

Primaries and Candidates:
Examining the Influence of Primary Electorates on
Candidate Ideology

Appendix

Descriptive Statistics for Independent Variables

The independent variables we use in the models in Tables 1 and 2 in the main article are measures of the average ideology of the various electoral constituencies of candidates for the U.S. House of Representatives: the primary electorate, the partisan general electorate, and the general electorate. Full details on how we measured and analyzed these variables is found in the Data and Methods section of the article. Here we wish to further describe these variables.

Tables A1 and A2, and A3 display the mean, standard deviation, and number of observations for these three electoral independent variables. We show these statistics in several ways. First, Table A1 shows all 2008 and 2010 CCES respondents together as well as split by party affiliation (Republican and Democrat). Table A2 shows this same table but for 2008 CCES respondents only, and Table A3 shows these statistics for 2010 CCES respondents only. These descriptive statistics use the absolute values of respondents' self-reported ideology scores so that we can measure the magnitude of the extremity of these respondents; a higher mean ideology score indicates that the subgroup is more ideologically extreme. In most instances primary electorates are more extreme than partisan general electorates, which are in turn more extreme than general electorates. Most of these differences are statistically significant at the $p < 0.05$ level.

These tables also illustrate the differences in ideological distributions between Republican and Democratic voters. These differences are further shown in Figure 4 of the main article, and the implications of these distributions are discussed there as well. As a whole, Republican voters are more ideologically extreme than Democratic voters. For instance, looking at the mean ideology scores for voters in Table A1, Democratic primary electorates have a mean ideology score of 1.350 while Republican primary elec-

torates have a mean ideology score of 1.858. In all three types of electorates and in all years, Republican electorates are at least 0.5 points more extreme than the comparable Democratic electorate. In addition to the differences in mean ideology scores, Republican electorates also have a far lower standard deviation than Democratic electorates. Simply put, Republican electorates are more extreme than Democratic electorates, and their lower standard deviations means that there is simply not as much variation in ideology scores to explain among Republicans as there is among Democrats. Figure 3 in the main article shows that these same patterns exist for candidates as well; Republican candidates are slightly more extreme than Democratic candidates and have a much lower standard deviation.

We also performed a correlation check between the three electoral ideology variables and the candidate ideology variable to check for collinearity. Table A4 shows a correlation matrix between these four variables. Most variables correlated with each other lower than 0.20. The only exception to this is the correlation between primary electorate ideology and general electorate ideology. These two variables correlate at 0.62, which while admittedly higher than the other correlations, does not pose undue concern about the results of our analysis. We ran a version of the analysis with the collinear variables removed from the models and found no changes in the results.

Comparing the Ideologies of Primary and General Election Voters

Many other studies of primary elections have found that primary voters are more ideologically extreme than general election voters (see Kaufmann, Gimpel and Hoffman (2003); Fiorina, Abrams and Pope (2006); Brady, Han and Pope (2007); Abramowitz

and Saunders (2008), and Jacobson (2012)). Our CCES data matches what these other scholars have already found and support the finding that primary election voters and general election voters are very distinct groups ideologically, and to point out that candidates cannot necessarily please both these groups simultaneously. Figure A1 compares the means of the three electoral ideology scores for all individuals in the 2008 and 2010 CCES studies. In this figure ideology has been coded on a scale from zero to three, with zero representing moderate respondents and three representing strongly liberal or strongly conservative respondents. This figure demonstrates that primary election voters are more ideologically extreme than general electorate voters, and are about as extreme as general election voters of their own party.

Additional Versions of Table 1

Table 1 in the main article reports the findings of a regression model that tests whether the primary electorate extremity variable is a statistically significant predictor of a congressional candidate's ideology score. In addition to the three versions of the model shown in the article, we ran further versions of this model that we report here. We first look at the 2008 and 2010 candidates in separate regression models: Table A5 shows the results of the OLS model in Table 1 for 2008 only. This model has different patterns of significance than the model from the full article. We suspect this is because there are far fewer observations for 2008 than for 2010—the 2008 CCES had only 5,300 primary voters (compared to 30,000 for the 2010 CCES), which reduces the number of congressional candidates we can include in our OLS model to 190. This may result in a selection issue coming from which districts were able to meet our threshold to get into the sample. Table A5 also shows the model split by Republicans and Democrats in 2008.

