I. Overview/Goal for the Day:

Acquire language and concepts so that teams can articulate ideas and needs so that they can move to implementation.

Follow-up webinar will take up specific questions. (Note: You also have a stat consultant)

II. Data: The Big Picture

A. Kinds of Variables

1. Continuous (Age)

(OK, technically age isn’t continuous, it’s discrete. Probably won’t do much with that distinction, though!)

2. Categorical (Rank)

3. Ordinal (Lickert scale of How freq you use tratitional lecture)

B. Kinds of datasets

1. Cross Section (you might use this)

2. Repeated Cross Section (you might use this)

3. Longitudinal (you won’t have this)

III. Hypothesis Testing: The Big Picture

A. Likelihood, not proof

B. Basic idea: How for is estimated value from some reference point (null hypothesis)?

1. Absolute distance...

2. relative to the precision of your estimate

C. Lots of different test statistics for different contexts. Don’t get lost in the weeds of details; they all boil down to point B.

IV. Kinds of Hypothesis Tests You Might Perform

Note: Often multiple methods will get you to the same place...though perhaps with tests that sound like they’re different even though they boil down to same thing.

Note: Some methods are inappropriate when you have small numbers of observations in some cells.

A. X-group (or X-time or X-question) comparisons (X is categorical!)

1. 2-sample equality of means t test

Ex. %class time = student activity vs. tenure track/not tt

Y cont [Q: could you use ordinal Lickert values?], X cat

2. equality of 2 independent proportions z test

Ex. Is proportion of faculty using traditional lecture weekly or every class the same among those who are researchers vs. teachers?

Y binomial, X cat

[Note: need min 5 Y=0’s and 1’s for each category, otherwise need a related alternative]

3. k-sample equality of means one-way ANOVA F test

Ex. %class time = student activity vs. all rank groups

Y cont, X cat

4. Equality of variance F test or Levine test (F test sensitive to assumption that distribution is normal)

Ex. Is variance in % time =student activity the same in tenure track/not?

Y cont, X cat

5. Equality of distribution Kolmogorov-Smirnov test

Ex. Dist of frequency of traditional lecture (Lickert score measure) is the same tenure track/not?

Y cont or ord, X cat

B. Associations btw variables

1. Correlation

2. Linear Regression

(And non-linear variants like log-lin or log-log or lin-log)

3. Multivariate regression

4. Logit/probit

5. Ordered logitprobit