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On the measurement of voter ideology

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ABSTRACT

We propose a novel measure of voter ideology and study the (socio-economic) determinants of political beliefs. We examine the dimensionality of contemporary voter ideology using survey data of a representative sample of Dutch citizens. Using factor-analyses, we identify and validate four relevant dimensions that capture (1) preferences for economic equality, (2) preferences for markets and efficiency, (3) preferences for personal and cultural freedom, and (4) nationalist, protectionist and populist preferences. We continue with a regression analysis on the determinants of multidimensional voter ideology and compare these to the determinants of the traditional left-right measure of ideology. We find that there is substantial heterogeneity in the determinants of political preferences. Moreover, using a one-dimensional left-right representation of voter ideology conceals most of this heterogeneity.

1. Introduction

Back in the 18th century in the French parliament, the political divide was clearly visible. Loyalists to the king were seated to the president's right, whereas supporters of the revolution were seated on the left-hand side of the legislative assembly. It is in this context that the term left-wing versus right-wing politics finds its origin. However, in the course of the 20th century, the meaning of left versus right changed. Ever since, the left generally has referred to political parties and voters that are in favour of state intervention with respect to social security and income (re)distribution, whereas the right has referred to those that favour minimal government involvement and market outcomes.

With recent events such as the Brexit referendum, the 2016 American Presidential election, and several other elections around the world, however, it has become clear that political campaigns are no longer focused on traditional left-wing versus right-wing topics. Popular media have even suggested the end of left-wing versus right-wing ideology and claim the emergence of a new political divide between parties competing for protectionist (closed border) policies and globalist (open border) policies, and between the establishment and the anti-establishment.¹ Moreover, research shows that voters nowadays interpret the left-right scale on cultural and immigration grounds (de Vries et al., 2013). The emergence and electoral successes of many contemporary populist parties in the European political landscape is another evolution showing the outdatedness of left and right and the confusion around left and right as concepts. Parties like the PVV in the Netherlands, the Front National in France and the FPÖ in Austria have not only gained momentum, but are nowadays one of the largest political forces in their countries. These populist parties and their constituents are referred to as right-wing in the media, in research and in popular debate. However, these voters and parties either do not support traditional right-wing economic policies or view economic issues as inferior to their objectives on social and cultural grounds (Mudde, 2007).

Despite (or maybe due to) the simplicity of a left-right one-dimensional scale, the left-right classification has become part of political

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¹ A brief overview of examples can be found in the Economist, July 30th, 2016.

jargon and is used by researchers to develop and test comparative political economy theories - both on a macroeconomic and micro-economic level (Albright, 2010). Examples include the median voter theorem (Downs, 1957), the influence of partisan politics on macroeconomic outcomes (Hibbs, 1977) and the rational partisan theory of Alesina (1987). Besides theoretical merit, empirical constructs are developed to link the left-right scale to economic outcomes, (e.g. Bjørnskov, 2005; Sørensen, 2014; Tavares, 2004), policies (e.g. Angelopoulos et al., 2012; Herwartz and Theilen, 2017) and preferences (e.g. Alesina et al., 2004; Anderson and Singer, 2008; Di Tella and MacCulloch, 2005; Fisher et al., 2017; Pitlik et al., 2011; Wiese and Jong-A-Pin, 2017).²

Upon the widespread influence of political ideology on a governmental and individual level, it probably comes as no surprise that researchers have started to explore what drives political beliefs. Research shows that antecedents of political beliefs can originate from personality differences, genetics, psychological motives and needs, as well as socio-economic characteristics (Achterberg and Houtman, 2009; Alford et al., 2005; Carney et al., 2008; Feldman and Johnston, 2014; Gerber et al., 2010; Jost et al., 2009). While most of these studies use a one-dimensional left-right (or liberal-conservative in an American context) distinction of voter ideology, some allow for economically left-right and socially left-right political preferences (e.g. Feldman and Johnston, 2014; Gerber et al., 2010).

In this paper we aim to shed new light on the concept of voter ideology. To examine the dimensionality of voter ideology, we use data that is obtained from a survey of over 2400 Dutch citizens. The data, collected by CentERdata, represent a cross-section of the Dutch population. In the survey, respondents expressed their political preferences with respect to 40 political statements and self-reported their political position on a traditional left-right scale. It also included a range of social-demographic variables and individual characteristics. In effect, we are studying voter ideology in the Netherlands.

Our primary objective is to challenge the idea that voter ideology is a one-dimensional concept. Most certainly we are not the first to do so. Eysenck (1954) already suggested a two-dimensional framework, in which a distinction should be made between political views related to economic preferences and views with respect to the implementation of such policies. Ever since, many followed in his footsteps and aimed to classify voter ideology using conceptual, discursive and quantitative approaches.³ This paper fits in with the tradition of the quantitative approach.⁴ That is, we use (both exploratory and confirmatory) factor analysis to identify latent dimensions of contemporary political preferences. Yet, unlike previous approaches, we have no a priori assumptions about the number of underlying dimensions to be observed in the data. To decide about the appropriate number of dimensions we use generally accepted statistical tests. This data-driven approach is preferred, since no consensus has been reached among researchers regarding the dimensionality of voter ideology. Furthermore, we do not place restrictions on the orthogonality of the discovered dimensions, as such allowing for correlation between them, and we use a separate subset of our data to statistically validate the obtained factor model structure.

Previewing our results, we find evidence in favour of four dimensions capturing 1) preferences for economic equality, 2) preferences for markets and efficiency, 3) preferences for personal and cultural freedom, and 4) nationalist, protectionist and populist preferences. We find that these dimensions are not mutually exclusive and only modestly correlate with a traditional left-right measure up until a value of $r = 0.5$. Moreover, we find that parties' constituents interpret left versus right on different grounds and that much heterogeneity in political preferences of the electorate remains hidden when relying on the left-right scale.

The secondary objective of this paper is to examine what determines these multidimensional political attitudes. Using simple regression analyses, we identify the determinants of the four dimensions of voter ideology and compare them to those of left-right ideology. As far as we know, we are the first to examine the antecedents of an empirically identified and validated multidimensional measure of ideology. Whereas existing research has in some cases allowed for a second social left-right dimension alongside the traditional economic left-right one, these studies do not test whether more dimensions would represent political ideas more accurately and/or do not validate their measures (e.g. Achterberg and Houtman, 2009; Feldman and Johnston, 2014; Gerber et al., 2010). Our results indicate substantial heterogeneity in the determinants of the dimensions of voter ideology. Moreover, the direction of the effect of these determinants on voter ideology can differ between dimensions. We also find that part of the heterogeneity does not surface when relying on a one-dimensional left-right representation of voter ideology. As such, when using a left-right scale, we may overlook important drivers of political preferences.

The paper is organized as follows. In section 2, we describe the data and explain the exploratory and confirmatory factor analysis models. We also provide estimation results of both. In section 3, we illustrate that the voter ideology measures obtained from our analysis are substantially different from the traditional left-right measure. In section 4, we examine what determines political preferences and compare the drivers of multidimensional voter ideology with those of the left-right measure. Lastly, we conclude in section 5.

2. Data and method

We held a survey in the spring of 2016 among 2465 respondents from 1981 households using the panel of CentERdata. This panel consists of over 2000 households and is representative of the Dutch population. All panel-members were invited to participate in the survey and the response rate was 79.8 percent. The survey focused on political preferences and confronted respondents with 40 statements on contemporary political issues.⁵ The topics of the statements are partly based on the issues registered in the Manifesto Project database, which covers electoral programs in over 50 countries (Volkens et al., 2013). These are supplemented with (validated)

² For a detailed overview of empirical evidence on partisan theories, see Potrafke (2017).

³ See Maynard (2013) for an overview.

⁴ See e.g. Albright (2010); Achterberg and Houtman (2009); Bakker et al. (2012); Conover and Feldman (1984); Feldman (2013); Layman and Carsey (2002); Otjes (2017); Treier and Hillygus (2009).

⁵ The statements (translated from Dutch by the authors) are shown in table A1 in the appendix.

Table 2.1
Characteristics of respondents.

	Mean	Std. Dev	N
Age	54	17	2453
Net household income (euros)	2820	1391	2449
Life-satisfaction	7.4	1.5	2453
Left-right voter ideology	5.3	1.9	2420
Women (in percentages)	48.8	–	2453
Employed (in percentages)	50.5	–	2453
Married (in percentages)	76.7	–	2453
Religious (in percentages)	17.4	–	2442

Note: Life-satisfaction and left-right voter ideology are measured on a 10-point scale, ranging from very unsatisfied/left (1) to very satisfied/right (10). Employed respondents are defined as those that are on the payroll of a company or are self-employed. The percentage of employed respondents is relative to all other respondents, i.e., those that are unemployed, pensioned or disabled; charity-workers; stay-at-home parents; students; and those too young to work.

statements that are particularly relevant for the Dutch political landscape. Furthermore, we asked our respondents a broad set of questions concerning their socio-economic background, income expectations and life-satisfaction. We also asked them which political party they would vote for if elections were held the day after the survey, and whether they could place themselves on a 10-point left-wing vs. right-wing scale.⁶ Of the 2465 surveys, 2170 contained no missing values in the indicator variables (i.e., the 40 statements) and hence, are used for subsequent (factor) analyses. Table 2.1 shows the characteristics of our respondents. The average age of the respondents is 54, the youngest respondent being 16 and the eldest 93. 48.8% of the sample is female and average monthly household income is 2820 (net), relatively close to the country's average.⁷ Descriptive statistics for the statements can be found in the appendix.

