

Culture War or The Economy? A new perspective on the ideological structure of the American electorate

STEFFEN ZITTLAU

University of Mannheim

LUKAS F. STOETZER

University of Mannheim

June 18, 2015

Abstract

Political science research comes to different conclusions about which policy dimension primarily drives voting behavior in the United States. Some emphasize economic preferences as central in explaining voting decisions (Bartels 2006, Ansolabehere et al. 2006), others stress socio-cultural attitudes (Haidt 2012, Lavine 2010). In this paper, we propose a new perspective on the ideological structure of US voter preferences that reconciles these diverging finding. We make the case that the two dimensions are ideologically connected and are, at least partially, functional equivalents. Although voters may have well defined economic and cultural preferences, the two do not work additive in the vote choice mechanism: Voter preferences on the two dimensions are non-separable. We formally derive how non-separability of preferences can originate from one underlying ideological dimension that drives voting behavior. Analyzing survey data on US presidential elections from 1996 to 2012, we estimate to which extent economic and socio-cultural preferences are non-separable. Evidence from an original experiment underlines that non-separability is due to one-dimensional ideological considerations of voters. These findings inform us how voters and candidate campaigns use non-separability as an effective heuristic device to reduce the dimensional complexity of political choice and communication.

Is political conflict becoming increasingly about social or "moral" issues, while economic interest and class, the traditional line of political conflict, recedes into the background? This idea of a "Culture War" becoming the defining feature of political conflict in the United States reached center stage with Pat Buchanan's speech at the Republican National Convention in 1992, in which he claimed that there is a "religious war for the soul of America". The strategic use of so called "wedge issues" during the Republican campaign in the the subsequent presidential election has entrenched the perception of a realignment of American politics along a public morality cleavage. An influential popular account was given by Frank's (2004) book "What's the matter with Kansas" that suggests that the Republican Party had managed to convince working-class white voters to vote against their economic interests by shifting their attention to moral issues. The origins of the academic counterpart of this debate can be found in parts of political sociology and psychology. Hunter (1991) argued that the American electorate is increasingly divided along a progressive-orthodox cultural cleavage. This struggle over the moral authority is said to be played out on "hot-button" issues such as abortion, guns and homosexuality that as a result crowd out economic issues.

Political behavior research has vehemently argued against the notion that there a "supercession of the classic economic conflicts [...] by newly emergent moral and religious ones" (Fiorina, Abrams and Pope, 2004, p.2). Fiorina, Abrams and Pope (2004) find that while the importance of social issues has increased, economic issues are still more important to voters when choosing candidates. In a critical review of Frank (2004), Bartels (2006) reveals that economic issues are still most important in determining vote choice. In the same vain, Ansolabehere, Rodden and Snyder (2006) argue that the impact of economic preferences on voting behavior still dominates social preferences (see also Ansolabehere, Rodden and Snyder, 2008). Gelman (2008) comes to very similar conclusions, creating an overall unambiguous assessment: economic issues still trump social issues.

Our paper contributes to the debate by tackling the question from a different angle. We make transparent that past behavioral research has worked with a strong assumption about the relationship between economic and social policy preferences. Namely, that they have nothing to do with each other. We argue that economic and social policy preferences can not be treated independently of each other when we want to explain political choice. They are intricately linked, as both recur to a common underlying dimension that actually drives political behavior. This renders citizens preferences for economic and social issues non-separable.

Our argument is based on a multidimensional spatial voting model, where the relevant policy space is defined by a economic and social policy dimension. Economic

policy captures the conflict over the extent of economic redistribution, and social policy depicts conflict over non-economic "moral" and socio-cultural issues. The original formulation of the canonical Weighted Euclidean Distance model (WED) (Davis, Hinich and Ordeshook, 1970) specifically allows for non-separability of preferences. Non-separability means that utility loss derived from policy distance on one dimension is conditional on policy distance on the other dimension. Non-separability can work in two directions: preferences can act as substitutes or complements. We argue that if the multidimensional preferences recur to the same underlying ideological dimension, economic and social policy preferences act as substitutes. A substitutional relationship of dimensional preferences effectively means that voters prefer candidates that offer policy packages that combine policy distance on economic issues with distance in the opposite direction on social issues, or vice versa. Liberal and conservative deviations from the voter ideal point on the two dimensions compensate for each other, as both dimensions (partially) fulfill the same voter need of ideological closeness.

To outline our argumentation the remainder of the manuscript is structured as follows. First, we discuss non-separability in a model of multidimensional spatial voting in mass elections. We then investigate how one underlying dimension that structures political behavior can render multidimensional preferences non-separable. Our theoretical argumentation is tested by estimating the non-separability of voter preferences in five US presidential elections from 1996 to 2012. We corroborate our empirical finding, that economic and social policy preferences act as partial substitute goods in voter utility functions, with an experimental design. Our experimental evidence points in the same direction - preferences are non-separable and act as substitutes rather than complements. Lastly we discuss the implications of the findings for our understanding of the structure of multidimensional voter preferences for political behavior.

I. NON-SEPARABILITY IN THE WEIGHTED EUCLIDEAN DISTANCE MODEL

The spatial model of voting builds the basis of our theoretical considerations. We take the Weighted Euclidean Distance (WED) model (Davis, Hinich and Ordeshook, 1970; Enelow and Hinich, 1984; Hinich and Munger, 1997) as our starting point, as it explicitly allows for non-separable voter utility functions. In the following we outline the WED model and discuss the interpretation of non-separability in a two dimensional policy space. In the WED model, loss from spatial distance for a given voter i and policy platform j in a d -dimensional policy space is defined by:

$$U_{ij} = -\sqrt{[\mathbf{p}_j - \mathbf{v}_i]^T \mathbf{A} [\mathbf{p}_j - \mathbf{v}_i]}, \quad (1)$$

where v is a coordinate vector of voter ideal point of length d , and p is a coordinate vector of policy platform positions of the same length d . The elements of the $d \times d$ matrix A can be understood as weighting parameters (Davis, Hinich and Ordeshook, 1970, 433). For a two-dimensional Euclidean policy space, the utility function can be written as

$$U_{ij} = -\sqrt{a_{11}[p_{j1} - v_{i1}]^2 + a_{22}[p_{j2} - v_{i2}]^2 + 2a_{12}[p_{j1} - v_{i1}][p_{j2} - v_{i2}]}, \quad (2)$$

where a_{11}, a_{22} are the diagonal, and a_{12} (respectively a_{21}), the off-diagonal entries of the matrix

$$A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}.$$

The entries on the main diagonal of A are dimension-specific weighting parameters, which express the salience voters attach to each policy dimension.¹ The off-diagonal entries of A are interactions between the dimension-specific directed distances, and as such capture the degree of separability. Preferences are separable if and only if A is a diagonal matrix, i.e., all entries on the off-diagonals of A are zero. Voter utility then simplifies to $-\sqrt{a[p_j - v_i]^2}$, where a is a vector containing the diagonal elements of A .

If we allow for non-separability, an important constraint on A becomes relevant: A is a symmetric positive definite matrix (Davis, Hinich and Ordeshook, 1970, 433).² This property guarantees that the quadratic form $[p - v]^T A [p - v]$ is positive for all $p_j - v_i \neq 0$. The symmetric property means that $a_{12} = a_{21}$, i.e. is that non-separability works equally in both directions, i.e., that we expect the same interaction between the dimension-specific distances no matter which dimension is evaluated first. Furthermore, both these properties ensure that A can be depicted as an ellipsoid, which directly speaks to the notion of indifference curves. Figure 1 depicts the utility indifference contours for exemplary A matrices in a two-dimensional policy space.

If preferences are separable and dimensions are equally important (1), indifference contours are circular, as the WED simplifies to Simple Euclidean distance. When dimensional saliences differ (2), indifferences contours are compressed along the more salient dimension, in our case the first dimension. In scenarios (3) and (4) preferences are non-separable. The presence of the interaction between the dimensional distances leads indifference contours to be “stretched” along the diagonals of the policy space.

¹In line with the vast majority of applications of spatial voting theory, we assume A to be homogeneous in the population. For a detailed discussion of the homogeneity assumption see Rivers (1988).

²A symmetric matrix is positive definite if all its eigenvalues are positive. A 2×2 matrix is positive definite if the product of the diagonal elements is larger than the product of the off-diagonal elements.

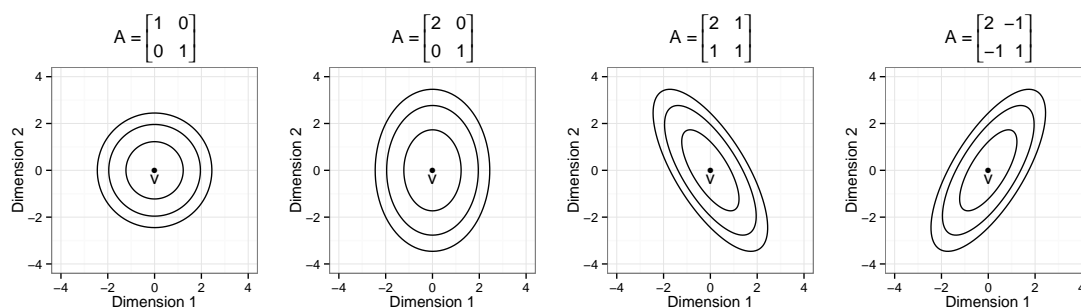


Figure 1: *Indifference Contours for exemplary A matrices. From left to right: (1) equally salient, separable dimensions, (2) Dimension 1 more salient, separable (3) negative complementary dimensions (substitute), (4) positive complementary dimensions (complement).*

Two directions of non-separability can be distinguished: dimensions can be positive or negative complementary. Negative entries in the off-diagonals of A are associated with positive complementarity, and vice versa. This is due to the fact that distance enters utility negatively: If separability parameters are positive, larger distances on the individual dimensions lead to even higher loss in utility. As this nomenclature might be confusing at times, we will refer to distances on dimensions as substitutes if they are negative complementary, and complements if they are positive complementary.

