# PBAF 527u

**Quantitative Methods**
**Winter 2005**

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## Why Use Statistics? Why do Research?

Case Study: The Latest Hite Report

- Define Statistics
- Describe the Uses of Statistics
- Distinguish Descriptive & Inferential Statistics
- Define Population, Sample, Parameter, Statistic, Data, Variable, Dataset
- Discuss bias, qualitative & quantitative variables, discrete & continuous variables

Thinking About Research

- Welfare Reform In WA State

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## Case Study: The Latest Hite Report

- Why did Hite undertake her study?
- Identify the population of interest to Hite.
- Identify the variables of interest to Hite.
- How did Hite obtain her sample?
- What inferences did Hite make about the population? Do you believe them?

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## What Is Statistics?

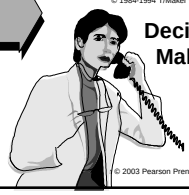
1. **Collecting Data**
   - **e.g. Survey**
2. **Presenting Data**
   - **e.g., Charts & Tables**
3. **Characterizing Data**
   - **e.g., Average**

**Data Analysis**

**Why?**



**Decision-Making**



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## Application Areas

| | |
|---|---|
| Economics<br>▪ Forecasting<br>▪ Demographics | Policy Research<br>▪ Impacts of Policies<br>▪ Document Problems |
| Sports<br>▪ Individual & Team Performance | Business<br>▪ Consumer Preferences<br>▪ Financial Trends |

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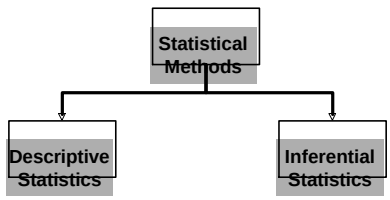
## Statistical Methods

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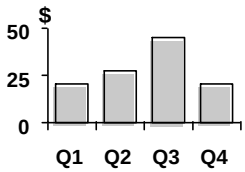
## Descriptive Statistics

1. Involves
   - Collecting Data
   - Presenting Data
   - Characterizing Data
2. Purpose
   - Describe Data




$\bar{X} = 30.5 \quad S^2 = 113$

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## Inferential Statistics

1. Involves
   - Estimation
   - Hypothesis Testing
2. Purpose
   - Make Decisions About Population Characteristics


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## What are data?

Data
- Facts or information relevant to a decision maker

Variable
- A piece of information that may vary from person to person (item to item)

Data Set
- A set of measurements of some variables

Population (Universe)
- All Items of Interest

Sample
- Portion of Population

Parameter
- Summary Measure about Population

Statistic
- Summary Measure about Sample

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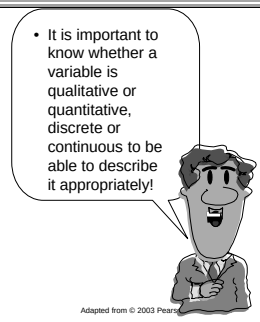
## Things to Think About

Bias
- Systematic over (or under) representation of some part of the population

Types of data
- Qualitative Variables
- Quantitative Variables

Coding of Variables
- Discrete
- Continuous

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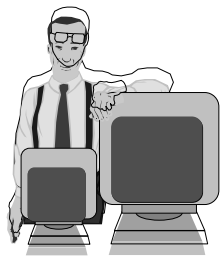
## Statistical Computer Packages

1. **Typical Software**
   - **SAS**
   - **SPSS**
   - **MINITAB**
   - **Excel**
2. **Need Statistical Understanding**
   - **Assumptions**
   - **Limitations**



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## So Far We Have…

1. Defined Statistics
2. Described the Uses of Statistics
3. Distinguished Descriptive & Inferential Statistics
4. Defined Population, Sample, Parameter, Statistic, Data, Variable, Dataset
5. Discussed bias, qualitative & quantitative variables, discrete & continuous variables

Let's apply what we've learned to a policy situation…

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## Thinking about Research:
**Welfare Reform in Washington State**

1. What is the overarching question that Clare is seeking to answer?
2. What is the population of interest to Clare?
3. What do you need to know to answer the question and what methods would you use to answer it?

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## Thinking about Research:
**Welfare Reform in Washington State**

4. What theories help you to understand the potential answers to the question? Are there issues that the theories do not address?
5. What hypotheses are suggested by the question and how would you test them?
6. What comparisons would you make in order to answer Clare's question and test your hypotheses?

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## Thinking about Research:
**Welfare Reform in Washington State**

7. Identify and define potentially relevant variables. Are they quantitative or qualitative (or both)? How would you measure these variables?
8. What unit of analysis would you use (individual, family, household, etc)?

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## Thinking about Research:
### Welfare Reform in Washington State

9. What research method(s) would you use (experiments, survey research, existing data research, etc.)?
10. What sort of data would be useful (cross-section, trend, panel, etc)?
11. How would you collect data?
12. How would you conduct the data analysis?

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## Thinking about Research:
### Welfare Reform in Washington State

13. What constraints or problems (budgetary, political, etc) could your research face?

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## This Class

Text: McClave and Sincich, 9th Ed
Notes handed out periodically and put on-line
Tips:
- Keep Up
- Work in Groups
- Ask Questions
- Email questions when scheduled

Homework, Exams allow you to build expertise
Policy Report
apply what you are learning

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## Some of your comments about the class so far…

- …I need to find a class on SPSS so I can do the class work better…
- Quant 1 did not deal with the limitations of microeconomic analysis and social choice theory …. Furthermore PMngt I did not consider corruption involved in two cases. While I value learning the ways of the system, I am seriously concerned that the full picture was not presented for consideration. I hope Quant II will work similar themes (overstatements of accuracy-ie census, intransitivity of preference) into the curriculum despite the obvious time constraints.

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## Some of your comments about the class so far…

- Unfortunately, I am not well versed in statistics and analytical methods. But, I will do my best and try very hard.
- Not only would I rather eat dirty socks, I would rather eat dirt than take this course…I'm nervous about doing well - statistics is such a struggle for me. I will work diligently but even that does not guarantee that I will pass the course.

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## Some of your comments about the class so far…

- I hope this course is interesting and does not become as tortuous as microeconomics was first quarter. I am interested and want to learn stats but I hope that the course is taught with the knowledge that the vast majority of Evans School graduates do not go on to be statisticians. Most of the organizations we will work for will hire a statistician to do heavy analysis work. I hope we are taught to interpret and understand statistics as well as perform fairly basic analyses ourselves.
- Thanks for taking the time to get to know our backgrounds! I'm hoping the course is fun despite the seemingly dry subject. I hope the course covers how to collect data (primary research), where to find data (secondary research), in addition to the number crunching. Thanks!

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## Keeping in Touch

Class website
http://courses.washington.edu/pbaf527a/index.html

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## End of Chapter

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