Political Methodology Comprehensive Examination
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Part I: Answer all 5 questions

1. Brambor, Clarke, and Golder (2006, *Political Analysis*) uncover an enormous level of misunderstanding among political scientists regarding using and interpreting interaction terms in OLS models. Why do you think there is so much misunderstanding about what would appear to be a fairly straightforward modeling topic? What are the key mistakes political scientists make? Outline a simple, "cookbook" version of modeling, interpreting, and understanding interaction terms that any empirically trained political scientist could comprehend.

2. Generating causal inferences has always been important in political science, but more attention has been brought to this issue in recent years. What are the most important conditions or assumptions that need to be met in order to estimate causal effects in empirical analysis? Discuss how and under what conditions various research designs meet or fail to meet those conditions/assumptions and thus the implications for making causal inferences.

3. You have estimated a linear regression model with two independent variables (i.e., you have two slope coefficients and an intercept) on a small sample of 33 observations. The F-statistic for the model is 7. Can you reject the null hypothesis that all the slopes are equal to 0?

After adding two more variables to the model (i.e., you have four slope coefficients and an intercept), the F-statistic for the larger model is 9. Test whether the model with four independent variables explains significantly more variation than the model with two independent variables.

4. Presenting the results from non-linear models like logit, probit, event count models, etc. demands making several analytic and estimation decisions. Outline some principles for deciding among presenting average marginal effects (AMEs), marginal effects at the mean (MEMs), and marginal effects at a representative value (MERs). Are there particular kinds of situations where one approach clearly dominates?

5. Say you are studying the EU and are interested in whether various subgroups of the EU (committees, e.g.) are biased, where bias is defined as a divergence between the median preferences of the committee and the median preferences of the entire parliament. Assume you can measure the preferences of the members of the parliament in a single dimension. Also assume you know the size of each country's delegation and the membership of the committees. Describe how you might go about evaluating potential biases in the committee memberships. What are the potential problems with the method you propose?

Part II: Answer ONE of these three questions

6a. A colleague of yours wants to study the timing of when pairs of countries (dyads) go to war, but he insists that the proper way to analyze the data (from 1945 to the present) is to include in his simple OLS model only the dyads that actually went to war with each other. His dependent variable is the number of years until each dyad goes to war; the data are cross-sectional data (one observation per dyad). Use the event history modeling approach to critique your colleague's research decisions.

6b. Many empirical researchers claim that the "fancy new methods" that appear in political science are just

marginal improvements over OLS (or more generally, completely pooled approaches for all sorts of dependent variables). According to this view, such new methods are fads, but they fade away, and we□re right back to OLS. Make an argument to such skeptics that models for multilevel data–be it a random effects (random intercept or random coefficient) or fixed effects modeling approach–are more than merely "fads" that will fade away and for these data, that all roads don't necessarily lead back to OLS.

6c. Outline the substantive underpinnings and implications of different dynamic processes in politics. Substantively speaking, what does a stationary process imply? What does a "random walk" or integrated series suggest about a dynamic political process? What does a first-order autoregressive dynamic imply? Use a substantive example to illustrate the different processes.