The graphical depiction of indifference curves lets the concept seem deceptively intuitive. Non-separability however has far-reaching consequences for our understanding of spatial voting. Non-separability “requires that voters consider *all* issue positions before choosing *any*” (Hinich and Munger, 1997, 85). In effect, this means that voters evaluate policy packages, and not the separate positions the platforms take on each of the relevant policy dimensions. Consider a policy space that is defined by a economic left-right and a socio-cultural liberal-conservative dimension. Assume the two dimensions to be equally salient ($a_{11} = a_{22}$), and voter i 's ideal point V at $[0,0]$, platform positions P_1 at $[1,0]$ and P_2 at $[1,.5]$. Figure 2 depicts this spatial configuration in a Cartesian coordinate system. More leftist and more socially conservative positions are found in quadrant II, more rightist and conservative combinations in I, and so on (see Figure 2).

When voter policy preferences are separable (left panel of Figure 2), i will prefer platform 1 over platform 2, as P_1 is located on a higher utility curve than P_2 . i 's preference ordering over platforms is reversed in the non-separable case, depicted in the right-hand panel of Figure 2. If dimension-specific distances are substitutes,

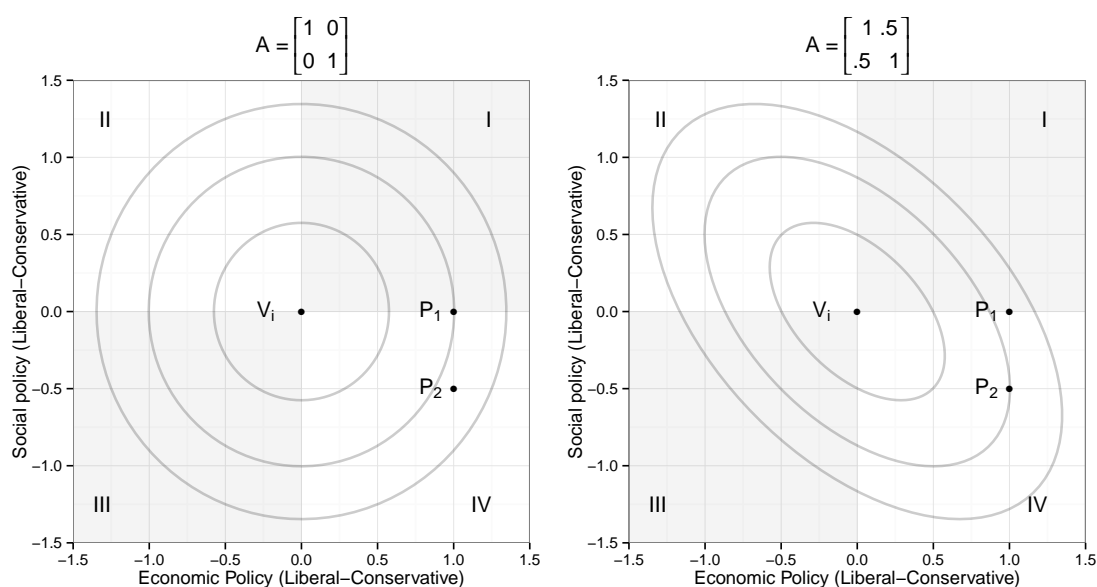


Figure 2: Exemplary choice scenario. Gray lines depict indifference contours. Left panel: Voter i with ideal point V and separable preferences prefers platform P_1 over platform P_2 . Right panel: Voter i with non-separable preferences prefers P_2 over P_1 .

platform 2 is at a higher utility curve even though both platforms are equidistant on the economic dimension and platform 1 is congruent with i 's liberal-conservative ideal point. Since voter i 's preferences are non-separable, platform 2 can substitute utility loss from being too economically rightist for voter i by holding more liberal positions than the voter. The reversal of voter i 's preference order over platforms is not a result of differences in proximity or salience, but due to the fact that the policy package offered by platform 2 combines dimensional distances in a way that conforms with the direction of the voter's non-separability terms.

Non-separability has strong theoretical implications for all multidimensional spatial voting models. If preferences are non-separable, policy packages hold properties of their own. All real-world policy platforms only come as policy packages and packaging, the way in which policy platforms combine policies, might matter to voters. In a recent paper, Stoetzer and Zittlau (2015) have shown that conventional separable model specifications yield biased and/or unreliable estimates of the effect of policy distances on vote choice probabilities in the presence of non-separable preferences. This renders conclusions based on separable model specifications unreliable to infer about the importance of socio-cultural and economic dimensions in voters evaluation of political candidates. Instead, Stoetzer and Zittlau show in three empirical applications, that voter preferences on economic and socio-cultural issues seem to be substitutes. The

next section offers a theoretical explanation for the origin of non-separability why policy preferences may be non-separable.

II. THE ORIGINS OF NON-SEPARABILITY

The interpretation of non-separability as an empirical phenomenon is relatively intuitive: Policy packages, the way in which platform combine directed distances in the multidimensional policy space, matter to voters. But why is this the case? Where does non-separability come from? The theoretical underpinnings of the phenomenon are not well understood, at least in the realm of multidimensional spatial voting in mass elections. In this section we try to shed light on what non-separability can teach us about the structure of voters multidimensional policy preferences.

Our contribution offers an explanation why voters' preferences across multiple dimensions are non-separable. We argue that non-separability in mass elections can be imagined as an ideological constraint. If two policy dimensions fulfill the same voter need, preferences on these dimensions become substitutes. This means that although voters might possess distinct preferences on these policy dimensions, what they really care about when choosing representatives is a lower-dimensional concept such as a single ideological dimension. In the case where preferences are perfect substitutes, it becomes hard to argue that voters really care about individual policy dimensions. In such a case, non-separability leads to a reduction in the effective dimensionality of the policy space.

This line of thought implies that non-separability of multidimensional preferences arises if multidimensional policy preferences can be traced back to one underlying dimension. We refer to this one-dimensional concept as ideology (for the lack of a better term), meaning the *liberal-conservative* general line of political conflict in the United States, in the European context generally labeled *the general left-right dimension*. Our argument starts with a hypothetical scenario where voters only care about the single ideological dimension when choosing which candidate to vote for: The utility of voter i to vote for party j is determined by the negative Euclidean ideological distance between the party platform P_j and the voter ideal point V_i ,

$$U_{ij} = -\sqrt{[P_j - V_i]^2} = -|P_j - V_i|. \quad (3)$$

Our argument supposes that voters reduce the dimensionality of their multidimensional policy preferences to these ideological platforms.³ Policy preference are

³This perspective mimics current developments in scaling of political positions from roll-call votes (Clinton, Jackman and Rivers, 2004), expert surveys (Lo, Proksch and Gschwend, 2013) and survey

represented by two dimensions, economic and social-cultural policy preferences. Reducing the dimensionality means that voters project their preferences as well as the positions of parties on a common ideological trait, using the expression

$$P_j = \hat{b}_1 p_{j1} + \hat{b}_2 p_{j2} \quad (4)$$

$$V_i = \hat{b}_1 v_{i1} + \hat{b}_2 v_{i2}. \quad (5)$$

p_{jk} denotes party j 's position on the economic ($k = 1$) and the social ($k = 2$) dimension and v_{ik} describe a voter's position. Essentially, the parameters \hat{b}_k entail how ideology is connected to policy positions. They are of special concern in the latter analysis, as they define the ideological constraint. Suppose that both parameters have the same sign, i.e. point in the same direction on the underlying ideological dimension. The two equations further imply that the ideological structure and the way how positions are projected is the same for voters and parties.

The ideological constraint of policy preferences has consequences for multi-dimensional spatial voting. To see that the ideological constraint will result in a non-separable preferences profile, we can substitute equation 4 and 5 in equation 3:

$$U_{ij} = -\sqrt{\left[(\hat{b}_1 p_{j1} + \hat{b}_2 p_{j2}) - (\hat{b}_1 v_{i1} + \hat{b}_2 v_{i2}) \right]^2} \quad (6)$$

Which after some manipulation yields:

$$U_{ij} = -\sqrt{\left[\hat{b}_1^2 (p_{j1} - v_{i1})^2 + \hat{b}_2^2 (p_{j2} - v_{i2})^2 + 2\hat{b}_1\hat{b}_2 (p_{j1} - v_{i1})(p_{j2} - v_{i2}) \right]} \quad (7)$$

As a result, utility depends on the distance on the first dimension, the second dimension and the interaction of the directed distance terms. This corresponds to the utility model in two-dimensional Euclidean policy space with non-separable preferences, as outlined in equation 2. The salience parameters are generally positive as they appear squared in the final expression. The last term represents the non-separability. Whether this results in substitutional or complementary preference profiles depends on the structure of ideological constraint in equation 4 and 5. If both parameters have the same sign and thus fulfill the same ideological conviction, this creates substitutes. If they show in opposed directions, preferences will be complements. Given that the b 's'

responses (Hare et al., 2014). Following the commonly applied item response formulation of this literature, the relationship can be represented as a linear mapping of ideology to multidimensional policy preferences. The estimated structure enables the projection of multidimensional preference on underlying dimensions.

are positively related to the ideological platforms, perfect substitutes occur.⁴

To illustrate this by the means of a simple example, recall the voting decision presented in Figure 2 in the right panel, where the off-diagonal of the weighting matrix are positive, representing substitutes. The voter in this scenario prefers candidate P_2 . Although the sum of distance is clearly larger to P_2 's platform compared to P_1 , who even holds the same position on the social policy dimensions. Given that the two dimensions both positively affect ideological positioning $b_k \hat{=} 1$, we can calculate the utility derived for both candidates according to equation 7. The voter's position on both dimensions is at 0. The utility for P_1 is thus $-\sqrt{1^2} = -1$, because the candidate shares the same position on the second dimension. The utility for P_2 , on the other hand, is also affected by this dimension as the candidate is more liberal on this dimension. Although this negatively affects his evaluation, the overall utility is still higher, as the directed terms $(p_{i1} - v_{i1})(p_{i2} - v_{i2})$ are positive: $-\sqrt{(1^2 + (0.5)^2 + (1 * -0.5))} = -0.86$. This holds for all scenarios where P_2 position on the second dimensions is below zero, more liberal than the voter.

