Week 7: Experimental design, and collecting and managing data (II) – Analysis and presentation:
A discussion of how to recognize statistically significant trends in data and the importance of error analysis. A discussion of case studies will demonstrate the importance of critical reasoning in data analysis. A presentation and discussion will explore effective methods for visually presenting data.

Instructors Outline

Timeline:
Introduce scenarios 2-2:10
HW discussion 2:10-2:30
Small groups discussion of case studies: 2:30-3PM
Break 3-3:15
Group Discussion 3:15-3:30
Ethics 3:30-4

1) Small group discussion of homework case studies (print out the case studies)

(Divide the scenarios between groups….have the students divide up the scenarios…then have them present “their” scenario and discuss it with the group)

Method and Scenarios (from The Responsible Collection, Retention, Sharing, and Interpretation of Data http://www.onlineethics.org/reseth/mod/data.html

- Struggle over Data
- Data Reduction Techniques
- Confidentiality and Data Access
- Data in a Press Release
- Data Sharing and Intellectual Property
  - Information sharing
- A lie or Just "a Way of Speaking"?
  - Typically vs Best vs Average vs. representative data
  - Number of data sets
  - Suspicious data sets
- Data and Collaboration
  - Information Sharing
3) Group discussion:

Questionable research practices

- Refusing to give peers reasonable access to unique research materials or data that support published papers
- Using inappropriate statistical or other methods of measurement to enhance the significance of research findings;
- Misrepresenting speculations as fact or releasing preliminary research results, especially in the public media, without providing sufficient data to allow peers to judge the validity of the results or to reproduce the experiments.

4) Group discussion: on Mirkin/Schwartz publication ethics case

Publication ethics – The case of Peter V. Schwartz
http://pubs.acs.org/cen/topstory/7946/7946sci1.html

Note:

Have the students turn in the week 8 writing assignment during week 7 start of class.