

White Outgroup Intolerance and Declining Support for American Democracy: Supplemental Appendix

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Contents

Introduction	2
Descriptive Statistics	2
Robustness Tests and Alternate Specifications	3
There Is No Robust Effect of Outgroup Intolerance on Non-White Respondents	4
Alternate Estimations of White Outgroup Intolerance Do Not Change Our Inferences . .	6
Experimenting With Different Considerations of Temporal (and Spatial) Heterogeneity .	9
Full Models on the Nexus Between Increased Education and White Outgroup Intolerance	13
An Alternate Proxy for Support for American Democracy	13

Introduction

This is the supplemental appendix to “White Outgroup Intolerance and Declining Support for American Democracy,” currently a working paper in preparation for submission and hopeful acceptance at a peer-reviewed journal. The supplemental appendix, like the manuscript, is a dynamic document that automates the code and the presentation of the finished results in the document itself (Xie, 2013). This approach to document preparation has multiple benefits, namely in the ability to drive the incidence of transcription error to zero while calling specific results into the document. We will make some references in this document to specific statistics that the raw markup will show is a direct extrapolation from code into presentation. We plan to make the raw markup available upon request during the peer review process and will deposit the final analyses to the corresponding author’s Github account upon publication. This will facilitate transparency in published statistical analysis, consistent with the [Data Access and Research Transparency Initiative](#) (DA-RT) by the American Political Science Association.

Descriptive Statistics

We start the supplemental appendix with basic descriptive statistics for the variables we present in the manuscript. We choose to be brief in this section of the appendix since this information is descriptive and provides basic background information about the analyses we present in the manuscript.

Table A.1 is a basic table of descriptive statistics for all variables used in Figure 2 in the manuscript. We took care to note that we standardized all variables by two standard deviations around the mean for all non-binary inputs, which is consistent with best practice in the mixed effects modeling framework (c.f. Gelman, 2008). Here, we present the summary statistics for the raw inputs and, for ease, do not present summary statistics for the square terms we also derive from the age and ideology variables.

Table A.1: Descriptive Statistics for Variables Used in Figure 2 in the Manuscript

Statistic	N	Mean	St. Dev.	Min	Max
Strong Leader (Dummy)	4,505	0.249	0.433	0	1
Oppose Democracy (Dummy)	4,454	0.123	0.329	0	1
Army Rule (Dummy)	4,476	0.425	0.494	0	1
Age	4,606	48.922	17.245	18	94
Female	4,621	0.524	0.499	0	1
College Educated	4,621	0.295	0.456	0	1
Ideology	4,394	4.811	1.958	0	9
Income Scale	4,344	4.652	2.267	0	9
Republican	3,838	0.446	0.497	0	1
Democrat	3,838	0.411	0.492	0	1
Unemployed	4,564	0.049	0.216	0	1
Emancipative Values	4,597	0.015	0.493	-1.499	1.341
White Outgroup Intolerance	4,621	0.187	0.390	0	1

Figure A.1 provides a quick visual summary of the variation of number observations by survey wave/year and race/ethnicity. These categories are obviously not mutually exclusive, nor

related in a meaningful way. We offer this visualization to quickly communicate that 75% of the third, fourth, fifth, and sixth waves of WVS data featured respondents who self-identify as white and that the total number of observations by the survey year range from 1,200 (1999) to 2,232 (2011).

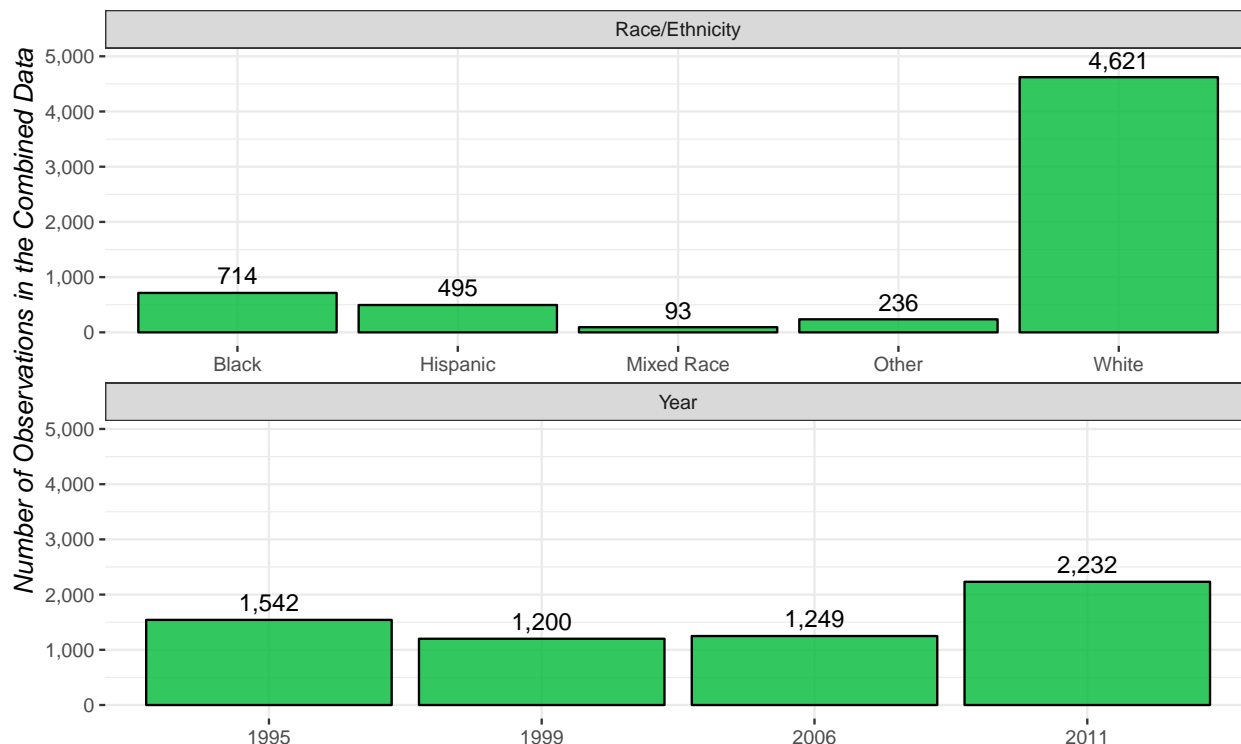


Figure A.1: Number of Observations by Race/Ethnicity and Survey Wave in Our Analyses

Figure A.2 provides a correlation matrix of the variables used in Figure 2 in the analysis. Only two of the covariates show any meaningful correlation: the dummy for Republican and the dummy for Democrat. This much is unsurprising since those two variables are mutually exclusive and serve as fixed effects communicating the effect of self-identifying with one of the two major parties in the U.S. relative to the baseline of self-identified independents and third-party supporters. No two other variables correlate in any meaningful way that would serve as an estimation problem in the models we report in the manuscript.

