Political Methodology Comprehensive Examination, August 2016
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Instructions: *Read all questions before answering any of them. When you use substantive examples in your answers, we strongly prefer to see examples from political science. Answer all questions in part I. Answer 3 questions in part II. Question GT in part II counts as two questions. Feel free to hand write answers in a blue book, but carefully label those answers and note that you are using the blue book in your typed document. Good luck!*

Part I

1. Your friend is commenting on one of your empirical models and she recommends that you add a particular control variable. There's no downside, she says, and at best, it will control for a confounder. Hmmm. Discuss at least two ways that adding a control variable can make your estimation worse. (Note that you can define "worse" in many ways.)

2. You have estimated a country level analysis where your main independent variable is regime type. You have coded countries into 3 categories: {democracy, mixed, autocracy} and in your analysis you have included dummies for democracy and autocracy, with mixed as your omitted category. In your sample, you have roughly the same number of observations of each type Your results produce substantively sizable estimates for the effects of democracy and autocracy, but indicate that neither is statistically significant. An audience member raises the possibility that your null results could be due to multicollinearity. Could that explain your results? Why or why not? Is there a way to re-specify your model (still using the same data) that could help you diagnose the problem? What would that be and how could it help?

3. After the game theory question in part II, you will find a section labelled **Fundamentals (Part I, question 3)**. It contains variable definitions, Stata output, and a series of questions. Answer those questions as concisely as possible.

Part II

1. An article (this is based on a real paper) seeks to test the effect of regime type (democracy vs. autocracy) on child health. It does this using a survey of women in developing countries, with individuals as the unit of analysis. Unfortunately, the survey was not completed every year in each country. Table 1 below shows the country, year, regime type, and number of women (in each country-year) making up the sample. The empirical model uses OLS to predict a continuous measure of child health, with the country's regime type (a dummy variable for democracy) as the main variable of interest. To account for country heterogeneity, country fixed effects are included. You can ignore the role of other control variables.

Describe the advantages and limitations of this empirical design. If the authors claim this design is superior to the typical country-year setup because it has more than 1 million data points, what would your response be? What is an equivalent way to set up this model and get the same results regarding regime type? How could this design be improved?

2. Prior to estimating a logit model with a dichotomous dependent variable Y, you discover that one of your dummy independent variables D takes on the value of 1 for all observations where $Y = 1$. Will that cause a problem in estimating the effect of D on Y? If not, why not? If so, what can you do about the problem?

Table 1: Data structure for Part II, question 1

	Kenya	**Nigeria**	**Cameroon**	**Mali**	**Swaziland**	**India**	**Nepal**	**Honduras**	**Burma**
Year	**1999**	**2003**	**1998**	**1999**	**1997**	**2000**	**1999**	**2000**	**2001**
Democracy	0	0	0	1	0	1	0	1	0
N	101,897	45,675	78,889	49,992	75,678	120,381	15,459	83,893	45,349
Year	**2004**	**2007**		**2005**	**2001**	**2005**			**2006**
Democracy	1	0		1	0	1			0
N	89,785	56,901		34,542	78,943	118,093			83,451
Year					**2004**				
Democracy					0				
N					81,980				

3. Network analysis includes, among other things, a set of measurement tools. Give examples of two of these tools. Explain the theoretical basis for these tools, what advantages they have over more conventional measurement tools, and their limitations. For each tool, give an example of how one might use it in applied research, including an explanation of why it would be useful in this context and how it can improve our inferences.

4. You want to analyze some data with the following properties. The dependent variable is ordinal, with 4 values. The main independent variable of interest is likely to be endogenous Explain the steps you would take in selecting a model. Can you deal with the ordinality and the endogeneity all in a single model? If not, what will guide your model choice? What are some of the tradeoffs or shortcomings from choosing your recommended model? Would there be auxiliary analyses that you might present in an appendix? How would you decide what belongs in the main text of your report versus in an appendix?

5. Suppose a mysterious stranger gives you a dataset. She wants you to figure out if the first variable in the dataset is caused by the second. Other variables are potentially useful as controls or in estimation. However, you're not told what any of these variables are and the variable names are inscrutable. Although you can't make any firm causal conclusions without knowing anything about these variables, are there any conditional causal claims one could make using the data? Suppose you ran several regressions controlling in turn for various combinations of the potential controls. Could this be useful in making your conditional causal claims?

GT: counts as two questions

Consider an activist who wants a dictator to implement some political reform. The activist comes in three types: Radical, Moderate, and Quiet. The dictator's prior beliefs over these types are given by q_R, q_M, and $q_Q = 1 - q_R - q_M$. The order of the game is as follows:

1. The activist chooses to protest or not at cost c.
2. The dictator implements the reform or not.
3. The activist chooses to launch a revolution or not, at cost d to both players and with likelihood of success p.

