Technical Appendix

Administering Section 2 of the VRA After *Shelby County*

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Contents

1 Ideal Point Estimation

We generate ideal points based on 38 inferred policy positions from 22 questions on the 2010 Cooperative Congressional Election Survey (CCES). The CCES common content includes questions about a wide range of policy domains that provide a reliable baseline for estimating a scaled measure of ideology. (Warshaw and Rodden, 2012; Tausanovitch and Warshaw, 2013; Shor and Rogowski, 2013). Below we provide the text of each policy question and our dichotomization choices.[1] Following convention we code "yes" votes as 1, "no" votes as 6, and NAs as 9.

1.1 CCES Policy Questions

Afghanistan Troops (2 roll calls). Do you think the United States should send more troops to Afghanistan to fight the Taliban and al Qaeda?

1. Increase troops in Afghanistan
2. Decrease troops in Afghanistan
3. Keep the current deployment about the same

```
> library(car)
> afghan.increase.troops <- recode(cces$CC307, "2=6;3=6;NA=9")
> afghan.decrease.troops <- recode(cces$CC307, "1=6;2=1;3=6;NA=9")
```

Gun Control (2 roll calls). In general, do you feel the laws covering the sale of firearms should be made more strict, less strict, or kept as they are?

1. More Strict
2. Less Strict
3. Kept As They Are

```
> gun.more.strict <- recode(cces$CC320, "2=6;3=6;NA=9")
> gun.less.strict <- ifelse(cces$CC320, "1=6;2=1;3=6;NA=9")
```

Climate Change (1 roll call). From what you know about global climate change or global warming, which one of the following statements comes closest to your opinion?

1. Global climate change has been established as a serious problem, and immediate action is necessary.
2. There is enough evidence that climate change is taking place and some action should be taken.

[1] A full list of variables and values is available in the CCES codebook at http://projects.iq.harvard.edu/cces/data.

3. We don't know enough about global climate change, and more research is necessary before taking any actions.

4. Concern about global climate change is exaggerated. No action is necessary.

5. Global climate change is not occurring; this is not a real issue.

```
> climate.take.action <- recode(cces$CC321, "2=1;3=6;4=6;5=6;NA=9:")
```

Immigration (5 roll calls). What do you think the U.S. government should do about immigration? Select all that apply.

1. Fine businesses.

2. Grant legal status to all illegal immigrants who have held jobs and paid taxes for at least 3 years, and not been convicted of any felony crimes.

3. Increase the number of guest workers allowed to come legally to the U.S.

4. Increase the number of border patrols on the U.S.-Mexican border.

5. Allow police to question anyone they think may be in the countrty illegally.

```
> ## Each option coded by CCES as separate dummy
> imm.fine.business <- recode(cces$CC322.1, "2=1;1=6;NA=9")
> imm.legal.status <- recode(cces$CC322.2, "2=1;1=6;NA=9")
> imm.guest.worker <- recode(cces$CC322.3, "2=1;1=6;NA=9")
> imm.border.patrol <- recode(cces$CC322.4, "2=1;1=6;NA=9")
> imm.police.anybody <- recode(cces$CC322.5, "2=1;1=6;NA=9")
```

Abortion (3 roll calls). Which one of the opinions on this page best agrees with your view on abortion?

1. By law, abortion should never be permitted.

2. The law should permit abortion only in case of rape, incest, or when the woman's life is in danger.

3. The law should permit abortion for reasons other than rape, incest, or danger to the woman's life, but only after the need for the abortion has been clearly established.

4. By law, a woman should always be able to obtain an abortion as a matter of personal choice.

```
> abortion.never <- recode(cces$CC324, "2=6;3=6;4=6;NA=9")
> abortion.incest <- recode(cces$CC324, "2=1;3=6;4=6;NA=9")
> abortion.mom.health <- recode(cces$CC324, "2=1;3=1;4=6;NA=9")
```

Jobs vs. Environment (2 roll calls). Some people think it is important to protect the environment even if it costs some jobs or otherwise reduces our standard of living. Other people think that protecting the environment is not as important as maintaining jobs and our standard of living. Which is closer to the way you feel, or haven't you thought much about this?

