FE '00

Chaminade University

# CJ215 Criminal Justice Research

**Time:** Monday, 5:30 p.m. - 9:40 p.m.

**Location:** Ft. Shafter Education Center

**Instructor:** Alvin Nakamura, MA
Research Statistician, Hawaii Department of Health

Telephone: 733-4057 (day phone)
E-mail: aknakamura@fhsd.health.state.hi.us

Required Textbooks: Statistics (5th Edition)
Witte, R. and J. Witte, Hartcourt Brace, 1997

*Student Workbook* for the 5th Ed. *Statistics*

**Recommended** Text: *Statistics for the Terrified (2d* Ed.)
Kranzler, G. and J. Moursund, NJ: Prentice-Hall, 1999

## Course Objectives

To gain a working knowledge of statistical methods and an understanding of the theory behind these methods. Discussion, problems, lecture, and computer exercises will be used. Specific objectives are:

- Considerations in collecting and presenting data (research design)
- Calculating and interpreting statistics (data analysis, primary sources)
- Reading and interpreting secondary sources of data (data limitations)
- Appreciating ethical issues in research and statistical analysis

## Grading

Three (3) tests, each weighted 30% toward the final grade. Quizzes and homework, 10% of final grade.

90%+ = A 80-89% = B 70-79% = C 60-69% - D 59% & lower = F

Quizzes and homework problems are to master understanding of topics as the school term progresses. The tests are intended to measure competence, for which the quizzes and homework problems are indispensable preparation. All tests and quizzes are open book. A test can be made up only if the instructor is notified before the test. Tests are cumulative in the sense that learning statistics builds on materials covered previously. However, each test will focus on topics presented since the last test.

## Attendance

Regular class attendance is important because we will be covering a tot of material in each 4-hour class session, and because learning is cumulative in that earlier topics are foundational for later ones in the course. Attendance will be taken at each class. Be sure to inform me when you foresee that you will miss a class. A missed test because of an unexcused absence receives a grade of 0.

## Schedule

| Session | Chapter in Textbook |
|---|---|
| Oct 2 | 1 Introduction<br>2 Describing Data with Tables<br>3 Describing Data with Graphs |
| Oct 9 | HOLIDAY (Discoverers' Day) |
| Oct 16 | 4 Describing Data with Averages<br>5 Describing Variability |
| Oct 23 | 6 Normal Distribution l: Basics<br>7 Normal Distribution II: Applications |
| Oct 30 | Review & Test (Chapters 1-7)<br>8 More About Z scores<br>9 Describing Relationships. Correlation |
| Nov 6 | 10 Prediction (Linear Regression) |
| Nov 13 | 11 Population and Samples<br>13 Sampling Distribution of the Mean<br>(Note: Skip Chapter 12) |
| Nov 20 | Review & Test (Chapters 8-11,13)<br>14 Introduction to Hypothesis Testing: The z Test<br>15 More About Hypothesis Testing |
| Nov 27 | 17 Estimation (From sample to population)<br>18 t-Test for One Sample<br>(Note: Skip Chapter 16) |
| Dec 4 | 19 t-Test for Two Independent Samples<br>21 Beyond Hypothesis Tests: p-Values and Effect Size<br>(Note: Skip Chapter 20) |
| Dec I I | Review & Test (Chapters 14, 15, 17-19, 21)<br>24 Chi-Square ($\chi^2$) Test for Qualitative Data<br>(Note: Skip Chapters 22-23) |

Exercises from the Student Workbook will be assigned in *class for in-class quiz,* or *for* homework.

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Ft. **Shafter, Monday, 5:30 pm - 9:40 pm**

