

*Perceiving Political Polarization in the United States: Party Identity Strength and Attitude
Extremity Exacerbate the Perceived Partisan Divide*

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SUPPLEMENTAL MATERIAL

Method

Data selection and definition

The American National Election Study (ANES) is a nationally representative repeated cross-sectional survey.¹ Over the years, respondents to these surveys were asked to report their own attitude on ten different partisan issues. As an illustration of one of the issues, which was presented in the main text, respondents in 2004 read:

Some people think the government should provide fewer services, even in areas such as health and education, in order to reduce spending. Suppose these people are at one end of a scale, at point 1. Other people feel that it is important for the government to provide many more services even if it means an increase in spending. Suppose these people are at the other end, at point 7. And of course, some other people have opinions somewhere in between, at points 2, 3, 4, 5, or 6.

Respondents placed themselves on this 7-point scale. For data analysis, we coded all responses such that -3 represented the most liberal attitude (e.g., government providing more services and increasing spending) and +3 represented the most conservative attitude (e.g., government providing fewer services and decreasing spending). Table 1 presents the 10 issues, the liberal and

¹ Technically, although the ANES cumulative data file consists mostly of repeated cross-sectional surveys, some respondents in the 1970s were re-interviewed up to 3 election years in a row. All of the analyses that we report appropriately account for this incomplete nesting of respondents under years.

conservative scale labels, the years in which each issue was measured, and the sample size for each issue in each year.

For each of the 10 issues, respondents were also asked, separately, to place the Democratic party and the Republican party on the same scale. And in Presidential election years, respondents were asked to place the two Presidential candidates on the same scale. We used these responses to measure perceived polarization between Democrats and Republicans and between the Presidential candidates.

Respondents' own level of partisan identification was measured using a branched question about political identification. This question resulted in a 7-point scale (coded with $-3 = \textit{Strong Democrat}$; $-2 = \textit{Moderate Democrat}$; $-1 = \textit{Weak Democrat}$; $0 = \textit{Independent/Undecided}$; $1 = \textit{Weak Republican}$; $2 = \textit{Moderate Republican}$; $3 = \textit{Strong Republican}$).

The ANES data that we analyzed included all of the years in which the necessary variables were measured. Questions about the perceived placement of the Democratic and Republican parties were included every election year (presidential and mid-term) from 1970 to 2004, except the year 2002. Questions about the self-reported attitudes of respondents toward the same set of issues were included every election year from 1968 to 2008, except for the years 2002 and 2006. Questions about the perceived placement of Democratic and Republican presidential candidates were only included in presidential election years, beginning in 1972 and continuing every 4 years until 2008. Final sample sizes of respondents vary across models depending on the availability of relevant data for that model, ranging from 10,473 to 21,602 (see Table 1).

Analyses of Exaggerated Polarization Perception

To analyze exaggerated perception of polarization between Democrats and Republicans, we calculated two variables for every issue and respondent: perceived polarization and actual polarization. *Perceived polarization* was the respondent's estimated attitude of the "Republican Party" minus the respondent's estimated attitude of the "Democratic Party" for that issue. Higher numbers indicate greater perceived polarization. *Actual polarization* was calculated as the mean attitude of all respondents who self-identified as Republican minus the mean attitude of all respondents who self-identified as Democrat. We calculated actual polarization separately for each issue in each year. We then calculated *exaggerated polarization* as *perceived polarization* minus *actual polarization* for each respondent on each issue in every year. Positive scores indicate that the respondent overestimated (i.e., exaggerated) the actual level of polarization; negative scores indicate that the respondent underestimated polarization; and a score of zero indicates that the respondent's perceptions of the difference between Democrats and Republicans were accurately calibrated with the actual difference.

We modeled these exaggerated polarization scores using linear mixed effects models that simultaneously tested multiple predictors (Gelman & Hill, 2007; Snijders & Bosker, 2011). These models incorporate uncertainty due to random effects of both respondents and issues, avoiding potential problems of traditional regression procedures for analyzing data with multiple random factors, and allowing for generalization of results simultaneously across both respondents and issues (Judd, Westfall, & Kenny, 2012). The model thus reflects that both the respondents and the issues are but samples drawn from populations of respondents who might have been interviewed and from political issues that might have been asked about. Just as we wish to make inferences about the population of respondents, we also wish to make inferences about the population of partisan issues. The confidence intervals reported in our models therefore

reflect both respondent variability and uncertainty associated with variability within and between issues. We assumed that random effects were uncorrelated in our models.

In the primary models, we included several predictors to control for effects that are not the primary focus of investigation (see Table A1). We included demographic variables for age, gender, race/ethnicity, level of education, and income. Because demographics are not central to our hypotheses, they are not discussed in the text. The full results are reported in the relevant tables.