Robustness Tests and Alternate Specifications

We use this section of the appendix to detail some robustness tests we ran to check how sensitive our inferences are to the models we ran. We also use this section to include full results of some abbreviated models we ran and displayed in the manuscript. We facilitate the reader's experience with this appendix by offering informative subsections so that the reader can jump to a particular analysis from the table of contents we include on the first page. We will also summarize the main takeaways from our robustness tests in list format.

- There is no robust effect of outgroup intolerance on anti-democratic orientations for non-white respondents in the WVS data. This offers an empirical justification for our argument about white outgroup intolerance in the United States.

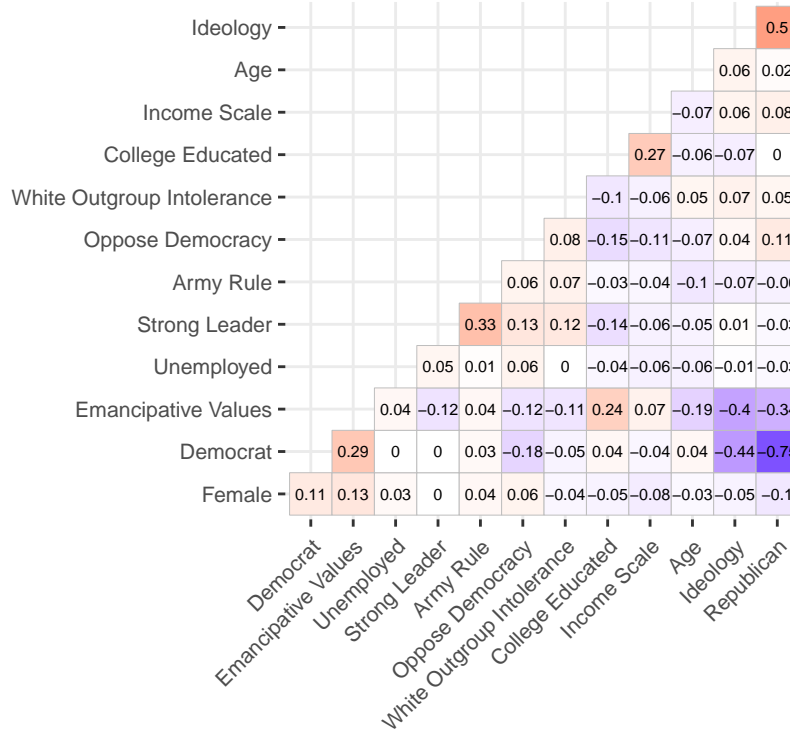


Figure A.2: A Correlation Matrix of the Variables Used in the Analysis

- We experiment with different estimations of the white outgroup intolerance measure. There is no robust effect of attitudes toward Muslims or Jews as potential neighbors on anti-democratic orientations, though these categories were no longer listed after the fourth wave in 1999. The “militant minority” option is biased in the measurement sense and its effect on anti-democratic orientations actually drifts negative. These three alternate options, when included in our white outgroup intolerance measure, do not change the inferences we report in the manuscript.
- We experiment with seven different estimations that account for concerns of spatial and temporal heterogeneity in the data. These include a combination of fixed effects, random effects, and subsetting the data to just the particular survey wave. Our findings are remarkably robust to almost all estimations. There were only two cases in which we could not reject the null hypothesis: the oppose-democracy model in 1995 and the army-rule model in 1999. However, we think it important to highlight this a successful replication rate of 91.67% in the combined 24 models we report in Figure A.5.

There Is No Robust Effect of Outgroup Intolerance on Non-White Respondents

Our theoretical argument focuses on white Americans and we justify this in the manuscript with our review of U.S. history and academic literature on prejudice and tolerance. However, there is good reason to wonder if the effect is generalizable to all Americans, even those who are not white. This is especially important given that the reader could interpret our argument about democracy as opportunity of access as cutting both ways.

We subset the data to non-white respondents across the third through sixth waves of World Values Survey (WVS) data and re-estimated the three main analyses we report in Figure 2 in the manuscript. The results show there is no robust effect of outgroup intolerance on anti-democratic

Table A.2: The Covariates of Democratic Orientations of Non-White Americans in the World Values Survey (1995-2011)

	AM 1	AM 2	AM 3
	<i>Strong Leader</i>	<i>Army Rule</i>	<i>Oppose Democracy</i>
Age	-0.475 ** (0.149)	-0.329 * (0.142)	-0.785 ** (0.262)
Age ²	0.027 (0.283)	0.150 (0.272)	-0.439 (0.481)
Female	0.096 (0.133)	-0.041 (0.129)	0.213 (0.201)
College Educated	-0.405 * (0.176)	-0.061 (0.168)	-2.050 *** (0.476)
Ideology	0.197 (0.135)	-0.010 (0.131)	-0.021 (0.195)
Ideology ²	-0.120 (0.170)	-0.105 (0.163)	0.335 (0.236)
Income Scale	0.026 (0.145)	-0.252 (0.141)	0.177 (0.213)
Republican	-0.140 (0.275)	-0.025 (0.265)	-0.416 (0.330)
Democrat	0.309 (0.230)	-0.013 (0.222)	-1.208 *** (0.276)
Unemployed	0.584 * (0.233)	0.141 (0.222)	0.536 (0.284)
Emancipative Values	-0.523 *** (0.149)	-0.178 (0.143)	-0.361 (0.218)
Outgroup Intolerance	0.631 ** (0.205)	0.262 (0.201)	0.210 (0.285)
<i>Random Effect</i> sd(Year)	0.376	0.265	0.207
N	1063	1057	1061

*** p < 0.001; ** p < 0.01; * p < 0.05.

orientations for non-white respondents. Only the strong leader model (AM1) had a statistically significant effect. The lower bounds of the 95% intervals surrounding the coefficient estimates in the army rule and opposition to democracy models clearly overlap with zero. All told, Table A.2 offers an empirical justification of our decision to focus on the effect of outgroup intolerance on white Americans. Our argument is aggrieved white Americans perceive democracy as empowering unwelcome ethnic/racial minorities with an equal opportunity of access to power beyond the minority's numerical endowment. This leads to an anti-democratic orientation we observe among white Americans if these respondents do not view these groups as welcome in their life. However, we do not observe a robust effect of this outgroup intolerance for non-white Americans.