# Student Questionnaire

**Please Print**

**Name (First Last):**

**Military status:** **OActive Duty** **O Dependent** **O Retired** **O Not in Military**

**Are you in a degree-granting program?**

O **Chaminade** O **Other University** **O Not in a degree program**

**If in a degree-granting program, your class standing:**

O **Freshman** **O Sophomore O Junior** **O Senior** **O Other**

**Previous college math course(s) you have taken (e.g., MATH100):**

Previous **criminal justice course(s) you have taken at Chaminade University:**

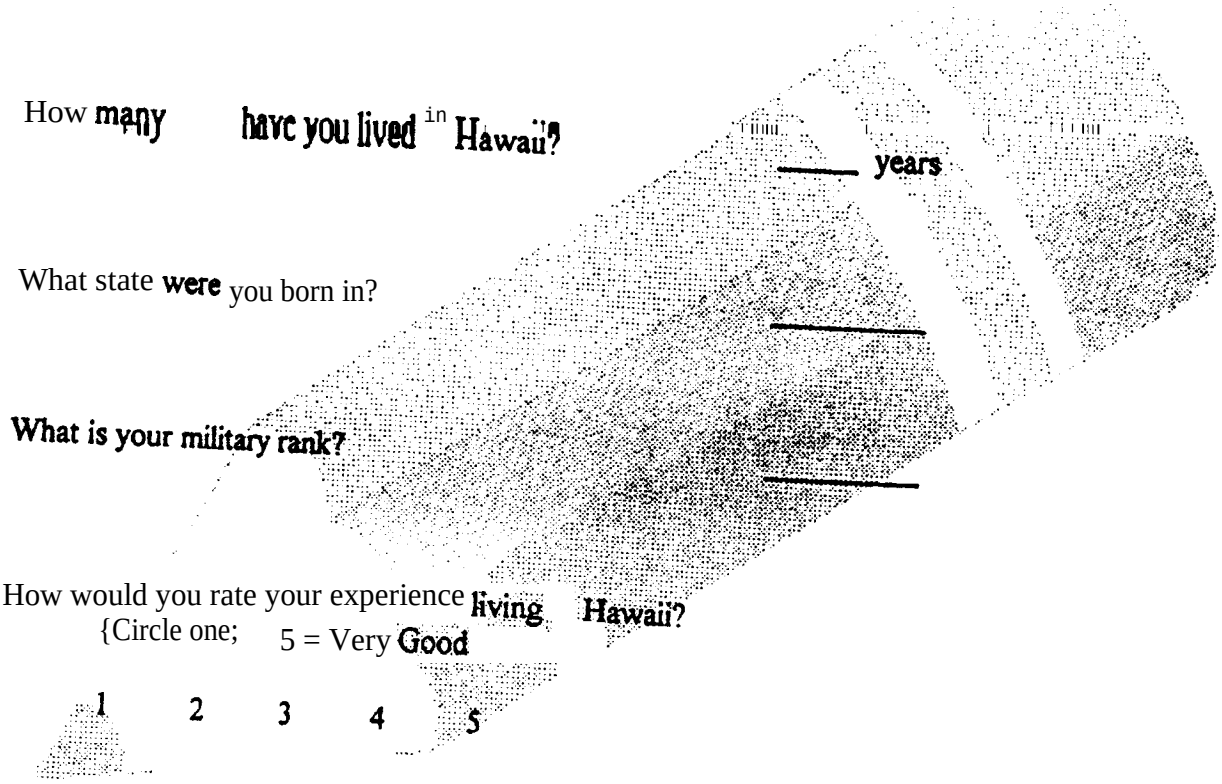
**Do you currently work in criminal justice (any capacity)?** **O No** **O Yes**

| **What is your experience using the following:** | None/ Little | Some | Experienced |
|---|---|---|---|
| **Windows 95 or above.....** | O | O | O |
| **Spreadsheets (e.g., Excel) .....** | O | O | O |
| **Database management software.....** | O | O | O |
| **Computer statistical software.....** | O | O | O |

Your e-mail address (if available):

***** Thank You *****

# A SURVEY QUESTIONNAIRE.



How many years have you lived in Hawaii?

What state were you born in?

What is your military rank?

How would you rate your experience living Hawaii?
{Circle one; 5 = Very Good

1 2 3 4 5

What is your favorite food?

Children begin their lives as eager and competent learners. They have to "learn" to have trouble with learning in general and mathematics in particular.

If people believe firmly enough that they cannot do math, they will usually succeed in preventing themselves from doing whatever they recognize as math.

Seymour Papert
*Mindstorms*
p. 40 and p. 42

## DIGRESSION: STATISTICAL ANALYSIS

**"Figures won't lie, but liars will figure."**
**(General Charles H. Grosvenor)**

**People have an understandable but unfortunate skepticism concerning the efficacy of statistics in helping to solve "real-world" problems. Understandable because the feeling is so pervasive; even you, the reader, will probably agree with the following quip: statistics can be used to prove anything. Unfortunate because this is simply not the case. Actually, statistics, once properly understood, can indeed be used to augment decisions being arrived at through qualitatitive ("gut-feeling") analysis.**

**This section provides the necessary background to understand the statistical approach that the forecasting project will use. it is hoped that with sufficient understanding of the approach, more confidence will be placed on the forecasts generated by the project.**