Below, we analyse whether there is a latent structure underlying the responses to the 40 political statements of the survey. That is, we propose a factor analytic model that assumes that one or more underlying dimensions are able to predict the answers to each of the statements. We proceed in two steps. In the first step we use 75% of the dataset for an Exploratory Factor Analysis (EFA). This 75% of the data was selected by generating a pseudorandom number from a uniform distribution for each observation. Subsequently, the data was sorted by this pseudorandom sequence and the first 75% of observations form the calibration sample for the EFA.⁸ The aim of the EFA is to separate the information contained in the statements that is common to (groups of) statements from the information that is unique to individual statements. More specifically, we impose a model structure on the covariance matrix of all political statements in which a small number of so-called factors approximate the observed variance in the sample covariance matrix. To decide about the appropriate model structure, it is important to note that we do not impose a priori restrictions on the outcome (i.e., the number of factors). The goal of the EFA is to examine whether the observed variables can be approximated by a smaller number of latent factors. In order to decide on this number we use conventional statistical tests.

In the second step, we use the remaining 25% of the observations to validate the identified dimensions of voter ideology using a Confirmatory Factor Analysis (CFA). In the CFA we test the hypothesized relations between the observed statements and the underlying dimensions by restricting them to those found in the EFA. As such, we compare factor models in terms of how well they fit the underlying data and validate the dimensionality of voter ideology (see Wansbeek and Meijer (2000) for an exhaustive discussion on EFA vs. CFA).

2.1. Exploratory factor analysis

The calibration sample consists of approximately 1840 observations. We restrict the analysis to those observations for which none of the indicators contain missing values.⁹ In all, we have 40 indicators (i.e., statements) of an unknown number of unobserved factors. As the number of factors is a priori unclear, we need a factor model that is capable of estimating multiple factors. The multiple factor model with m indicators and k factors is:

$$\mathbf{y}_n = \mathbf{B}\boldsymbol{\xi}_n + \boldsymbol{\varepsilon}_n$$

$$\boldsymbol{\xi}_n \sim N(0, \boldsymbol{\Phi})$$

$$\boldsymbol{\varepsilon}_n \sim N_M(0, \boldsymbol{\Omega})$$

where $\mathbf{y}_n$ and $\boldsymbol{\varepsilon}_n$ are column vectors with M elements and $\boldsymbol{\xi}_n$ with k elements, and $\mathbf{B}$ is a $M \times k$ matrix. It is assumed that $\boldsymbol{\xi}_n$ and $\boldsymbol{\varepsilon}_n$ are independent, $\boldsymbol{\Phi}$ is positive definite and $\boldsymbol{\Omega}$ is an $M \times M$ diagonal matrix. This leads to the following distribution for $\mathbf{y}$: $\mathbf{y}_n \sim N_M(0, \boldsymbol{\Sigma})$ with

⁶ The survey (in Dutch) is available upon request.

⁷ Dutch net household income per year is 35,000 euro, resulting in 2917 euro per month. This is household income in 2014, the most recently available year. Source: Central Bureau of Statistics Netherlands.

⁸ The calibration and validation samples are created randomly from the full dataset.

⁹ To check the robustness of our factor outcome, we imputed data for the missing values using the EM algorithm (Dempster et al., 1977) and excluded the respondents without strong opinions, i.e. those that answered 3 (neither agree nor disagree) on more than 75 percent of the statements. These alternative approaches do not affect our results.

Fig. 2.1. Scree-plot of eigenvalues - 75% of sample. This figure shows eigenvalues of the factors against the number of extracted factors. This plot is used to determine the number of factors to extract based on the 'elbow' criterion. According to this criterion, the factors before the 'elbow' (or kink) in the graph should be extracted. In this plot, we find 'elbows' at factor 4 and factor 11.

covariance matrix $\Sigma = \mathbf{B}\Phi\mathbf{B}' + \Omega$. Together these equations form the multiple factor model, where $\mathbf{B}$ is a matrix of factor loadings, ξ_n is a vector of factor scores and $\mathbf{y}_n$ represents the indicators for ξ , the latent variables. In such a factor model, the variance of the indicators (the diagonal elements of Σ) is separated in the common variance, which is that accounted for by the factors (the corresponding elements of $\mathbf{B}\Phi\mathbf{B}'$), and the unique variance (the corresponding element of Ω). We estimate the multiple factor model with maximum likelihood and predict factor scores using the Bartlett predictor. This predictor is known to produce unbiased estimates and is more likely to generate the actual factor scores compared to other predictors. Interpretation of the factors is based on rotated factor loadings using an oblique rotation, which does not restrict the factors to be orthogonal (Wansbeek and Meijer, 2000).¹⁰

We use several statistical tests to determine the appropriate number of factors. First, we use Cattell's scree-test, which graphs the number of factors against the eigenvalues of these factors (Cattell, 1966). Based on this criterion, we should retain all factors before the 'elbow' or kink in the plot. Second, we use the Kaiser-criterion, which states that all factors with an eigenvalue larger than 1 should be retained. Third, we consider the Bayesian Information Criterion (BIC): the lower the BIC, the better the model fit. Fourth, we rely on the Root Mean Squared Error of Approximation (RMSEA). The rule of thumb for selecting the optimal amount of factors based on the RMSEA is to retain the smallest number of factors for which this statistic falls below 0.05 (Preacher et al., 2013). Both the BIC and the RMSEA give a penalty for adding parameters to the model, and thus favour a more parsimonious model. Apart from the statistical properties of the model, it is equally important that the extracted factors can be well interpreted as the unobservable latent variables, i.e., dimensions of voter ideology. Interpretation of the factors is done on the basis of conceptual similarity of the statements with high (generally > 0.3) estimated factor loadings.

Fig. 2.1 shows the scree-plot of the EFA on the statements. Based on this criterion, the number of factors to be retained is ambiguous. Several kinks, or 'elbows', are observed. The clearest kink is found at factor 4, indicating that we should retain 3 factors. However, the 'elbow' at factor 11, suggesting 10 factors, would also give a plausible outcome. In cases of double or triple 'elbows' as observed here, Cattell (1966) argues that, as an empirical rule, the lowest number of factors should be retained. However, without any ulterior base for choosing between a lower or higher number of factors more investigation is warranted. The Kaiser criterion suggests that 10 factors should be retained. The BIC, however, is in favour of 8 factors. The RMSEA for the 3-factor model is 0.052 and for the 4-factor model 0.044; increasing the number of factors to 5 or more reduces the RMSEA further. So, based on this criterion, we should retain 4 factors.

Overall it is clear that the different decision rules do not give consistent information on the appropriate number of factors to extract. In short, they direct us towards a model structure with 3, 4, 8 or 10 factors. We investigate the interpretability of these models to find a conclusive answer on the underlying factor structure.

The interpretability of the 3- and 4-factor models is very clear. Statements that load on the factors are evidently related to each other, factor loadings are high and the factors are interpretable as elements of ideology. However for the 8- and 10-factor models this is not the case. Due to several reasons the extracted factors are difficult to interpret. Firstly, seemingly unrelated statements load on the same factors. Secondly, factor loadings are low, especially compared to those of the 3- and 4-factor outcome. This makes distinguishing what the factors represent in terms of political beliefs unclear. Taking this and the factor retention criteria into account, we believe the 3 and 4 factor models best represent the underlying structure of voter ideology. As such, we predict factor scores for both factor structures. Before turning to the interpretation of the factors, we first examine their correlations.

Tables 2.2 and 2.3 show the correlations between factors for both factor structures. Correlations are never higher than 0.17 (absolute value), which indicates that each factor is capturing different elements of voter ideology. Table 2.4 shows correlations between the

¹⁰ Specifically, we use an oblique quartimin rotation. With this rotation method, the sums of the cross-products of the squared factor loadings are minimized (Carroll, 1953).

factors of the 3- and 4-factor solutions. These correlations suggest that the factors retained in the 3-factor structure are well determined in the 4-factor solution. Furthermore, correlations between the additional factor of the 4-factor solution and the factors in the 3-factor model are relatively low, suggesting that the fourth factor captures a distinctly separate element of ideology. We continue with the interpretation of the factors as dimensions of voter ideology and conduct a confirmatory factor analysis of the 3-factor and 4-factor solutions using the validation sample. We aim to verify the factor structure underlying the data and test how the models perform in terms of cross-validation and generalizability.

