

Beitrag für das
Jahrbuch für Handlungs- und Entscheidungstheorie Band 11, 2018
Kurzanalyse

Mauerer, I., Schneider, M. (2019). Perceived Party Placements and Uncertainty on Immigration in the 2017 German Election. In: Debus, M., Tepe, M., Sauermann, J. (eds) *Jahrbuch für Handlungs- und Entscheidungstheorie. Jahrbuch für Handlungs- und Entscheidungstheorie. Band 11*. Springer VS, Wiesbaden. https://doi.org/10.1007/978-3-658-23997-8_5

Perceived Party Placements and Uncertainty on Immigration
in the 2017 German Election

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July 19, 2018

Abstract

Almost all national election studies contain policy scales that are intended to measure where respondents perceive parties or candidates on central campaign issues. These placements form the basis for models of survey responses, party perceptions, and voter choice. It is well known that the placements might be affected by uncertainty. We use the finite mixture model ‘BetaBin’ to study response patterns to party placements on policy issues. The model consists of a placement part and an uncertainty part. Whereas the placement part of the model accounts for lower and higher placements on the ordinal scales, the uncertainty component accounts for tendencies to locate the parties on the middle or at the extremes of the policy scales. We use the 2017 German national election (Study-No. ZA6800, GLES 2017, Cologne: GESIS Data Archive) and apply the model to the immigration issue. Our results demonstrate that uncertainty strongly influences the respondents’ perceptions of most parties. Neglecting this structure leads to worse models as indicated by performance measures.

Keywords: Party Placements, Uncertainty, Mixture Models, BetaBin, 2017 German National Election

1 Introduction

Almost all national election studies around the world contain policy scales. These policy scales were developed to assess the policy preferences of citizens and the positions of political figures on central campaign issues. A lot of theoretical and empirical concepts rely on the respondents' stated policy preferences and political perceptions. They form the basis for models of survey responses, party perceptions, policy choices, and voter choice. In public opinion research, several studies explore citizens' policy preferences (i.e., self-placements) on policy scales and test rival explanations of variability in attitudes due to uncertainty, ambivalence or equivocation. Alvarez and colleagues focus on policy choices of American citizens on public policies such as abortion (Alvarez and Brehm, 1995), racial policies (Alvarez and Brehm, 1997) or Internal Revenue Services (Alvarez and Brehm, 1998) (see also Alvarez and Brehm, 2002). In a similar vein, Harbers et al. 2013 explore response variability in Left-Right placements among the Latin American electorate, and De Vries and Steenbergen (2013) examine European citizens' ambivalence in attitudes toward European integration.

Citizens' policy preferences and their perceptions about party platforms also play a central role in spatial voter choice models. These models assume that parties take stances on issues and that voters can perceive these stances (Downs, 1957; Davis et al., 1970; Campbell et al., 1960). However, Shepsle (1972) and Enelow and Hinich (1981) reasoned that voters might be uncertain about the positions parties or candidates take on policies due to limited information on the side of the voters or position blurring on the side of the parties. They propose to represent party or candidate positions by probability distributions instead of single points. A few empirical studies account for voter uncertainty and incorporate it into the choice rule (e.g., Bartels, 1986; Gill, 2005; Berinsky and Lewis, 2007). These studies highlight that electoral decisions are not only systematically related to spatial distance but also to uncertainty about party platforms. Another recent study found that also voters are quite uncertain about their policy preferences and show a considerable degree of inconsistency (Stoetzer, 2017). In addition, not all parties put the same emphasis on the same issues and the reliance on issues when voting is party-specific (Mauerer et al., 2015; Mauerer, 2016). As a result, citizens might be uncertain what position they should ascribe when it comes to specific issues and parties.

If ordinary citizens do elect parties or candidates that best represent their preferences on public policies, it is necessary to understand in the first place how they perceive the parties' policy platforms and what role uncertainty plays in these perceptions. As uncertainty about party platforms can hamper democratic representation, we need models of survey responses that are able to detect the impact of uncertainty and to account for different response patterns due to uncertainty. Such insights will help us to understand how the electorate incorporates uncertainty into their political perceptions. This will then add to our understanding of the impact of policy-oriented decision making and its electoral consequences.