Because our measure of perceived polarization was computed as a respondent's estimate of the Republican party attitude minus the estimate of the Democratic party attitude, the possible range was +6 (indicating that respondents thought that Republicans held the most conservative attitude and Democrats held the most liberal attitude) to -6 (indicating that respondents estimated that Republicans held the most *liberal* attitude possible and Democrats held the most *conservative* attitude). In actuality, the vast majority of perceived polarization scores were between 6 and 0, indicating that most respondents correctly identified the *direction* of the difference between Republicans' and Democrats' attitudes. (There were no years and no issues for which the actual average Republican attitude was more liberal than the actual average Democrat attitude.) A minority of respondents consistently reversed the positions of the parties, estimating that Democrats held more conservative attitudes than did Republicans or that Republicans held more liberal attitudes than did Democrats. We excluded from analysis those 4.9% of respondents for whom we had estimates on at least three issues and who gave reversed estimates on more than half of these issues. These respondents were factually incorrect about the parties' respective attitude positions. All sample sizes reported in this paper are after applying this exclusion criterion.

Analysis of Change Over Time

We analyzed the actual and perceived polarization between the Democratic and Republican Parties in separate linear mixed models (see Table A3). Both models included a full set of orthogonal contrast codes for the years of the study in order to avoid autocorrelation in the model residuals across years. To examine increases in actual polarization over time, we included a contrast code comparing the average attitudes of self-identified Democrats to self-identified Republicans and allowed this code to interact with the linear effect of time. To examine increases in perceived polarization over time, we included a contrast code comparing the perceived attitude of the Democratic Party to the perceived attitude of the Republican Party and allowed this code to interact with the linear effect of time. In both cases, the interaction term is indicative of increased actual or perceived polarization between Democrats and Republicans over time.

Because of gaps in the time series (the years 2002 and 2006), the full set of contrast codes for years must be constructed with care: conventional orthogonal polynomial contrasts would not be orthogonal in the case of missing groups, and would thus test slightly different hypotheses. To deal with this, we first constructed a linear contrast by mean-centering a vector containing the unique non-missing year values for that analysis (e.g., for actual polarization: 1968, 1970, ..., 2000, 2004, 2008). We then used singular value decomposition to find a remaining set of orthogonal vectors, which, together with the linear contrast, would comprise a complete set of orthogonal contrast codes. In this way we can examine the linear effect of time (denoted as $Year_L$) while also controlling for all nonlinear effects of time (denoted as $Year_N$) in order to avoid autocorrelation of the model residuals.

Analyses of Perceived Presidential Polarization

During presidential election years, respondents were asked to estimate the attitudes of the Democrat and Republican presidential candidates on many of the same political issues for which they estimated the attitudes of the Democratic and Republican parties. We analyzed respondents' estimates of the attitudes of the presidential candidates using linear mixed models that had the same structure and included the same predictors as the models used to analyze respondents' estimates about the parties.

Although it is not possible to compare respondents' estimates of the presidential candidates' attitudes to the criterion of their actual attitudes (given that we have no measure of the candidates' actual attitude) we can still examine factors associated with perceived polarization between the two candidates. The perception of polarization between candidates is particularly important, because variation in perceived polarization between presidential candidates implies that different respondents attribute different political attitudes to the same concrete individuals. The analysis avoids the possibility, as might occur with estimates of the parties, that different individuals estimate different party attitudes because they construe the makeup of the parties differently. For example, respondents who identify more strongly with a party or who hold more extreme partisan attitudes might believe that the parties are more sorted (Fiorina et al., 2010) compared with individuals with weaker partisan identification and more moderate attitudes.

Analyses of Perceived Polarization in Own Group versus Opposing Group

Respondents' reported partisan identification also affords examination of whether people perceived polarization to a greater or lesser degree when estimating their political ingroup or their political outgroup (see Figure 4). We did this by comparing the perceived positions of Democrats and Republicans held by self-identified Democrats and Republicans with those held

by respondents who did not identify with either party, treating the Independents as a control group (see Table A5). For Independents, both Democrats and Republicans are outgroups, but neither is an opposing group.

Analyses of Political Action

We also tested whether perceived polarization between the parties and the candidates was predictive of political behaviors, which as a set we refer to as *political action*. In these models, measures of perceived polarization were predictors, rather than the criteria. These models simultaneously controlled for partisan identification (i.e., as Democrat, Republican, or independent), strength of partisan identification, attitude, attitude extremity, and all of the demographic variables included in our other models of perceived polarization. The measures of political action that we used in these analyses included responses to six binary behavioral items related to political action:

1. Did respondent vote in the November elections?
2. Did respondent try to influence the vote of others during the campaign?
3. Did respondent attend political meetings/rallies during the campaign?
4. Did respondent work for party or candidate during the campaign?
5. Did respondent display candidate button/sticker during the campaign?
6. Did respondent donate money to party or candidate during the campaign?

We analyzed these six items simultaneously using a mixed-effects logistic regression with crossed random effects for respondents and actions, including all predictors and covariates used in the models of polarization perception. We allowed varying slopes of perceived polarization across actions. Model estimates thus allow for generalization across the different forms of political action (see Table A6).

Results

People Exaggerate Polarization Between Democrats and Republicans

Respondents substantially exaggerated polarization between Democrats and Republicans, Wald $\chi^2(1) = 167.70, p < .001$ (see Figure 1). Even respondents who perceived the lowest levels of polarization, those with moderate or centrist attitudes and the lowest levels of partisan identification, significantly exaggerated polarization, Wald $\chi^2(1) = 13.91, p < .001$ (see Table A2 for a summary of the statistical model).