Alternate Estimations of White Outgroup Intolerance Do Not Change Our Inferences

We also consider whether the inferences we report in the manuscript are sensitive to the measure of white outgroup intolerance we devised. The ridgeline plots in Figure 3 show a discernible robustness in our simulations of the 12 different models we ran. Only one of the thousand simulations of those 12 models resulted in a distribution of first differences in which more than 5% of the first differences were negative. That was the simulated first differences for the effect of not wanting a neighbor who spoke a different language on attitudes in opposition to democracy. Even then, just 7.6% of those simulated first differences were negative.

We explore the effect that some other relevant responses may have on the anti-democratic orientations we analyze. For one, our identification of white outgroup intolerance leveraged responses that identified immigrants/foreign workers, members of a different race, and people who speak a different language as indicators of white outgroup intolerance if the respondent would not welcome these groups as neighbors. There are two other responses of interest: Jews and Muslims. White nationalists routinely single out Muslims as a threat to their perception of American values and anti-Semitism is a long-running strand of bigotry in groups like the Ku Klux Klan. However, our specification opted for common nouns in lieu of proper nouns for the analyses we report in the manuscript. Further, WVS listed Muslims as potential responses in 1995 and 1999 and Jews as an option in the 1999 wave. They regrettably do not appear in the post-9/11 waves in 2006 and 2011.

Table A.3 is our re-estimation of Figure 2 from the manuscript for which the white outgroup intolerance measure includes responses from 1995 and 1999 that also identified Muslims or Jews as unwelcome neighbors. Nothing changes in our inferences. The white outgroup intolerance measure is still statistically significant across all three estimations.

We ran separate models to assess the effect of social intolerance toward Jews or Muslims on anti-democratic orientations and report these results in Figure A.3. We found no robust effect across all estimations. Only the model estimating the effect of anti-Semitic intolerance on opposition to democracy (AM6j) has any significant effect of the six different estimations we ran. Ultimately, the effect of social intolerance toward Jews (in 1999) and Muslims (in 1995 and 1999) appear to have no robust effect on anti-democratic orientations. The responses do not change the inferences we report in the analyses when we include them into our measure but the two responses, by themselves, have no robust effect.

We also consider whether the “militant minority” option affects our inferences. The manuscript noted that we could see the intuition behind this response for the sake of our argument. “Militant minority” could easily prime a respondent to think of an activist group like the Black Panthers, soliciting an anti-democratic orientation consistent with our argument. It could also conjure jihadi terrorists given its lone appearance in the first WVS wave after the September 11, 2001 terror

Table A.3: The Covariates of Democratic Orientations of White Americans in the World Values Survey [with Jews/Muslims Responses] (1995-2011)

	AM 4	AM 5	AM 6
	<i>Strong Leader</i>	<i>Army Rule</i>	<i>Oppose Democracy</i>
Age	-0.442 *** (0.087)	-0.451 *** (0.077)	-0.636 *** (0.120)
Age ²	0.157 (0.158)	0.040 (0.140)	0.075 (0.223)
Female	0.047 (0.084)	0.137 (0.072)	0.514 *** (0.118)
College Educated	-0.562 *** (0.103)	-0.155 (0.083)	-1.033 *** (0.171)
Ideology	-0.010 (0.102)	-0.172 * (0.082)	-0.267 (0.138)
Ideology ²	-0.521 *** (0.132)	-0.266 ** (0.102)	-0.121 (0.175)
Income Scale	0.046 (0.092)	-0.012 (0.079)	-0.431 *** (0.128)
Republican	-0.392 ** (0.130)	-0.208 (0.115)	-0.224 (0.159)
Democrat	-0.090 (0.124)	-0.065 (0.111)	-1.583 *** (0.187)
Unemployed	0.523 ** (0.188)	0.080 (0.176)	0.598 * (0.241)
Emancipative Values	-0.625 *** (0.096)	0.012 (0.081)	-0.690 *** (0.135)
White Outgroup Intolerance (w/ Jews/Muslims Responses)	0.473 *** (0.097)	0.319 *** (0.089)	0.380 ** (0.132)
<i>Random Effect</i> sd(Year)	0.189	0.232	0.228
N	3451	3432	3420

