)
- Communication (1 client)
- Criminology (1 client)
- Economics (1 client)
- Education (8 clients)
- Finance (1 client)
- Human Services and Studies (6 client)
- Information Studies (5 clients)
- Information Management Science (3 clients)
- Geography (1 client)
- Leisure Studies (1 client)
- Nursing (3 clients)
- Nutrition, Food and Movement Sciences (5 clients)
- Oceanography (3 clients)
- Psychology (2 clients)
- Social Work (2 clients)

In addition, clients from other FSU organizations, or from outside FSU were assisted, such as:

- Center for Biomedical and Toxicological Research (1 client)
- Center for Economic Forcasting (1 client)
- Center for Intensive English (1 client)
- Florida A&M University (1 client)
- Florida Department of Environmental Protection (1 client)
- FSU Personnel Office (1 client)
- Havana Herald Publishing Co. (1 client)
- National High Magnetic Field Laboratory (1 client)

Typically, clients were seen about twice, although this varied by the client's need. Some clients were seen four or five times. One visit clients were not uncommon either. A number of cases involved doing some additional research from texts or journals in-between client visits.

A number of different services were requested by clients. Many needed help designing a survey or sampling scheme, including issues of reliability, validity, sample size, and power. About half had already collected their data and were more concerned with choice of statistical procedure or interpreting and phrasing statistical results. For some clients, I read their results to see if they were accurate and clear.

Sometimes clients have specific questions about statistical software. Although I have used a number of different software programs and can sometimes be helpful concerning software questions, Betty Brown at ACNS (644- 2591, brown@acns.fsu.edu) is more of a software specialist.

Clients also had a wide variety of statistical backgrounds. Some clients were unfamiliar with even basic terminology used in statistics. Others had knowledge of specific statistical models that required me to learn additional background information to fully understand the client's research. Most clients had a statistical background somewhere in between those two extremes.

TWO TYPICAL CASES

The following cases may be illustrative of the kind of work done in the SCC. They can be considered somewhat typical, though still noteworthy enough to be mentioned separately.

CASE ONE

A client from the Oceanography Department came to me with a problem concerning phosphorus concentrations in estuaries of the Apalachicola Bay. He wished to determine an estimate for total phosphorus input based on sample measurements taken throughout the year. Over face-to-face conversations with the client, it was determined that we could use a certain linear combination of his measurements to estimate total annual phosphorus input. A standard error for the measurement was also obtained. The results have been submitted to an oceanographic journal.

This case involved significant work in translating what the client wanted into statistical quantities that, once properly understood, were relatively straightforward to estimate. Since measurements over different months appeared to have different variances, some investigation of the Approximate Degrees of Freedom method of variance estimation was necessary.

CASE TWO

A professor from the Classics Department collected some data on types of clay instruments found at different locations within a certain archaeological site in Greece. He wanted to know whether certain types of instruments tended to be excavated at certain locations. Knowledge of this type would speak as to the integrity of the excavation. For example, if there were not significantly more food-related artifacts found where the mess hall used to be located than

the rest of the site, then it is possible that the artifacts have been moved around considerably since their original burial. In addition, many of the locations had low cell counts.

Using a version of Fisher's Exact Test for contingency tables of size greater than 2x2, we determined that a few locations, such as the mess hall, did indeed have more occurrences of certain artifacts. However, many other locations appeared to have artifacts distributed randomly, with little regard as to which

types of artifacts were found where. Perhaps artifacts are more reliably retained (at the original location) for certain types of locations than others.

This case also involved a software search, as the client was unaware of any software that would perform the needed analysis. I was able to locate software on our system that would perform the statistical tests and (in a rare exception to our no-analysis policy) used the software to obtain the results before interpreting them to the client.

REFLECTIONS

I would like to say that I have enjoyed working in the SCC very much this year, and I look forward very much to working with future clients. I need the statistical learning experience of working with "real" data not from a textbook, and I enjoy the interaction with clients on both a professional and personal level. I think I've learned a little about everything from diabetes to stock prices.

I would also like to thank a number of professors in the FSU statistics department, especially Dr. Duane Meeter, Dr. Pi-Erh Lin, Dr. Ian McKeague, and Dr. Xufeng Niu, for assistance with some unusual or difficult cases. Furthermore, I appreciate Dr. Zahn's generosity in loaning me a copy of the Sage Monograph series.