2.2. Interpretation: the dimensions of voter ideology

Table 2.5 contains an overview of which statements load on what factor for the 3- and 4-factor solution. We take into account those statements with a factor loading higher than 0.3 (absolute value) and search for similarity between these statements to interpret the factors as dimensions of voter ideology. The first three dimensions are represented in both factor models, and therefore, their interpretation does not differ between the factor structures. The additional fourth dimension is only represented in the 4-factor model.

We label the first factor *Openness*. It captures the divide between ‘closed versus open’ attitudes regarding economic policies, societal issues, and politics in general. It can be related to what is nowadays referred to in popular media as contemporary populism. To facilitate interpretation, we have inverted factor loadings and scores, such that a negative association with this dimension captures a preference for a more closed-off society and a positive association the preference for a more open one. As such, a negative score on this dimension captures support for national sovereignty and protection of the domestic economy, and negative attitudes towards immigration. It is associated with the belief that the will of the (native) ‘people’ should go before that of the establishment or some elite group (Mudde and Kaltwasser, 2013). Moreover, it is associated with support for more direct democracy and support for the exclusion of certain (minority) groups, which have values and attitudes viewed as not in the interest of the ‘people’ (Jagers and Walgrave, 2007). Nativism is a characterizing feature of this dimension, which forms the basis for arguing that citizens in a country can be treated unequally. A positive association with this dimension would imply a preference for a more open society, i.e., support for a multi-cultural society, where all citizens are treated equally, demand for international cooperation, trust in supranational organizations and an open, globalized domestic economy. The *Openness* dimension, in short, captures political preferences regarding nationalist, protectionist and populist issues.

As to the second factor, we label it *Economic Equality*. Statements that deal with income inequality, the rights of the working class, and nationalization and regulation of markets form this economic dimension. It constitutes of the belief that redistribution and economic equality should be strived for by society. It is in line with the ideology of social democracy, which encompasses that democratic collective action should be used to extend economic equality and oppose injustice created by unregulated markets with too much power. Collective action may occur via different channels such as political parties, trade unions or other institutions that represent the interests of the working class. An egalitarian society should be achieved through (labour market) regulation, economic policies, social welfare, and, if necessary, nationalization of some markets (Jackson, 2013). In brief, the *Economic Equality* dimension captures a political preference for economic equality.

The statements that load high on the third factor deal with freedom, equal rights regardless of sexual orientation or gender, and decision-making power in an individual's life choice. Therefore, we name this factor *Self-determination*. This dimension is associated with liberal ideological views. As does liberalism, it places high value on rights, justice, individuality, equality and liberty for everyone. People should have a high level of autonomy and intervention of political power in social life should be limited. Every individual should be able to choose his or her own life plan. This dimension is a social one in the sense that it encompasses views on how life should be organized. As such, the beliefs captured by this dimension are not related to individuals' internal locus of control, but deal with autonomy of individuals in social life. The counterpart of this dimension can be described as the belief in traditional morality, authority and established order (Freeden and Stears, 2013). In sum, the *Self-determination* dimension measures political beliefs in personal and cultural freedom.

Lastly, we label the fourth factor *Efficiency*. Statements that load high on this dimension deal with spending cuts on social security, more decentralization of government tasks, emphasis on market forces in health care and the labour market, and a European constitution replacing the Dutch one. It captures the belief in voluntary exchange, market forces and a decentralized, minimal state. The economy should be deregulated, taxes cut, and markets privatized. The political preferences captured by this dimension are most closely related to the ideology of economic libertarianism, which prioritizes the economy and approaches any political issue from an economic view. There is a focus on market forces and efficiency, not only in economics, but also in politics. The role of the government should be small, solely to protect property rights, enforce contracts and protect the market order. Other government functions should be taken over by the market, which should be deregulated as much as possible. According to economic libertarianism, there is a role for democracy, but this should be as rule-based, i.e., constitutional-based, as possible. Democracy's role should be one of indirect representation (Gamble, 2013). Altogether, the *Efficiency* dimension captures preferences for markets and efficiency.

Table 2.2
Correlation between factors - 3 factor solution EFA.

	Factor 1	Factor 2	Factor 3
Factor 1	1.00		
Factor 2	−0.02	1.00	
Factor 3	−0.13	0.17	1.00

Table 2.3

Correlation between factors - 4 factor solution EFA.

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.00			
Factor 2	0.00	1.00		
Factor 3	−0.12	0.13	1.00	
Factor 4	0.10	−0.04	−0.01	1.00

Table 2.4

Correlation between factors from 3 and 4 factor solutions - EFA.

	Factor 1 - 3 Factor Solution	Factor 2 - 3 Factor Solution	Factor 3 - 3 Factor Solution
Factor 1 - 4 Factor Solution	0.99	−0.06	−0.14
Factor 2 - 4 Factor Solution	0.03	0.97	0.12
Factor 3 - 4 Factor Solution	−0.11	0.15	0.99
Factor 4 - 4 Factor Solution	0.08	−0.27	−0.13

2.3. Confirmatory factor analysis

Using confirmatory factor analysis, we test the model fit of the 3-factor and 4-factor solutions obtained from the EFA. We use the validation sample of our dataset. The goal is to cross-validate the factor structure, and find which model best balances generalizability and fit to the underlying data structure in terms of the optimal number of factors (see Preacher et al., 2013).

CFA is based on the same multiple factor model as EFA; however, in CFA there are restrictions on the matrix of factor loadings, $\mathbf{B}$, and on the covariance matrix, Φ .¹¹ These restrictions are either based on theoretical considerations or based on an EFA-implied factor structure. The latter is the case for us. We cross-validate the 3-factor and 4-factor structures by estimating a fully constrained model for each factor structure. In such a model the parameters are restricted to be equal to the estimated coefficients of the EFA, the variance of the latent dimensions restricted to 1 and their covariance constrained to be equal to their correlation coefficient after rotation and prediction in the EFA (van Prooijen and van der Kloot, 2001; Preacher et al., 2013).

In order to determine which of the 2 factor structures is superior in terms of generalizability, we present 5 goodness-of-fit statistics. We compute a Likelihood Ratio (LR) test of the hypothesized model versus the saturated model. The null-hypothesis of this test is that the hypothesized model fits as well as the saturated model. Accepting the null indicates good model fit. We also present the Comparative Fit Index (CFI), a relative fit index, and the RMSEA, here used as a measure of absolute fit. The CFI should be higher than 0.95 for good fit and across models a higher CFI indicates a better fit. The RMSEA has a cut-off value of 0.06 to indicate good model fit. We also compute the standardized root mean squared residual (SRMR), which is based on the covariance of the residuals. For this measure, values closer to 0 are considered to be better, and a SRMR lower than 0.08 can be interpreted as adequate model fit. Lastly, we calculate the BIC. The smaller the BIC, the better the fit of the model compared to a different model that includes the same variables (Hu and Bentler, 1999).

Table 2.6 gives an overview of the goodness-of-fit statistics for the 3-factor and 4-factor solutions. The likelihood ratio test is rejected for both factor structures and the CFI is lower than the threshold value for good fit. However, the latter fit index is higher for the 4-factor model, indicating that this model fits better than the 3-factor model. On the other hand, the RMSEA is lower than 0.06 and the SRMR lower than 0.08 for both models. The BIC is lowest for the 4-factor model, indicating that this model has superior fit. Based on these indices we conclude that the model with 4 factors fits (slightly) better than the 3-factor model. Therefore, we prefer a 4-dimensional representation of voter ideology. Nevertheless, in subsequent analyses, we will use the 3-factor model for robustness checks.

3. The dimensions vs. left-right ideology

Based on our results above, we proceed and predict factor scores for each subject in our dataset by conducting a CFA on all observations.¹² Factor scores are standardized and predicted for both the 4-dimensional and the 3-dimensional models. We use the four dimensions of voter ideology in subsequent analyses; however, check our results for robustness with the dimensions measured and predicted with the 3 factor model.

To examine the difference between the dimensions and left-right ideology, we report estimates of regressing these dimensions, separately and simultaneously, on the left-right self-reports in Table 3.1. In order to simplify interpretability, we first standardize left-right ideology. This allows us to interpret the coefficients of the bivariate regressions as simple correlations. Left-right ideology is positively correlated with *Efficiency* indicating that people have beliefs that are associated with this dimensions are more likely to self-

¹¹ The variables in a CFA model are distributed as in the EFA model. As mentioned in footnote 6, the indicators are assumed to have a multivariate normal distribution, which is unlikely to hold; however, the estimators remain to be consistent. Nevertheless, we adapt standard errors and chi-square tests using the Satorra-Bentler adjustment, which is robust to non-normality. Since many goodness-of-fit statistics are based on chi-square tests, this adjustment makes these also robust to non-normality (Satorra and Bentler, 1994).