Because our primary measures of perceived polarization were based on survey questions that asked respondents about the attitudes held by “the Democratic party” and “the Republican party,” it is possible that respondents interpreted these questions as being not about typical party members, but rather about party elites such as political operatives, elected officials, or the most strongly identified party members, all of whom might be expected to hold relatively extreme partisan attitudes. The results of a follow-up study cast doubt on this possibility, however.

We recruited 270 participants from Amazon.com’s Mechanical Turk (Burmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). They placed themselves and the Democratic and Republican parties on 7-point attitude scales for 6 issues from the ANES that were pertinent in 2012: Defense, Health, Jobs, Minorities, Services, Women. The question formats were identical to those in the ANES. We experimentally manipulated the phrasing used to describe the intended Democratic and Republican targets using one of the four following targets: (a) the Democratic [Republican] Party, exactly as in the ANES; (b) those people who identify as Democrats [Republicans], which explicitly includes all self-identified party members; (c) Democratic [Republican] Party officials, that is, Democrats [Republicans] who hold an elected position at any level of government; and (d) people who identify as Strong Democrats

[Republicans]. We analyzed these data using linear mixed models with crossed random effects for respondents and issues, similar to our primary models of the ANES data, and tested fixed effects using the Kenward-Roger approximate denominator degrees of freedom method (Kenward & Roger, 1997).

The possibility that people interpret questions about the party as being about party officials or strong party members implies that estimates of the party should be more polarized than estimates of all identified party members. They were not. Participants did not perceive significantly more polarization when estimating the parties, as in the ANES ($M_{polarization} = 1.86$), than when estimating all self-identified party identifiers ($M_{polarization} = 1.74$), $F(1, 258.69) = 0.64$, $p = .422$. Participants also did not estimate the parties to be more polarized than strong Party identifiers ($M_{polarization} = 2.12$), $F(1, 253.54) = 2.36$, $p = .126$. In fact, participants estimated that the parties were *more* polarized than “Party officials” ($M_{polarization} = 1.46$), $F(1, 256.71) = 12.56$, $p < .001$, suggesting that even if people did interpret the ANES questions as being about party officials, such an interpretation would undermine rather than artificially inflate polarization. More generally, these results suggest that question interpretation does not fully account for exaggeration of political polarization between Democrats and Republicans.

Change Over Time

Actual polarization between Democrats and Republicans—defined as differences in the average attitudes of self-identified Democrats and Republicans—has increased over time, Wald $\chi^2(1) = 28.88$, $p < .001$ (see Table A3). Along with this, the perceived degree of polarization between the Democratic and Republican Parties—defined as differences in the average perceived attitudes of the two parties—has also increased over time, Wald $\chi^2(1) = 202.22$, $p < .001$.

Perceived Polarization Predicts Political Action

We analyzed 82,142 responses from 10,473 respondents toward the six reported political actions described earlier using a mixed-effects logistic regression model, structured similarly to those in the previous analyses, with crossed random effects for respondents and actions (Table A6). The more that respondents perceived polarization between typical Democrats and typical Republicans, the more likely they were to report having engaged in these political actions, Wald $\chi^2(1) = 28.80, p < .001$. Likewise, the more that respondents perceived polarization between the Democratic and Republican presidential candidates, the more likely they were to report having engaged in these actions, Wald $\chi^2(1) = 50.52, p < .001$.

These two associations between reported political actions and perceived polarization remain significant when entering perceptions of polarization between the parties and perceptions of polarization between candidates in the model simultaneously so that each effect is independent of the other. Respondents who perceived greater polarization between the parties were more likely to report having engaged in the political actions, holding constant perceptions of polarization between the candidates, Wald $\chi^2(1) = 11.27, p < .001$. And respondents who perceived greater polarization between the presidential candidates were also more likely to report having engaged in the political actions, holding constant perceptions of polarization between the parties, Wald $\chi^2(1) = 38.44, p < .001$.

Because of its central interest as an instrumental form of political action, we also tested models estimating reports of voting alone. The more that participants perceived polarization between the parties, the more likely they were to report having voted in the previous election, likelihood-ratio $\chi^2(1) = 92.20, p < .001$ (see line 1 in Figure 3, left panel). Compared to respondents who perceived *no* polarization between Republicans and Democrats (i.e., perceived polarization = 0; reported voting probability = 58.3%), those who perceived wide polarization

were more likely to report having voted (i.e., perceived polarization = 4; reported voting probability = 70.3%).

The results were similar for perceptions of polarization between presidential candidates, likelihood-ratio $\chi^2(1) = 98.03, p < .001$ (see line 1 in Figure 3, right panel). The more that respondents perceived the candidates as polarized, the more likely they were to report having voted in the election. Respondents who perceived *no* polarization between the presidential candidates (i.e., perceived polarization = 0; reported voting probability = 68.7%) were less likely to report having voted than were respondents who perceived wide polarization between the presidential candidates (i.e., perceived polarization = 4; reported voting probability = 82.5%). Again, both associations remained significant in a separate mixed model where both perceptions of polarization were entered simultaneously, $\chi^2_s > 9, p_s < .0001$.