The approach we develop in this paper is a model of political perceptions that allows detecting how the perceptions of party platforms among ordinary citizens are structured. It is a model of survey responses to ordinal policy scales where specific response styles capture the uncertainty structure. The model belongs to the class of mixture models for ordinal data that are able to account for both the placement structure and the uncertainty structure of responses. We apply the so-called BetaBin model (Tutz and Schneider, 2017) that can handle different response patterns when citizens are uncertain where to place the parties on the policy scales: a tendency to the middle category and a tendency to extreme categories. Whereas the concentration in the middle category is widely known (see, e.g., Aldrich et al., 1982; Alvarez and Franklin, 1994), the approach we develop does not only account for this tendency but also for response styles to extreme categories, which has been discussed by Baumgartner and Steenkamp (2001) for example. Both the placement and the uncertainty structure of responses can be related to covariates. Since there are little theoretical and empirical insights into the mechanisms of how respondents' political perceptions are structured, we exploratively evaluate different sets of explanatory variables. We examine predictors that relate to cognitive processes or the respondents' information costs, to the relationship between the respondent and the party to be located at the policy, to issue characteristics, and standard demographics.

Compared to existing approaches, we see three main advantages of the proposed model. First, instead of modeling the variance by additional scale parameters as done in the heteroscedastic regression model (e.g., Harvey, 1976; Alvarez and Brehm, 1995), our approach can model specific response styles, namely the tendency to the middle, random choice or to extreme categories. Thus, we are able to detect particular structures of uncertainty which can be explained by covariates. Using models with scale parameters can only model high or low variance, but the variability is still rather unstructured. Second, the model is designed for ordinal responses, as compared to previous work relying on the logit/probit model for binary response (e.g., Alvarez and Brehm, 1995) or on the linear regression model (e.g., Harbers et al., 2013; De Vries and Steenbergen, 2013). It is well known that these models are not the best choice for modeling ordinal response data. Third, we do not need additional survey questions that directly ask respondents how certain they are about party or candidate positions, which are very rare in surveys.

We use the 2017 German national election study (Rossteutscher et al., 2017) to demonstrate the advantages of the proposed model. The election study contains typical eleven-point issue scales to measure the positions of parties on issues of current concern, such as immigration, taxes and climate change. On these ordinal scales, respondents were asked to place the parties. We apply the model to the immigration issue that played a significant role in the 2017 election campaign with different parties being more or less clear or ambiguous in the position they offered on it. We examine where the respondents perceive the major German parties on this central campaign issue and what role uncertainty plays in these perceptions. Our results show that the BetaBin model provides fruitful and new

insights into the perceptions of party platforms and outperforms traditional cumulative models without uncertainty structure. Including the uncertainty structure leads to better model performances, and therefore increases our understanding of political perceptions. Uncertainty strongly determines the respondents' perceptions of most parties on the immigration issue. Whereas the respondents expressed a clear preference where to place the AfD, they exhibit major difficulties in locating the CDU and the FDP.

2 Measuring and Modeling Uncertainty

There are some empirical approaches in the literature on how to measure and model uncertainty in party platforms. Here, we give a very brief overview of the most important models and approaches. One way to deal with variability and uncertainty in survey responses is to rely on range formats that adjust the traditional seven-point or eleven-point policy scales (see, e.g., Tomz and Van Houweling, 2009; Aldrich et al., 1982; Alvarez, 1999). Another approach is to stick to the original policy scales and to design additional survey questions to measure and examine uncertainty variability of survey responses (e.g., Alvarez and Franklin, 1994). These questions directly ask respondents how certain they are about candidate or party positions after they have provided these placements. However, only a few electoral studies have included self-reports on uncertainty yet.

Instead of relying on survey-based measures of uncertainty using self-assessments of respondents, Bartels (1986) proposes the following two-stage procedure to examine the impact of issue uncertainty on individual voting behavior. First, he develops a model of survey responses to assess the respondents' uncertainty in party placements. He takes refused answers as an indicator of uncertainty. The basic idea is that respondents who are uncertain are not able to give a placement at all. If a respondent refuses to place a candidate, this is interpreted as uncertainty which can be modeled as a function of observable characteristics of the respondent, the candidate, and the political environment. Based on the estimated probabilities of non-response that should capture the variance of candidate perceptions, in the second stage, he estimates a voter choice model to assess the importance of uncertainty in individual voting decisions. In both stages, he uses a linear probability approach.