¹² 'All observations' refers to the observations used in the factor analyses, i.e., those without missing values in the indicators for voter ideology (see Section 2). To facilitate interpretation of the *Openness* dimension, we invert predicted scores for this factor, such that a negative association captures a preference for a more closed-off society and a positive association the preference for an open one.

Table 2.5

Factor loadings - 3 and 4 factor solutions.

3 Factors	4 Factors	
<i>Factor 1 - Openness</i>		
–0.812	–0.810	Borders should be closed for asylum-seekers.
–0.790	–0.796	The government should cut spending on development aid.
–0.668	–0.668	The Netherlands should leave the European Union.
0.660	0.685	Immigrants are entitled to social security.
–0.609	–0.619	National sovereignty is more important than international relations.
–0.537	–0.531	The death penalty should be reintroduced in the Netherlands.
–0.485	–0.476	Outcomes of referenda should be binding for the government.
0.421	0.419	Everyone residing in the Netherlands should be treated equally, irrespective of religion, race or gender.
–0.421	–0.403	Governors, such as the Prime Minister and mayors, should be chosen in direct elections.
–0.392	–0.391	Freedom of expression is more important than protection against discrimination.
–0.382	–0.381	Nuclear energy is the best alternative when fossil fuels are depleted.
–0.378	–0.367	The government should protect the domestic economy, for example by taxing imports.
0.345	0.361	Sustainable development is more important than economic growth.
–0.345	–0.337	To protect the Dutch state, it is allowed to restrict certain freedom, such as the right to privacy or freedom of religion.
–0.339	–0.333	To encourage entrepreneurship, income taxes should be reduced.
–0.314	–0.308	The government should cut spending on unemployment benefits.
0.300	0.300	A European constitution should be created, which will replace the Dutch constitution.
x	–0.307	The government should invest in education, even during recessions.
<i>Factor 2 – Economic Equality</i>		
0.618	0.642	Income inequality is more important than economic growth.
0.514	0.508	In order to protect the rights of workers, trade unions should be given more power.
0.452	0.476	To better protect the rights of consumers, the government must regulate markets more.
0.451	0.431	All utilities, such as gas, water and electricity, should be nationalized.
–0.373	x	Reducing the government deficit should be given a higher priority than investments in the social security system.
–0.366	x	Dismissal law should become more flexible.
0.365	0.392	Access to museums should be free for all Dutch.
–0.362	x	The government should cut spending on unemployment benefits.
0.322	0.312	Outcomes of referenda should be binding for the government.
0.301	x	During recessions the government should not cut spending, but stimulate the economy by investing more.
x	0.305	Governors, such as the Prime Minister and mayors, should be chosen in direct elections.
<i>Factor 3 - Self-determination</i>		
0.743	0.734	It should be possible for same-sex couples to adopt children.
–0.669	–0.656	Civil servants may refuse to marry same-sex partners.
0.548	0.558	Euthanasia should be allowed to all.
–0.379	–0.363	When a mother has a paid job, it will be at the expense of her children.
x	0.314	Soft-drugs should be legalized.
<i>Factor 4 - Efficiency</i>		
x	0.499	Insurance companies should have access to individual medical records, so they can better determine the height of insurance premiums.
x	0.478	A European constitution should be created, which will replace the Dutch constitution.
x	0.397	It is a good thing that municipalities have more responsibilities, for example for youth care.
x	0.359	The government should cut spending on unemployment benefits.
x	0.357	Dismissal law should become more flexible.
x	0.332	Reducing the government deficit should be given a higher priority than investments in the social security system.
x	0.312	The minimum wage should be abandoned.

Note: the first column gives factor loadings for the 3 factor solution; the second column for the 4 factor solution. An 'x' indicates no load of that statement on the factor. To facilitate interpretation, we have inverted the loadings on the first factor 'Openness'.

report to be right-wing. Left-right ideology is negatively related to *Openness*, *Economic Equality* and *Self-determination* suggesting that beliefs associated with these dimensions are more likely to be related to a left-wing self-report. These relations are in line with expectations. Moreover, as none of the coefficients indicate a near perfect relation, we are capturing the different aspects of voter ideology with these dimensions than left-right ideology encompasses.

Additionally, we report the R-squared of each regression in Table 3.1, which tells us how much variance in the left-right self-reports can be explained by the dimensions. *Efficiency* and *Self-determination* do not explain much of the variance, even though beliefs related to both dimensions have a significant influence on left-right ideology. *Economic Equality* already accounts for more of the variance in the left-right scale and *Openness* accounts for most of it. Taking the dimensions together, they account for more than 40 percent of the variance in left-right ideology. However, seeing that this is no indication of near perfect prediction, it confirms our previous statement that the dimensions are not measuring the same aspects that make up left-right voter ideology. Besides those measured by the dimensions, it is unclear what other (political) beliefs and characteristics are captured with a left-right scale.

Perhaps surprisingly, the relation between the *Openness* dimension and left-right ideology is strongest. It suggests that the left-right scale might nowadays be interpreted on populist and nationalist grounds, whereas this scale was first associated with economic issues (de Vries et al., 2013). As argued by these authors, a change in the interpretation of left-right ideology shows the volatility of left-right

Table 2.6

Goodness of fit statistics - parameters constrained to factor loadings of EFA.

	LR		CFI	RMSEA	SRMR	BIC
	Chi2	p-value				
3-Factor solution	1843.04	0.00	0.738	0.050	0.073	57441.74
4-Factor solution	1550.41	0.00	0.810	0.042	0.067	57101.75

Table 3.1

OLS estimation results of regressing dimensions on standardized left-right scale.

Dependent variable: Standardized left-right scale	(1)	(2)	(3)	(4)	(5)
Economic Equality	−0.358*** (0.022)				−0.338*** (0.017)
Efficiency		0.152*** (0.023)			0.066*** (0.018)
Openness			−0.499*** (0.021)		−0.478*** (0.019)
Self-determination				−0.285*** (0.022)	−0.150*** (0.019)
Observations	2149	2149	2149	2149	2149
R-squared	0.129	0.023	0.251	0.082	0.416
F-statistic	272.887	45.083	590.086	168.361	438.615
Prob > F	0.000	0.000	0.000	0.000	0.000

Note: OLS regression results are displayed with robust standard errors. Significance is indicated as follows: ***p < 0.01, **p < 0.05, *p < 0.1. No constant is added to the regressions.

ideology and its dependency on the dynamics of the political landscape.¹³ Nevertheless, based on the robustness of this factor in all factor solutions and the results in Table 3.1, we believe that *Openness* is a very dominant and influential element of contemporary politics.¹⁴

To investigate whether the four dimensions also capture more variance contained in the survey statements than left-right ideology, we separately regress the 40 statements on the four dimensions using only the validation sample.¹⁵ From these regressions we calculate the average R-squared. We do the same for the 40 statements and the left-right ideology index. The average R-squared for the regressions containing the four dimensions is 0.33, whereas the average R-squared for the regressions containing left-right ideology is 0.06.

To further illustrate the differences between the underlying dimensions of voter ideology and left-right ideology, we compare the average left-right self-report (see Fig. 3.1) with average scores of the constituents of four political parties on each dimension (see Fig. 3.2). We base this on respondents' (self-indicated) voting behaviour. We use a typical 'left-wing' party, the SP (the socialists); a typical 'right-wing' party, the VVD (the liberals); a centre party, D66 (the social liberals); and the largest populist party, the PVV (the populists) for this exercise. The average constituent of the socialists and the liberals follow the traditional interpretation of left and right in their economic preferences. The average socialist prefers equality and opposes markets and efficiency. The opposite holds for the average liberal. This is reflected in their left-right self-reports; the socialist self-assesses as left-wing and the liberal as right-wing. Surprising is that the average socialist has preferences negatively related to *Openness*, which is considered 'right-wing' in popular debate. The average social liberal has traditional 'right-wing' economic preferences; however, outspoken 'left-wing' social preferences on the *Self-determination* and *Openness* dimensions. This may explain why they place themselves in the centre of the left-right scale. On the other hand, the average populist constituent has economic preferences that would be considered 'left-wing', but preferences for freedom and nationalist and populist preferences that some would place on the right end of the scale. The average populist voter, however, identifies with the right. This illustration shows that the interpretation given to left and right differs across the electorate. Furthermore, it shows that much of the heterogeneity in contemporary political beliefs remains hidden when using the one-dimensional left-right measure of voter ideology.¹⁶

4. The determinants of voter ideology

We use the new measures of voter ideology to examine the determinants of political beliefs. Due to the cross-sectional nature of our data, we unfortunately cannot rule out reverse causality. Nevertheless, we hypothesize that individual characteristics, socio-economic background and surrounding determines political attitudes. We take into account age, gender, education and income. We also consider

¹³ It should be mentioned, though, that we measure left-right ideology at one point in time. This could mean that, due to the scale's dynamic nature, our respondents' left-right alignment differs from the ones used in existing research.