There are some interesting findings of note here, including the fact that Democrats seem to be more responsive to their partisan electorates while none of the electoral variables are significant for Republicans. This may be the result of it being an election year that favored Democrats nationally, which motivated different types of candidates to seek office. Democrats who were running may have been running as representatives of their party label. In any case, we are hesitant to draw any strong conclusions from these results because of the relatively few numbers of observations in 2008. Nonetheless, we have included 2008 data in the model we report in the main article to show that some of our findings are not just an artifact of the 2010 election.

Table A6, which shows the results for this OLS model for 2010, looks much like Table 1 from the main article. One notable difference from Table 1 in the main article is that the coefficient for Partisan General Electorate Extremity is not significant for Democrats in 2010 (p-value of .06). We suspect this may be a result of a reduction in the sample. We would ideally like to supplement this study with more CCES data, however the 2012 CCES did not ask its respondents whether they voted in their primary or not. Hopefully future CCES's will ask this question in future studies.

We also ran the regression models with a Tea Party endorsement variable that is not included in Table 1 in the main article. We did this to address simultaneity issues; that is, whether the Tea Party tended to recruit candidates who were ideologically extreme or whether the Tea Party tended to endorse candidates who were already ideologically extreme. This model is reported in Table A7. When comparing the model from the full paper to the version with the Tea Party variable, we see that none of the coefficients change significance, although some of the coefficient sizes do change very slightly. The Tea Party variable is significant, which indicates that the Tea Party tended to endorse more ideologically extreme candidates. While this variable accurately

captures the electoral environment of 2010, we have chosen not to include this variable in the models we report in the full paper because it is generally outside the scope of the research question of the paper.

Additional Versions of Table 2

Table 2 in the main article shows the findings of a probit model analyzing what factors affect a candidate's chance of winning his or her primary election. We ran several other versions of this model that we report here. We first examine this model for open seat primary elections, which we define as primary races in which there is no congressional incumbent running. Thus, if the Republican Party holds the congressional seat, then the Democratic primary is classified as an open seat.¹ Table A8 shows the results of this probit model for all candidates, Table A9 shows the results of this probit model for Republican candidates, and Table A10 shows the results of this probit model for Democratic candidates. While Table 2 in the main paper shows that candidate ideology is only statistically significant for Republicans, when we examine open elections in these three tables we do not see a similar pattern.

Finally, we also ran the probit model from Table 2 with an interaction between the candidate's ideology and the ideology of the primary electorate to test whether more extreme primary electorates elect more extreme candidates. Because this probit model included electoral ideology variables we restricted it to districts with more than 30 respondents in the CCES, as we did with our OLS models. This explains the difference in observations from Tables A8, A9, and A10. Table A11 shows the results of this interacted probit model for all candidates, Table A12 shows the results of this probit model for Republican candidates, and Table A13 shows the results of this probit model

for Democratic candidates. However, the findings of this model were not informative, as neither the interaction nor the constituent terms were statistically significant. This did not change when we separated candidates according to their party affiliation.

Notes

¹Unfortunately there were not enough candidates running in pure open-seat elections, where the current incumbent has retired or is otherwise not running in the election, to draw statistically valid conclusions from.

