

Topics for today:

- Short Writing Assignment for Tim: How can Statistics help? [check your email]
- ABA^{-1} : starting with A.
 - ...
- The Treatment of Depression analysis and writing assignment.
- Stat Tutor demonstration [Monday].

Our “metaphor”: ABA^{-1}

- A : Formulate a statistical problem from a scientific one;
- B : Solve the statistical problem;
- A^{-1} : Communicate the solution to the relevant audience(s).

Chatfield (1995). *Problem Solving: A Statistician's Guide*:

1. Formulate a real problem in statistical terms;
2. Give advice on efficient data collection;
3. Analyze data and extract the maximum amount of information;
4. Interpret and report the results.

Derr (2000). *Statistical Consulting: A Guide to Effective Communication*.

- Client's problem.
- Statistical model.
- Statistical solution.
- Client's solution.

A: Formulate a statistical problem from a scientific one

Understanding the problem

- Avoid Errors of the third kind! (the right answer to the wrong problem)
- Understand the problem
 - What type of investigation is this?
 - At what stage is the investigation?
 - Learn about the field of application.
- Strategies for gathering information

What type of investigation is this?

- Designed experiments.
- Sample surveys.
- Observational studies.

What is (are) the main goal(s)?

- Describe
- Compare
- Estimate
- Predict

At what stage is the investigation?

1. Investigator is formulating the problem.
2. Data are being collected.
3. Data are being coded.
4. Data are being explored.
5. Model-building, tests of fit, statistical inference, etc.
6. Compare results with other relevant information.
7. Interpret results and communicate with others.

Learn about the field of application.

- Where do the data *really* come from?
- What kinds of data reduction happen “by habit” in this field?
- What are important sources of variation (planned and unplanned)?
- What kinds of questions are important to be answered in this field?

Strategies for gathering information

- Closed questions, forced choices, leading questions, jargon
- Learn to follow the client's train of thought (General to specific? Specific to general? Substantive before quantitative? etc.)
- Slow down.
- Paraphrase and repeat back information to the client.
- Open questions, client shares control of the agenda.
- Teaching about statistical requirements, procedures, etc. (not only *what*, but *why*)

Treatment of Depression...

Think about the “A” part - translate the research question into 2-3 statistical problems (and write them down).