The payoffs are such that Radical types will revolt no matter what. Quiet types will never revolt, but prefer getting the reform. Moderate types will revolt if and only if the reform is not granted. Implementing the reform costs the dictator 1. The dictator also gets benefit W from ruling and 0 otherwise. If a revolution is attempted, the activist's payoff does not depend on whether the reform was granted (since they'll either be in charge or in jail), but assume the dictator still loses 1 by granting the reform.

(a) What is the total payoff to the dictator if they do not reform and face revolt? What is the total payoff to the dictator if they reform and avoid revolt?

(b) Call the updated beliefs of the dictator in step 2 q'_R, q'_M, and q'_Q,. For what set of updated beliefs will the dictator implement the reform in step 2?

(c) What are the conditions for each type of activist to protest in step 1?

(d) Using (b) and (c), under what conditions is there a separating equilibrium? (This includes cases where two of the three types overlap, but the third does something different.)

(e) In the separating equilibrium, what is the probability that reform occurs? What is the probability of revolt?

(f) How does the structure of signaling in step 1 and/or payoffs for the activist types need to change to get an equilibrium that is maximally beneficial for the dictator?

Fundamentals (Part I, question 3)

For this question, use the OLS and logistic regression output below. The data are from the 2016 American National Election Study pilot survey. The observations are Democratic identifiers (including Democratic-leaning independents). "R" denotes survey (R)espondents.

The variables used below include:
ClintonFT: Feeling thermometer for Hillary Clinton, scale of 0 to 100
sup_hil_not_sanders: Vote intention in Democratic primary 1 if Clinton, 0 if Sanders
Gender Discrmin: Whether or not the R feels they have personally experienced a lot of gender discrimination, 0 if no, 1 if yes
Local_terror_worry: Whether or not the R worries a lot about a terrorist event occurring in their local area, 0 if no, 1 if yes
Minwage: R's opinion of the minimum wage on a 4 point scale (1=should be raised, 2=kept the same, 3=lowered, 4=eliminated)
Getahead= How much opportunity R sees in America today for the average person to get ahead (1=none, 2=a little, 3=a moderate amount, 4= a lot, 5=a great deal)
Femoff_issues: R's assessment of how much female elected officials are likely to focus on issues that mainly affect women (1=a great deal more likely to focus on women, 2=moderately more likely to focus on women, 3=a little more likely to focus on women, 4=no more likely to focus on men ot women, 5=a little more likely to focus on men, 6= moderately more likely to focus on men, 7=a great deal more likely to focus on men)
Follow: how much R follows politics on a 4 point scale (1=Most of the time, 2=some of the time, 3=only now and then, 4=hardly at all)
Women: 1 for women Rs, 0 for men Rs
Black: 1 for Rs that chose black as their race, 0 otherwise
Hispanic: 1 for Rs that chose Hispanic as their race, 0 otherwise
otherRace: 1 for non-white/non-black/non-hispanic Rs (Asian, mixed, other), 0 otherwise

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      Source |       SS           df       MS         Number of obs   =       553
-------------+----------------------------------   #4 F(10, 542)       =      5.82
   #6  Model |   39065.828        10   3906.5828      Prob > F        =    0.0000
    Residual |  363866.917       542  671.341175      R-squared       =    0.0970
-------------+----------------------------------   #5 Adj R-squared   =    0.0803
       Total |  402932.745       552  729.950625      Root MSE        =     25.91

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       ClintonFT     |  #1 Coef. #2 Std. Err.      t     P>|t|   #3[95% Conf. Interval]
---------------------+--------------------------------------------------------------
               women |   1.315898   2.249748     0.58   0.559    -3.103397    5.735192
    Gender Discrimin |  -.5011863   3.290931    -0.15   0.879    -6.965728    5.963355
  local_terror_worry |   2.523558    2.58036     0.98   0.329    -2.545173     7.59229
             minwage |  -3.785915   2.150771    -1.76   0.079    -8.010782     .438953
            getahead |   4.845829   1.198763     4.04   0.000     2.491038     7.20062
       femoff_issues |   .4545297   .3883526     1.17   0.242    -.3083309     1.21739
              follow |  -3.555783   1.314837    -2.70   0.007    -6.138584   -.9729816
               black |    13.9804   3.035169     4.61   0.000     8.018263    19.94254
            hispanic |  -1.475287   3.735297    -0.39   0.693     -8.81272    5.862146
           otherRace |   .9659694   4.508633     0.21   0.830    -7.890566    9.822505
               _cons |   60.70036   5.029369    12.07   0.000     50.82092     70.5798
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Logistic regression                               Number of obs     =        497
                                               #7 LR chi2(10)       =     114.92
                                                  Prob > chi2       =     0.0000
Log likelihood = -284.61308                       Pseudo R2         =     0.1680