To sum up, if it is actually ideology that matters to voters and ideology constraints policy-positions, we should observe a preference profile where distance on the two dimensions are non-separable.

III. IDEOLOGICAL STRUCTURE OF THE AMERICAN ELECTORATE

In this section we estimate the non-separability of economic and social policy preferences in the American electorate from survey data on voting in presidential elections. The data we are analyzing is part of the American National Election Study (ANES). We cover five presidential elections, from 1996 to 2012. To analyse spatial voting decisions, we require reliable estimates of voter ideal points and candidate positions in the two-dimensional policy space. Voter issue preferences are generally operationalized by a set of well-established ANES survey items, which ask respondents to indicate their own preferences on issue-specific topics like "taxes vs spending", "extent of government involvement in the economy", "abortion" or "role of women". Additionally, voters are asked to locate the presidential candidates on these scales. Ansolabehere, Rodden and Snyder (2008) show that taking these concrete issues scales at their face value may not be an adequate measurement strategy to infer the policy preferences of voters, since they come with considerable measurement error. Following their advice, we employ factor-analytic techniques to estimate latent policy preferences from these concrete issue

⁴Perfect non-separability in the two-dimensional case is defined as $a_{11}a_{22} - a_{12}^2 = 0$. This is the case here, since $b_1^2b_2^2 - (b_1b_2)^2 = 0$.

item batteries (for similar applications see Quinn, Martin and Whitford, 1999; Schofield et al., 1998; Schofield and Zakharov, 2009; Stoetzer and Zittlau, 2015).

Survey responses on a number of issue items are used to estimate an explanatory factor model. We apply this method to five US presidential elections. For the 1996-2004 and 2012 election we use the ANES Time Series Studies. For the 2008 election we use the 10th wave of the American National Election Panel Study 2008-2009 (American National Election Studies, 2009), since the Time Series Study for that year does not contain serviceable issue scales. Thus, there is considerable variation which survey items were part of the ANES in the elections we cover (see Appendix). This is not a problem for our operationalization, since we are primarily interested in the latent positions, not the concrete issue preferences. From the factor analytic solution, we investigate the number of underlying dimensions that sufficiently describes the policy space. Work on the ideological structure of the American electorate shows that voter preferences are structured by an economic and a social policy dimension (Shafer and Claggett, 1995; Treier and Hillygus, 2009; Klar, 2014). In line with this, we find a two-factor model to be most appropriate in all elections.⁵ We identify the first factor as capturing economic preferences, and the second as capturing social-cultural policy preferences. The factor scores provide an estimate of voters' ideal platforms. Perceived candidate positions are estimated by projection into the same space, using the candidate issue placements and the factor loadings from the voter solution. We then average over the perceived candidate positions to obtain a robust estimate that prevents projection bias. (Factor loadings and two-dimensional density plots can be found in the Appendix.)

Given the voter ideal point and candidate position estimates on the two policy dimensions, we fit vote choice models, with vote choice in the presidential elections as the dependent variable. We control for partisan identification of the voters, as this covariate is related to both the policy positions and voting. Additionally, our specification controls for gender, age, education, religion, income and race. For each election, we specify two vote choice models: a normal WED model that allows for dimension-specific weights, but assumes separability, and a non-separable WED model that allows for non-separability. We estimate the two models according to the conditional logit specification outlined in Stoetzer and Zittlau (2015).⁶

RESULTS

⁵We employ a varimax rotation to ensure the orthogonality of policy space.

⁶The description of the conditional logit model with non-separable preferences from the article is attached in the Appendix.

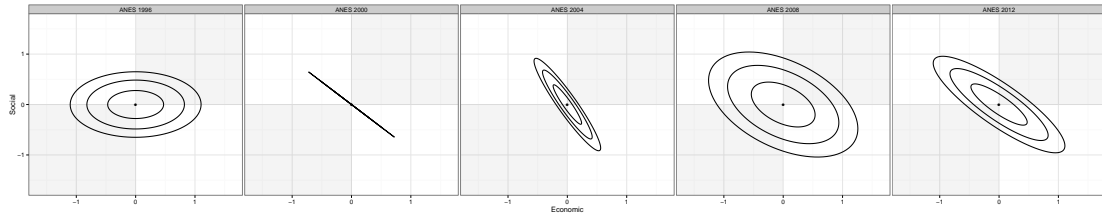


Figure 3: *Indifference contours for A matrix point estimates.*

Table 8 compares the spatial parameter estimates obtained from the separable and non-separable model specifications.⁷ We report the A matrix parameter estimates, where the diagonal entries a_{11}, a_{22} express the salience of economic and social preferences in the vote choice rationale. The separability term a_{12} expresses the estimated symmetric off-diagonal entries.⁸ How strongly non-separable preferences are in a given A matrix is oftentimes not easily interpretable. We therefore report an intuitive measure of the degree of non-separability, that sufficiently summarizes both the direction and the degree of non-separability in two-dimensional policy spaces. The measure scale the separability parameter to the interval $[-1, 1]$, where -1 indicates perfect complements, and 1 perfect substitutes.⁹

Our results indicate partial support for our hypothesis that economic and social policy preferences act as substitutes in the presidential choice rationale of the respondents. In three of the five applications, 2000, 2004 and 2012, we find the non-separability term to be significantly larger than zero, which indicates a substitutorial relationship. The magnitude of non-separability is substantial: For the 2000 presidential election economic and social preferences are estimated to be close to perfect substitutes. The degree of non-separability is also substantial in the 2004 and 2012 election, with an estimated degree of separability of .94 [.3;1] and .86 [.4;1]. The strong non-separability is also illustrated by the estimated shape of the indifference contours (Figure 3). In 2000, the contours virtually collapse into a line, indicating that vote choice is driven by a uni-dimensional concept. A likelihood ratio test reveals that the non-separable model

⁷A regression table that contains all parameter estimates and standard errors can be found in the Appendix

⁸As salience parameters are constrained to be positive, 95% confidence intervals are used to quantify estimation uncertainty. Confidence intervals may be non-symmetrical due to the constraint induced by the Cholesky decomposition.

⁹As A is a symmetric positive definite 2×2 matrix, the condition $a_{11} \cdot a_{22} - a_{12}^2 \geq 0$ holds. By rearranging we see that a_{12} is bounded between $\pm \sqrt{a_{11} \cdot a_{22}}$. Therefore $\frac{a_{12}}{\sqrt{a_{11} \cdot a_{22}}}$ is bounded between $[-1, 1]$. In order to convey the estimation uncertainty associated with the measure, we approximate 95% confidence intervals by calculating the degree of separability for repeated draws from the sampling distribution of L .

	ANES 1996		ANES 2000		ANES 2004		ANES 2008		ANES 2012	
	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.
Economic (t_{11})	0.23 (0.06; 0.49)	0.23 (0.07; 1.26)	0.64 (0.16; 1.38)	0.23 (0.09; 0.45)	1 (0.47; 1.71)	0.46 (0.26; 1.93)	0.97 (0.58; 1.44)	0.6 (0.36; 1.82)	1.28 (0.96; 1.67)	0.51 (0.39; 1.14)
Social (t_{22})	0.67 (0.35; 1.12)	0.67 (0.05; 2.12)	0.88 (0.29; 1.83)	0.29 (0.12; 0.54)	0.62 (0.17; 1.34)	0.17 (0.02; 0.51)	1.64 (1; 2.38)	0.87 (0.14; 2.16)	1.65 (1.28; 2.02)	0.68 (0.37; 1.03)
Sep. term (t_{12})	0 (-0.9; 0.21)	0 (-0.9; 0.21)	0 (-0.9; 0.21)	0.26 (0.1; 0.49)	0 (-0.9; 0.21)	0.27 (0.09; 0.46)	0 (-0.9; 0.21)	0.33 (-0.28; 0.54)	0 (-0.9; 0.21)	0.5 (0.37; 0.61)
Degree of Sep	0 (-0.58; 0.99)	0 (-0.58; 0.99)	0 (-0.58; 0.99)	1 (0.99; 1)	0 (-0.58; 0.99)	0.94 (0.31; 1)	0 (-0.58; 0.99)	0.46 (-0.16; 0.99)	0 (-0.58; 0.99)	0.86 (0.4; 1)
Num. Observation	1034	1034	560	560	721	721	1080	1080	3615	3615
log-Likelihood	-510.2	-510.2	-144.3	-141.6	-202.5	-201	-320.8	-320.3	-705.8	-702
Likelihood Ratio Test		1		0.02		0.09		0.32		0.01