¹⁴ The results presented in this section are robust to using the 3-dimensional representation of voter ideology.

¹⁵ The results of these regressions can be found in the appendix in table A4 (left-right scale) and table A5 (dimensions).

¹⁶ For more on the heterogeneity and dimensionality in political beliefs of the Dutch electorate, we refer you our short article on this (Laméris et al., 2017).

Fig. 3.1. Scores of average constituent on the left-right scale for respondents that indicated to vote for the socialist party, the social liberal party, the liberal party and the populist party, respectively. The left-right scale ranges from 1 (left) to 10 (right).

how being married, having kids, being employed, and being religious (here: Christian) influence political beliefs. Additionally, we take into consideration how satisfied someone is with their life, how they expect their future income position to be and their self-reported risk-averseness. Lastly, we examine how location affects voter ideology using a measure of the density in the area of residence. For comparison, we include a specification using self-reported left-right ideology. Table 4.1 shows the results.

Column 1 shows the determinants of the preferences for economic equality. We find that an individual that is female, older and is less educated (relatively speaking) has a stronger preference for equality. Furthermore, this is increasing in the number of children that live at home and preferences also become stronger when someone expects a deterioration of their income. On the other hand, having a monthly income higher than 1800 euro, being religious, less satisfied with life and more risk-loving (relatively speaking) are negatively related to preferences for equality.

Looking at the determinants of *Efficiency* (column 2), our results suggest that, regardless of age and gender, a person that is less educated, more risk-loving (both relatively speaking), and not married has a stronger preference for *Efficiency*. There is no clear trend in the relation between income and preferences for markets and efficiency; however, we do find that having an income in the highest category (compared to the base category) leads to a stronger preference for efficiency. Moreover, expected downward income movements are negatively related to this dimension.

With regard to the determinants of ‘open versus closed’ preferences (column 3), our results indicate that someone that is female, younger, happier and more highly educated (relatively speaking) has more ‘open’, less populist and nationalist political beliefs. The same holds for religious people. Other determinants are expecting a deterioration of income over time and being married, which positively affect nationalist, protectionist and populist preferences. These political preferences are also increasing in the number of children living at home. Additionally, we find that location matters: the more rural the area, the stronger preferences for a ‘closed’ society.

Column 4 sheds light on the drivers of *Self-determination*. Being female, employed, more highly educated, more risk-loving and happier (relatively speaking) strengthens preferences for personal and cultural freedom. Moreover, there seems to be some trend in the relation between income and preferences for self-determination: the higher an individual's income, the stronger these preferences. Individuals that expect an improvement of income over time also have stronger preferences for self-determination. Not surprisingly, being religious puts you on the other end of the spectrum preferring traditional morality, authority and the status quo. The latter is increasing in the number of children someone has. Again we find that location matters; the more rural the area, the stronger political preferences for tradition, and thus, the weaker preferences for self-determination.¹⁷

Looking at column 5, we find that being male, religious, less educated and risk-loving (relatively speaking) increases a person's self-

¹⁷ The results presented in this section are robust to using the 3-dimensional representation of voter ideology.

Fig. 3.2. Scores of average constituent on the four dimensions of voter ideology for respondents that indicated to vote for the socialist party (upper-left), the social liberal party (upper-right), the liberal party (lower-left) and the populist party (lower-right).

report on the left-right scale. In other words, these characteristics make it more likely that this person associates with right-wing ideology. Furthermore, the score on the left-right scale is increasing in both income and the amount of children living at home. The same holds for individuals expecting an improvement in income over time. However, we find no relation between left-right ideology and age; employment; being married; happiness; and location, even though these are drivers of the dimensions of voter ideology.

All in all, we draw two conclusions from the above. First, there is substantial heterogeneity in the determinants of political beliefs, and in how they influence different elements of voter ideology. This is exemplified by the effects of education. We find a negative effect of education on *Economic Equality* and *Efficiency*, whereas *Openness* and *Self-determination* are positively affected by education. Second, by using a one-dimensional left-right representation a large part of this heterogeneity does not surface. As such, important determinants of voter ideology are overlooked. Take, for example, life-satisfaction. A person's happiness affects his or her preferences for *Economic Equality*, *Openness* and *Self-determination*. However, we do not find an effect of happiness on left-right ideology. The same can be said for the effects of marriage and the effects of geographical location on political beliefs, to give two additional examples. Hence, measuring ideology on multiple dimensions gives us a better understanding of the drivers of different political preferences, and as such, more insight in (economic) choices made by individuals.

5. Conclusion

In this paper we have investigated the dimensionality of voter ideology and its determinants. Based on exploratory factor analysis as well as confirmatory factor analysis, we identify four dimensions of voter ideology. These dimensions capture preferences for economic equality; preferences for markets and efficiency; preferences for personal and cultural freedom; and nationalist, protectionist and populist preferences. We show that the newly obtained measures differ from the traditional left-right measure. Based on simple correlations, we find that the four dimensions are not mutually exclusive and only modestly correlate with a traditional left-right measure (max. $r = 0.5$). Examining the four dimensions in the Dutch party space, we find that there is much heterogeneity in preferences between political parties that remains hidden when using a left-right measure. Moreover, we find that voters are interpreting left and right on the basis of different issues. As such, a left-wing score for one party does not translate one-for-one to a right-wing score for another party.

It should be stressed that our dimensions of ideology are measured from a demand perspective. That is, they are based on the political

Table 4.1

OLS regression results of explaining the dimensions of voter ideology.

Dependent variable:	(1)	(2)	(3)	(4)	(5)
	Economic Equality	Efficiency	Openness	Self-determination	Left-right Scale
Dummy female	0.094** (0.040)	0.035 (0.042)	0.088** (0.038)	0.192*** (0.038)	−0.313*** (0.079)
Age	0.003* (0.002)	0.002 (0.002)	0.003* (0.002)	−0.001 (0.002)	−0.002 (0.004)
Dummy married	0.099* (0.059)	−0.144** (0.068)	−0.190*** (0.058)	0.014 (0.057)	0.034 (0.126)
Number of kids	0.041* (0.024)	0.012 (0.026)	−0.064*** (0.021)	−0.109*** (0.028)	0.082* (0.048)
Education	−0.046*** (0.008)	−0.024*** (0.008)	0.119*** (0.008)	0.027*** (0.007)	−0.107*** (0.016)
Dummy employed	−0.052 (0.049)	−0.060 (0.055)	−0.068 (0.048)	0.135*** (0.047)	0.082 (0.099)
Dummy religious	−0.449*** (0.054)	0.050 (0.060)	0.231*** (0.052)	−1.019*** (0.066)	0.965*** (0.106)
Life-satisfaction	−0.056*** (0.015)	0.005 (0.017)	0.076*** (0.016)	0.050*** (0.015)	−0.030 (0.031)
Future Income Position: Worse	0.194*** (0.052)	−0.351*** (0.054)	−0.098* (0.052)	−0.005 (0.049)	−0.058 (0.102)
Future Income Position: Better	−0.088 (0.066)	−0.051 (0.069)	−0.060 (0.061)	0.166*** (0.058)	0.238* (0.129)
Risk-averseness	−0.022* (0.012)	0.052*** (0.013)	−0.006 (0.012)	0.030** (0.012)	0.091*** (0.024)
Net monthly household income between 1151€–1800€	−0.013 (0.100)	0.120 (0.102)	−0.068 (0.097)	0.218** (0.102)	0.318 (0.212)
Net monthly household income between 1801€–2600€	−0.219** (0.103)	0.125 (0.101)	−0.045 (0.098)	0.089 (0.100)	0.543** (0.213)
Net monthly household income > 2600€	−0.455*** (0.103)	0.271** (0.106)	0.105 (0.098)	0.235** (0.100)	0.512** (0.216)
Density of place of residence: Fairly high	0.089 (0.075)	−0.179** (0.070)	−0.171** (0.069)	−0.187*** (0.065)	0.149 (0.141)
Density of place of residence: Average	−0.016 (0.080)	−0.055 (0.079)	−0.205*** (0.071)	−0.156** (0.068)	0.204 (0.146)
Density of place of residence: Fairly low	−0.141* (0.078)	−0.111 (0.079)	−0.191*** (0.072)	−0.273*** (0.067)	0.377** (0.149)
Density of place of residence: Low	−0.113 (0.081)	−0.033 (0.080)	−0.171** (0.074)	−0.250*** (0.073)	0.189 (0.164)
Constant	1.136*** (0.209)	0.014 (0.228)	−1.783*** (0.206)	−0.695*** (0.194)	5.603*** (0.404)
Observations	2132	2132	2132	2132	2112
R-squared	0.147	0.036	0.187	0.237	0.088
F-statistic	21.345	4.777	25.716	27.596	12.946
Prob > F	0.000	0.000	0.000	0.000	0.000