*** p < 0.001; ** p < 0.01; * p < 0.05.

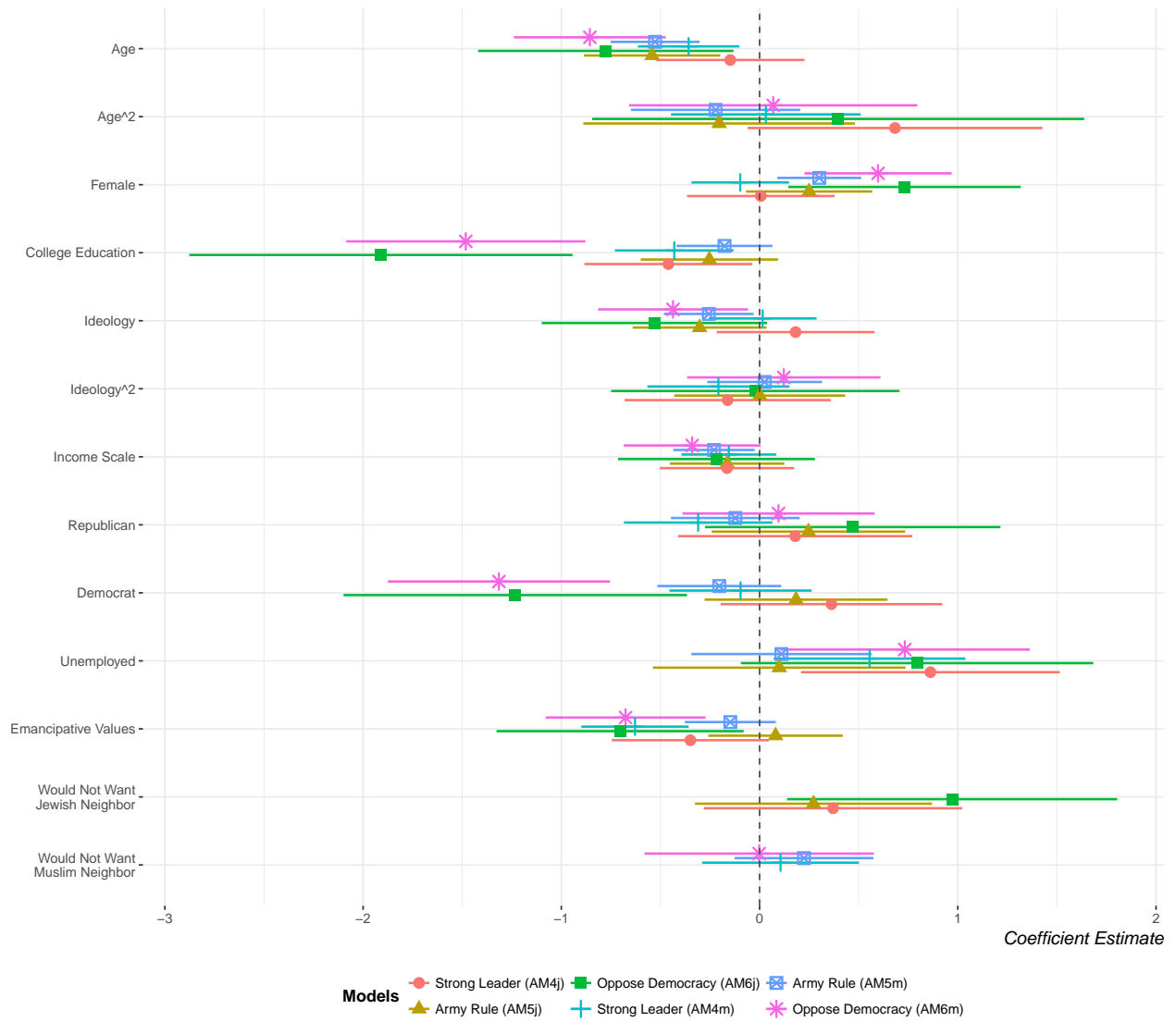


Figure A.3: Dot-and-Whisker Plots of the Effect of Intolerance Toward Jews and Muslims on Anti-Democratic Orientations

attacks. However, we fear this term is biased in the measurement sense. A respondent who selects this could be intolerant of the “minority” or may be reacting to the “militant” magnifier that WVS added. A person could justifiably conjure an image of a potential neighbor sufficiently “militarized” with weaponry in that response and not want that person as a neighbor. We should be careful as researchers to not view that response as necessarily indicating prejudice against an ethnic/racial minority.

We re-ran the models from Figure 2 in the manuscript, including potential responses for “militant minority” in the 2006 wave in our white outgroup intolerance variable. The results we report in Table A.4 are substantively identical to Figure 2 in the manuscript. This holds even though the effect of the “militant minority” treatment drifts negative, per the individual regressions we ran and summarize in Figure A.4. Table A.4 and Figure A.4 offer important takeaways similar to Table A.3 and Figure A.3. Alternate responses consistent with white outgroup intolerance do not change our inferences when we add them to our measure but these alternate responses, by themselves, have no robust effect on anti-democratic orientations. Figure 3 (in the manuscript) highlights how the effect of the three categories we included in our measure are robust as individual indicators in a model, itself a form of a robustness test for the effect of white outgroup intolerance on anti-democratic orientations of white Americans.

Experimenting With Different Considerations of Temporal (and Spatial) Heterogeneity

All our covariates are micro-level demographical attributes or political attitudes from the WVS respondents themselves but these paper over some important unit heterogeneity in the data. We modeled the temporal heterogeneity but it is conceivable there is also spatial heterogeneity in which Americans in the South, for example, cluster more than Americans in the Northeast. Thus, we follow [Schmidt-Catran and Fairbrother \(2015\)](#), who argue that the best way to handle spatial and temporal heterogeneity in survey data like this is to include random effects for the spatial unit, the year of observation, and the intersection of the spatial unit and the year. This creates random effects in our analysis for the survey year (i.e. 1995, 1999, 2006, 2011), the Census region (i.e. Midwest, Northeast, South, West), and the Census region-year (e.g. South-2011, West-1995, Midwest-2006). We model all random effects with weakly informative Wishart priors on the covariance matrices (c.f. [Chung et al., 2015](#)) given the relatively few number of categories. We report these analyses in Table A.5, showing that the results are almost identical to the inferences we report in the manuscript’s Figure 2.

Finally, we ran multiple versions of the same model to note that different techniques for modeling temporal and/or spatial heterogeneity have no effect on the inferences we report in the analyses. Figure A.5 is an abbreviated dot-and-whisker plot that includes the estimates of white outgroup intolerance for estimations in which we model temporal and/or spatial heterogeneity with 1) just year random effects (i.e. the results we report in the manuscript), 2) region, region-year, and year random effects (i.e. abbreviated from Table A.5), 3) region and year fixed effects, and 4) fixed effects for just the year.¹ We also re-run the models subsetting the data to each year (i.e. individual models for 1995, 1999, 2006, and 2011).

Figure A.5 shows all these effects in the fixed effects and random effects models are almost identical. The differences between these estimates are, at most, in the hundredths of a decimal point of the coefficient and associated z statistic. The results for the individual models that subset the analyses to the individual survey year are worth highlighting. We want the reader to notice we that we observe significant effects in all but two estimations. This was in the oppose-

¹The baselines in the fixed effects models are for 1995 (survey year) and the Midwest (Census region).

Table A.4: The Covariates of Democratic Orientations of White Americans in the World Values Survey [with 'Militant Minority' Responses] (1995-2011)

	AM 7	AM 8	AM 9
	<i>Strong Leader</i>	<i>Army Rule</i>	<i>Oppose Democracy</i>
Age	-0.441 *** (0.087)	-0.451 *** (0.077)	-0.634 *** (0.120)
Age ²	0.162 (0.158)	0.044 (0.139)	0.076 (0.223)
Female	0.039 (0.084)	0.133 (0.072)	0.509 *** (0.118)
College Educated	-0.571 *** (0.103)	-0.160 (0.083)	-1.042 *** (0.171)
Ideology	-0.003 (0.102)	-0.167 * (0.082)	-0.264 (0.138)
Ideology ²	-0.521 *** (0.132)	-0.266 ** (0.102)	-0.122 (0.175)
Income Scale	0.044 (0.092)	-0.014 (0.079)	-0.430 *** (0.128)
Republican	-0.387 ** (0.130)	-0.206 (0.115)	-0.217 (0.160)
Democrat	-0.085 (0.124)	-0.063 (0.111)	-1.578 *** (0.187)
Unemployed	0.525 ** (0.188)	0.082 (0.176)	0.603 * (0.241)
Emancipative Values	-0.635 *** (0.095)	0.007 (0.081)	-0.695 *** (0.135)
White Outgroup Intolerance (w/ 'Militant Minority' Responses)	0.416 *** (0.099)	0.313 *** (0.089)	0.331 * (0.134)
<i>Random Effect</i> sd(Year)	0.167	0.220	0.228
N	3451	3432	3420