Figure A1: Distribution of Electorate Extremity by General and Primary Electorates

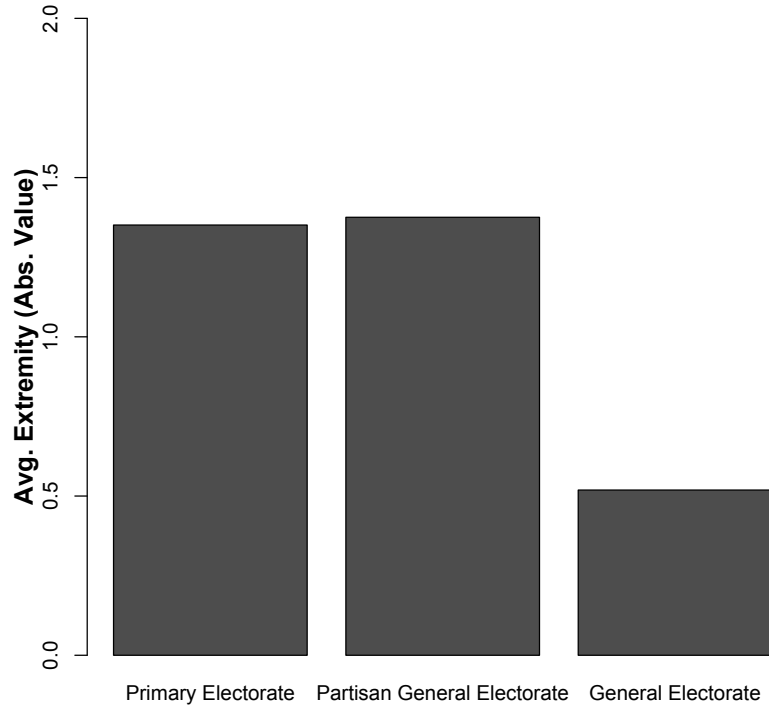


Table A1: Summary Statistics for 2008 and 2010 Electoral Variables

Population	Avg. Ideology	Std. Dev.	N
Primary Electorate Extremity	1.568	1.032	36,005
Partisan General Electorate Extremity	1.552	1.065	53,091
General Electorate Extremity	1.525	1.076	59,925
Rep Primary Electorate Extremity	1.858	0.944	16,333
Dem Primary Electorate Extremity	1.350	1.049	15,301
Rep Partisan General Electorate Extremity	1.916	0.944	20,645
Dem Partisan General Electorate Extremity	1.395	1.068	19,392

Table A2: Summary Statistics for 2008 Electoral Variables

Population	Avg. Ideology	Std. Dev.	N
Primary Electorate Extremity	1.555	1.156	5,886
Partisan General Electorate Extremity	1.620	1.177	18,896
General Electorate Extremity	1.566	1.187	23,153
Rep Primary Electorate Extremity	1.819	1.081	3,029
Dem Primary Electorate Extremity	1.337	1.171	2,857
Rep Partisan General Electorate Extremity	2.049	0.995	7,291
Dem Partisan General Electorate Extremity	1.466	1.185	6,624

Table A3: Summary Statistics for 2010 Electoral Variables

Population	Avg. Ideology	Std. Dev.	N
Primary Electorate Extremity	1.571	0.998	30,119
Partisan General Electorate Extremity	1.514	0.995	34,195
General Electorate Extremity	1.500	0.997	36,772
Rep Primary Electorate Extremity	1.868	0.902	13,304
Dem Primary Electorate Extremity	1.354	1.005	12,444
Rep Partisan General Electorate Extremity	1.846	0.904	13,354
Dem Partisan General Electorate Extremity	1.355	0.993	12,768

Table A4: Correlation Matrix of Constituency Ideology

Measure	1	2	3	4
1. Candidate Ideology	1.0000			
2. Primary Electorate Ideology	0.1111	1.0000		
3. Partisan General Electorate Ideology	0.0357	0.1693	1.0000	
4. General Electorate Ideology	0.1856	0.6261	0.1426	1.0000