Table 1: Non-separability in voter utility function in US presidential elections, estimated from survey data

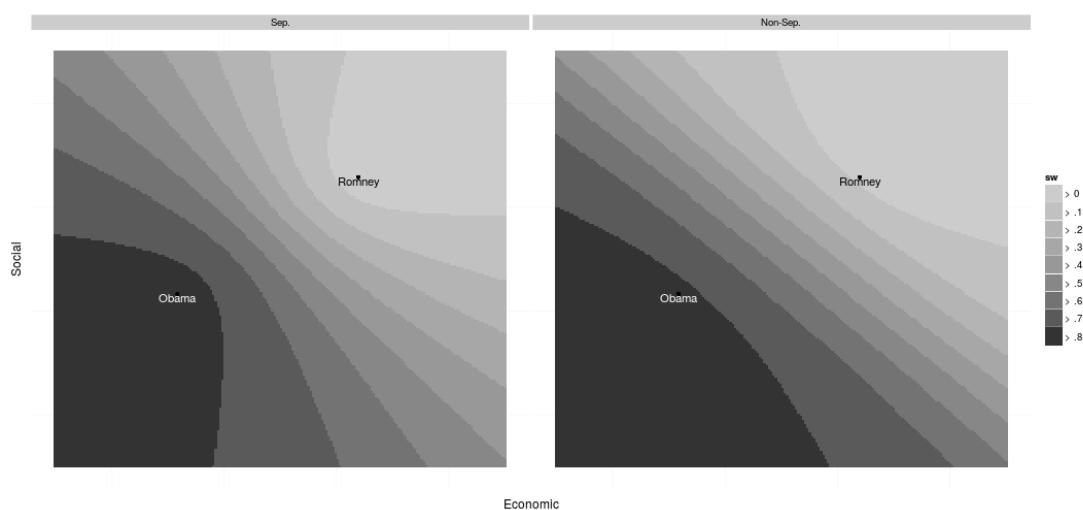


Figure 4: *Probability to Vote for Obama in 2012 Election under Separable Model and Non-Separable Model*

fits the data considerable better. In 2004 and 2012 we also see that indifference contours are heavily stretched along the diagonals of the policy space, indicating substantial non-separability. We find no support for non-separability in the survey data for the 1996 election, where our point estimate indicates perfect separability, and only minor support in the 2008 election. Here the confidence interval of the separability parameter includes zero, indicating that we cannot reject the null hypothesis of separability. This is also indicated by the non-significant likelihood ratio test.

Non-separability implies that voting decisions are stronger structured by a single dimension of conflict. To ease this interpretation of non-separability, we examine the voting probabilities for Obama in the 2012 presidential election. We calculate predicted probabilities for a hypothetical respondent with varying ideal points from the separable model and the non-separable model (other covariates set to the respective median values). This results in a heat map of voting probabilities across the two dimensional policy space (Figure 4). The left panel shows the predicted probabilities from the separable model. If we suppose that preferences across the two broad dimensions are separable, distance on the two dimensions enter utility additive. Which naturally implies that voters more conservative on social issues than Obama have a smaller chance to vote for him. In the separable specification, this decrease, however, is independent of their preferences for economic issues. It holds for voters more liberal on economic issues than Obama as well as voters more conservative, resulting in the parabolic form of voting probabilities around Obama's (and also Romney's) policy platform we see in the Figure. With the better fitting non-separable model this pattern changes. For

voters more economically liberal than Obama, the decrease in voting probabilities due to higher distance on social issues is small, because Obama's platform combines directed distance in substitutional manner. On the other hand, for voters more economic conservative than Obama, higher distance on social issues clearly decreases voting probabilities. This leads voting probabilities to be structured by a one-dimensional conflict line.

Although we find substantial variation between elections our findings show that two-dimensional voter preferences are not always separable. In the cases where we find preferences to be non-separable, they are substitutes: Voters find candidates offering policy packages that compensate distance on one dimension with distance in the opposite direction on the other dimension more attractive. We interpret this as support for the stipulated presence of an underlying ideological constraint that links economic and social policy preferences.

IV. EXPERIMENTAL EVIDENCE

The evidence we have presented so far for non-separability in the spatial utility functions of American voters has been solely based on survey data. The methodological drawbacks of observational data are well established. To corroborate our finding that economic and social preferences act as partial substitutes for American voters, we employ an experimental design. The crucial point about the experimental design is that it allows us to manipulate the supply-side of the spatial voting setup, the policy options between which respondents can decide. This is not possible with observational data, as there are only two or three candidates who offer one fixed platform to voters. In an ideal research design, we would have a large number of elections with different candidates that take on different positions, spread out uniformly all over the policy space. In such a case we could "scan" the policy space to determine the shape a voter's spatial utility. Even in an experimental setup this is hardly possible. But what we can do is simulate electoral scenarios, where the candidates are located at decisive points in the policy space to learn about the utility contours. Are they "stretched" along the diagonals of the policy space indicating non-separability? In our experiment we compare how attractive candidates are that are located along these diagonals. This enables us to test an additional observable implication of our "ideological substitution" argument. If our argument was valid, we expect to find that voters are generally more likely to vote for a candidate who offers a substitutional policy package than a candidate who offers a complementary package.

PROTOCOL

The experiment was conducted online, using 165 participants recruited from the *Amazon Mechanical Turk (MTurk)* online panel. Studies that have evaluated the MTurk recruitment platform come to positive conclusions regarding treatment effect size and representation in comparison to student samples (see e.g. Berinsky, Huber and Lenz, 2012; Crump, McDonnell and Gureckis, 2013). MTurk has been used by many recent studies in political science (see e.g. Arceneaux, 2012). Our survey took on average four and half minutes to complete, for which subjects were granted with \$0.4 in vouchers for amazon.com. The sample can be described as being fairly representative of the wider population. The average age in the sample is 37.9 with standard deviation of 11.35. About the same share of female and male participants took part: 70 female, and 80 male. Most respondents are white (120 respondents). A majority has a BA level degree (61 respondents), or went to college without a degree (61 respondents). Party affiliation, however, is biased towards the Democratic party. While 48 respondents in the sample identify strongly or weakly with the Democratic party, only 19 see themselves as strong or weak Republicans.

We opt for two concrete issues that exemplify the broader latent economic and social policy dimensions: taxes vs spending, and abortion law. These specific issues are chosen because each of them is distinctly related to one single latent dimension. In the factor analysis employed in the previous part of the paper we find strong support that this is indeed the case - Taxes vs spending only loads onto the first factor that captures economic policy, and abortion only loads onto the second factor which captures social policy. The issue scales are introduced and participants are asked to indicate their own position on the two issues. We employ the same wording as the ANES. The taxes vs spending issue is based on a seven point scale ranging from “the government to provide many more services even if this means an increase in spending ” to “the government should provide fewer services, even in areas such as health, education , in order to reduce spending”. The abortion item entails of four ordered statements, ranging from ‘by law, abortion should never be permitted” to “by law, a woman should always be able to obtain an abortion as a matter of personal choice”.¹⁰

In the experiment we asked respondents to decide between two imaginary candidates. Once participants have placed themselves on the two issue scales, we assigned them to one of four treatment conditions.¹¹ The conditions differ in where the supplied

¹⁰The full questionnaire, along with descriptive statistics, can be found in the appendix.

¹¹Most participants were assigned randomly to the groups. In case of extreme self-positing, however, we conditionally assigned respondents to treatments, in order to avoid presenting them a candidate with a position that is not defined on the original scale.

candidates are positioned relative to the ideal point indicated by the respondent. The two candidates were introduced using the following text (here for treatment group 1)¹²:

“Please imagine that you participate in an election, in which you can choose between two candidates, Candidate 1 and Candidate 2.”. Both candidates have the same position on how many services the federal government in Washington should provide. Both candidates want Washington to provide more services than you would prefer, even if this means an increase in spending. On the issue of abortion, the two candidates hold different opinions: Candidate 1 has the same opinion on abortion as you. Candidate 2 is slightly more pro-choice than you. Based on their positions, which of the two candidates do you prefer? Candidate 1, Candidate 2, or are you undecided between the two?

The underlined parts differed between the treatment groups and manipulate the candidates position on the two issues. We set-up the treatment groups in a way that candidate 1 always yields higher utility if respondent preferences are separable. While the candidate disagrees with the respondent on the economic issue on taxes vs spending (either he wants more services or less services), he is congruent with the respondent’s ideal point on the social issues of abortion. Candidate 2 has the same position on the economic issue as candidate 1, but her position on abortion is not congruent with the respondent’s view. The candidate is introduced to be either more pro-choice or more pro-life than the respondent. When taking the direction of policy distance on both issues into account, we wind up with four combinations of candidate positions, which represent our treatment groups. The setup of our experiment can best be conveyed graphically (Figure 5). In treatment groups 1 and 3, the policy package offered by the “non-separable candidate”, candidate 2, is complementary, as it combines policy distance on one issue with distance in the same direction on the second issue.¹³ In treatment groups 2 and 4, candidate 2 offers a substitutional package, combining distance on one issue with distance in the opposite direction on the second issue.¹⁴

¹²When providing the information, we deliberately tried to avoid priming the participants with spatial representations of the choice scenario, and the use of spatial wording like “closeness” or “distance”. Furthermore, we assigned generic labels “Candidate 1/Candidate 2” to the candidates to avoid partisan or socio-demographic associations of any kind.

¹³In treatment group 1 candidate 2 is more liberal on economic *and* more liberal on the social issue. In treatment group 3 candidate 2 is more conservative on economic *and* more conservative on abortion.