1. Much more important to protect the environment even if we lose jobs and have a lower standard of living.
2. Environment somewhat more important.
3. About the same.
4. Economy somewhat more important.
5. Much more important to protect jobs even if environment worse.

```
> enviro.jobs <- recode(cces$CC325, "2=1;3=6;4=6;5=6;NA=9")
> jobs.enviro <- recode(cces$CC325, "1=6;2=6;3=6;4=1;5=1;NA=9")
```

Same-sex marriage (1 roll call). Do you support a Constitutional Amendment banning Gay Marriage?

1. Yes
2. No

```
> ssm <- recode(cces$CC326, "2=1;1=6;NA=9")
```

Affirmative action (1 roll call). Affirmative action programs give preference to racial minorities in employment and college admissions in order to correct for past discrimination. Do you support or oppose affirmative action?

1. Strongly support.
2. Somewhat support.
3. Somehwat oppose.
4. Strongly oppose.

```
> affirm.action.support <- recode(cces$CC327, "2=1;3=6;4=6;NA=9")
```

Balanced Budget (3 roll calls). The federal budget is approximately $600 billion this year. If the Congress were to balance the budget it would have to consider cutting defense spending, cutting domestic spending (such as Medicare or Social Security), or raising taxes to cover the deficit.

CC328. What would you ***most*** prefer that Congress do – cut domestic spending, cut defense spending, or raise taxes?

1. Cut defense spending.
2. Cut domestic spending.
3. Raise taxes.

CC329. What would you ***least*** want Congress to do?

1. Cut defense spending.
2. Cut domestic spending.
3. Raise taxes.

```
> defense.taxes.RC <- ifelse(cces$CC328==1 & cces$CC329==3, 1,
                                                  ifelse(cces$CC329==2, 9, 6))
> defense.domestic.RC <- ifelse(cces$CC328==1 & cces$CC329==2, 1,
                                                  ifelse(cces$CC329==3, 9, 6))
> domestic.taxes.RC <- ifelse(cces$CC328==2 & cces$CC329==3, 1,
                                                  ifelse(cces$CC329==1, 9, 6))
```

Military Troops (6 roll calls). Would you approve of the use of U.S. military troops in order to . . .? Please check all that apply.

1. Ensure the supply of oil.
2. Destroy a Terrorist camp.
3. Intervene in a region where there is genocide or a civil war.
4. Assist the spread of democracy.
5. Protect American allies under attack by foreign nations.
6. Help the United Nations uphold international law.

```
> ## Each option coded by CCES as separate dummy
> mil.oil <- recode(cces$CC414_1, "2=1;1=6;NA=9")
> mil.terror <- recode(cces$CC414_2, "2=1;1=6;NA=9")
> mil.genocide <- recode(cces$CC414_3, "2=1;1=6;NA=9")
> mil.democ <- recode(cces$CC414_4, "2=1;1=6;NA=9")
> mil.protect <- recode(cces$CC414_5, "2=1;1=6;NA=9")
> mil.un <- recode(cces$CC414_6, "2=1;1=6;NA=9")
```

Prompt for the following 10 questions: Congress considered many important bills over the past two years. For each of the following tell us whether you support or oppose the legislation in principle.

1. Support
2. Oppose

American Recovery and Reinvesment Act. Authorizes $787 billion in federal spending to stimulate economic growth in the U.S.

```
> stimulus <- recode(cces$CC332A, "2=1;1=6;NA=9")
```

State Children's Health Insurance Program. Program insures children in low income households. Act would renew the program through 2014 and include 4 million additional children.

```
> schip <- recode(cces$CC332B, "2=1;1=6;NA=9")
```

American Clean Energy and Security Act. Imposes a cap on carbon emissions and allows companies to trade allowances for carbon emissions. Funds research on renewable energy.

```
> clean.energy <- recode(cces$CC332C, "2=1;1=6;NA=9")
```