Another idea is to model the variance by a heteroscedastic regression model introduced by Harvey (1976). In this case, the variance of the disturbance is modeled by covariates. Alvarez and Brehm (1995) apply a heteroscedastic binary probit model to analyze attitudes toward abortion in the U.S. electorate. Harbers et al. (2013) and De Vries and Steenbergen (2013) use a heteroscedastic linear regression model. These approaches have the disadvantage that they are not designed for small ordinal response scales. Using heteroscedastic linear regression for ordinal responses can lead to several difficulties. The error terms might not be normally distributed, and the linear regression might predict values lower, in between or above the response scale. Furthermore, it is not designed to

measure specific response styles such as a tendency to middle or extreme categories.

The model by Rozenas (2013) can be seen as a combination of non-response (Bartels, 1986) and variance heterogeneity (Harvey, 1976) which lead to a complex model with hyper-parameters and the necessity of choosing appropriate prior distributions. Another approach was developed by Gill (2005) who combines uncertainty with the concept of entropy. The entropy approach is based on an aggregate measure of issue uncertainty that uses information on the survey question, the issue to be evaluated, attributes of the candidates or parties as well as aggregated responses by the whole sample. In contrast to Bartels (1986) who imposes a homogeneous uncertainty threshold across respondents to model uncertainty, the entropy approach is based on an uncertainty term that is still the same across respondents but varies across issues and candidates.

The existing approaches deal very differently with missing values. The crucial question when relying on missing data in the response to measure uncertainty is whether there is a particular mechanism for generating the missing data. Empirical applications based on pure heteroscedastic models (as, e.g., Harvey, 1976) do not make use of any missing data and rely only on observed values. Contrarily, Bartels (1986) and Rozenas (2013) argue that missing data in the response is caused by the uncertainty of the respondents and related to covariates. This might be the case but maybe not the only or major process of generating missing values in the response structure. Respondents might have a clear position but do not want to report it because of social desirability, which is quite probable when it comes to delicate questions or policies. Another reason might be that respondents just skip the question because of time limitations or lack of motivation. In such cases, missing values consist of both uncertain and certain placements. Since we usually do not know the true data generating process of missing data, we prefer to exclude the missing values (including ‘don’t know’ answers) from the analysis instead of assuming that missing data in the response is directly linked to the uncertainty of the respondents.

3 Response Styles and Variability in Uncertainty across Parties

The literature is in agreement that uncertainty is inherently subjective and that particular segments are more certain or uncertain about party placements. Previous research on response patterns mainly suspected that respondents show a tendency to the middle of the scale due to limited information, when they are not politically interested or involved. On the policy scales, the middle categories reflect moderate positions. Whereas the concentration in the middle category is widely known (see, e.g., Aldrich et al., 1982; Alvarez and Franklin, 1994), the approach we develop in this paper can account for several kinds of uncertainty – especially the tendency to middle or extreme categories. Particularly the response style to extreme categories, i.e., a tendency to ascribe parties extreme policy stances, seems to be very promising because the response patterns might not only be the

result of cognitive processes of citizens but might also stem from how parties behave on issues, what strategies parties pursue on particular issues. Parties might take ambiguous stances, blur their positions that induce uncertainty on the side of the voters where the party actually positions itself. However, parties also often overshoot their positions (Kedar, 2005a,b). Therefore, one might also expect that respondents show a tendency to place the parties at the extremes when they are uncertain.¹

In addition, we expect differences in uncertainty patterns across parties. In general, parties often pursue different strategies on different issues, yielding different levels of uncertainty in the position respondents ascribe to parties. We argue that this variation relates to the underlying party system and resulting dynamics of party competition that reduce or increase uncertainty in perceived party platforms. We apply the model to the issue of immigration. Why should there be different levels of uncertainty in the position respondents ascribe to parties on the immigration issue? We expect that there is systematic variation in uncertainty on the immigration issue due to party family.

