Sociology 750 (Freese) - Final Examination

Instructions.  Put your ID number on the front of your blue book. Then, give correct answers to each of the questions below. Do not try to use verbosity, jargon, complex and/or idiosyncratic notational schemes, or illegibility as a substitute for actually knowing the answer, as all that such tactics will accomplish is annoyance. Don’t cheat, and we will at long last all get through this semester okay. I apologize for any detrimental effects that this course and its exams have had on your psychological well-being, enjoyment of graduate school, or belief in the fundamental goodness of humanity.

If you think there is a problem with one (or more) of the questions, you may write the number of the question and what you think the problem is on the last page of your blue book.

1. We begin with a two-part question about sampling:
   
   (a) What is meant by the term sample space?
   
   (b) For a population of a given size, which is larger: (a) the sample space under a simple random sampling design or (b) the sample space under a sampling design that employs a proportionate stratified design with two equal-sized strata?

2. You have a set of measures that are all measures of the one and same underlying latent variable (or factor). You create a scale by summing these measures.
   
   (a) Under what condition that we discussed does Cronbach’s alpha provide only a bounded estimate of the reliability of the resulting scale?
   
   (b) Is it a lower-bound estimate or an upper-bound estimate?

3. What is the distinction between using primary sources and secondary sources in a comparative historical analysis?

4. For a given effect size, sample size, and a significance level of \( p < .05 \) (two-sided), a power analysis calculates the power of our hypothesis test as being .27. What does this result (i.e., the .27) mean?

5. Give an example of a study for which one might conduct a snowball sample?  (Your answer should make plain that you know what one does when one conducts a snowball sample.)

6. In the case of a set of items and more than one underlying latent variable (or factor), we talked about rotating the solution of an exploratory factor analysis in order to provide the solution that most approximated “simple structure” among the items. What does “simple structure” mean in this context?

7. The following two part-question concerns the Skocpol reading and our discussion of it:
   
   (a) What kind of comparative-historical sociology is one doing if one’s aim is to provide “meaningful interpretations” of historical instances or historical currents?
   
   (b) How does this differ in its focus from the kind of comparative-historical sociology that Skocpol primarily identifies her own work with?

8. What is the effective N of a sampling design?
9. You have a scale of graduate student anomie comprising items with the variable names GSANOMIE1, GSANOMIE2, GSANOMIE3, GSANOMIE4, GSANOMIE5, and GSANOMIE6. When you compute the alpha for this scale, you ask also for item analyses and it reports that the item-rest score correlation for GSANOMIE4 is .38. What is this a correlation between?

10. Two-part question in which you are studying the effect of one normally distributed continuous variable (explanatory variable X) on another (outcome variable Y).

(a) Say that data availability restricts your sample to only observations with relatively high values of Y. If you estimated the causal effect without attempting any special correction, would you expect the resulting estimate to be (a) larger in magnitude than the true causal effect of X on Y for the population, (b) smaller in magnitude than the true causal effect of X on Y for the population, or (c) not to imply any consistent bias in either direction?

(b) Say that instead data availability restricts your sample to only observations with relatively low values of X. If you estimated the causal effect without attempting any special correction, would you expect the resulting estimate to be (a) larger in magnitude than the true causal effect of X on Y for the population, (b) smaller in magnitude than the true causal effect of X on Y for the population, or (c) not to imply any consistent bias in either direction?

11. Mahoney describes three different strategies (or styles) of inference/appraisal in macrocausal analysis: nominal, ordinal, and narrative. Which of these best approximates the idea of inference from Mills’s methods that we described elsewhere in the course and that is criticized by Lieberson?

12. Two-part question that you should have known was coming:

(a) When you stratify a sample, do you get more efficient estimates if you maximize the variation within a stratum or between strata?

(b) What about when you use clustering, do you get more efficient estimates if you maximize the variation within a cluster or between clusters?

13. You have a dataset in which you plan to compute a model in which income is an independent variable. The trouble is, you do not have complete information on income for some respondents because they did not answer the question. You consider substituting the mean of income for these respondents, although other people suggest to you that you should substitute the median income for the missing values instead. If you are going to substitute the same value for all missing values of income, what can you also do when estimating the model so that the estimated coefficient for the effect of income will be the same regardless of what single value you substitute?