¹⁴In treatment group 2, candidate is more conservative on economic, *but* more liberal on the social issue. In treatment group 3 candidate 2 wants more liberal on economic, *but* more conservative on social issues.

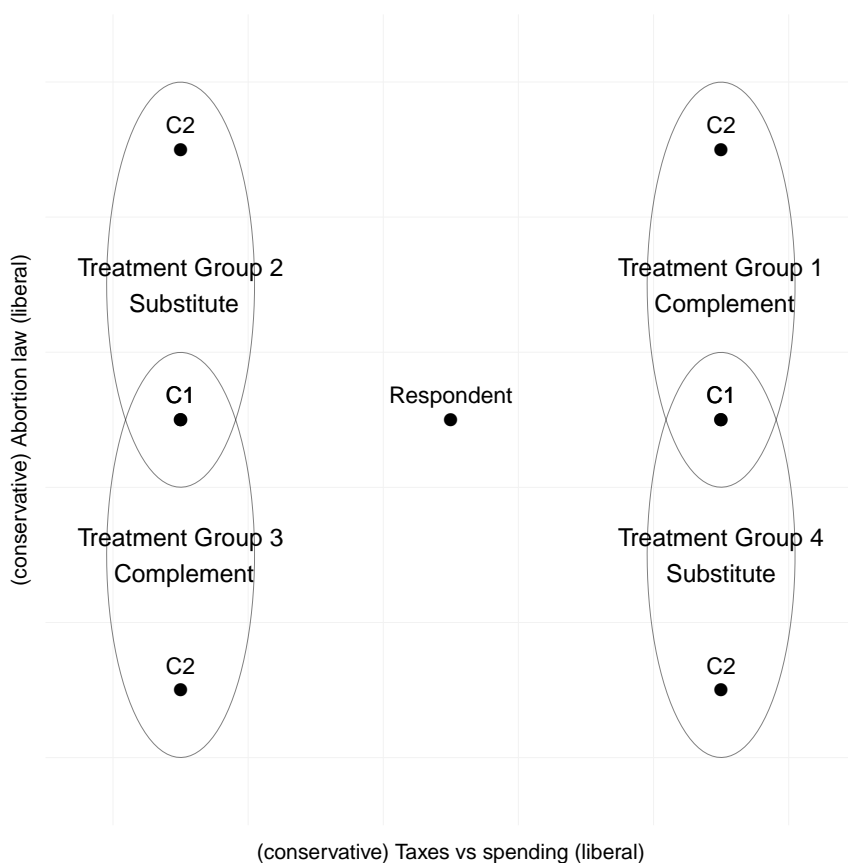


Figure 5: *Experimental setup*

OBSERVABLE IMPLICATIONS

The theoretical considerations allow to derive concrete observable implications for the experimental setup. First of all, if all respondents have preferences separable over economic and social issues, candidate 1 should always be preferred over candidate 2. Of course we would not expect *all* respondents to choose candidate 1. Even if all respondents have separable preferences, there might be considerable measurement error, e.g. if respondents do not properly read the instructions or misinterpret the information given about the candidates. What we would expect though is that the measurement error is independent of the treatment group that the respondents are assigned to. A testable implication of separability is therefore that the vote share of candidate 2 does not vary between the treatment groups.

If respondents have non-separable preferences, we expect a notable proportion of the respondents to choose candidate 2.¹⁵ In case of substitutional preferences, more

¹⁵We do not necessarily expect that the vote share of the separable candidate 1 is smaller than that of candidate 2. Apart from measurement error, this is due to the fact that candidate 2 is not always

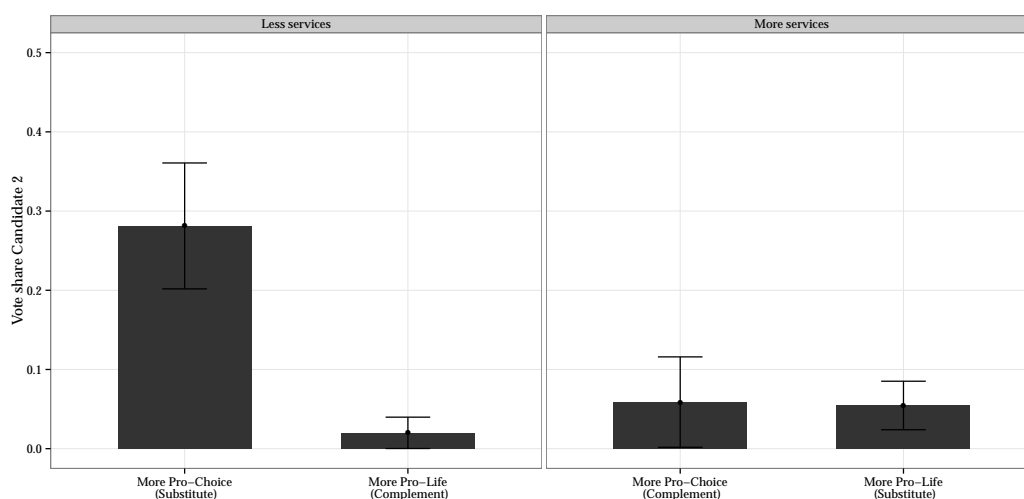


Figure 6: *Indifference contours for A matrix point estimates.*

respondents should vote for candidate 2 if that candidate offers a substitutional package than if the candidate 2 offers a complementary policy package. I.e. the vote share of candidate 2 is larger in groups 2 and 4 than in groups 1 and 3, or smaller if economic and social preferences are complements. As non-separability might be non-symmetric, we argue for a pairwise comparison of the treatment groups: To establish non-separability is suffices to establish that two conditions are true: The vote share of candidate 2 in group 2 is larger than in group 1, and larger in group 4 than in group 3.¹⁶

RESULTS

Figure 6 shows the percentage of voters that prefer the second, non-separable candidate. If both candidates hold more conservative positions on the economic policy dimension (less services), the vote share for candidate 2 is considerably larger if the policy package offered by that candidate acts as a substitute, compared to if the policy package acts as a complement. If candidate 2 holds more liberal positions on abortion around 28 % of the respondents voted for the non-separable candidate. Only 6 % of the respondents voted for the non-separable candidate when that candidate offered a complementary package. This clearly indicates that substitutes are more attractive to voters than complements.

Our results are inconclusive for the comparison of the treatment groups in which both

preferable if preferences are non-separable. Non-separability, even if present, might be too weak, or the policy distances imagined by the voter too large, to induce a switch in the candidate preference ordering.

¹⁶If non-separability is symmetric, we would additionally expect an equal vote share for candidate 2 in groups 2 and 4, and an equal vote share in groups 1 and 3.

Culture War or The Economy

	Model 1	Model 2	Model 3	Model 4	Model 5
(Intercept)	-1.92*** (0.30)	-1.92*** (0.30)	-0.55 (0.68)	-1.32 (0.94)	-2.09*** (0.40)
Substitutes	0.92** (0.34)		0.71* (0.35)		
Substitute 1		1.35*** (0.38)		1.12* (0.48)	1.35*** (0.40)
Substitute 2		0.54 (0.38)		0.55 (0.39)	1.36* (0.55)
Attitude Service			-0.14 (0.08)	-0.05 (0.10)	
Attitude Abortion			-0.23 (0.13)	-0.11 (0.17)	
Abortion Extreme					0.36 (0.39)
Abortion Extreme*Substitute 2					-1.34* (0.63)
AIC	105.20	100.63	100.31	100.89	96.59
BIC	111.45	110.01	112.71	116.39	112.09
Log Likelihood	-50.60	-47.32	-46.16	-45.45	-43.30
Deviance	101.20	94.63	92.31	90.89	86.59
Num. obs.	168	168	164	164	164

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

candidates held more liberal positions than the respondent on economic issues (more services). Here only five percent of the respondents decided in favor of candidate 2, irrespective of whether that candidate offered a substitutional or complementary policy package. Our null findings might be potentially due to the large share of respondents who express an extreme pro-choice attitude in this condition (80 %). It might be that those respondents are not willing to accept a candidate with a different position on abortion except for their own.

To account for such heterogeneity in our experiment, we run a statistical analysis of our experiment data. We model the probability to vote for the second candidate as a function of the treatment conditions. Table 2 reports estimates from five probit regressions. The negative intercept highlights the general small chance to vote for candidate 2 if that candidate offered a complementary policy package. All models include a direct effect of a dummy indicating whether the candidate supplied in the treatment group offered a substitutional or complementary package. The combined effect in Model 1 shows that this probability increases for a candidate with a substitution platform. Model 2 reveals that this is mostly driven by the pattern observed in fewer service and more pro-choice platform treatment. Model 3 and Model 4 control for the original attitudes service and abortion. These show no direct effect, but the estimate

for the dummy indicating substitutes decreases slightly. The final Model 5 tests the supposition that the effect of the second substitution platform is insignificant due to the fact that most people in this group possess extreme liberal abortion attitudes. It, therefore, includes an interaction between the second substitution group with a dummy indicating if a respondent holds an extreme attitude on the abortion issue. The negative interaction effect confirms the supposition that the treatment did not work for respondents with extreme abortion positions. For the rest of the respondents, in this group, the direct effect of the second substitution platform equals the effect of the first substitution treatment, indicating an increasing likelihood to vote for a candidate that offers a substitution platform.

All in all, the experimental evidence grants further support for our previous finding that economic and social policy preferences are substitutes. Respondents tend to substitute distance on the economic dimension with distance on social dimension. This leads respondents to be more likely to vote for substitutional policy package than for packages that act as complements.