Comprehensive Health Reform Act. Requires all Americans to obtain health insurance. Allows people to keep current provider. Sets up health insurance option for those without coverage. Increases taxes on those making more than $280,000 a year.

```
> obamacare <- recode(cces$CC332D, "2=1;1=6;NA=9")
```

Appoint Elena Kagan to the U.S. Supreme Court.

```
> kagan <- recode(cces$CC332E, "2=1;1=6;NA=9")
```

Financial Reform Bill. Protects consumers against abusive lending. Regulates high risk investments known as derivatives. Allows government to shut down failing financial institutions.

```
> dodd.frank <- recode(cces$CC332F, "2=1;1=6;NA=9")
```

End Don't Ask, Don't Tell. Would allow gays to serve openly in the armed services.

```
> dont.ask.tell <- recode(cces$CC332G, "2=1;1=6;NA=9")
```

Foreign Intelligence Surveillance Act. Allow U.S. spy agencies to eavesdrop on overseas terrorist suspects without first getting a court order.

```
> cia.spy <- recode(cces$CC332H, "2=1;1=6;NA=9")
```

Embryonic Stem Cell Research. Allow federal funding of embryonic stem cell research.

```
> stem.cell <- recode(cces$CC332I, "2=1;1=6;NA=9")
```

Troubled Asset Relief Program. $700 billion loans to banks to stabilize finance.

```
> tarp <- recode(cces$CC332J, "2=1;1=6;NA=9")
```

1.2 Estimation using ideal()

We estimate ideal points for each CCES respondent using the `ideal()` function of Jackman's `pscl` package in `R` (Jackman, 2012; Clinton, Jackman and Rivers, 2004). We set a starting value for self-identified Democrats and Republicans to -1 and 1 respectively and use the default parameters for maxiter (10,000), thin (100), and burnin (5,000). In the current draft we estimate ideal points in one dimension for ease of computation. Future drafts will explore the effects of estimating ideal points in multiple dimensions. Full replication code is available at http://www.dougspencer.org/research/geography_of_discrimination.html.

1.3 Distribution of ideal points

We present two plots of the distribution of ideal points. The first plot compares the distribution of ideal points between political party identification. As expected, self-identified Democrats are more liberal than self-identified Republicans with self-identified Independents somewhere in between. The ideal points of Democrats and Republicans do not overlap much and are much less dispersed than the ideal points of self-identified Independents. Figure 1 is graphical evidence that our measure of ideology is facially valid.

In Figure 2 (next page) we plot the distribution of ideal points by racial category and compare our scaled measure to the distribution of self-reported ideology scores. We normalize both measures for ease of comparison. The general relationship between distributions is similar across all races and the distributions are relatively similar whether ideology is self-reported or scaled. The similarity between measures stands in contrast to a recent paper on the perils of self-reported ideology, particularly for Latino respondents for whom the terms "conseravtive" and "liberal" may have a different meaning than the American context (Abrajano, 2013).[2]

[2]The difference between our finding and the asymmetry reported by Abrajano (2013) may reflect that the CCES population is comprised of individuals who are more acclimated to U.S. political norms than the population of the Latino oversample in the American National Election Survey (ANES) on which Abrajano relies.