Note: OLS regression results are displayed with robust standard errors clustered at the household level. Significance is indicated as follows: ***p < 0.01, **p < 0.05, *p < 0.1. Number of kids refers to the children living at home. The education variable is denoted in the amount of years needed (on average) to obtain a specific educational degree, i.e. the higher this variable, the higher level of obtained education. Employed respondents are defined as those that are on the payroll of a company or are self-employed. The percentage of employed respondents is relative to all other respondents. The religion dummy is a proxy based on whether a respondent has voted for a Christian political party during the last governmental election. Life-satisfaction is measured on a 10-point scale ranging from 'not at all satisfied' to 'completely satisfied'. Future income position is a subjective measure of how individuals expect their future income position to be: better, the same or worse. As a base category we use those that expect no changes in income. Risk-averseness is measured on a 10-point scale ranging from 1 (risk-averse) to 10 (risk-loving). Respondents earning less than 1151 on a monthly basis are used as the base category for income.

views of the electorate. This demand-driven approach exemplifies the demand for populist parties in the Netherlands since one of our four dimensions represents these preferences. It is likely that the Netherlands is not unique in this respect and that the emergence of populist parties elsewhere in Europe is also demand-driven. Surprisingly, we find that constituents of these parties (the PVV in particular) have traditional left-wing economic preferences, whereas they identify with the right. Subsequent research has to show whether using a supply-driven approach (i.e., investigating the dimensionality of ideology from the point of view of political parties) will confirm our results. Insofar our demand-driven approach is one; another limitation is that our approach is a snapshot. As recent history shows, ideology has become a dynamic phenomenon. As such, we do not know whether the dimensions are stable over time, which is something that provides a natural agenda for further research.

In the second part of the paper, we have investigated the determinants of voter ideology. We compare the determinants of our multidimensional measure of ideology with those of one-dimensional left-right ideology. We find that the pattern of determinants is different for each dimension. In other words, there is considerable heterogeneity in the antecedents of political preferences. We also find that the same determinants can affect the four dimensions of voter ideology in opposite ways. Moreover, our results show that a

significant part of this heterogeneity only surfaces when measuring ideology on multiple dimensions and that potentially important determinants of political beliefs remain hidden when relying on the one-dimensional left-right scale. As such, measuring voter ideology on multiple dimensions better represents what drives political beliefs and improves our understanding of ideology. This could give us more insight into individual choices, for example with regards to voting behaviour, voter turnout and political polarization. Additionally, a better understanding of a constituent's characteristics and background could improve the link between policy proposals of parties and policy preferences of voters. How and in what direction the determinants of the different elements of political beliefs affect these outcomes is food for thought and opens up avenues for future research.

Acknowledgements

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Appendix

Table A1

List of statements in the order they appeared in survey (translated from Dutch by authors).

1	Euthanasia should be allowed to all.
2	The government should cut spending on defence.
3	During recessions the government should not cut spending, but stimulate the economy by investing more.
4	Access to museums should be free for all Dutch.
5	Landlords should be able to determine the height of the rent freely.
6	National sovereignty is more important than international relations.
7	The minimum wage should be abandoned.
8	Civil servants may refuse to marry same-sex partners.
9	In order to protect the rights of workers, trade unions should be given more power.
10	The Netherlands should leave the European Union.
11	All utilities, such as gas, water and electricity, should be nationalized.
12	Freedom of expression is more important than protection against discrimination.
13	The government should protect the domestic economy, for example by taxing imports.
14	The government should cut spending on development aid.
15	Nuclear energy is the best alternative when fossil fuels are depleted.
16	Insurance companies should have access to individual medical records, so they can better determine the height of insurance premiums.
17	Immigrants are entitled to social security.
18	Reducing the government deficit should be given a higher priority than investments in the social security system.
19	The constitutional monarchy should be replaced by a ceremonial monarchy.
20	A person that refuses to work should not receive any benefits.
21	To protect the Dutch state, it is allowed to restrict certain freedom, such as the right to privacy or freedom of religion.
22	The government should invest in education, even during recessions.
23	Governors, such as the Prime Minister and mayors, should be chosen in direct elections.
24	It is a good thing that municipalities have more responsibilities, for example for youth care.
25	To encourage entrepreneurship, income taxes should be reduced.
26	Intellectual property rights, such as copyright, should be protected.
27	To better protect the rights of consumers, the government must regulate markets more.
28	Borders should be closed for asylum-seekers.
29	When a mother has a paid job, it will be at the expense of her children.
30	Income inequality is more important than economic growth.
31	Outcomes of referenda should be binding for the government.
32	Dismissal law should become more flexible.
33	Everyone residing in the Netherlands should be treated equally, irrespective of religion, race or gender.
34	The death penalty should be reintroduced in the Netherlands.
35	Soft-drugs should be legalized.
36	Sustainable development is more important than economic growth.
37	It should be possible for same-sex couples to adopt children.
38	Healthcare benefits should be income-dependent.
39	A European constitution should be created, which will replace the Dutch constitution.
40	The government should cut spending on unemployment benefits.

Table A2

Descriptive statistics of statements (complete sample).

Statement	Mean	SD	Min	Max	Statement	Mean	SD	Min	Max
1	3.66	1.12	1	5	21	2.64	1.08	1	5
2	2.59	0.95	1	5	22	4.15	0.64	1	5
3	3.43	0.82	1	5	23	3.34	1.02	1	5
4	3.01	1.07	1	5	24	2.83	0.99	1	5
5	2.30	0.93	1	5	25	3.40	0.80	1	5
6	2.82	0.95	1	5	26	3.74	0.66	1	5

(continued on next page)

Table A2 (continued)

Statement	Mean	SD	Min	Max	Statement	Mean	SD	Min	Max
7	2.21	0.92	1	5	27	3.17	0.78	1	5
8	2.07	1.17	1	5	28	2.78	1.21	1	5
9	3.07	0.92	1	5	29	2.27	1.03	1	5
10	2.38	1.18	1	5	30	2.61	0.91	1	5
11	3.30	1.04	1	5	31	3.20	1.02	1	5
12	3.18	0.97	1	5	32	2.68	0.95	1	5
13	2.97	0.84	1	5	33	4.03	0.93	1	5
14	3.08	1.12	1	5	34	2.01	1.17	1	5
15	2.58	1.05	1	5	35	3.15	1.17	1	5
16	1.69	0.81	1	5	36	3.50	0.84	1	5
17	2.56	1.03	1	5	37	3.82	1.04	1	5
18	2.60	0.87	1	5	38	3.86	0.89	1	5
19	2.78	1.08	1	5	39	2.04	0.92	1	5
20	3.85	0.94	1	5	40	2.58	0.93	1	5

Note: The mean, standard deviation and the range of answers is given for each statement. (Dis)agreement with the statements is given on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree).

Table A3

Correlation between dimensions of voter ideology and self-reported left-right ideology - 3 factor solution.

	Left-Right Ideology
Openness	−0.49
Economic Equality	−0.39
Self-determination	−0.31

Table A4

Output of regressing left-right ideology on the 40 statements (see table A1 for a list).

Dependent variable	Left-right scale	Obs.	Adj. R-squared
Statement 1	−0.048** (0.024)	542	0.005
Statement 2	−0.118*** (0.020)	542	0.061
Statement 3	−0.054*** (0.018)	542	0.014
Statement 4	−0.066*** (0.023)	542	0.013
Statement 5	0.084*** (0.021)	542	0.028
Statement 6	0.148*** (0.019)	542	0.098
Statement 7	0.084*** (0.020)	542	0.030
Statement 8	0.110*** (0.025)	542	0.033
Statement 9	−0.126*** (0.020)	542	0.069
Statement 10	0.159*** (0.025)	542	0.070
Statement 11	−0.062*** (0.022)	542	0.013
Statement 12	0.105*** (0.020)	542	0.046
Statement 13	0.036** (0.017)	542	0.006
Statement 14	0.237*** (0.022)	542	0.180
Statement 15	0.199*** (0.021)	542	0.142
Statement 16	0.082*** (0.018)	542	0.034
Statement 17	−0.220*** (0.020)	542	0.184
Statement 18	0.115*** (0.018)	542	0.069
Statement 19	−0.077*** (0.024)	542	0.017
Statement 20	0.128*** (0.018)	542	0.082

(continued on next page)

Table A4 (continued)

Dependent variable	Left-right scale	Obs.	Adj. R-squared
Statement 21	0.134*** (0.023)	542	0.056
Statement 22	−0.026** (0.013)	542	0.005
Statement 23	0.042** (0.021)	542	0.005
Statement 24	−0.036* (0.022)	542	0.003
Statement 25	0.104*** (0.017)	542	0.064
Statement 26	−0.023 (0.014)	542	0.003
Statement 27	−0.048*** (0.016)	542	0.014
Statement 28	0.276*** (0.023)	542	0.212
Statement 29	0.104*** (0.022)	542	0.038
Statement 30	−0.147*** (0.018)	542	0.104
Statement 31	0.057** (0.022)	542	0.010
Statement 32	0.105*** (0.020)	542	0.048
Statement 33	−0.127*** (0.019)	542	0.074
Statement 34	0.200*** (0.024)	542	0.112
Statement 35	−0.146*** (0.025)	542	0.057
Statement 36	−0.116*** (0.017)	542	0.075
Statement 37	−0.170*** (0.022)	542	0.102
Statement 38	−0.106*** (0.019)	542	0.052
Statement 39	−0.051*** (0.019)	542	0.011
Statement 40	0.151*** (0.019)	542	0.099

Note: OLS regression results are displayed with robust standard errors clustered at the household level. Significance is indicated as follows: ***p < 0.01, **p < 0.05, *p < 0.1.