Table A5: OLS Model on 2008 Only

Variables	All Candidates	Republicans	Democrats
Primary Electorate Extremity	0.031 (0.051)	-0.000 (0.055)	0.002 (0.095)
Partisan General Electorate Extremity	0.227** (0.078)	0.043 (0.109)	0.379** (0.131)
General Electorate Extremity	-0.033 (0.094)	-0.090 (0.113)	0.183 (0.170)
Incumbent	-0.172 (0.132)	0.262 (0.166)	0.255 (0.218)
Unchallenged	0.143 (0.097)	0.092 (0.100)	0.077 (0.181)
Open Election	0.277* (0.121)	0.483** (0.155)	0.177 (0.201)
Primary Competitiveness	0.001 (0.001)	0.000 (0.001)	0.003 (0.003)
District Cook PVI	0.008 (0.004)	0.022** (0.004)	-0.009 (0.008)
Previous Officeholder	0.108 (0.087)	-0.023 (0.085)	0.275 (0.165)
Closed Primary	-0.092 (0.055)	-0.136* (0.058)	-0.005 (0.107)
Open Primary	0.181* (0.091)	0.256** (0.091)	0.162 (0.169)
Republican	-0.230** (0.072)		
Constant	0.215 (0.187)	0.227 (0.273)	0.072 (.324)
No of Obs	190	109	81
Adj R-squared	.1684	.3224	.1595

*prob < .05, **prob < .01; Standard errors in parentheses

Table A6: OLS Model on 2010 Only

Variables	All Candidates	Republicans	Democrats
Primary Electorate Extremity	0.096* (0.040)	0.015 (0.047)	0.183* (0.071)
Partisan General Electorate Extremity	0.185** (0.046)	0.150* (0.060)	0.141 (0.076)
General Electorate Extremity	0.021 (0.045)	0.019 (0.058)	-0.115 (0.084)
Incumbent	-0.372** (0.061)	-0.320** (0.076)	-0.455** (0.101)
Unchallenged	0.039 (0.052)	-0.094 (0.065)	0.101 (0.085)
Open Election	-0.018 (0.057)	-0.043 (0.068)	0.073 (0.097)
Primary Competitiveness	-0.001 (0.000)	-0.001* (0.000)	-0.001 (0.001)
District Cook PVI	0.002 (0.001)	0.011** (0.002)	-0.002 (0.002)
Previous Officeholder	-0.103** (0.032)	-0.087** (0.033)	-0.187* (0.072)
Closed Primary	-0.139** (0.028)	-0.163** (0.033)	-0.034 (0.047)
Open Primary	0.028 (0.036)	0.069 (0.044)	0.025 (0.061)
Republican	-0.279** (0.043)		
Constant	0.966** (0.091)	0.844** (0.136)	1.029** (.158)
No of Obs	748	478	270
Adj R-squared	.2065	.2087	.3281

*prob < .05, **prob < .01; Standard errors in parentheses

Table A7: Regression of Candidate Extremity Scores on Electoral Variables for 2008 and 2010 Elections with Tea Party Endorsement

Variables	All Candidates	Republicans	Democrats
Primary Electorate Extremity	0.074* (0.031)	0.015 (0.036)	0.148** (0.053)
Partisan General Electorate Extremity	0.206** (0.038)	0.122* (0.052)	0.190** (0.061)
General Electorate Extremity	0.016 (0.040)	0.017 (0.052)	-0.060 (0.073)
Incumbent	-0.246** (0.056)	-0.246** (0.069)	-0.324** (0.091)
Unchallenged	0.056 (0.046)	-0.053 (0.055)	0.113 (0.077)
Open Election	0.065 (0.052)	0.015 (0.061)	0.124 (0.086)
Primary Competitiveness	-0.000 (0.000)	-0.001 (0.000)	-0.000 (0.001)
District Cook PVI	0.003* (0.001)	0.012** (0.002)	-0.002 (0.002)
Previous Officeholder	-0.079** (0.030)	-0.085** (0.030)	-0.093 (0.067)
Closed Primary	-0.122** (0.025)	-0.153** (0.029)	-0.044 (0.043)
Open Primary	0.055 (0.034)	0.101* (0.039)	0.025 (0.058)
2008	-0.055* (0.028)	-0.016 (0.033)	-0.114 (0.047)
Tea Party Endorsement	0.048 (0.031)	0.073** (.029)	
Republican	-0.269** (0.036)		
Constant	0.802** (0.082)	0.755** (0.121)	0.859** (.141)
No of Obs	931	584	351
Adj R-squared	.2007	.2337	.2727