*** p < 0.001; ** p < 0.01; * p < 0.05.

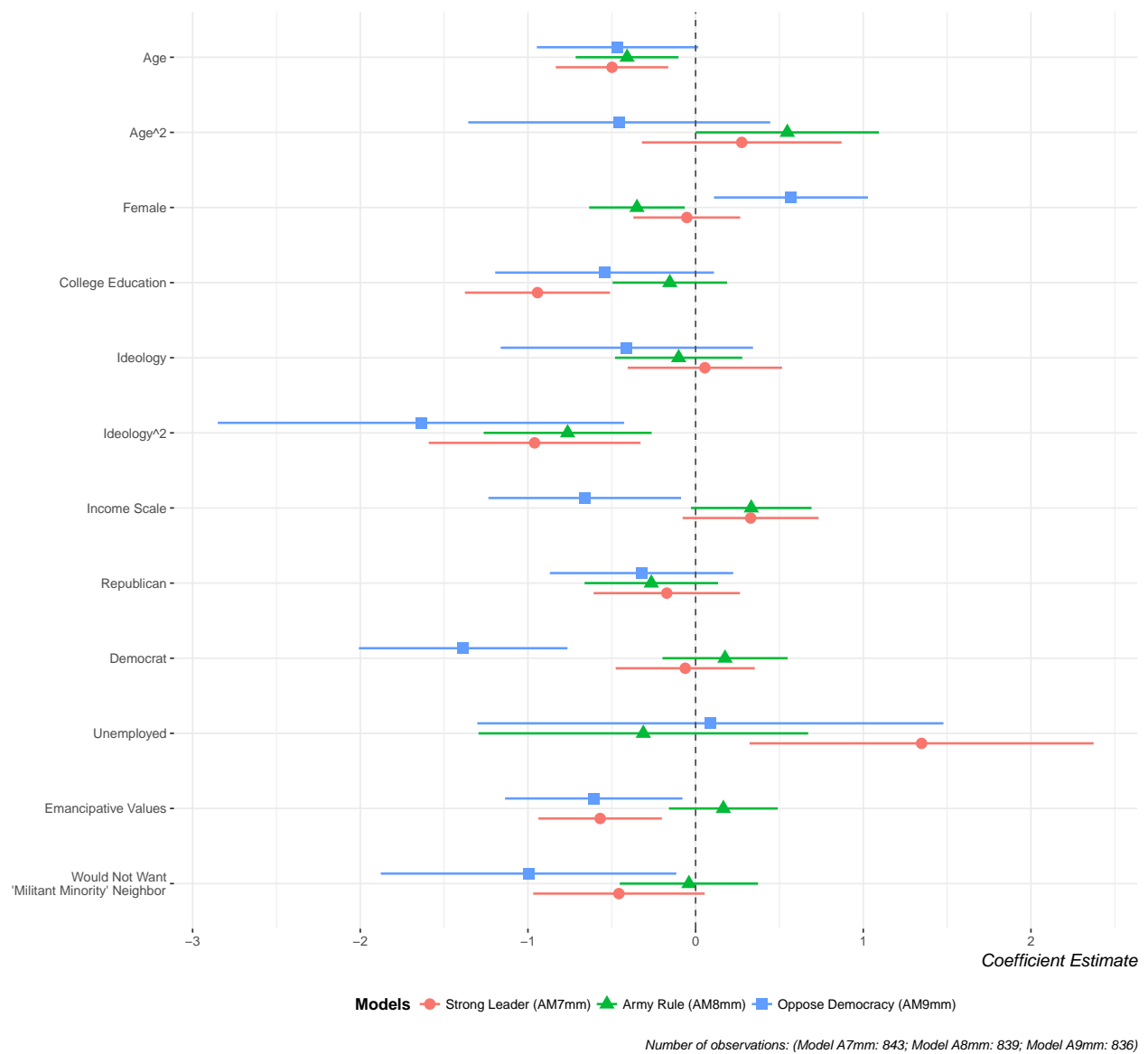


Figure A.4: Dot-and-Whisker Plots of the Effect of Not Wanting a 'Militant Minority' for a Neighbor on Anti-Democratic Orientations

Table A.5: The Covariates of Democratic Orientations of White Americans in the World Values Survey [with Spatial-Temporal Random Effects] (1995-2011)

	AM 10	AM 11	AM 12
	<i>Strong Leader</i>	<i>Army Rule</i>	<i>Oppose Democracy</i>
Age	-0.437 *** (0.088)	-0.453 *** (0.077)	-0.620 *** (0.121)
Age ²	0.138 (0.159)	0.046 (0.140)	0.048 (0.225)
Female	0.048 (0.084)	0.137 (0.072)	0.519 *** (0.119)
College Educated	-0.572 *** (0.104)	-0.160 (0.083)	-1.063 *** (0.173)
Ideology	-0.005 (0.102)	-0.167 * (0.082)	-0.272 (0.139)
Ideology ²	-0.513 *** (0.132)	-0.259 * (0.102)	-0.122 (0.176)
Income Scale	0.042 (0.093)	-0.012 (0.080)	-0.414 ** (0.130)
Republican	-0.395 ** (0.131)	-0.209 (0.116)	-0.254 (0.161)
Democrat	-0.077 (0.125)	-0.070 (0.111)	-1.614 *** (0.189)
Unemployed	0.510 ** (0.189)	0.070 (0.176)	0.638 ** (0.242)
Emancipative Values	-0.615 *** (0.096)	0.032 (0.082)	-0.647 *** (0.137)
White Outgroup Intolerance	0.530 *** (0.102)	0.366 *** (0.094)	0.463 *** (0.138)
<i>Random Effect</i>			
sd(Year)	0.187	0.224	0.283
sd(Census Region)	0.132	0.090	0.312
sd(Census Region:Year)	0.194	0.079	0.228
N	3431	3412	3400

*** p < 0.001; ** p < 0.01; * p < 0.05.

democracy model in 1995 and the army-rule model in 1999. Ten of the other 12 estimations yield significant results.

We think this is an important finding from our paper. Our main analyses leverage all four waves together, offering random effects for the survey years, to show a general relationship between social intolerance and support for democracy. This is a current and salient policy discussion in the age of Trump and there is no shortage of analyses in major newspapers and academic blogs about how Trump’s rhetoric erodes democratic norms and compromises democratic longevity in the United States. Our major survey data sets are starting to track these developments as well. However, we find these trends emerging as early as 1995, a full 20 years before then-candidate Trump first descended his gilded escalator to begin his presidential campaign with a statement that Mexicans were rapists and thugs.