Table A5

Output of regressing dimensions of voter ideology on the 40 statements (see [table A1](#) for a list).

Dependent variable	Openness	Equality	Self-determination	Efficiency	Obs.	Adj. R-squared
Statement 1	−0.262*** (0.036)	0.031 (0.036)	0.728*** (0.035)	0.123*** (0.035)	549	0.461
Statement 2	0.110*** (0.037)	0.297*** (0.037)	0.138*** (0.036)	0.216*** (0.036)	549	0.178
Statement 3	−0.022 (0.036)	0.260** (0.036)	0.059* (0.035)	−0.034 (0.035)	549	0.098
Statement 4	−0.097** (0.043)	0.479*** (0.042)	0.136*** (0.041)	0.100** (0.041)	549	0.215
Statement 5	−0.077* (0.040)	−0.156*** (0.039)	0.013 (0.038)	0.329*** (0.038)	549	0.157
Statement 6	−0.615*** (0.029)	0.076*** (0.029)	−0.139*** (0.028)	−0.212*** (0.028)	549	0.494
Statement 7	−0.256*** (0.036)	0.068* (0.036)	−0.108*** (0.035)	0.299*** (0.035)	549	0.222
Statement 8	0.157*** (0.033)	0.094*** (0.033)	−0.894*** (0.032)	0.056* (0.033)	549	0.585
Statement 9	0.049 (0.033)	0.583*** (0.033)	0.005 (0.032)	−0.048 (0.032)	549	0.381
Statement 10	−0.795*** (0.035)	0.340*** (0.035)	−0.137*** (0.034)	−0.193*** (0.034)	549	0.541
Statement 11	−0.131*** (0.040)	0.499*** (0.040)	0.028 (0.039)	−0.026 (0.039)	549	0.236

(continued on next page)

Table A5 (continued)

Dependent variable	Openness	Equality	Self-determination	Efficiency	Obs.	Adj. R-squared
Statement 12	−0.408*** (0.039)	0.065* (0.038)	0.089** (0.037)	−0.011 (0.037)	549	0.170
Statement 13	−0.275*** (0.031)	0.293*** (0.031)	−0.097*** (0.030)	0.046 (0.030)	549	0.244
Statement 14	−0.923*** (0.028)	−0.143*** (0.028)	0.103*** (0.027)	−0.089*** (0.027)	549	0.672
Statement 15	−0.380*** (0.040)	−0.152*** (0.040)	−0.041 (0.039)	0.222*** (0.039)	549	0.229
Statement 16	−0.152*** (0.026)	0.113*** (0.026)	−0.116*** (0.025)	0.556*** (0.026)	549	0.520
Statement 17	0.755*** (0.030)	0.179*** (0.030)	−0.019 (0.029)	0.104*** (0.029)	549	0.559
Statement 18	−0.036 (0.032)	−0.215*** (0.031)	−0.117*** (0.031)	0.350*** (0.031)	549	0.294
Statement 19	−0.039 (0.046)	0.265*** (0.046)	0.178*** (0.045)	0.193*** (0.045)	549	0.106
Statement 20	−0.358*** (0.033)	−0.284*** (0.033)	0.131*** (0.032)	0.042 (0.032)	549	0.270
Statement 21	−0.401*** (0.045)	−0.093** (0.044)	0.033 (0.043)	0.181*** (0.043)	549	0.171
Statement 22	0.079*** (0.025)	0.010 (0.024)	0.220*** (0.024)	−0.082*** (0.024)	549	0.189
Statement 23	−0.488*** (0.035)	0.324*** (0.035)	0.208*** (0.034)	0.017 (0.034)	549	0.355
Statement 24	0.147*** (0.040)	0.092** (0.040)	−0.002 (0.039)	0.441*** (0.039)	549	0.194
Statement 25	−0.306*** (0.032)	−0.003 (0.032)	0.138*** (0.031)	0.086*** (0.031)	549	0.166
Statement 26	0.079*** (0.028)	−0.025 (0.028)	0.134*** (0.027)	−0.063** (0.027)	549	0.071
Statement 27	−0.042 (0.029)	0.378*** (0.029)	−0.044 (0.028)	0.010 (0.028)	549	0.234
Statement 28	−1.015*** (0.027)	0.064** (0.027)	−0.075*** (0.026)	0.009 (0.027)	549	0.729
Statement 29	−0.246*** (0.036)	0.344*** (0.036)	−0.502*** (0.035)	0.068* (0.035)	549	0.389
Statement 30	0.122*** (0.026)	0.692*** (0.026)	−0.145*** (0.025)	0.077*** (0.025)	549	0.575
Statement 31	−0.573*** (0.034)	0.392*** (0.034)	0.156*** (0.033)	−0.120*** (0.033)	549	0.441
Statement 32	−0.045 (0.034)	−0.262*** (0.034)	0.074** (0.033)	0.424*** (0.033)	549	0.308
Statement 33	0.388*** (0.033)	0.003 (0.033)	0.285*** (0.032)	−0.057* (0.033)	549	0.321
Statement 34	−0.631*** (0.043)	0.100** (0.042)	−0.144*** (0.041)	0.112*** (0.041)	549	0.331
Statement 35	0.112** (0.047)	0.132*** (0.047)	0.491*** (0.045)	0.100** (0.046)	549	0.212
Statement 36	0.369*** (0.031)	0.240*** (0.031)	0.060** (0.030)	0.099*** (0.030)	549	0.290
Statement 37	0.070*** (0.026)	−0.045* (0.026)	0.831*** (0.026)	−0.046* (0.026)	549	0.673
Statement 38	0.082** (0.037)	0.255*** (0.037)	0.144*** (0.036)	−0.069* (0.036)	549	0.138
Statement 39	0.319*** (0.030)	0.134*** (0.030)	0.065** (0.029)	0.528*** (0.029)	549	0.436
Statement 40	−0.332*** (0.030)	−0.290*** (0.030)	0.092*** (0.029)	0.425*** (0.030)	549	0.471

Note: OLS regression results are displayed with robust standard errors clustered at the household level. Significance is indicated as follows: ***p < 0.01, **p < 0.05, *p < 0.1.

References

- Achterberg, P., Houtman, D., 2009. Ideologically illogical? Why do the lower-educated Dutch display so little value coherence? *Soc. Forces* 87, 1649–1670. <http://dx.doi.org/10.1353/sof.0.0164>.
- Albright, J.J., 2010. The Multidimensional nature of party competition. *Party Polit.* 16, 699–719. <http://dx.doi.org/10.1177/1354068809345856>.
- Alesina, A., 1987. Macroeconomic policy in a two party system as a repeated game. *Q. J. Econ.* 102, 651–678. <http://dx.doi.org/10.2307/1884222>.
- Alesina, A., Di Tella, R., MacCulloch, R., 2004. Inequality and happiness: are Europeans and Americans different? *J. Publ. Econ.* 88, 2009–2042. <http://dx.doi.org/10.1016/j.jpubeco.2003.07.006>.