*prob < .05, **prob < .01; Standard errors in parentheses

Table A8: Probit Model on Open Seats

Variable	Coefficient (Std. Err.)
Candidate Extremity	0.079 (0.069)
Previous Officeholder	0.590** (0.144)
Relative Campaign Spending	0.039** (0.002)
Constant	-2.243** (0.155)
N	
	669
Log-likelihood	
	-222.752
$\chi^2_{(3)}$	
	479.412

*prob < .05, **prob < .01; Standard errors in parentheses

Table A9: Probit Model on Open Seats for Republicans

Variable	Coefficient (Std. Err.)
Candidate Extremity	0.435 (0.243)
Previous Officeholder	0.550** (0.172)
Relative Campaign Spending	0.041** (0.003)
Intercept	-2.711** (0.317)
N	
	474
Log-likelihood	
	-152.159
$\chi^2_{(3)}$	
	346.155

*prob < .05, **prob < .01; Standard errors in parentheses

Table A10: Probit Model on Open Seats for Democrats

Variable	Coefficient (Std. Err.)
Candidate Extremity	0.340 (0.287)
Previous Officeholder	0.740** (0.279)
Relative Campaign Spending	0.036** (0.004)
Intercept	-1.792** (0.359)
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N	195
Log-likelihood	-67.381
$\chi^2_{(3)}$	134.41

*prob < .05, **prob < .01; Standard errors in parentheses

Table A11: Probit Model with Interaction

Variable	Coefficient (Std. Err.)
Candidate Extremity	0.182 (0.243)
Incumbent	0.866** (0.220)
Challenger	-0.488* (0.245)
Previous Officeholder	0.570** (0.138)
Relative Campaign Spending	0.038** (0.002)
Primary Electorate Extremity	0.032 (0.058)
Primary Electorate Extremity x Candidate Extremity	-0.014 (0.116)
Intercept	-2.350** (0.235)
N	980
Log-likelihood	-262.778
$\chi^2_{(7)}$	821.53

*prob< .05, **prob< .01; Standard errors in parentheses

Table A12: Probit Model with Interaction for Republicans

Variable	Coefficient (Std. Err.)
Candidate Extremity	0.532 (0.724)
Incumbent	0.821* (0.322)
Challenger	-0.448 (0.350)
Previous Officeholder	0.622** (0.171)
Relative Campaign Spending	0.043** (0.003)
Primary Electorate Extremity	0.186 (0.330)
Primary Electorate Extremity x Candidate Extremity	-0.047 (0.397)
Intercept	-3.120** (0.659)
N	625
Log-likelihood	-166.761
$\chi^2_{(7)}$	532.06
*prob< .05, **prob< .01; Standard errors in parentheses	

Table A13: Probit Model with Interaction for Democrats

Variable	Coefficient (Std. Err.)
Candidate Extremity	-0.092 (0.291)
Incumbent	0.869** (0.311)
Challenger	-0.630† (0.350)
Previous Officeholder	0.481* (0.242)
Relative Campaign Spending	0.033** (0.003)
Primary Electorate Extremity	0.010 (0.159)
Primary Electorate Extremity x Candidate Extremity	-0.100 (0.197)
Intercept	-1.848** (0.329)
N	355
Log-likelihood	-92.223
$\chi^2_{(7)}$	288.10

*prob < .05, **prob < .01; Standard errors in parentheses

Table A14: F-Test Results for Dem Extremity Vs. Rep Extremity

$F = 0.4537$	$df = 894, 781$	$p - value < .0000$	$ratio = 0.454$
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