Predicting Perceived Polarization

We expected that the strength of respondents' partisan identification and their attitude extremity would be independently associated with their perceived polarization between the parties and between the presidential candidates. We analyzed these effects simultaneously in the same model. Our four key predictors were the 7-point measure of the respondent's partisan identification (where $-3 = \textit{Strong Democrat}$ and $+3 = \textit{Strong Republican}$), the 7-point measures of the respondent's attitude on each issue (where $-3 =$ the most liberal response and $+3 =$ the most conservative response), and the quadratic effects of both partisan identification and attitude (i.e., partisan identification squared and attitude squared, with values of 0, 1, 4, or 9). The quadratic effects reflect the strength of respondents' partisan identification and the extremity of respondents' attitudes.

Partisan Identification Strength. The analysis yielded significant associations between the quadratic of respondents' partisan identification and perceived polarization between the parties, Wald $\chi^2(1) = 83.57, p < .001$, and between the two presidential candidates, Wald $\chi^2(1) = 44.86, p < .001$ (summarized in Figure 5 and Table A4). Respondents with stronger partisan identification as Democrat or Republican thus perceived greater polarization between the parties and between the presidential candidates than did respondents with weaker partisan identification. Moreover, the lack of a significant linear association with partisan identification in either model indicates that Democrats and Republicans did not significantly differ in their tendencies to perceive polarization between the parties and the presidential candidates.

Own Group versus Opposing Group. Testing and comparing the effects of own group polarization and opposing group polarization involve testing somewhat complicated linear combinations of the coefficients of the model shown in Table A5. There are six relevant groups of responses that are used to test these effects. Those six groups, and the linear combinations of model coefficients (labeled β_0 through β_5 ; see Table A5) that give their predicted group means, are the following:

$$\text{Republicans perceiving Democrats: } L_{RD} = \beta_0 - \beta_1 - \beta_2 - \beta_3 + \beta_4 + \beta_5$$

$$\text{Independents perceiving Democrats: } L_{ID} = \beta_0 + 2\beta_2 - \beta_3 - 2\beta_5$$

$$\text{Democrats perceiving Democrats: } L_{DD} = \beta_0 + \beta_1 - \beta_2 - \beta_3 - \beta_4 + \beta_5$$

$$\text{Republicans perceiving Republicans: } L_{RR} = \beta_0 - \beta_1 - \beta_2 + \beta_3 - \beta_4 - \beta_5$$

$$\text{Independents perceiving Republicans: } L_{IR} = \beta_0 + 2\beta_2 + \beta_3 + 2\beta_5$$

$$\text{Democrats perceiving Republicans: } L_{DR} = \beta_0 + \beta_1 - \beta_2 + \beta_3 + \beta_4 - \beta_5$$

Own group polarization can be tested against the following null hypothesis:

$$H_0: L_{Own} = (L_{ID} - L_{DD}) + (L_{RR} - L_{IR}) = -2\beta_1 - 6\beta_5 = 0$$

Opposing group polarization can be tested against the following null hypothesis:

$$H_0: L_{Opp} = (L_{ID} - L_{RD}) + (L_{DR} - L_{IR}) = 2\beta_1 - 6\beta_5 = 0$$

And the difference between own group polarization and opposing group polarization can be tested against the following null hypothesis:

$$H_0: L_{Opp} - L_{Own} = 4\beta_1 = 0$$

These linear combinations of coefficients were tested using the `linearHypothesis()` function from the `car` package in R. Respondents tended to perceive their own group's attitudes as more extreme, compared with how their group's attitudes were perceived by Independents. This was true for both the overall attitudes of their party, Wald $\chi^2(1) = 6.29, p = .012$, as well as the attitudes of the presidential candidate from their own group, Wald $\chi^2(1) = 2.96, p = .085$. Far stronger than respondents' tendency to exaggerate the extremity of their own group's attitudes was their tendency to exaggerate the extremity of the opposing group's attitudes, both the overall attitudes of the opposing party, Wald $\chi^2(1) = 118.13, p < .001$, as well as the attitudes of the presidential candidate from the opposing party, Wald $\chi^2(1) = 85.91, p < .001$. Most importantly, relative to the estimates made by non-identifiers, partisan respondents' estimates of the opposing political group showed greater polarization than did respondents' estimates of their own political group (Robinson, Keltner, Ward, & Ross, 1995). This was true both for perceptions of polarization between the parties, Wald $\chi^2(1) = 69.27, p < .001$, and perceptions of polarization between presidential candidates, Wald $\chi^2(1) = 113.2, p < .001$. Participants thus exaggerated polarization of their partisan outgroup more than their ingroup.

Attitude Extremity. People perceived greater polarization between both the parties and the candidates to the extent that their own attitudes were extreme. Notice that attitude extremity,

unlike partisan identification strength, varies both between-respondents and within-respondents. That is, some respondents generally hold more extreme attitudes than other respondents (between-respondents variability), and respondents often have more extreme attitudes on some issues than on other issues (within-respondents variability). We separately estimated the effects of within- and between-respondent variation in average attitudes on perceived polarization (see Table A4).²

People who generally held more extreme attitudes across issues perceived more polarization than people who held less extreme attitudes across issues, both for polarization between the parties, Wald $\chi^2(1) = 245.32, p < .001$ (see Figure 7, left panel), and for polarization between presidential candidates, Wald $\chi^2(1) = 166.51, p < .001$ (see Figure 7, right panel). People also perceived greater polarization on those issues for which their own attitudes were more extreme compared with those issues on which their own attitudes were less extreme. There were significant quadratic effects of respondents' own attitudes, both for parties, Wald $\chi^2(1) = 20.29, p < .001$, and for candidates, Wald $\chi^2(1) = 24.98, p < .001$. These results indicate that people who generally held relatively extreme attitudes perceive the greatest levels of polarization, and that people perceived greater polarization on those issues on which they held relatively extreme attitudes compared with those issues on which they held relatively less extreme attitudes. Of course, these effects of attitude extremity are independent of the effects of the respondent's partisan identification strength, partisan identification (i.e., Democrat or Republican) and the respondents' attitude position on specific issues (liberal or conservative).