V. CONCLUDING REMARKS

In this article we advocated for a new perspective on the ideological structure of the American electorate. Political commentators and strategists assert that political conflict gets increasingly about social-cultural issues, while the conventional line of economic conflict has lost in importance. Research in political science scrutinizes these claims and demonstrates that economic preferences still trump social-cultural convictions when the American electorate chooses its president. We make the case that these two policy dimensions are too strongly connected to allege that they independently affect political behavior. Although citizens may possess well defined economic and cultural preferences, the two do not work additive in the voters evaluation of candidates. Instead, policy distance on the two partially fulfill the same voter demand of ideological closeness. We integrated this perspective in a spatial voting model, showing that if voters care about an underlying line of conflict, preferences in a two-dimensional policy space become non-separable.

In light of our empirical results, we find it hard to argue that politics is either about a “Culture War” or the “Economy”. Our empirical results underscore that the preferences of the American electorate on the two broad dimensions of politics are non-separable. In three out of five presidential elections we find evidence that the two dimensions act as substitutes to voters. Voting decisions are much more structured by a single dimension of conflict than an additive model would suggest. Experimental evidence

strengthens the conclusion that distance on the two dimensions act as substitutes to voters. We find that respondents are generally more likely to vote for candidate who offers substitutional policy package compared to candidate with platform that act as complements.

REFERENCES

- Alvarez, R. Michael and Jonathan Nagler. 1998. "When Politics and Models Collide: Estimating Models of Multiparty Elections." *American Journal of Political Science* 42(1):55–96.
- American National Election Studies. 2009. "American National Election Studies (ANES) Panel Study, 2008-2009. ICPSR29182-v1."
- Ansolabehere, Stephen, Jonathan Rodden and James M Snyder. 2006. "Purple America." *Journal of Economic Perspectives* 20(2):97–118.
- Ansolabehere, Stephen, Jonathan Rodden and James M. Snyder. 2008. "The Strength of Issues: Using Multiple Measures to Gauge Preference Stability, Ideological Constraint, and Issue Voting." *American Political Science Review* 102(02):215–232.
- Arceneaux, Kevin. 2012. "Cognitive biases and the strength of political arguments." *American Journal of Political Science* 56(2):271–285.
- Bartels, Larry M. 2006. "What's the Matter with What's the Matter with Kansas?" *Quarterly Journal of Political Science* 1(2):201–226.
- Berinsky, Adam J, Gregory A Huber and Gabriel S Lenz. 2012. "Evaluating online labor markets for experimental research: Amazon. com's mechanical turk." *Political Analysis* 20(3):351–368.
- Clinton, Joshua, Simon Jackman and Douglas Rivers. 2004. "The Statistical Analysis of Roll Call Data." *American Political Science Review* 98(2):1–16.
- Crump, Matthew J C, John V McDonnell and Todd M Gureckis. 2013. "Evaluating Amazon's Mechanical Turk as a Tool for Experimental Behavioral Research." *PLOS ONE* 8(3):e57410.
- Davis, Otto A., Melvin J. Hinich and Peter C. Ordeshook. 1970. "An Expository Development of a Mathematical Model of the Electoral Process." *American Political Science Review* 64(2):426–448.
- Dow, Jay K. and James W. Endersby. 2004. "Multinomial probit and multinomial logit: a comparison of choice models for voting research." *Electoral Studies* 23(1):107–122.
- Enelow, James M. and Melvin J. Hinich. 1984. *The Spatial Theory of Voting: An Introduction*. New York: Cambridge University Press.

- Fiorina, Morris P., Samuel J. Abrams and Jeremy C. Pope. 2004. *Culture War? The Myth of a Polarized America*.
- Frank, Thomas. 2004. *What's the matter with Kansas? : How conservatives won the heart of America*. 1 ed. New York: Metropolitan Books.
- Gelman, Andrew. 2008. *Red state, blue state, rich state, poor state : why Americans vote the way they do*. Princeton: Princeton Univ. Press.
- Hare, Christopher, David A Armstrong, Ryan Bakker, Royce Carroll and Keith T Poole. 2014. "Using Bayesian Aldrich-McKelvey Scaling to Study Citizens' Ideological Preferences and Perceptions." *American Journal of Political Science* .
- Hinich, Melvin J. and Michael C. Munger. 1997. *Analytical Politics*. Cambridge, New York, Melbourne: Cambridge Univ. Press.
- Hunter, James Davison. 1991. *Culture wars : The struggle to define America*. New York: Basic Books.
- Klar, Samara. 2014. "A Multidimensional Study of Ideological Preferences and Priorities among the American Public." *Public Opinion Quarterly* 78:344–359.
- Lo, James, Sven-Oliver Proksch and Thomas Gschwend. 2013. "A Common Left-Right Scale for Voters and Parties in Europe." *Political Analysis* 22(2):205–223.
- Pinheiro, José C. and Douglas M. Bates. 1996. "Unconstrained parametrizations for variance-covariance matrices." *Statistics and Computing* 6(3):289–296.
- Quinn, Kevin M., Andrew D. Martin and Andrew B. Whitford. 1999. "Voter Choice in Multi-Party Democracies: A Test of Competing Theories and Models." *American Journal of Political Science* 43(4):1231–1247.
- Rivers, Douglas. 1988. "Heterogeneity in Models of Electoral Choice." *American Journal of Political Science* 32(3):737–757.
- Schofield, Norman and Alexei Zakharov. 2009. "A stochastic model of the 2007 Russian Duma election." *Public Choice* 142(1-2):177–194.
- Schofield, Norman, Andrew D. Martin, Kevin M. Quinn and Andrew B. Whitford. 1998. "Multiparty electoral competition in the Netherlands and Germany: A model based on multinomial probit." *Public Choice* 97(2):257–293.
- Shafer, Byron E. and William J. M. Claggett. 1995. *The Two Majorities: The Issue Context of American Politics*. Baltimore: Johns Hopkins University Press.

Stoetzer, Lukas F. and Steffen Zittlau. 2015. "Multidimensional spatial voting with non-separable preferences." *Political Analysis* .

Treier, Shawn and D. Sunshine Hillygus. 2009. "The nature of political ideology in the contemporary electorate." *Public Opinion Quarterly* 73(4):679–703.

A. ITEMS

ANES	1996	2000	2004	2008	2012
spending	×	×	×		×
defense	×	×	×	×	×
healthcare	×				
health					×
jobs	×	×	×		×
blacks	×	×	×		×
abortion	×	×	×		×
crime	×				
jobsvsenvir	×	×	×		×
women	×	×	×		
guns		×	×		
gay marriage				×	
taxes				×	
drugs				×	
terror suspect				×	
terror (wire tape)				×	
illegal immigrants (citizin)				×	
illegal immigrants (work)				×	
Num Issues	9	8	8	8	7

Table 2: *Items available in different studies models*

B. AMERICAN NATIONAL ELECTION STUDY

FACTOR ANALYSIS

	economic	social
spending	-0.52	-0.06
defense	0.21	0.33
healthcare	0.55	0.14
jobs	0.84	-0.01
blacks	0.60	0.11
abortion	-0.07	-0.47
crime	0.29	0.40
jobsvsenvir	0.14	0.44
women	0.16	0.47

Table 3: *Factor loadings study ANES 1996*

	economic	social
spending	-0.45	-0.18
defense	0.32	0.20
jobs	0.76	-0.05
blacks	0.48	0.10
abortion	-0.03	-0.46
jobsvsenvir	0.04	0.30
guns	0.30	0.30
women	0.02	0.53

Table 4: *Factor loadings study ANES 2000*

Culture War or The Economy

	economic	social
spending	-0.50	-0.14
defense	0.33	0.21
jobs	0.78	0.01
blacks	0.64	0.04
abortion	-0.13	-0.55
jobsvsenvir	0.27	0.32
guns	0.30	0.15
women	0.16	0.48

Table 5: *Factor loadings study ANES 2004*

	economic	social
gay marriage	-0.15	-0.37
taxes high income	0.52	0.28
drugs low income seniors	0.65	0.14
health care	0.76	0.16
terrorism suspend	-0.07	-0.56
terrorism wiretap	0.24	0.50
illegal immigrants work	0.09	0.32
illegal immigrants citizenship	0.11	0.50

Table 6: *Factor loadings study ANES 2008*

	economic	social
spending	-0.69	0.02
defense	0.35	0.30
health	0.72	0.16
jobs	0.75	-0.15
blacks	0.66	-0.12
abortion	-0.23	-0.40
jobsvsenvir	0.65	0.19

