POLI 300 PROBLEM SET #4 due 10/13/10

MEASURING VARIABLES

1. Using the Fall and Spring 2010 Student Survey Questionnaire and data (distributed with PS #2 and also available on the course webpage), classify respondents with ID numbers 1 through 10 on the *seven-category* PARTY IDENTIFICATION scale discussed in the handout on *Measuring Variables* and elsewhere. Then reclassify these same respondents on the *recoded* measures of DIRECTION OF PARTY IDENTIFICATION and STRENGTH OF PARTY IDENTIFICATION described on p. 3 of Handout #4 on *Measuring Variables*.

2. Again using the Student Survey Questionnaire and data, suggest a way to form an INDEX OF POLITICAL CYNICISM from questions #18 through #20. Then apply this measure to respondents with ID numbers 28 through 35 on your on index.

3. Sentences #2 and #11 (with some stretching) and #13, #14, #15, and #17 (quite straightforwardly) in Problem Set #3A can be researched by using the data associated with the SETUPS/ANES: 1972-2008 Codebook. You have already identified the two variables in each sentence (Problem Set #3A). Now look through the SETUPS/NES Codebook and find the question/item that (perhaps after *recoding*) best operationalizes (or measures) each variable you have identified (two variables in each of the six statements). Please identify the questions/items by both descriptive name (e.g., VOTED IN ELECTION) and formal name (e.g., V03).

4. The best (indeed, only) measure available in the SETUPS/NES Codebook for DEGREE OF RELIGIOSITY (sentence #2) is a *proxy* or *indicator*. Explain why? Briefly assess the *accuracy* (*reliability*, *bias*, and — especially — *validity*) of this measure. If you were designing your own survey questionnaire and wanted to measure this variable, how would you do it?

5. You are doing a study which addresses the hypothesis given in sentence #4 in Problem Set #3. How would you operationalize the two variables, i.e., DEGREE OF COMPETITIVENESS (of districts) and DEGREE OF RESPONSIVENESS (of members)? Briefly assess the accuracy of the measures you suggest. Which variable appears to be easier to measure?

6. Recall sentence #10 in Problem Set #3: "An apple a day keeps the doctor away." One variable in the sentence (overlooking the quaint suggestion in the proverb that the doctor comes to visit you, rather than vice versa) is FREQUENCY OF VISITS TO DOCTOR. But the variable that the proverb probably is really referring to is LEVEL OF HEALTH, for which FREQUENCY OF VISITS TO DOCTOR is an *indicator* or *proxy*. Suggest at least two reasons why this indicator or proxy may be *invalid*.

7. How would you measure the two variables in sentence #6 in Problem Set #3A? Briefly assess the accuracy of the measures you suggest.

See Over for additional problems that are taken or adapted from David S. Moore, *Statistics: Concepts and Controversies*.

8. Customers returned 36 coats to Sears this holiday season, and only 12 to La Boutique Classique next door. Sears sold 1100 coats this season, while La Boutique sold 200. We can use these numbers to create an (indirect) measure of LEVEL OF CUSTOMER SATISFACTION (at different stores)

   (a) Why is NUMBER OF RETURNS not a valid indication that Sears's coat customers were less satisfied than those of La Boutique?

   (b) What would be a more valid indicator of LEVEL OF CUSTOMER SATISFACTION at these two stores?

9. Between 1977 and 1998, 432 convicted criminals were executed the United States. Here are data on the number of executions in several states during those years, as well as the 1990 population of these states:

State	Population (thousands)	Executions
Alabama	4,040	16
Arkansas	2,351	16
Florida	12,938	39
Missouri	5,117	29
Nevada	1,202	6
Texas	16,986	144
Virginia	6,189	46

   Texas and Florida are among the leaders in executions. Because these are large states, we might expect them to have many executions. Find the *rate* of executions for each of the states listed above, in executions per million of population. Arrange the states in order of the number of executions relative to population. Are Florida and Texas still high by this measure?

10. "Intelligence" means something like "general problem solving ability." Explain why it is not valid to measure intelligence by a test that asks questions such as

   Who wrote "The Star-Spangled Banner"?
   Who won the last soccer World Cup?

11. Crime data make headlines. We measure the amount of crime by the number of crimes committed or (better) by crime rates (e.g., crimes per 100,000 population). The FBI publishes its Uniform Crime Reports compiling crimes reported to police departments. The National Crime Victimization Survey publishes data based on a national probability sample of more than 43,000 households. The victim survey shows about two and a half times as many crimes as the FBI report. Explain why the FBI reports likely have a large downward bias for many types of crime. (Here is a case in which bias in producing data leads to bias in measurement.)

12. Each year, *U.S. News and World Report* ranks the nation's colleges and universities. Colleges often dispute the validity of the rankings, and some even say that U.S. News changes its measurement process a bit each year to produce different "winners" and thus generate news. Identify three readily available measures that you would use as *indicators* of a college's "academic excellence" (and that might be combined into an overall index).