Issue Partisanship: Partisan Identification \times Attitude Extremity. To examine the effect of issue partisanship—that is, the correspondence between attitudes and partisan identity—

² The separate estimation of between-respondent and within-respondent effects also solves the potential problem of random effects correlating with predictors in mixed effects models (Bafumi & Gelman, 2006; Bell & Jones, 2015; Mundlak, 1978).

we added to the model of perceived polarization the linear and quadratic interactions between partisan identification and attitude position (and extremity; see Table A4). Perceived polarization was largest among respondents whose attitudes were coherent with their partisan identification—that is, among Democrats with liberal attitudes and Republicans with conservative attitudes—than among respondents whose attitudes were not coherent with their partisan identification (see Figure 7).

This effect of issue partisanship was found both at the within-respondent and the between-respondent levels. Within respondents there was a significant linear strength of partisan identification \times linear attitude interaction, both for perceived polarization between the parties, Wald $\chi^2(1) = 99.87, p < .001$, and perceived polarization between presidential candidates, Wald $\chi^2(1) = 53.14, p < .001$. These effects indicate that when respondents hold an attitude that is more consistent with their partisanship (e.g., a Democrat whose position on an issue is more liberal) than an attitude that is less consistent, perceived polarization is greater. At the between-respondent level, perceived polarization was substantially larger among respondents who were strong, extreme, and consistent in their partisan identification and attitude positions (i.e., high issue-partisanship respondents) compared with respondents whose partisan identification and attitude positions were less consistent (i.e., low issue-partisan respondents), both for parties, Wald $\chi^2(1) = 232.2, p < .001$, and for candidates, Wald $\chi^2(1) = 232.74, p < .001$.

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Table A1

Description of all predictor variables used in primary models reported in the paper, and the ANES variable codes from which they were derived.

| Predictor | Description |
|--------------------------------------|---|
| $Attitude_{ij}$ | 7-point score indicating respondent i 's self-reported attitude toward political issue j , scaled such that a score of -3 represented the most "liberal" response (e.g., government should increase services and spending) and a score of $+3$ represented the most "conservative" response (e.g., government should decrease services and spending). |
| $Attitude_{i\bar{v}}$ | Within-respondent mean-centered attitude, representing attitudes that are more or less liberal and the average attitude for a respondent. Computed as $Attitude_{ij} - \overline{Attitude}_{i\cdot}$. |
| $Attitude_{\bar{v}}$ | Respondent mean on the Attitude predictor. Computed as $\overline{Attitude}_{i\cdot}$. |
| $Attitude_{i\bar{v}}^2$ | Quadratic within-respondent mean-centered Attitude score, representing attitude extremity. Computed as $Attitude_{ij}^2 - Attitude_{\bar{v}}^2$. |
| $Attitude_{\bar{v}}^2$ | Respondent mean on the squared Attitude predictor, representing extremity of average attitude. |
| Party | 7-point score indicating respondent's political identification, scaled so that -3 represented Strong Democrats, 0 represented Independents, and $+3$ represented Strong Republicans. |
| Party ² | Quadratic Party score, representing strength of partisan identification, ranging from 0 (Independents) to 9 (strongest identification with the Democratic or Republican party). |
| Age | Continuous covariate, grand-mean centered. |
| Gender | Categorical covariate, coded with males = -1 and females = $+1$. |
| Race ₁ -Race ₅ | Categorical covariate indicating race of respondent, coded with a complete set of orthogonal contrast codes |
| Education | Seven-point scale with response categories ranging from "8 grades or less" to "Advanced degree including LLB." Entered as a grand-mean centered continuous covariate. |
| Income | Five-point scale with response categories ranging from "0 to 16 percentile" to "96 to 100 percentile." Entered as a grand-mean centered continuous covariate. |
| TargetParty | Contrast code comparing perceptions of the Democratic Party (code = -1) with perceptions of the Republican Party (code = $+1$). |
| OwnParty | Contrast code comparing respondents identifying with the Democratic Party (code = -1) to respondents identifying with the Republican Party (code = $+1$). Independents had missing values on this variable. |
| OwnDvsR | Contrast code comparing respondents identifying with the Democratic Party (code = $+1$), the Republican Party (code = -1), or as Independents (code = 0). |
| OwnIvsNI | Contrast code comparing respondents identifying as Independents (code = $+2$) to respondents identifying with either of the major parties (both with code = -1). |
| Year | Complete set of 18 orthogonal polynomial contrast codes representing election years (presidential and mid-term) from 1968 to 2008, with data from 2002 and 2006 missing (see Table 1). |
| Year _L | The linear effect of time (i.e., the first polynomial contrast code for Year). |
| Year _N | All nonlinear effects of time (i.e., the set of all 17 other polynomial contrast codes for Year beyond the first, linear code.) |
| PartyPol. | Perceived polarization between "the Democratic Party" and "the Republican Party," computed as the estimated attitude position of Republicans minus the estimated attitude position of Democrats. This is the dependent variable in the "party members model" from Table A4, and a predictor in the model in Table A6. |
| CandPol. | Perceived polarization between the Democrat presidential candidate and the Republican presidential candidate, computed as the estimated attitude position of the Republican minus the estimated attitude position of the Democrat. This is the dependent variable in the "presidential candidates model" from Table A4, and a predictor in the model in Table A6. |