Table 7: *Factor loadings study ANES 2012*

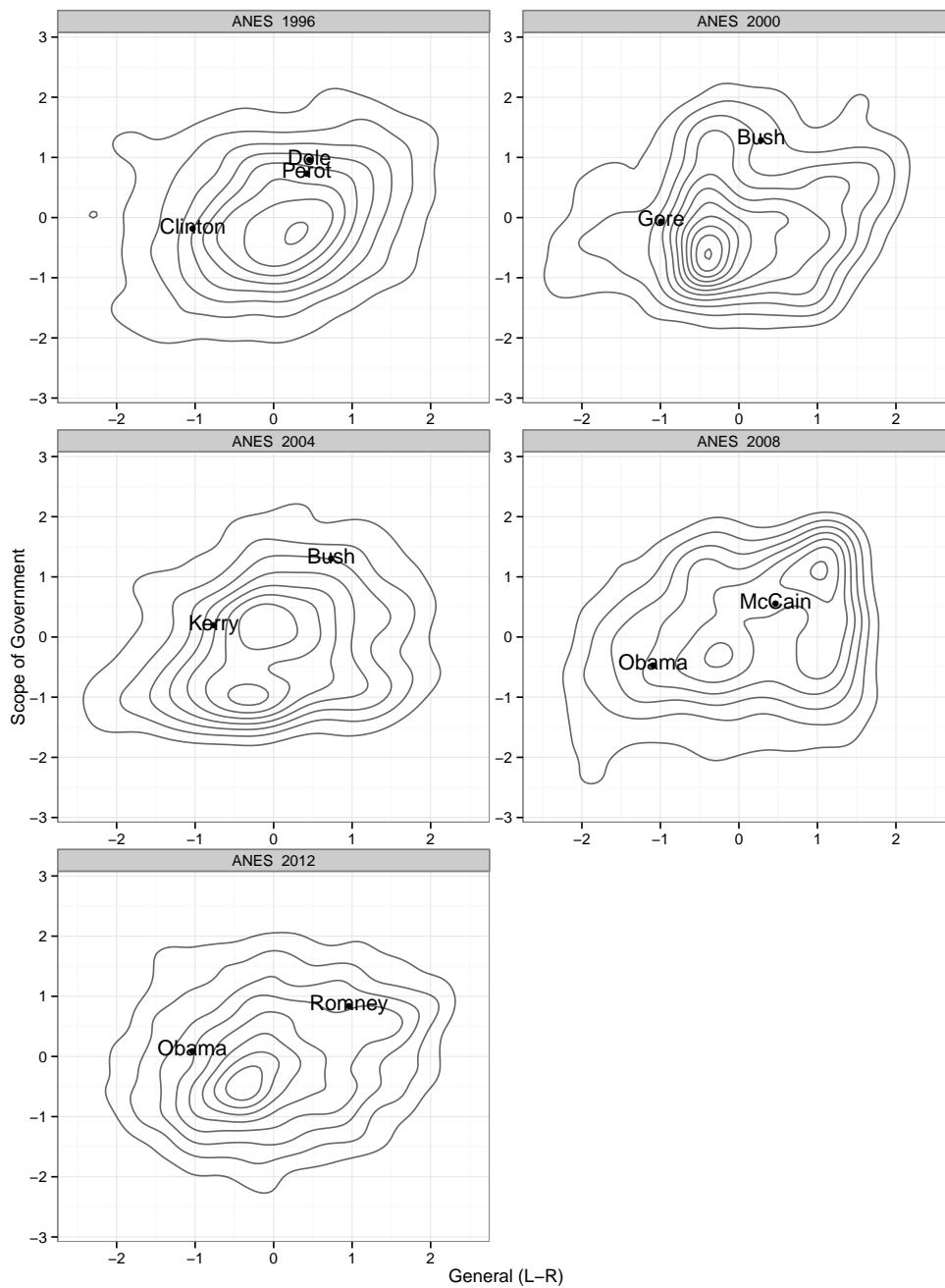


Figure 7: Distribution of voter ideal points and candidate positions

A CONDITIONAL LOGIT MODEL WITH NON-SEPARABLE PREFERENCES

This is copied from Stoetzer and Zittlau (2015) page 4ff

McFadden's (1974) conditional logit is widely considered an appropriate discrete choice model to study spatial voting in multi-party systems (Alvarez and Nagler, 1998; Dow and Endersby, 2004).¹⁷ Taking the conditional logit as our starting point, we propose a non-separable specification of the systematic component that follows from the WED model, and account for the positive definite constraint over A . Unlike conventional specifications, which specify A as diagonal, we specify A to be symmetric and positive definite.

In the conditional logit, choice probabilities for voters $i \in (1, \dots, n)$ choosing between policy platforms $j \in (1, \dots, k)$ take the form

$$P_{ij} = \frac{e^{V_{ij}}}{\sum_{j=1}^k e^{V_{ij}}}. \quad (8)$$

V_{ij} is the systematic component of the voter utility function, which we specify as

$$V_{ij} = \theta_j + \mathbf{X}_i \delta_j - \sqrt{[\mathbf{p}_j - \mathbf{v}_i]^T \mathbf{A} [\mathbf{p}_j - \mathbf{v}_i]}. \quad (9)$$

θ_j is a platform-specific constant that captures non-policy aspects, oftentimes labelled party or candidate valence. $\mathbf{X}_i \delta_j$ captures the effect of non-spatial individual-specific covariates on choice probabilities. The negative square root is the multidimensional spatial voting part as conceptualized in the WED model. \mathbf{A} is a symmetric positive definite matrix. To incorporate this constraint in the maximum likelihood framework, we re-parameterize \mathbf{A} as its Cholesky decomposition. This is a common procedure to solve numerically difficult optimization problems, such as the estimation of variance-covariance matrices (Pinheiro and Bates, 1996). \mathbf{A} is parameterized as a lower triangular matrix \mathbf{L} , with $\mathbf{A} = \mathbf{L}^T \mathbf{L}$.

For a 2×2 \mathbf{A} matrix, \mathbf{L} contains three parameters.

$$\mathbf{L} = \begin{bmatrix} l_1 & 0 \\ l_{12} & l_2 \end{bmatrix} \quad (10)$$

¹⁷Conditional logit, like multinomial logit, assumes the random error to be independently and identically distributed Type-1 extreme value. An undesirable feature of conditional logit is its reliance on the independence of irrelevant alternatives (IIA) (for a detailed discussion see e.g. Rivers, 1988; Alvarez and Nagler, 1998; Dow and Endersby, 2004). Multinomial probit has been considered as a solution. Specifying the systematic component in multinomial probit models as non-separable works the same way. Nevertheless, we opt for conditional logit because of its continuing popularity and since its computational convenience facilitates our Monte Carlo experiments.

¹⁸ δ_j and θ_j are choice-specific parameters, while \mathbf{A} is assumed to be homogeneous over choices and individuals.

A is restored post-estimation after maximizing likelihood with respect to L, θ_k, δ_k . The likelihood function is given by the product over all realized probabilities. In order to identify this model, θ_k and δ_k are set to zero, for a baseline platform $j = k$. We use Broyden-Fletcher-Goldfarb-Shanno (BFGS) iterative numerical algorithm to maximize log-likelihood directly, using R's `optim()` function. In order to assure convergence on global maxima, maximization is repeated multiple times using randomly drawn starting values.

COMPLETE MODEL RESULTS

	ANES 1996				ANES 2000				ANES 2004				ANES 2008				ANES 2012			
	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.	Sep.	Non-sep.		
I_{11}	0.48 (0.12)	-0.48 (0.25)	-0.8 (0.2)	0 (0.03)	1 (0.16)	-0.23 (0.52)	-0.98 (0.12)	-0.69 (0.34)	1.13 (0.08)	-0.37 (0.33)										
I_{22}	0.82 (0.12)	0.82 (0.32)	-0.94 (0.21)	-0.54 (0.1)	0.78 (0.19)	-0.42 (0.14)	1.28 (0.14)	-0.93 (0.28)	-1.28 (0.08)	0.82 (0.1)										
I_{12}	0 .	0 (0.3)	0 .	-0.48 (0.09)	0 .	-0.64 (0.15)	0 .	-0.36 (0.28)	0 .	0.61 (0.11)										
	Clinton	Dole	Perot	Clinton	Dole	Perot	Gore	Bush	Gore	Bush	Kerry	Bush	Kerry	Bush	Obama	McCain	Obama	Romney	Obama	Romney
Intercept	0.69 (0.66)	-4.1 (0.74)	0 (0)	0.69 (0.66)	-4.1 (0.74)	0 (0)	2.85 (0.85)	0 (0)	2.85 (0.85)	0 (0)	3.25 (0.68)	0 (0)	3.25 (0.67)	0 (0)	0.51 (0.64)	0 (0)	4.2 (0.38)	0 (0)	4.21 (0.38)	0 (0)
PID	-0.37 (0.07)	0.64 (0.08)	0 (0)	-0.37 (0.07)	0.64 (0.08)	0 (0)	-1.2 (0.11)	0 (0)	-1.2 (0.11)	0 (0)	-1 (0.08)	0 (0)	-1 (0.08)	0 (0)	-0.8 (0.06)	0 (0)	-0.96 (0.04)	0 (0)	-0.96 (0.04)	0 (0)
Gender	0.4 (0.28)	0.16 (0.3)	0 (0)	0.4 (0.28)	0.16 (0.3)	0 (0)	-0.04 (0.35)	0 (0)	-0.04 (0.35)	0 (0)	-0.13 (0.27)	0 (0)	-0.12 (0.28)	0 (0)	0.23 (0.21)	0 (0)	-0.21 (0.14)	0 (0)	-0.21 (0.14)	0 (0)
Age	0.03 (0.01)	0.03 (0.01)	0 (0)	0.03 (0.01)	0.03 (0.01)	0 (0)	0.02 (0.01)	0 (0)	0.02 (0.01)	0 (0)	0 (0.01)	0 (0)	0 (0.01)	0 (0)	-0.01 (0.01)	0 (0)	-0.01 (0)	0 (0)	-0.01 (0)	0 (0)
Education	0.22 (0.13)	0.38 (0.14)	0 (0)	0.22 (0.13)	0.38 (0.14)	0 (0)	0.18 (0.14)	0 (0)	0.18 (0.14)	0 (0)	0.04 (0.12)	0 (0)	0.03 (0.12)	0 (0)	0.31 (0.11)	0 (0)	0.06 (0.07)	0 (0)	0.05 (0.07)	0 (0)
Catholic	0.37 (0.31)	0.47 (0.33)	0 (0)	0.37 (0.31)	0.47 (0.33)	0 (0)	0.03 (0.33)	0 (0)	0.03 (0.33)	0 (0)	0.31 (0.31)	0 (0)	0.31 (0.31)	0 (0)	0.02 (0.23)	0 (0)	0.43 (0.16)	0 (0)	0.44 (0.16)	0 (0)
Income	-0.02 (0.02)	0 (0)	0 (0)	-0.02 (0.02)	0 (0)	0 (0)	0 (0.05)	0 (0)	0 (0.05)	0 (0)	0 (0.02)	0 (0)	0 (0.03)	0 (0)	0.06 (0.03)	0 (0)	-0.01 (0.01)	0 (0)	-0.01 (0.01)	0 (0)
African-American	1.89 (0.75)	-1.32 (1.3)	0 (0)	1.89 (0.75)	-1.32 (1.3)	0 (0)	2.06 (1.27)	0 (0)	2.06 (1.27)	0 (0)	0.71 (0.41)	0 (0)	0.7 (0.41)	0 (0)	2.05 (0.53)	0 (0)	2.31 (0.32)	0 (0)	2.33 (0.32)	0 (0)
Numt. Observation	1034	1034	560	560	721	721	1080	1080	1080	1080	3615	3615	1080	1080	3615	3615	1080	1080	3615	3615
log-Likelihood	-510.2	-510.2	-144.3	-141.6	-202.5	-201	-320.8	-320.3	-320.8	-320.3	-705.8	-702								