We choose to present the results we do because we think the mixed effects modeling framework is flexible for the nature of the data and it serves as precedent to also treat education levels as random effects. We also think the random effect for the survey year is an appropriate focus because of increasing sample size in the WVS and a concern for how these attitudes might be increasing over time in the U.S. Ultimately, different specifications of spatial and temporal heterogeneity have no effect on the inferences we report in the manuscript.

Full Models on the Nexus Between Increased Education and White Outgroup Intolerance

We dedicated the second half of the analyses to an exploration of how education and white outgroup intolerance interact, finding that increasing education does decrease the likelihood of an anti-democratic orientation but that effect of white outgroup intolerance might be stronger and more precise at higher levels of education. We did this with two models. The first interacts college education with white outgroup intolerance. The second treats education levels as random effects and allows the slopes of the fixed effect for white outgroup intolerance to vary by levels of that random effect.

The manuscript mentions we defer a full presentation of those two models to the appendix to focus on the main insights those models communicate. We present the full results as dot-and-whisker plots in this section. Figure A.6 is the full analysis in which we interact college education and white outgroup intolerance. Figure A.7 is a full dot-and-whisker plot in which we treat education as a random effect and allow the slope of white outgroup tolerance to also vary by levels of education. We also include Figure A.8, which is a caterpillar plot that communicates the different intercepts and random slopes across the three models in Figure A.7 (and Figure 5 in the manuscript). We offer this to communicate how the decreasing intercepts at higher levels of education suggest that more educated people are less likely to have an anti-democratic orientation but the increasing random slope suggests the effect of white outgroup intolerance gets larger and more positive at higher levels of education.

An Alternate Proxy for Support for American Democracy

We offer a final robustness test for the main dependent variables we model in the manuscript. In particular, we are interested in an alternate measure for the “having a democratic political system” question we model. That prompt is a regular staple in the WVS data since the third wave, asking the respondent to say whether “having a democratic political system” is very good, good, bad, or very bad for the United States. The fifth and sixth waves feature an another question that gets at the same concept. This question prompts the reader to answer “how important is it for you to live in a country that is governed democratically?” The responses range from 1 (not at all

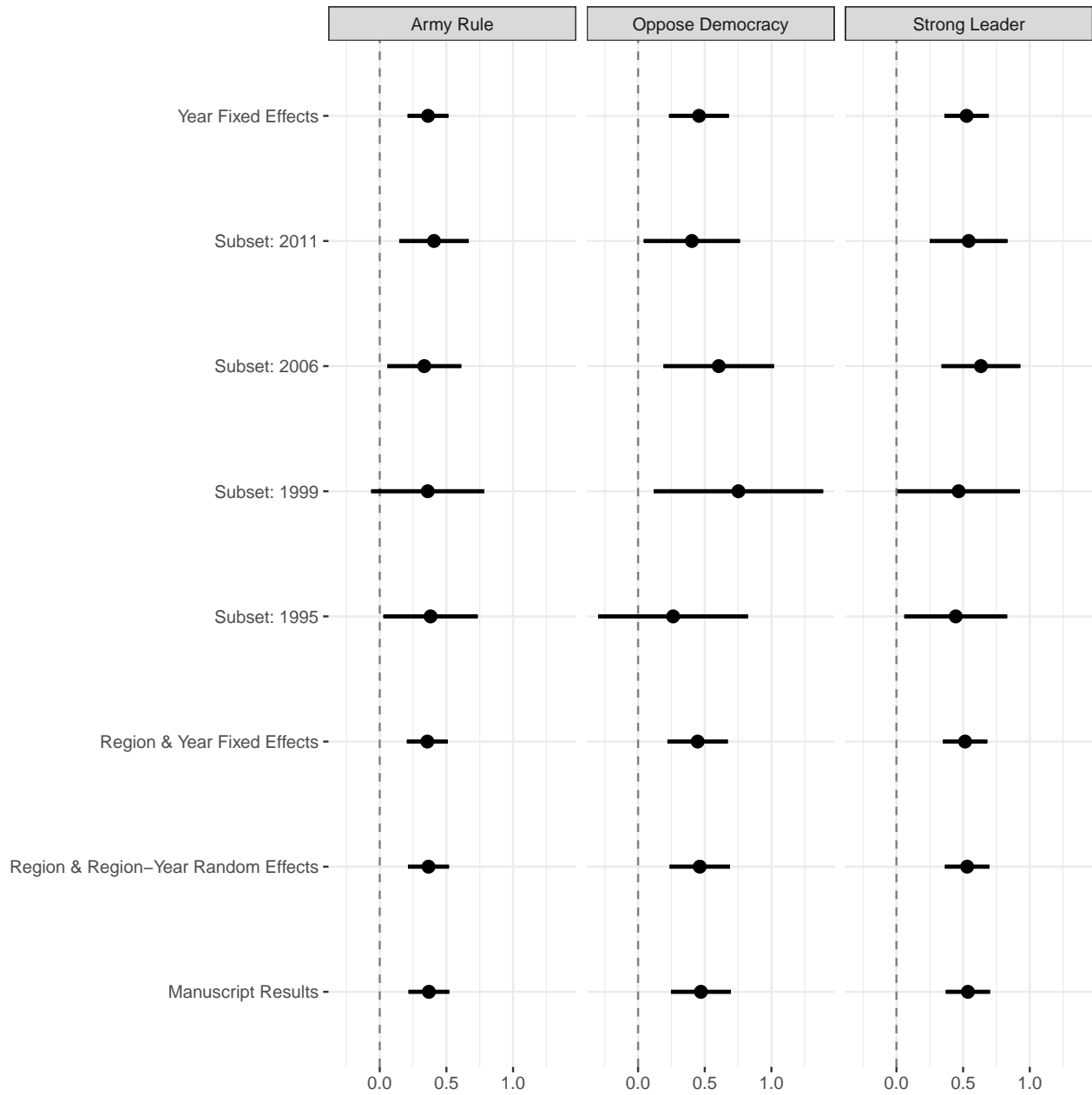


Figure A.5: Dot-and-Whisker Plots of the Effect of White Outgroup Intolerance Across Multiple Specifications for Temporal/Spatial Heterogeneity