Table A2

Parameter estimates from linear mixed models of exaggerated polarization scores. SD = standard deviation; SE = standard error. Random effect standard deviations listed as “—” were not estimated in the model. Fixed effects estimates and standard errors listed as “—” are multiple-degree-of-freedom tests that have been collapsed to a single row to save space.

* $p < .05$, ** $p < .01$, *** $p < .001$

Random effects (standard deviations):

| Predictor | Respondents | Issues |
|------------------------------------|--------------------|---------------|
| Income | — | 0.04 |
| Education | — | 0.05 |
| Race ₅ | — | 0.01 |
| Race ₄ | — | 0.06 |
| Race ₃ | — | 0.03 |
| Race ₂ | — | <0.01 |
| Race ₁ | — | 0.14 |
| Gender | — | 0.02 |
| Age | — | <0.01 |
| Party ² | — | 0.01 |
| Party | — | 0.07 |
| Attitude _B ² | — | 0.03 |
| Attitude _B | — | 0.08 |
| Attitude _W ² | 0.05 | 0.01 |
| Attitude _W | 0.39 | 0.04 |
| Intercept | 0.98 | 0.12 |
| Sample sizes: | 19,384 | 10 |
| Residual SD: | 1.46 | |
| Total observations: | 80,973 | |

Fixed effects:

| Predictor | Estimate | SE | Wald χ^2 |
|------------------------------------|-----------------|-----------|---------------------------------|
| Intercept | 0.194 | 0.071 | 7.43** |
| Attitude _W | -0.033 | 0.015 | 4.96* |
| Attitude _W ² | 0.021 | 0.005 | 20.85*** |
| Attitude _B | -0.108 | 0.026 | 17.07*** |
| Attitude _B ² | 0.169 | 0.011 | 227.18*** |
| Party | 0.037 | 0.023 | 2.64 |
| Party ² | 0.053 | 0.005 | 93.14*** |
| Age | 0.005 | 0.002 | 8.44** |
| Gender | -0.053 | 0.011 | 24.60*** |
| Education | 0.178 | 0.017 | 111.33*** |
| Income | 0.072 | 0.015 | 22.31*** |
| Race | — | — | 26.96*** |
| Year | — | — | 305.88*** |

Table A3

Parameter estimates from linear mixed models of actual and perceived polarization over time. SD = standard deviation; SE = standard error. Random effect standard deviations listed as “—” were not estimated in the model. Fixed effects estimates and standard errors given as “—” are multiple-degree-of-freedom tests that have been collapsed to a single row to save space, or if the Wald χ^2 statistic is also missing, were not estimated in the model. † $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Random effects (standard deviations):

| Predictor | Actual polarization model | | Perceived polarization model | |
|---------------------|----------------------------------|---------------|-------------------------------------|---------------|
| | Respondents | Issues | Respondents | Issues |
| TargetParty | — | — | 0.53 | 0.17 |
| OwnParty | — | 0.15 | — | — |
| Intercept | 0.77 | 0.85 | 0.47 | 0.26 |
| Sample sizes: | 21,602 | 10 | 21,398 | 10 |
| Residual SD: | 1.59 | | 1.26 | |
| Total observations: | 124,340 | | 183,158 | |

Fixed effects:

| Predictor | Actual polarization model | | | Perceived polarization model | | |
|----------------------------|----------------------------------|-----------|---------------------------------|-------------------------------------|-----------|---------------------------------|
| | Estimate | SE | Wald χ^2 | Estimate | SE | Wald χ^2 |
| Intercept | 0.158 | 0.269 | 0.34 | -0.085 | 0.084 | 1.04 |
| Year _L | -0.006 | 0.001 | 37.52*** | 0.010 | 0.001 | 316.70*** |
| OwnParty | 0.405 | 0.047 | 74.57*** | — | — | — |
| OwnParty*Y _L | 0.004 | <0.001 | 28.88*** | — | — | — |
| TargetParty | — | — | — | 0.705 | 0.055 | 166.69*** |
| TargetParty*Y _L | — | — | — | 0.008 | 0.001 | 202.22*** |
| Year _N | — | — | 361.24*** | — | — | 425.77*** |

Table A4

Parameter estimates from linear mixed models of perceived polarization between typical party members and presidential candidates. These models were first estimated without the interaction terms, and the estimates from this first model are what are reported for all coefficients other than the interaction terms. SD = standard deviation; SE = standard error. Random effect standard deviations listed as “—” were not estimated in the model. Fixed effects estimates and standard errors given as “—” are multiple-degree-of-freedom tests that have been collapsed to a single row to save space.

† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Random effects (standard deviations):

| Predictor | Party model | | Presidential candidates model | |
|--|--------------------|---------------|--------------------------------------|---------------|
| | Respondents | Issues | Respondents | Issues |
| Income | — | 0.03 | — | 0.05 |
| Education | — | 0.05 | — | 0.03 |
| Race ₅ | — | 0.01 | — | 0.02 |
| Race ₄ | — | 0.05 | — | — |
| Race ₃ | — | 0.02 | — | 0.03 |
| Race ₂ | — | <0.01 | — | 0.02 |
| Race ₁ | — | 0.13 | — | 0.12 |
| Gender | — | 0.01 | — | 0.02 |
| Age | — | <0.01 | — | <0.01 |
| Party ² | — | 0.01 | — | 0.01 |
| Party | — | 0.07 | — | 0.05 |
| Attitude _B ² | — | 0.02 | — | 0.03 |
| Attitude _B | — | 0.07 | — | 0.10 |
| Attitude _W ² | 0.04 | 0.01 | 0.04 | 0.01 |
| Attitude _W | 0.38 | 0.04 | 0.43 | 0.03 |
| Attitude _W *Party | — | 0.04 | — | 0.05 |
| Attitude _W *Party ² | — | <0.01 | — | <0.01 |
| Attitude _W ² *Party | — | <0.01 | — | <0.01 |
| Attitude _W ² *Party ² | — | <0.01 | — | <0.01 |
| Attitude _B *Party | — | 0.03 | — | 0.02 |
| Attitude _B *Party ² | — | <0.01 | — | <0.01 |
| Attitude _B ² *Party | — | 0.01 | — | <0.01 |
| Attitude _B ² *Party ² | — | <0.01 | — | <0.01 |
| Intercept | 0.97 | 0.24 | 0.96 | 0.27 |
| Sample sizes: | 19,382 | 10 | 13,547 | 7 |
| Residual SD: | | 1.46 | | 1.51 |
| Total observations: | | 80,971 | | 52,299 |

Fixed effects:

| Predictor | Party model | | | Presidential candidates model | | |
|-----------------------------|-------------|-------|---------------|-------------------------------|-------|---------------|
| | Estimate | SE | Wald χ^2 | Estimate | SE | Wald χ^2 |
| Intercept | 0.970 | 0.099 | 95.77*** | 0.886 | 0.110 | 64.89*** |
| $Attitude_{IV}$ | -0.032 | 0.016 | 4.05* | 0.010 | 0.016 | 0.40 |
| $Attitude_{IV}^2$ | 0.021 | 0.005 | 20.29*** | 0.036 | 0.007 | 24.98*** |
| $Attitude_B$ | -0.110 | 0.025 | 18.49*** | -0.067 | 0.041 | 2.68 |
| $Attitude_B^2$ | 0.168 | 0.011 | 245.32*** | 0.213 | 0.017 | 166.51*** |
| Party | 0.038 | 0.023 | 2.65 | 0.022 | 0.022 | 0.94 |
| Party ² | 0.052 | 0.006 | 83.57*** | 0.055 | 0.008 | 44.86*** |
| Age | 0.005 | 0.002 | 7.99** | 0.002 | 0.002 | 1.46 |
| Gender | -0.053 | 0.011 | 24.85*** | -0.064 | 0.016 | 16.70*** |
| Education | 0.178 | 0.018 | 102.52*** | 0.168 | 0.017 | 99.17*** |
| Income | 0.072 | 0.015 | 23.58*** | 0.072 | 0.023 | 10.16** |
| Race | — | — | 26.85*** | — | — | 13.70** |
| Year | — | — | 549.45*** | — | — | 447.73*** |
| $Attitude_{IV} * Party$ | 0.124 | 0.012 | 99.87*** | 0.147 | 0.020 | 53.14*** |
| $Attitude_{IV} * Party^2$ | 0.001 | 0.002 | 0.12 | 0.004 | 0.002 | 3.11† |
| $Attitude_{IV}^2 * Party$ | -0.001 | 0.002 | 0.29 | -0.003 | 0.002 | 3.67† |
| $Attitude_{IV}^2 * Party^2$ | 0.000 | 0.001 | 0.16 | -0.004 | 0.001 | 12.57*** |
| $Attitude_B * Party$ | 0.164 | 0.011 | 232.20*** | 0.187 | 0.012 | 232.74*** |
| $Attitude_B * Party^2$ | 0.004 | 0.003 | 1.92 | 0.008 | 0.004 | 4.13* |
| $Attitude_B^2 * Party$ | -0.006 | 0.004 | 2.92† | -0.006 | 0.004 | 2.12 |
| $Attitude_B^2 * Party^2$ | 0.002 | 0.002 | 1.26 | -0.004 | 0.002 | 3.49† |

Table A5

Parameter estimates from linear mixed models of perceived attitudes of typical party members and presidential candidates. SD = standard deviation; SE = standard error. Random effect standard deviations listed as “—” were not estimated in the model. Fixed effects estimates and standard errors given as “—” are multiple-degree-of-freedom tests that have been collapsed to a single row to save space.

† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Random effects (standard deviations):

| Predictor | Party model | | Presidential candidates model | |
|-------------------------------|-------------|---------|-------------------------------|---------|
| | Respondents | Issues | Respondents | Issues |
| Income | — | 0.01 | — | 0.02 |
| Education | — | 0.02 | — | 0.04 |
| Race ₅ | — | 0.01 | — | 0.02 |
| Race ₄ | — | 0.03 | — | 0 |
| Race ₃ | — | 0.03 | — | 0.02 |
| Race ₂ | — | 0.03 | — | 0.06 |
| Race ₁ | — | 0 | — | 0 |
| Gender | — | 0.01 | — | 0.01 |
| Age | — | 0 | — | 0 |
| (β ₃) TargetParty | 0.53 | 0.17 | 0.52 | 0.19 |
| (β ₂) OwnIvsNI | — | 0.03 | — | 0.04 |
| (β ₁) OwnDvsR | — | 0.05 | — | 0.04 |
| (β ₅) TP*OINI | — | 0.03 | — | 0.04 |
| (β ₄) TP*ODR | — | 0.12 | — | 0.1 |
| (β ₀) Intercept | 0.44 | 0.25 | 0.44 | 0.4 |
| Sample sizes: | 19,453 | 10 | 13,708 | 7 |
| Residual SD: | | 1.24 | | 1.29 |
| Total observations: | | 164,566 | | 108,356 |

Fixed effects:

| Predictor | Party model | | | Presidential candidates model | | |
|-------------------------------|-------------|-------|---------------|-------------------------------|-------|---------------|
| | Estimate | SE | Wald χ^2 | Estimate | SE | Wald χ^2 |
| (β ₀) Intercept | -0.047 | 0.086 | 0.30 | -0.113 | 0.164 | 0.48 |
| (β ₁) OwnDvsR | 0.141 | 0.017 | 69.27*** | 0.189 | 0.018 | 113.20*** |
| (β ₂) OwnIvsNI | 0.005 | 0.012 | 0.17 | 0.015 | 0.015 | 0.99 |
| (β ₃) TargetParty | 0.636 | 0.055 | 135.22*** | 0.774 | 0.071 | 117.57*** |
| (β ₄) TP*ODR | -0.035 | 0.038 | 0.87 | -0.013 | 0.039 | 0.11 |
| (β ₅) TP*OINI | -0.075 | 0.010 | 59.85*** | -0.092 | 0.016 | 34.55*** |
| Age | 0.000 | 0.001 | 0.04 | -0.001 | 0.001 | 0.37 |
| Gender | 0.016 | 0.006 | 7.50** | 0.007 | 0.008 | 0.77 |
| Education | -0.006 | 0.006 | 0.95 | -0.008 | 0.017 | 0.25 |
| Income | -0.020 | 0.007 | 9.20** | -0.010 | 0.008 | 1.42 |
| Race | — | — | 34.85*** | — | — | 14.71* |
| Year | — | — | 683.95*** | — | — | 717.45*** |

Table A6

Parameter estimates from logit mixed models of political actions. SE = standard error. Random effect standard deviations listed as “—” were not estimated in the model. Fixed effects estimates and standard errors given as “—” are multiple-degree-of-freedom tests that have been collapsed to a single row to save space, or if the Wald χ^2 statistic is also missing, were not estimated in the model.

† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Random effects (standard deviations):

| Predictor | Party model | | Presidential candidates model | |
|---------------------|--------------------|----------------|--------------------------------------|----------------|
| | Respondents | Actions | Respondents | Actions |
| PartyPol. | — | 0.05 | — | — |
| CandPol. | — | — | — | 0.05 |
| Intercept | 1.25 | 1.81 | 1.27 | 1.88 |
| Sample sizes: | 10,473 | 6 | 10,661 | 6 |
| Total observations: | 82,142 | | 68,699 | |

Fixed effects:

| Predictor | Party model | | | Presidential candidates model | | |
|------------------------------------|--------------------|-----------|---------------------------------|--------------------------------------|-----------|---------------------------------|
| | Estimate | SE | Wald χ^2 | Estimate | SE | Wald χ^2 |
| Intercept | -3.007 | 0.762 | 15.56*** | -2.885 | 0.768 | 14.12*** |
| Attitude _R | -0.022 | 0.018 | 1.38 | -0.038 | 0.018 | 4.54* |
| Attitude _R ² | 0.061 | 0.011 | 33.38*** | 0.027 | 0.010 | 7.72** |
| Party | -0.001 | 0.009 | 0.00 | 0.005 | 0.009 | 0.30 |
| Party ² | 0.114 | 0.005 | 536.51*** | 0.120 | 0.005 | 515.96*** |
| PartyPol. | 0.118 | 0.022 | 28.80*** | — | — | — |
| CandPol. | — | — | — | 0.156 | 0.022 | 50.52*** |
| Age | 0.012 | 0.001 | 122.70*** | 0.010 | 0.001 | 85.47*** |
| Gender | -0.074 | 0.017 | 18.01*** | -0.067 | 0.018 | 14.29*** |
| Education | 0.293 | 0.012 | 624.28*** | 0.300 | 0.012 | 614.23*** |
| Income | 0.226 | 0.017 | 181.68*** | 0.229 | 0.018 | 167.23*** |
| Race | — | — | 60.80*** | — | — | 36.01*** |
| Year | — | — | 852.61*** | — | — | 244.63*** |