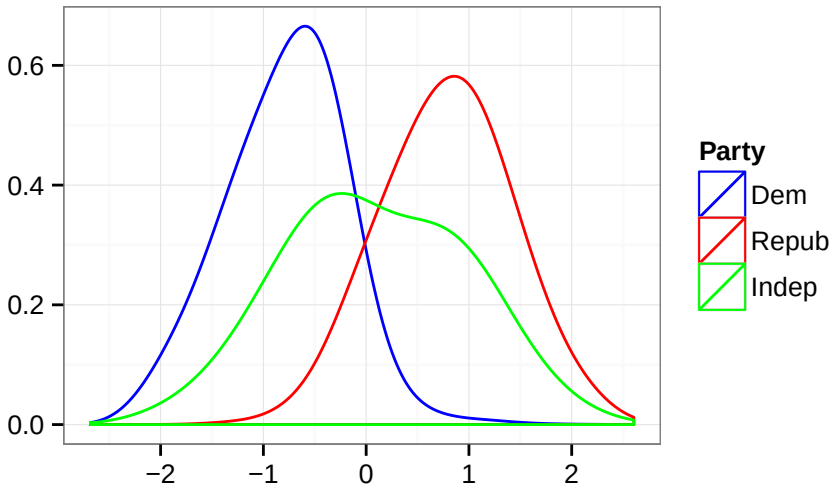

Figure 1: Density of ideal points for all respondents in the 2010 CCES.

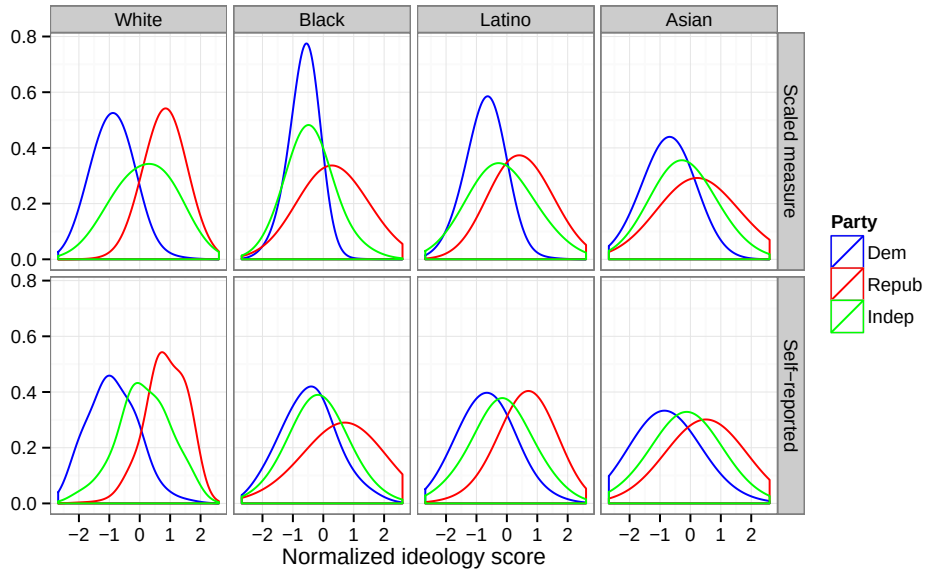

Figure 2: Ideal points by race and self-reported ideology.

Finally, as we note in footnote 256 of the paper, the "racial gap" in the correlation between respondent ideology and preference in congressional and presidential elections is smaller when ideology is estimated using a scaled measure than when ideology is measured using self-reports on the 7-point scale. In Table 1 we present pairwise correlations for the four major races between vote choice and ideology. In every case, the scaled measure of ideology is a stronger predictor of vote choice, in line with the research of other scholars (Shor and Rogowski, 2013; Warshaw and Rodden, 2012). In short, scaled measures of ideology are better at predicting things that we expect to be associated with ideology, such as voting, because there is less measurement error in scaled measures than in self-reported measures (Ansolabehere, Rodden and James M. Snyder, 2008).

In Table 1 we also see that the *distance* between correlations by race is smaller for the scaled measure than for the self-reported measure. To the extent that racial minority groups do not understand the policy questions on the CCES, the "racial gap" should be larger for the scaled measure of ideology than self-reports. We observe that the opposite is true, meaning the explanatory power of our estimated ideal points is stronger than the explanatory power of the self-reported measure.

	2008 Obama		2010 Congress	
	`ideal()`	self-report	`ideal()`	self-report
White	-0.809	-0.746	-0.693	-0.630
Black	-0.534	-0.316	-0.324	-0.191
Latino	-0.718	-0.623	-0.492	-0.382
Asian	-0.694	-0.607	-0.489	-0.383
Racial Gap				
White-Black	0.275	0.430	0.369	0.439
White-Latino	0.091	0.123	0.201	0.247
White-Asian	0.115	0.139	0.204	0.247

Table 1: Pairwise correlations between self-reported vote choice and ideology. Numbers in the top panel are negative because ideology values increase with conservativeness and vote choice equals 1 if respondents voted for a Democrat. The racial gap represents the *distance* between correlations of White and each racial minority group.