Table 8: Complete Parameter Estimates

C. EXPERIMENTAL EVIDENCE

DESCRIPTIVE STATISTICS

Table 9

Statistic	N	Mean	St. Dev.	Min	Max
att_abort	150	3.300	0.981	1	4
att_serv	153	4.026	1.842	1	7
birth	151	38.910	11.350	20	70
race	150	1.493	1.128	1	6
edu	150	5.507	0.918	3	7
pid	150	3.467	1.744	1	7
relig	150	3.160	1.461	1	5

EXPERIMENTAL PROTOCOL

[]

There has been some discussion about abortion in recent years. Which of the of the following opinions best corresponds with your view?

Please choose **only one** of the following:

- By law, abortion should never be permitted.
- The law should permit abortion only in case of rape, incest, or when the woman's life is in danger.
- 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.
- By law, a woman should always be able to obtain an abortion as a matter of personal choice.

[]How important is this issue to you personally?

Only answer this question if the following conditions are met:

Answer was less than or equal to 'By law, a woman should always be able to obtain an abortion as a matter of personal choice.' at question '30 [Q00029]' (There has been some discussion about abortion in recent years. Which of the of the following opinions best corresponds with your view?)

Please choose **only one** of the following:

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

[]

Some 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 1.

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 7

Where would you place yourself on this scale?

Please choose the appropriate response for each item:

	1	2	3	4	5	6	7	
Government should provide many more services: increase spending a lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Government should provide many fewer services: reduce spending a lot

[]How important is this issue to you personally?

Only answer this question if the following conditions are met:

Answer was less than at question '32 [Q00031]' (Some 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 1. 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 7 Where would you place yourself on this scale? (Government should provide many more services: increase spending a lot | Government should provide many fewer services: reduce spending a lot))

Please choose **only one** of the following:

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Nonsep_experiment1

[]

Please imagine that you participate in an election, in which you can choose between two candidates, Candidate 1 and Candidate 2.

Both candidates have the same position on how many services the federal government in Washington should provide. Both candidates want Washington to provide more services than you would prefer, even if this means an increase in spending.

On the issue of abortion, the two candidates hold different opinions:

Candidate 1 has the same opinion on abortion as you.

Candidate 2 is slightly more pro-choice than you.

Based on their positions, which of the two candidates do you prefer? Candidate 1, Candidate 2, or are you undecided between the two? *

Only answer this question if the following conditions are met:

Answer was at question '34 [Q00033]' ({if(Q00031_SQ001.NAOK == "1", if(Q00031_SQ001.NAOK == "1", 2, if(Q00029.NAOK == "4", 4, round(rand(1, 2)) * 2)), if(Q00031_SQ001.NAOK == "7", if(Q00029.NAOK == "1", 1, if(Q00029.NAOK == "4", 3, 1 + rand(0, 1) * 2)), if(Q00029.NAOK == "1", rand(1,2), if(Q00029.NAOK == "4", rand(3,4), rand(1,4)))))))

Please choose **only one** of the following:

- Candidate 1 (more services, same opinion on abortion)
- Candidate 2 (more services, more pro-choice)
- Don't know

[]

Please imagine that you participate in an election, in which you can choose between two candidates, Candidate 1 and Candidate 2.

Both candidates have the same position on how many services the federal government in Washington should provide. Both candidates want Washington to provide fewer services than you would prefer in order to reduce spending.

On the issue of abortion, the two candidates hold different opinions:

Candidate 1 has the same opinion on abortion as you.

Candidate 2 is slightly more pro-choice than you.

Based on their positions, which of the two candidates do you prefer? Candidate 1, Candidate 2, or are you undecided between the two? *

Only answer this question if the following conditions are met:

Answer was at question '34 [Q00033]' ({if(Q00031_SQ001.NAOK == "1", if(Q00031_SQ001.NAOK == "1", 2, if(Q00029.NAOK == "4", 4, round(rand(1, 2)) * 2)), if(Q00031_SQ001.NAOK == "7", if(Q00029.NAOK == "1", 1, if(Q00029.NAOK == "4", 3, 1 + rand(0, 1) * 2)), if(Q00029.NAOK == "1", rand(1,2), if(Q00029.NAOK == "4", rand(3,4), rand(1,4)))))))

Please choose **only one** of the following:

- Candidate 1 (fewer services, same opinion on abortion)
- Candidate 2 (fewer services, more pro-choice)
- Don't know

[]

Please imagine that you participate in an election, in which you can choose between two candidates, Candidate 1 and Candidate 2.

Both candidates have the same position on how many services the federal government in Washington should provide. Both candidates want Washington to provide more services than you would prefer, even if this means an increase in spending.

On the issue of abortion, the two candidates hold different opinions:

Candidate 1 has the same opinion on abortion as you.

Candidate 2 is slightly more pro-life than you.

Based on their positions, which of the two candidates do you prefer? Candidate 1, Candidate 2, or are you undecided between the two? *

Only answer this question if the following conditions are met:

Answer was at question '34 [Q00033]' ({if(Q00031_SQ001.NAOK == "1", if(Q00031_SQ001.NAOK == "1", 2, if(Q00029.NAOK == "4", 4, round(rand(1, 2)) * 2)), if(Q00031_SQ001.NAOK == "7", if(Q00029.NAOK == "1", 1, if(Q00029.NAOK == "4", 3, 1 + rand(0, 1) * 2)), if(Q00029.NAOK == "1", rand(1,2), if(Q00029.NAOK == "4", rand(3,4), rand(1,4)))))))

Please choose **only one** of the following:

- Candidate 1 (more services, same opinion on abortion)
- Candidate 2 (more services, more pro-life)
- Don't know

[]

Please imagine that you participate in an election, in which you can choose between two candidates, Candidate 1 and Candidate 2.

Both candidates have the same position on how many services the federal government in Washington should provide. Both candidates want Washington to provide fewer services than you would prefer in order to reduce spending.

On the issue of abortion, the two candidates hold different opinions:

Candidate 1 has the same opinion on abortion as you.

Candidate 2 is slightly more pro-life than you.

Based on their positions, which of the two candidates do you prefer? Candidate 1, Candidate 2, or are you undecided between the two? *

Only answer this question if the following conditions are met:

Answer was at question '34 [Q00033]' ({if(Q00031_SQ001.NAOK == "1", if(Q00031_SQ001.NAOK == "1", 2, if(Q00029.NAOK == "4", 4, round(rand(1, 2)) * 2)), if(Q00031_SQ001.NAOK == "7", if(Q00029.NAOK == "1", 1, if(Q00029.NAOK == "4", 3, 1 + rand(0, 1) * 2)), if(Q00029.NAOK == "1", rand(1,2), if(Q00029.NAOK == "4", rand(3,4), rand(1,4)))))))

Please choose **only one** of the following:

- Candidate 1 (fewer services, same opinion on abortion)
- Candidate 2 (fewer services, more pro-life)
- Don't know

Questionnaire

[] What is your year of birth?

Only numbers may be entered in this field.

Please write your answer here:

[]

What is your sex?

Please choose **only one** of the following:

- Female
- Male

[]

What racial or ethnic group best describes you?

Please choose **only one** of the following:

- White
- Black
- Asian
- Native American
- Hispanic
- Other

[] What is the highest degree in education that you have earned?

Please choose **only one** of the following:

- 8th Grade or less ('grade school')
- 9-12th Grade ('high school'), no diploma/equivalency
- 12th Grade, diploma or equivalency
- 12th Grade, diploma or equivalency plus non-academic training
- Some college, no degree; junior/community college level degree (AA degree)
- BA level degrees
- Advanced degrees incl. LLB

[] Generally speaking, do you usually think of yourself as a Republican, a Democrat, or an Independent?

Please choose **only one** of the following:

- Strong Democrat
- Weak Democrat
- Lean Democrat
- Independent
- Lean Republican
- Weak Republican
- Strong Republican

[]

Is your religious preference Protestant, Catholic, Jewish, or something else?

Please choose **only one** of the following:

- Protestant
- Catholic
- Jewish
- None
- Other

[] What region of the United States do you live in?

Please choose **only one** of the following:

- Northeast
- North Central
- South
- West