Report of Sabbatical Activity
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Over the course of the sabbatical, I completed work as the lead author on a textbook, *Using and Interpreting Statistics in the Social, Behavioral, and Health Sciences*. The book is published by Sage Publications in Thousand Oaks and is currently available. Here is the ISBN: 978-1-5264-0249-3. The book itself is a representation of the work completed over the sabbatical period. This report is only a brief summary of such work.

Summary of Purpose/Goals:

The sabbatical supports my work on a co-authored new survey research textbook (213 pages in length) and ancillary materials. Access, manageability of material, and affordability for students were primary concerns when developing this project. The work on this book lies at the intersection of much of my work in the areas of research and in teaching. In research, much of my work is carried out using quantitative primary and secondary data. Statistical methods are then used for analysis. The lion's share of my published and presented research is based on quantitative research methodologies. Statistics are a major component, naturally, courses in the fields of health science as well as sociology, and our courses at California State University Channel Islands: SOC 303, Statistical Applications in the Social Sciences, a newly proposed statistics course for health science, as well as within research method design courses such as SOC 310 (Sociological Research Methods) and Health 309 (Health Science Research Methods).

Summary of Work/Outcomes:

The outcome of this project was the creation of a comprehensive statistical methodology book that incorporates data analysis across more than one discipline. Most existing books on this topic tend to go far beyond what is most useful for our students. This book keeps the material straightforward, without excessive burden, for the best opportunity for our students to connect. It also incorporates images of my dog, Mina, in more than one place where Mina helps to explain the interpretation of basic statistics. Moreover, this book utilizes the national data from the General Social Survey to offer complete and up-to-date real world demonstrations of the statistical techniques covered.

Multi- & Inter- disciplinarity: This book deals with statistical methodology as utilized in sociology, criminal justice/criminology, public health/health science, political science, psychology, communications, and social work. Specific

issues/challenges in the aforementioned disciplines, and the increasing interdisciplinary spaces between them, are incorporated throughout the book.

Approach: While the book provides a complete understanding of statistical methods from start to finish, appropriate for an undergraduate student audience, it incorporates unique challenges/issues of specific disciplines and serves as a comprehensive initial statistical methodology book for the social, behavioral, and health sciences. Based in empirical research, the book provides breadth and examples suitable for statistical methods review for graduate students as well as advanced/upper-division undergraduate students.

Apparatus/Specifications: The length of the manuscript is 213 finished pages, following the Sage reference style. Tables and figures are used throughout the book. Online ancillaries (e.g., data files, other instruments/devices) contribute to the richness of the examples/demonstrations/learning tools.

Table of Contents by Section & Chapter

Chapter 3: Sampling & Data Collection

I. Probability sampling methods
Defined, explanation
Simple-random
Systematic
Stratified
Proportionate
Disproportionate
Cluster & Multi-stage cluster

II. Non-probability sampling methods
Defined, explanation
Convenience
Snowball
RDS, Respondent Driven Sampling
Quota sampling

III. Data collection & other considerations
Relevance to sampling
Split ballot designs
Face-to-face, phone, Internet

Chapter 4: Frequency Distributions

Distribution Tables
The Normal Distribution
Skewness and Kurtosis
Frequencies and Relative Frequency
Cumulative Frequency
Cumulative Percentages

Chapter 5: Charts and Graphs

The x- and y-axes
Bar Graph
Histogram
Line Graph
Box Plot
Stem and Leaf Plot
Scatterplot

Chapter 6: Measures of Central Tendency & Variability

I. Measures of central tendency, introduction

Mode, calculation, appropriateness
Median, calculation, appropriateness
Mean, calculation, appropriateness
Choosing a measure of central tendency

II. Measures of Variability, introduction
IQV, Index of qualitative variation, appropriateness, calculation, interpretation
Range, appropriateness, calculation, interpretation
IQR, Inter-quartile range, appropriateness, calculation, interpretation
Variance, appropriateness, calculation, interpretation
Standard deviation, appropriateness, calculation, interpretation

Chapter 7: Standard Z Scores

I. What is a Z score
II. How to calculate a Z score and return to a raw score
III. The standard normal distribution
IV. Working with the standard normal distribution to calculate
Percentiles
Areas under the curve (e.g., probabilities)
Interpretation
V. The central limit theorem
VI. Standard error

Chapter 8: Tests of Significance

I. Introduction
a. Hypothesis Testing
b. Error Types I and II
c. Statistical Significance
II. t-test (z)
III. Chi-square
IV. F-test, ANOVA, Bonferroni, etc.

Chapter 9: Measures of Association

I. Introduction to Measures of Association
II. PRE Statistics
General formula, explanation
Application & general interpretation
III. Lambda
For what variables is this statistic appropriate?
How is it calculated?

How can one interpret this statistic?

IV. Gamma
For what variables is Gamma appropriate?
How is Gamma calculated?
How can Gamma be interpreted?

V. Somers' *d*
For what type of variables is Somers' *d* appropriate?
When would one use Somers' *d* versus Gamma?
How is Somers' *d* calculated?
How can Somers' *d* be interpreted?

VI. Kendall's tau-b
For what types of variables can Kendall's tau-b be used?
How is it calculated?
How is it interpreted?

VII. Pearson's *r*, R-square, coefficient of determination
For what types of variables can *r* and r-square be utilized?
How are they calculated?
How can they be interpreted?
Note that these will be discussed relative to regression analysis in Chapter 11

Chapter 10: Effect Size (Difference between Groups)

I. Cohen's d
For what types of analysis should Cohen's d be utilized?
How is it calculated?
How can it be interpreted?

II. Phi
For what types of analysis should Phi be utilized?
How is it calculated?
How can it be interpreted?

III. Cramer's V
For what types of analysis should Cramer's V be utilized?
How is it calculated?
How can it be interpreted?

Chapter 11: Regression Analysis

I. Correlation
Pearson's *r*

II. Linear Regression
Bivariate regression
Coefficient of determination

Multiple regression
Dummy variables
Interaction effects

III. Logistic Regression
Bivariate
Multivariate

Chapter 12: Scales & Indices

I. Scales vs. Indices (Measurement)
II. Types of Scales
III. Cronbach's Alpha
IV. Other

Appendices:

A. Reference for Statistical Procedures
B. Z-Score Table (Standard Normal Table)
C. Critical Values for T-Statistic
D. Critical Values for Chi-Square
E. Critical Values for F-Statistics
F. Glossary of Terms and Formulas