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 sup_hil_not_sanders |      Coef.   Std. Err.      z     P>|z|     [95% Conf. Interval]
---------------------+--------------------------------------------------------------
               women |   .2426956   .2077314     1.17   0.243    -.1644505    .6498418
self_disc_gender_LOT |  -.2257896   .3209315    -0.70   0.482    -.8548038    .4032246
   loc_terror_worry |   1.246239   .2654065     4.70   0.000     .7260513    1.766426
             minwage |   .6168494    .269273     2.29   0.022     .0890841    1.144615
            getahead |   .4929081    .122362     4.03   0.000     .2530829    .7327333
       femoff_issues |  -.0452006   .0360809    -1.25   0.210     -.115918    .0255167
              follow |   -.064548   .1269065    -0.51   0.611    -.3132802    .1841842
               black |    1.66255   .3172365     5.24   0.000     1.040778    2.284323
            hispanic |   .5752656   .3592221     1.60   0.109    -.1287969    1.279328
           otherRace |  -.0170922    .389938    -0.04   0.965    -.7813567    .7471722
               _cons |  -2.051892   .5113486    -4.01   0.000    -3.054117   -1.049667
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a. (For each emboldened item in the output (1-7), **briefly** explain its meaning/interpretation, being sure to note what, if any, population parameter it is meant to estimate. (Note that the items are numbered—use that numbering for the order of your answers!)

b. Now suppose that not all of the Gauss-Markov (CRLM) assumptions hold. In particular, the data are characterized by heteroskedasticity, and it is a function of the Xs. Nevertheless, you estimated your model with OLS. For each of the six emboldened items on the OLS regression output, explain the implications. Be sure to note whether or not you would expect a different value (as compared to the value you'd expect if the Gauss-Markov assumptions held) and if so, where that change in value would come from. Also be sure to mention statistical properties (bias, consistency, etc.), where applicable, when estimating via OLS under these data conditions.

c. Suppose you have reason to believe (a theory!) that the heteroskedasticity you worried about in part b was a function of gender. You conduct multiple formal statistical tests for heteroskedasticity and find support for it (i.e., you reject the null of homoscedasticity). What would support for that theory mean and what would be your next step?

d. Using the OLS regression model, how would you test the hypothesis that "race doesn't matter to Americans' evaluations of Hillary Clinton"? If you can test the hypothesis from this output alone, do so (set-up/report/interpret). If you cannot, explain why not and what else you'd need to know. [Go back to assuming the Gauss-Markov assumptions hold for this question.]

e. All else equal, what is the expected difference in Clinton ratings between Hispanic women and black men?

f. You present the results of these models at a panel about Election 2016. One audience member gets up and says "Well, obviously your model of voter preference is much better than your model of Clinton evaluations. Look at those p-values and [pseudo] R-squareds!" What is the audience member talking about and is he justified? Are there any cautions or lessons you might want to share with this audience member?

g. Another audience member wants to dismiss your models entirely because you failed to account for voters' attitudes about government policies to address gender discrimination. "That must be important to Clinton voters," he argues. You reply to the critic that you're not concerned about that, because previous research has shown unified support for such policies among Democrats. Explain the problem the audience member was claiming you had, and how your response was addressing it.

h. Another audience member asks whether you "considered the argument that the women who are Clinton supporters are far more likely to value her candidacy as vindication for personal experiences of gender discrimination? That these women are especially enthusiastic about Clinton for this uniquely personal reason?" Did your model do that? If so, report and discuss the relevant results. If not, write down an amended model that would consider the argument the audience member raised. Discuss what information from that model (including any necessary tests) you would use to answer the audience member's question.

i. One more audience member comments, "I wonder if your model of the choice between Clinton and Sanders is right. I'm not sure it captures the reality that people who could really go either way are more likely to be moved to support a particular candidate by the policy messaging of the candidates." You reply, "Well, I do think the model captures that at least to some extent in its logistic functional form." Explain this answer.

j. Yet another grumpy audience member gets up… "I hope you don't think you can dismiss gender as important here. I know your dummy variable is insignificant. But the effect of gender isn't simply about women and men categorically disagreeing on Clinton. It's buried in their attitudinal and experiential differences. Men are less likely to experience discrimination, are less supportive of the minimum wage, and are much more likely to believe Americans can still get ahead with hard work. And ***that*** matters." Wow. Explain what this audience member is arguing and how you could shed empirical light on her argument. Be sure to note what you can say with just the output here and what other information you would need and how you would use it.

k. One of the reporters at this panel is actually impressed by your presentation and would like you to comment on how the issue of gender discrimination could matter for the general election between Hillary Clinton and Donald Trump. Would you feel comfortable commenting? Why or why not? If so, what kind of comment would you make?