14. If you and I have a fifteen-minute debate about the level of reality at which a social aggregates like a “nation-state” and social events like “revolutions” exist, are we having (a) an ontological debate, (b) an epistemological debate, (c) a metrological debate, or (d) a meteorological debate.

15. You have 5 items all of which have been standardized so that they have a variance of 1. When you sum the items into a scale, the resulting variance of the summated scale is 15. What is Cronbach’s alpha for this scale (you can express your answer as a fraction instead of in decimal form).

16. Using the concept of a sampling distribution, what does it mean to say that a sample estimator is an unbiased estimate of the population parameter?

17. Hedström and Swedberg contrast the “mechanism-based approach” that they advocate with what kind of approach they see as prevailing in the social sciences?
18. Under simple random sampling, how many samples of size 3 can be drawn without replacement from a population of size 5?

19. Give an example of using criterion-related validity to argue that a given measure adequately reflects what it is claimed to measure? (The example should make plain that you understand what criterion-related validity means.)

20. When a sample is not epsem, you can obtain an unbiased estimate of parameters like the population mean by using weights. To do so, the weight must be proportional to what?

21. Tilly declares an opposition to “monadic thinking” in comparative historical analysis. What does he mean by “monadic thinking”?

22. When you compute Cronbach's alpha from a correlation matrix, the value of alpha depends on two things. What are they, and how do changes in each affect alpha?

23. Two part question:

   (a) What does DEFF stand for?

   (b) All else being equal, is a larger DEFF or smaller DEFF preferred?

24. Yet another two-part question:

   (a) We used a scree plot to help us determine what?

   (b) What is the conventional rule-of-thumb used to make this same determination without a scree plot?

25. In grounded theory sampling, one eventually reaches a point that no new or relevant data seem to emerge regarding a category, category development is dense, and relationships between categories are well established and validated. What is this point commonly called?

26. If you are going to use optimal allocation when doing a stratified random sample as a way of improving the estimate of the population mean of a variable, what strata do you want to disproportionately oversample?

27. If we are doing regression analyses on a sample that involves weights, what relationship would we expect between the weights and the variables in our model that would result in the largest discrepancy between the weighted and unweighted regression results.

28. In our discussion of “selection bias induced by the world,” we discussed the possibility of “prospective” vs. “retrospective” sampling in historical studies. What did this distinction involve in this context?

29. As measures of reliability, Coefficient KR20 is very much like Cronbach’s alpha, except for what?

30. Among other things, estimates of statistical power depends on (1) the specified effect size, (2) the specified sample size, (3) the p-value of the significance test of the null hypothesis (i.e., that the effect is zero) we intend to use. How do specific changes in each of these three effect the resulting power of our test?
31. In our discussion of consensus theory, I suggested that for the types of questions that the method was developed to examine, one could obtain answers with a high degree of confidence with many fewer respondents than are necessary to achieve confident parameter estimates in standard survey research. What is the difference between the kind of question that someone using consensus theory pursues versus the kind of question the typical survey researcher pursues that makes this difference in the number of required respondents possible?

32. In our discussion of test-retest reliability, one reason that a score on a measure may vary for the same person between one time and another may be because the measure is unreliable. However, what were two other causes of this kind of variation that we talked about? (Recall that it was because of these reasons that DeVellis recommends referring to “temporal stability” for describing the consistency of measures over time than to “reliability.”)

33. 700 individuals have been assigned to cluster A and 300 people have been assigned to cluster B. You are instructed to draw a sample of 50 from one of these clusters and 0 from the other. How can you conduct the sampling so that the resulting design is epsem? You are instructed to draw a sample of 50 from one of these clusters and 0 from the other. How can you conduct the sampling so that the resulting design is epsem?

34. The very last thing we considered in this class was optimal scaling, using a handout that involved a scale of the WAIS similarities items from the Wisconsin Longitudinal Study. What assumption was relaxed when we did the optimal scaling that had been imposed when we simply created a scale by standardizing the raw scores for the items (0, 1, or 2) and summing them?