- Alford, J.R., Funk, C.L., Hibbing, J.R., 2005. Are political orientations genetically transmitted? *Am. Polit. Sci. Rev.* 99, 153–167. <http://dx.doi.org/10.1017/S0003055405051579>.
- Anderson, C.J., Singer, M.M., 2008. The sensitive Left and the impervious Right. *Comp. Polit. Stud.* 41, 564–599. <http://dx.doi.org/10.1177/0010414007313113>.
- Angelopoulos, K., Economides, G., Kammass, P., 2012. Does cabinet ideology matter for the structure of tax policies? *Eur. J. Polit. Econ.* 28, 620–635. <http://dx.doi.org/10.1016/j.ejpolco.2012.06.002>.
- Bakker, R., Jolly, S., Polk, J., 2012. Complexity in the European party space: exploring dimensionality with experts. *Eur. Union Polit.* 13, 219–245. <http://dx.doi.org/10.1177/1465116512436995>.
- Bjornskov, C., 2005. Does political ideology affect economic growth? *Publ. Choice* 123, 133–146. <http://dx.doi.org/10.1007/s11127-005-0263-3>.
- Carney, D.R., Jost, J.T., Gosling, S.D., Potter, J., 2008. The secret lives of liberals and conservatives: personality profiles, interaction styles, and the things they leave behind. *Polit. Psychol.* 29, 807–840. <http://dx.doi.org/10.1111/j.1467-9221.2008.00668.x>.
- Carroll, J.B., 1953. An analytical solution for approximating simple structure in factor analysis. *Psychometrika* 18, 23–38. <http://dx.doi.org/10.1007/BF02289025>.
- Cattell, R.B., 1966. The Scree test for the number of factors. *Multivar. Behav. Res.* 1, 245–276. http://dx.doi.org/10.1207/s15327906mbr0102_10.
- Conover, P.J., Feldman, S., 1984. How people organize the political world: a schematic model. *Am. J. Polit. Sci.* 28, 95–126.
- Dempster, A.P., Laird, N.M., Rubin, D.B., 1977. Maximum likelihood from incomplete data via the EM algorithm. *J. Roy. Stat. Soc.* 39, 1–38.
- Downs, A., 1957. An economic theory of political action in a democracy. *J. Polit. Econ.* 65, 135–150.
- Eysenck, H.J., 1954. *The Psychology of Politics*. Routledge, London.
- Feldman, S., 2013. Political ideology. In: Huddy, L., Sears, L.O., Levy, J.S. (Eds.), *The Oxford Handbook of Political Psychology*. Oxford University Press, Oxford. <http://dx.doi.org/10.1093/oxfordhb/9780199760107.013.0019>.
- Feldman, S., Johnston, C., 2014. Understanding the determinants of political ideology: implications of structural complexity. *Polit. Psychol.* 35, 337–358. <http://dx.doi.org/10.1111/pops.12055>.
- Fisher, M., Kauder, B., Potrafke, N., Ursprung, H.W., 2017. Support for free-market policies and reforms: does the field of study influence students' political attitudes? *Eur. J. Polit. Econ.* 48, 180–197. <http://dx.doi.org/10.1016/j.ejpolco.2016.07.002>.
- Freedman, M., Stears, M., 2013. Liberalism. In: Freedman, M., Stears, M. (Eds.), *The Oxford Handbook of Political Ideologies*. Oxford University Press, Oxford. <http://dx.doi.org/10.1093/oxfordhb/9780199585977.001.0001>.
- Gamble, A., 2013. Economic libertarianism. In: Freedman, M., Stears, M. (Eds.), *The Oxford Handbook of Political Ideologies*. Oxford University Press, Oxford. <http://dx.doi.org/10.1093/oxfordhb/9780199585977.001.0001>.
- Gerber, A.S., Huber, G.A., Doherty, D., Dowling, C.M., Ha, S.E., 2010. Personality and political attitudes: relationships across issue domains and political contexts. *Am. Polit. Sci. Rev.* 104, 111–133. <http://dx.doi.org/10.1017/S0003055410000031>.
- Herwartz, H., Theilen, B., 2017. Ideology and redistribution through public spending. *Eur. J. Polit. Econ.* 46, 74–90. <http://dx.doi.org/10.1016/j.ejpolco.2016.11.002>.
- Hibbs, D., 1977. Political parties and macroeconomic policy. *Am. Polit. Sci. Rev.* 71, 1467–1487. <http://dx.doi.org/10.1017/S0003055400269712>.
- Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.: Multidiscip. J.* 6, 1–55. <http://dx.doi.org/10.1080/10705519909540118>.
- Jackson, B., 2013. Social democracy. In: Freedman, M., Stears, M. (Eds.), *The Oxford Handbook of Political Ideologies*. Oxford University Press, Oxford. <http://dx.doi.org/10.1093/oxfordhb/9780199585977.001.0001>.
- Jagers, J., Walgrave, S., 2007. Populism as political communication style: an empirical study of political parties' discourse in Belgium. *Eur. J. Polit. Res.* 46, 319–345. <http://dx.doi.org/10.1111/j.1475-6765.2006.00690.x>.
- Jost, J.T., Federico, C.M., Napier, J.L., 2009. Political ideology: its structure, functions and elective affinities. *Annu. Rev. Psychol.* 60, 307–337. <http://dx.doi.org/10.1146/annurev.psych.60.110707.163600>.
- Laméris, M.D., Jong-A-Pin, R.M., Garretsen, J.H., 2017. Kiezersvoorkeuren: links en Rechts ingehaald. *Econ. Stat. Ber.* 102, 140–143.
- Layman, G.C., Carsey, T.M., 2002. Party polarization and “conflict extension” in the American electorate. *Am. J. Polit. Sci.* 46, 786–802. <http://dx.doi.org/10.2307/3088434>.
- Maynard, J.L., 2013. A map of the field of ideological analysis. *J. Political Ideol.* 18, 299–327. <http://dx.doi.org/10.1080/13569317.2013.831589>.
- Mudde, C., 2007. *Populist Radical Right Parties in Europe*. Cambridge University Press, Cambridge. <http://dx.doi.org/10.1017/CBO9780511492037>.
- Mudde, C., Kaltwasser, C.R., 2013. Populism. In: Freedman, M., Stears, M. (Eds.), *The Oxford Handbook of Political Ideologies*. Oxford University Press, Oxford. <http://dx.doi.org/10.1093/oxfordhb/9780199585977.001.0001>.
- Otjes, S., 2017. What's left of the Left-Right dimension? Why the economic policy positions of Europeans do not fit the Left-Right dimension. *Soc. Indic. Res.* 1–18. <http://dx.doi.org/10.1007/s11205-017-1575-7>.
- Pitlik, H., Schwarz, G., Bechter, B., Brandl, B., 2011. Near is my shirt but nearer is my skin: ideology of self-interest as determinants of public opinion on fiscal policy issues. *Kyklos* 64, 271–290. <http://dx.doi.org/10.1111/j.1467-6435.2011.00506.x>.
- Potrafke, N., 2017. Partisan politics: the empirical evidence from OECD panel studies. *J. Comp. Econ.* 45, 712–750. <http://dx.doi.org/10.1016/j.jce.2016.12.004>.
- Preacher, K.J., Zhang, G., Kim, C., Mels, G., 2013. Choosing the optimal number of factors in exploratory factor analysis: a model selection perspective. *Multivar. Behav. Res.* 48, 28–56. <http://dx.doi.org/10.1080/00273171.2012.710386>.
- van Prooijen, J., van der Kloot, W.A., 2001. Confirmatory analysis of exploratively obtained factor structures. *Educ. Psychol. Meas.* 61, 777–792. <http://dx.doi.org/10.1177/00131640121971518>.
- Satorra, A., Bentler, P.M., 1994. Corrections to test statistics and standard errors in covariance structure analysis. In: von Eye, A., Clogg, C.C. (Eds.), *Latent Variables Analysis: Applications for Developmental Research*. SAGE Publications, Thousand Oaks.
- Sorensen, R.J., 2014. Political competition, party polarization, and government performance. *Publ. Choice* 161, 427–450. <http://dx.doi.org/10.1007/s11127-014-0168-0>.
- Tavares, J., 2004. Does Right or Left matter? Cabinets, credibility and fiscal adjustments. *J. Publ. Econ.* 88, 2447–2468. <http://dx.doi.org/10.1016/j.jpubeco.2003.11.001>.
- Di Tella, R., MacCulloch, R., 2005. Partisan social happiness. *Rev. Econ. Stud.* 72, 367–393. <http://dx.doi.org/10.2139/ssrn.267362>.
- Treier, S., Hillygus, D.S., 2009. The nature of political ideology in the contemporary electorate. *Publ. Opin. Q.* 734, 679–703. <http://dx.doi.org/10.1093/poq/nfp067>.
- Volkens, A., Bara, J., Budge, McDonald, M.D., Klingemann, H., 2013. *Mapping Policy Preferences from Texts: Statistical Solutions for Manifesto Analysts*. Oxford University Press, Oxford. <http://dx.doi.org/10.1093/acprof:oso/9780199640041.001.0001>.
- de Vries, C.E., Hakhverdian, A., Lancee, B., 2013. The dynamics of voter's Left/Right identification: the role of economic and cultural attitudes. *Polit. Sci. Res. Methods* 1, 223–238. <http://dx.doi.org/10.1017/psrm.2013.4>.
- Wansbeek, T., Meijer, E., 2000. *Measurement Error and Latent Variables in Econometrics*. North Holland, Amsterdam.
- Wiese, R., Jong-A-Pin, R., 2017. Expressive voting and political ideology in a laboratory democracy. *Eur. J. Polit. Econ.* 50, 54–74. <http://dx.doi.org/10.1016/j.ejpolco.2016.12.001>.