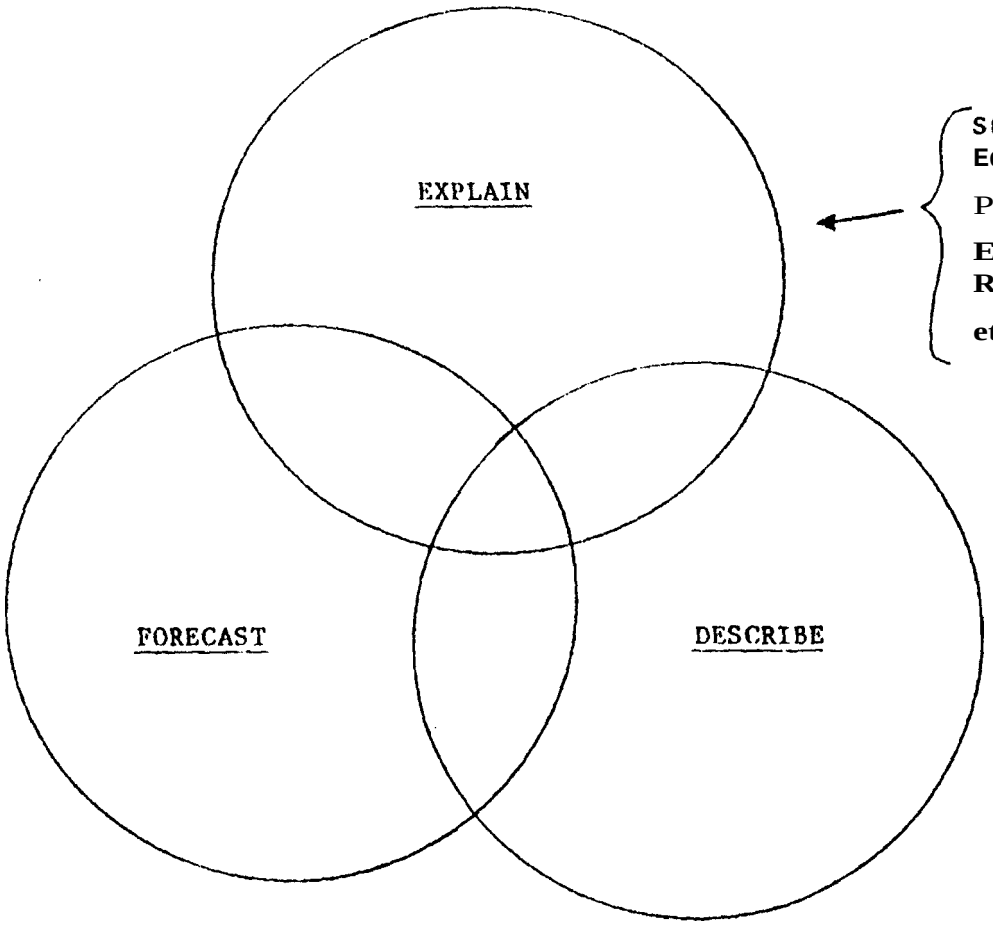
### The Domains of Statistical Analysis

**"He uses statistics as a drunken man uses lampposts - for support rather than for illumination." (Andrew Lang)**

**The figure on the next page depicts what the writer feels are the three primary domains of statistical analysis. The basic domain entails "description", that is, where we use statistics to describe phenomena for us. For example, we use "average monthly caseload", and "average cost per case" as a way to summarize program data. Note that the domains overlap,** indicating **that methods used in one domain can also be used in other domains.**

**Of particular interest to us are the "explanation" and "forecasting"** domains. **There seems to be much confusion between the two, even among statistical sophisticates, so some time will be spent differentiating between the two.**

Primary Spheres of Statistical Analysis




Structural/Simultaneous Equations

Path Analysis

Experimental/Evaluation Research

etc.

Quantitative

Regression

Auto-regression

Box-Jenkins

Adaptive Filtering

etc.

Qualitative

Delphi

etc.

Averages

Variation

Correlation

Regression

etc.

## Explanation v.s. Prediction

"The cause is hidden, but the result is known." (Ovid)

"There is a conflict between the desire of welfare administrators to know wt the *caseload is changing,* and their need to know what will happen for use in annual budget estimates. Answers to the 'why' question require researchers to develop more complicated models, while far simpler models may actually perform better figuring out the 'what' of the future."

("Materials Related to Welfare Research & Experimentation", U.S. Senate Committee on Finance, 1978, p. 15)

Explanatory research is the "glamor" work of the statistical enterprise. It is the most difficult, and most rewarding type of analysis that the statistician can undertake. Here, we want to know what "causes" phenomena: does being on welfare reduce work effort? does the unemployment rate affect the welfare caseload rate? does the partisan composition of state legislative bodies affect the type of welfare policies that the states have instituted in their separate jurisdictions? etc., etc.

The hallmarks of this domain are the use of conceptual theories to guide research, and the requirement of meeting the technical assumptions that are associated with the various analytical models.

The primary objective of explanatory analysis is to estimate size of effects. For example, we could build a model that would estimate the percentage change in the welfare caseload rate *due* to a 1% *change* in the unemployment rate (assuming that the unemployment rate is a "good" predictor of the welfare rate.)

However, and as observed in the U.S. Senate Finance Committee monograph, answers to these "why" questions require the development of complicated, and one may add, costly analytical models. In contrast, models in the forecasting domain need not be as complicated. With these latter models, we need not dig for "causes", but may merely use to advantage some of the known results.

From: "Forecasting Public Welfare Data; Developing a Model"
Alvin Nakamura (unpublished paper)