URS 410 Urban Empirical Research

- Culture of Research
- Statistical Notation: The Lingo

"Culture" of Research

Truth is a good habit

- the data never lies, researchers do
- researchers involved in academic research are trusted by their peers & the public to marshal data in an unbiased fashion
- researchers are supposed to be **THE EXPERTS** in the field--research should demonstrate this

Culture of Research

Attribute (sources)

- If in doubt, cite
- If you didn't know it before you read it, it can't be common knowledge

Attribute (contributors)

- Cartographers, TAs, RA

Attribute (assistants)

- Typist, Secretary . . . .
- NO MATTER HOW SMALL YOU THINK A CONTRIBUTION WAS

Always Give Credit

Culture of Research

Researchers have an obligation to the data & subjects

- primary data
  - get permission
  - respect privacy
  - do no harm
    - University's have an Office of Research & IRB to determine if research, particularly research on human subjects, meets these criteria
- secondary data
  - understand data collection methods
  - understand original purpose/intent of collecting data

Culture of Research

Codes of Conduct, Standards, & Ethics

- academic organizations, such as AAUP & AAG, author ‘white papers’
- Other University, Faculty & Student Organizations have standards, too

Conventions Develop

- Standard Citation Styles develop within Disciplines

Institutional Resources Develop

- Offices of Sponsored Programs & Research

Laws are passed

- IRBs are the result of federal legislation

Breaches of Conduct?

Ignoring the results of a single regression equation?

- Depends...was it expressly exploratory or the result of testing a previously stated hypothesis

Dropping out 'extreme' values from an analysis?

- some econometric models suggest it

Notation

- Statistics has a standard set of symbols and signs
- Statistical shorthand informs the reader
  - where the data came from
  - whether the research is discussing a population or sample
  - how calculated a test statistic

Notation

- Notation is based on the Greek Alphabet
- Capital symbols refer to population characteristics
- Lower case symbols refer to sample characteristics

Basic Symbols

Σ = sum associated data

Population	Sample
μ = mean	$\overline{X}$ = mean
σ^2 = variance	s^2 = variance
σ = std. deviation	s = std. Deviation
	n=total observations/rows
	m=total columns/variables

Notation: Where in the Matrix is It

- Data is arranged in a matrix (or lattice or array or table or spreadsheet)

- Notation is used to locate a value & observation within a matrix
  - superscript (number above a symbol) refers to ‘end’ location or ‘case’
  - subscript (number below a symbol) refers to ‘begin’ location or ‘case’

Locate It

j refers to column reference

i refers to column reference

	VAR_1	VAR_2
A		
B		

$\sum_{i=1}^{n} X_{ij}$, for j=1 (adding all observations in col.1)

$\sum_{j=1}^{m} X_{ij}$, for i=1 (adding all columns in row 1)

$\sum_{i=4}^{n} X_{ij}$, for j=1 (adding all rows in col.1 AFTER row 4)

$\sum_{i=4}^{5} \sum_{j=2}^{3} X_{ij}$ (add rows 4-5 in columns 2-3)