2 Our Models

2.1 Ideology

We model individual-level ideology using multi-level OLS regressions on four subsets of the data, based on the respondent's race (white, black, Latino, and Asian). See Figure 1 and 2 in the paper. For each model, we estimate ideal points P_i such that

$$P_i = \beta^0 + \alpha^{female}_{j[i]} + \alpha^{educ}_{k[i]} + \alpha^{county}_{l[i]} + \varepsilon_i \tag{1}$$

In our models, $female$ is a dummy variable and *educ* is a four-category measure of educational attainment: (1) less than HS degree, (2) HS degree or GED, (3) some college, and (4) college degree or more. Both $female$ and *educ* are modeled independently, drawn from a normal distribution with mean zero and some estimated variance.

$$\begin{aligned} \alpha^{female}_{j[i]} &\sim N(0, \sigma^2_{sex}), \text{ for } j = 1, 2 \\ \alpha^{educ}_{k[i]} &\sim N(0, \sigma^2_{educ}), \text{ for } k = 1, \ldots, 4 \end{aligned} \tag{2}$$

The *county* random effect is modeled independently as a function of the percent of the county population that belongs to the corresponding minority group (Bobo and Hutchings, 1996).

$$\alpha^{county}_{l[i]} \sim N(\alpha^{state}_{m[i]} + \beta^1(\%\text{ Black|Hispanic|Asian}), \sigma^2_{county}), \text{ for } l = 1, \ldots, 3075 \tag{3}$$

Finally, the *state* random effects variable is modeled with mean zero and some estimated

variance. The Census data of citizens broken down by age, education, race, and county (Table EEO-CIT07R-N1) excludes Alaska and Hawaii, but includes the District of Columbia.[3]

$$\alpha_{m[i]}^{state} \sim N(0, \sigma_{state}^2), \text{ for } m = 1, \ldots, 49 \tag{4}$$

Each combination of demographic and geographic variables defines a unique cell. In our current analysis, we include 8 demographic categories (2 sex $\times$ 4 education) in 3075 counties, giving us a total of $24,600$ unique cells (8×3075) for each racial group. The multi-level model estimates the *average* ideology in each cell.

2.2 Racial Stereotyping

We also use MRP to estimate the geographic distribution of racial attitudes. See Figure 3 in the paper. We rely on the 2008 Cooperative Campaign Analysis Project (CCAP) where respondents were asked to rate the intelligence and work effort of their own race and other minority groups on a 7-point scale from "hard working" to "lazy" and from "intelligent" to "unintelligent". Higher values correspond to more negative stereotypes. Our dependent variable of racial stereotyping S is an aggregated measure of ratings R such that

$$S_i = \sum_j R_{ij}^M - R_{ij}^O \tag{5}$$

where R_{ij}^M is respondent i's rating of minority group M on attribute j (e.g., intelligence), and R_{ij}^O is the respondent's rating of his or her own racial group on the same attribute. S_i is positive if, on average, the respondent views her own racial group as better than blacks on these criteria; it is negative if the respondent deems blacks better than her group.

Our multi-level models are similar to those in the previous section. Because our target population is citizen voting age population, we are limited to the EEO Tabulation that only provides cross-tabulations of age, education, and race by county. Unlike our models of ideology for each racial group, we estimate separate stereotyping models for each "own-race vs. other-race-being-stereotyped" pair, or nine models total: white-black, white-Latino, white-Asian, black-Latino, black-Asian, Latino-black, Latino-Asian, Asian-black, and Asian-Latino. This necessitates changing one of the right-hand side variables. We replace the percent of non-whites with the percent of the corresponding minority group that is stereotyped, which we theorize to be a predictor of racial attitudes in line with the "racial threat" literature (Key, 1949; Bobo and Hutchings, 1996; Gay, 2006; Hanjal, Abrajano and Warner, 2009). See footnote 266 in the paper for additional citations.