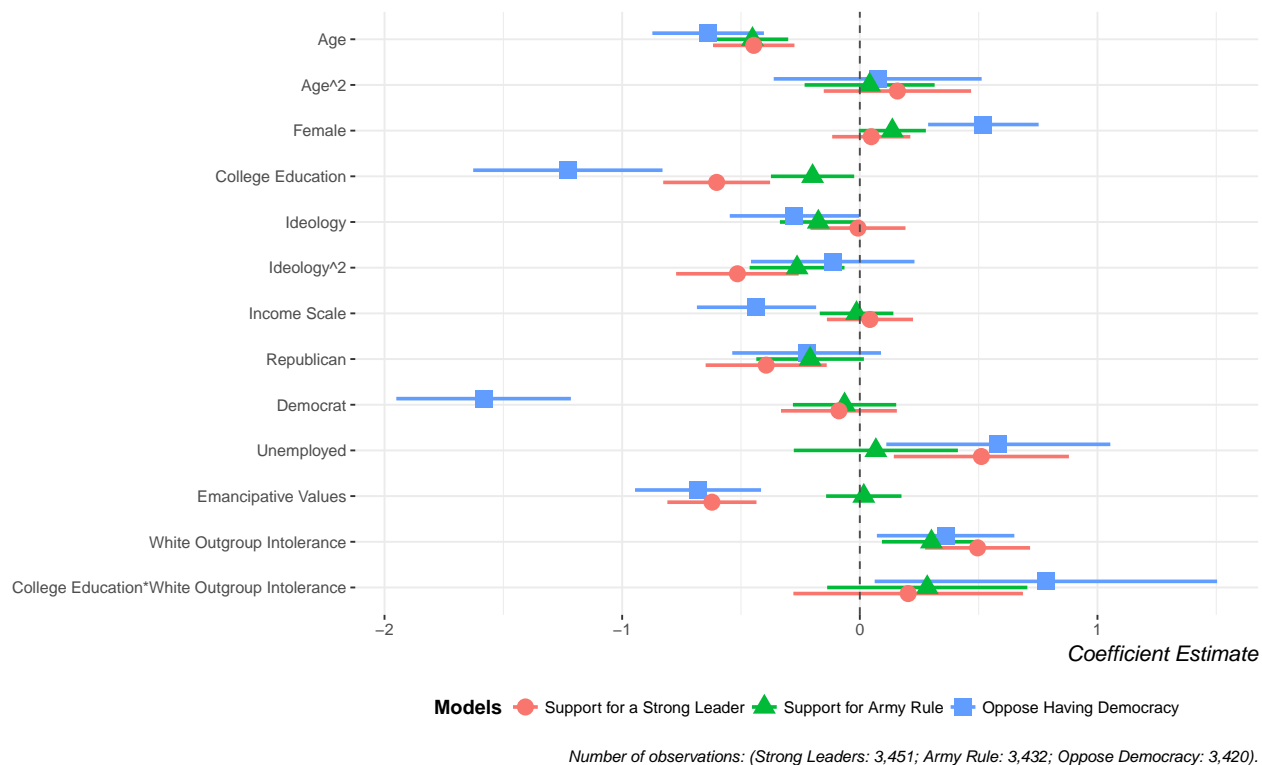


Figure A.6: A Full Version of Figure 4 From the Manuscript

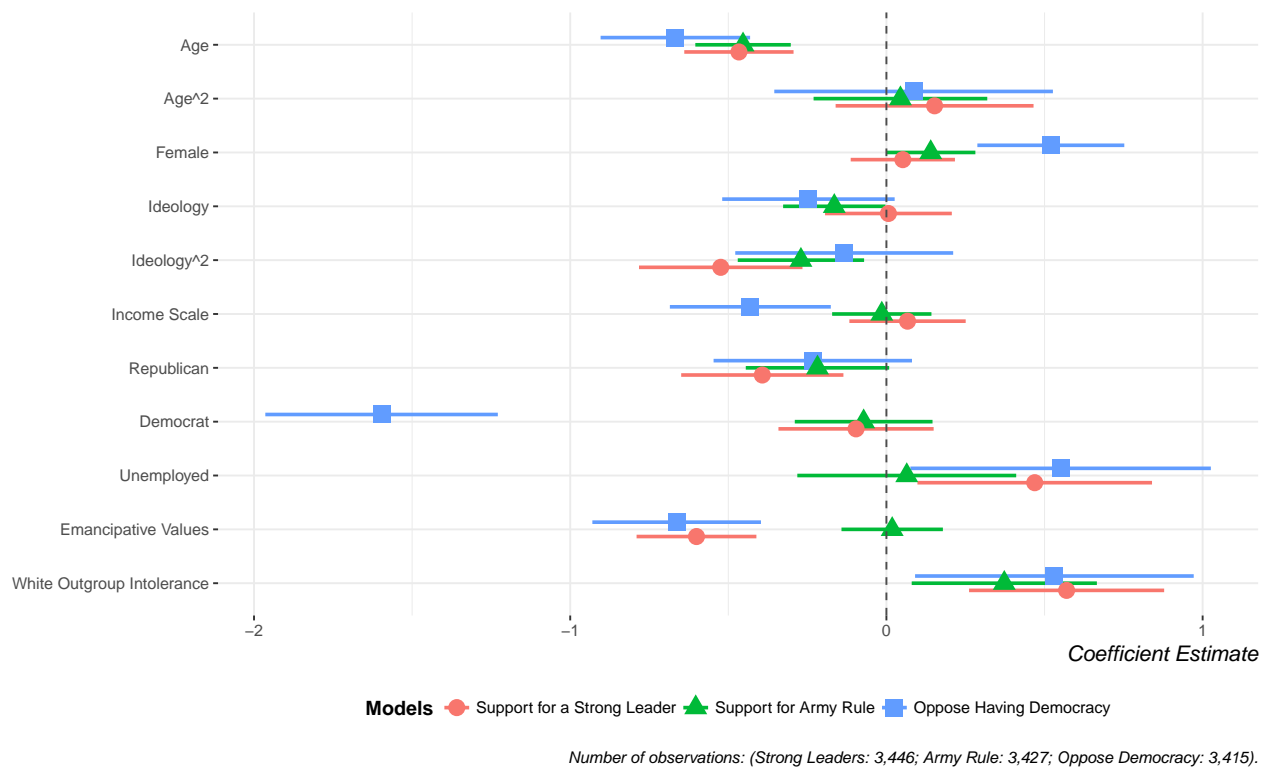


Figure A.7: A Full Version of the Regressions Summarized in Figure 5 From the Manuscript