Each of the nine models is subsetted to the respondents "own" race and estimates prejudice

[3]The EEO tabulation is sponsored by the Equal Employment Opportunity Commission (EEOC), the Department of Justice (DOJ), the Department of Labor (DOL) and the Office of Personnel Management (OPM). Table EEO-CIT07R-N1 can be accessed using the Census Bureau's FactFinder tool at http://factfinder2.census.gov/.

toward the "other" races, with the percent of "other" in the county population as a predictor. Our final measure of racial stereotyping aggregates prejudice scores by "other" races. Formally, our measure of stereotyping against group M is a fraction where

$$\frac{ave(S_i^M)}{ave(S_j)} \mid i \in \mathcal{K}, i \notin \mathcal{M}, j \in \mathcal{P} \tag{6}$$

and S is an individual's stereotype, i and j index voting-age citizens, $\mathcal{K}$ is the set of persons in the geographic unit of interest, $\mathcal{M}$ is the set of persons in the racial group being stereotyped, and $\mathcal{P}$ is the national population of voting-age citizens. When computing $ave(S_j) \mid j \in \mathcal{P}$ we take the average over persons rather than over stereotypes because whites in our dataset have stereotype scores for 3 racial groups, whereas minorities have stereotype scores for only two groups. Thus, taking the average over stereotypes rather than over persons would overweight the views of whites.

2.3 Poststratification Data

Detailed county-level data is not available through the Census. The IPUMS microdata file does not include geographic identifiers smaller than public use microdata areas (PUMAs), which are areas with populations no smaller than 100,000. Nearly 20% of all counties have a population smaller than 100,000. Thus, we must rely on tables compiled by the Census Bureau with cross-tabulations on pre-selected variables. Because our target population is voting age citizens, we are limited to the EEO Tabulation (Table EEO-CIT7R-N1) that only provides crosstabs by sex, education, and race within each county. See Table 2 on the next page.

Our multi-level regression models estimate the *average* stereotype in each cell. Suppose that θ_k represents the predicted value of each cell based on the relevant combination of coefficients from the multi-level model and that N_k represents the frequency of each cell in the population ("Cell %" in Table 2). To estimate the prejudice in each county, we weight θ_k by the population frequency N_k of each cell in each county such that

$$\text{Stereotype}^{\text{MRP}}_{\text{county } c} = \frac{\sum_{k \in c} N_k \theta_k}{\sum_{k \in c} N_k} \tag{7}$$

No.	County name	Race	Sex	Education	Cell count	County pop.	Cell %
1	Alabama, Autauga	White	Male	Less than HS	1200	54571	0.022
2	Alabama, Autauga	White	Male	HS degree	3630	54571	0.067
3	Alabama, Autauga	White	Male	Some college	3295	54571	0.060
4	Alabama, Autauga	White	Male	College degree	2420	54571	0.044
5	Alabama, Autauga	White	Female	Less than HS	410	54571	0.008
6	Alabama, Autauga	White	Female	HS degree	2790	54571	0.051
7	Alabama, Autauga	White	Female	Some college	3250	54571	0.060
8	Alabama, Autauga	White	Female	College degree	2375	54571	0.044
9	Alabama, Autauga	Black	Male	Less than HS	290	54571	0.005
10	Alabama, Autauga	Black	Male	HS degree	820	54571	0.015
.	...	...	...	...	...	...	...
.	...	...	...	...	...	...	...
24567	Wyoming, Weston	Asian	Female	Some college	0	7208	0.000
24568	Wyoming, Weston	Asian	Female	College degree	20	7208	0.003

Table 2: Sample from table of estimated population in each of 24,600 demographic and geographic "cells." The data, from Table EEO-CIT7R-N1 of the five-year ACS sample (2006-2010) subsets the total population to just citizens aged 20 and above.

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