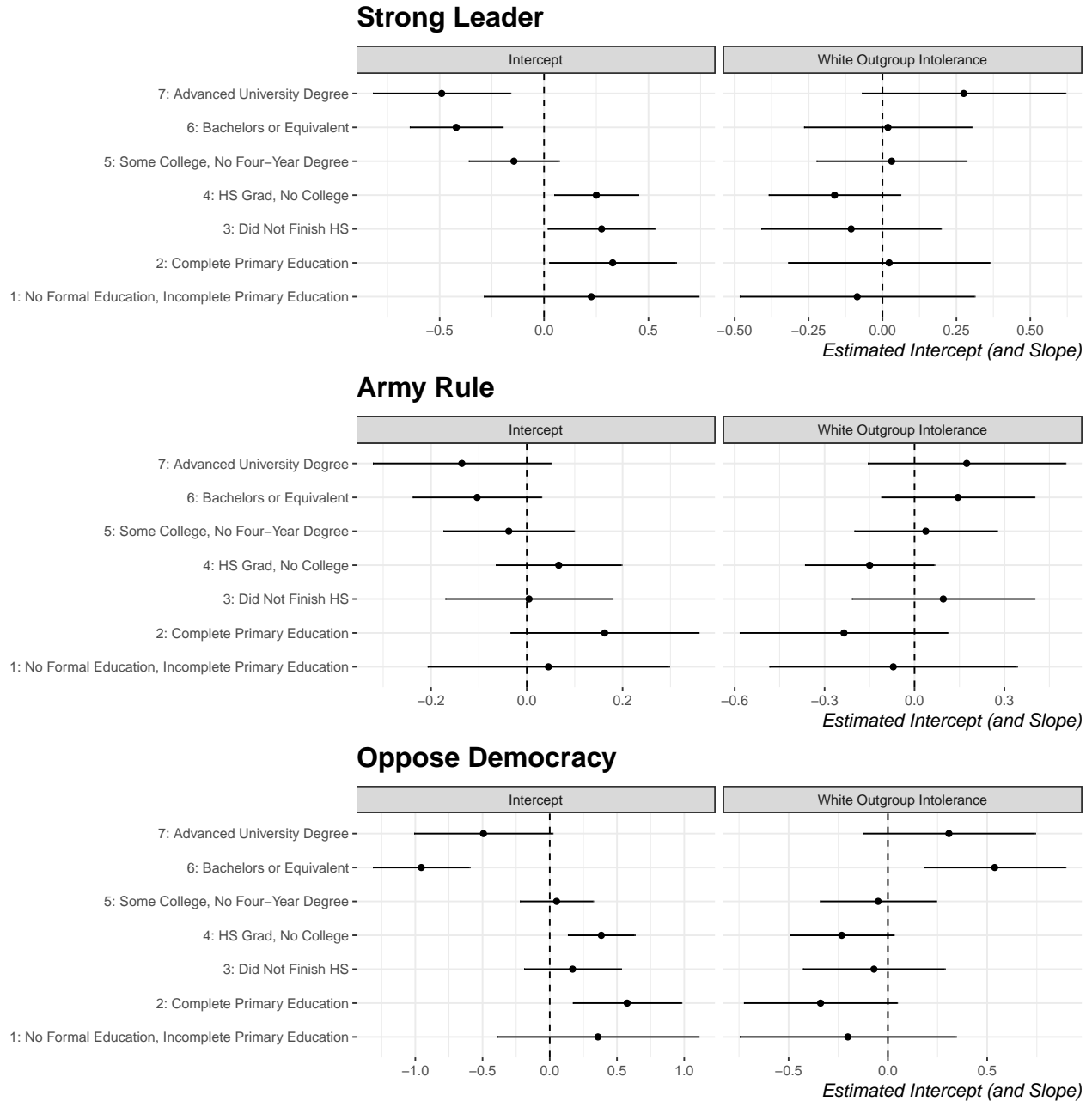


Figure A.8: A Caterpillar Plot of the Random Effect Intercepts and Varying Slopes from the Models Summarized in Figure 5 in the Manuscript

important) to 10 (absolutely important).

We ran two linear models on this item. The first resembles Figure 2 in the manuscript while the second interacts college education with our white outgroup intolerance measure (similar to the manuscript's Figure 4 and the appendix's Figure A.6). Mixed effects modeling collapses to classical regression when there are only two groups (i.e. survey years) so we forgo the mixed effects framework and include a fixed effect for 2011 compared to the 2006 survey wave.² The only difference in interpretation is we expect the effect to be negative. White outgroup intolerance decreases the value that white Americans afford to living in democracy.

Table A.6: The Covariates of the Importance of Living in a Democracy for White Americans in the World Values Survey (2006, 2011)

	AM 13	AM 14
Age	0.951 *** (0.086)	0.954 *** (0.086)
Age ²	-0.269 (0.152)	-0.269 (0.152)
Female	-0.052 (0.079)	-0.054 (0.079)
College Educated	0.358 *** (0.091)	0.300 ** (0.101)
Ideology	0.321 ** (0.097)	0.313 ** (0.098)
Ideology ²	0.382 *** (0.113)	0.384 *** (0.113)
Income Scale	0.174 (0.102)	0.174 (0.102)
Republican	0.615 *** (0.133)	0.614 *** (0.133)
Democrat	0.777 *** (0.129)	0.775 *** (0.129)
Unemployed	-0.303 (0.224)	-0.318 (0.225)
Emancipative Values	0.355 *** (0.093)	0.358 *** (0.093)
White Outgroup Intolerance	-0.339 *** (0.093)	-0.412 *** (0.107)
White Outgroup Intolerance*College Education		0.286 (0.213)
Year = 2011	-0.317 *** (0.083)	-0.310 *** (0.083)
N	1819	1819
R ²	0.132	0.133
logLik	-3494.539	-3493.626
AIC	7019.079	7019.251

*** p < 0.001; ** p < 0.01; * p < 0.05.

²Figure A.5 lends support to the idea that different estimations of spatial and temporal heterogeneity have little-to-no effect on the results we report.

Table A.6 yields results similar to what we report in the manuscript and elsewhere in the appendix. White outgroup intolerance decreases the value that white Americans afford to living in democracy as much as it makes them open to specific autocratic alternatives. The only major difference we find is there is no significant effect of the interaction in AM14 that interacts college education with white outgroup intolerance.

References

- Chung, Yeojin, Andrew Gelman, Sophia Rabe-Hesketh, Jingchen Liu and Vincent Dorie. 2015. "Weakly Informative Prior for Point Estimation of Covariance Matrices in Hierarchical Models." *Journal of Educational and Behavioral Statistics* 40(2):136–157.
- Gelman, Andrew. 2008. "Scaling Regression Inputs by Dividing by Two Standard Deviations." *Statistics in Medicine* 27(15):2865–2873.
- Schmidt-Catran, Alexander W. and Malcolm Fairbrother. 2015. "The Random Effects in Multilevel Models: Getting Them Wrong and Getting Them Right." *European Sociological Review* 32(1):23–38.
- Xie, Yihui. 2013. *Dynamic Documents with R and knitr*. Boca Raton, FL: CRC Press.