Immigration lies at the core of Inglehart's (1997) post-materialist dimension, and therefore represents an important 'new politics' issue. Immigrants issues grew increasingly salient in Western Europe in the last decades and gave rise to the emergence of new competitors on the radical right of the political spectrum. A considerable amount of scholarly attention has been paid to the explanation of the electoral fortunes of populist radical right parties (see, e.g., Givens, 2005; Kitschelt and McGann, 1995; Mudde, 2007; Ignazi, 2003; Art, 2011). Also, much scholarly work has been devoted to clarifying our understanding of the dynamics of party competition on immigrants issues (see, e.g., Meguid, 2005; Ivarsson, 2008; Norris, 2005; Bale, 2003, 2008; Abou-Chadi, 2015; Pardos-Prado et al., 2014). The recent studies point out that right-of-center and populist radical right parties have a strategic advantage over their competitors on immigrants issues. These parties lay particular emphasis on their core issue immigration by profoundly polarizing on them. In the light of their issue portfolio and long-term ideological backgrounds, center-right and radical right parties increase the saliency of immigrants issues by strongly politicizing it and taking unambiguous restrictive stances. As a result, one might expect that citizens are quite certain in their perceptions about what positions radical right and right-of-center parties offer on immigration.

Other studies focus on the mainstream left and investigate the electoral strategies of this party family concerning immigration (see, e.g., Bale et al., 2010; Alonso and Da Fonseca, 2012). For instance, Bale et al. (2010) examine the strategic responses of social-democratic parties. They find that these parties face a 'triple challenge' due to the rise and the success of extreme right parties: (1) Populist radical right parties mainly campaign on immigrants issues – and therefore increase the saliency of issues – that are traditionally owned by right-of-center parties; (2) the extreme right attempts to mobilize the working-

¹Baumgartner and Steenkamp (2001) provide other reasons. For instance, extreme response styles (ERS) can be seen as a 'reflection of rigidity'. Baumgartner and Steenkamp (2001) and Vaerenbergh and Thomas (2013) give an overview of different response styles.

class who is habitually linked to left-of-center parties; and (3) populist radical right parties ease to form center-right governments (see also Bale, 2003, 2008). Based on this line of reasoning, one might expect that citizens have difficulties in locating the mainstream left on immigrants issues.

4 A Model of Perceived Party Platforms under Uncertainty

Our modeling approach is based on the idea that variability in survey responses can be modeled by mixture models. In the framework of mixture models, any density f can be represented as a combination of a finite set of densities so that

$$f = \sum_{m=1}^M \pi_g f_g, \quad (1)$$

where $0 \leq \pi_g \leq 1$ is the mixture proportion or weight, and M is the number of densities used to describe the density f . Mixture models are widely used. An introduction to this model class is given by McLachlan and Peel (2000). Iannario and Piccolo (2016a) and Iannario and Piccolo (2016b) provide an overview of mixture models for ordinal data.

When studying perceived party placements, several requirements have to be considered. First, the number of densities M can be restricted to two, as we are only interested in the placement structure and uncertainty structure of survey responses. Second, we have ordinal responses so that we need density functions that are appropriate for this data type; any continuous densities cannot be considered. Third, we would like to use densities that are the best choice for modeling both components. However, the best choice is not always to use densities from the same type for both components.² By including an uncertainty component, we can account for specific response styles. One basic response style can be represented by a uniform distribution corresponding with a random choice of response category as done for example by D’Elia and Piccolo (2005) or Tutz et al. (2017). We use the so-called BetaBin model proposed by Tutz and Schneider (2017), which is characterized by flexible modeling of the response style and placement structure.

4.1 Model Formulation

Let R_i be the observed response of an individual i to an ordinal policy scale taking the values $\{1, \dots, k\}$. Y_i denotes an unobserved random variable that presents the deliberate choice, i.e., the real party placement. Let U_i be the unobserved uncertainty component modeling the type of response style. Both Y_i and U_i take ordered values from $\{1, \dots, k\}$.

²Choosing two binomial distributions are considered as the same type.

Given explanatory variables \mathbf{x}_i and \mathbf{w}_i , the mixture model ‘BetaBin’ has the form

$$P(R_i = r|\mathbf{x}_i, \mathbf{w}_i) = \pi_i P_M(Y_i = r|\mathbf{x}_i) + (1 - \pi_i) P_U(U_i = r|\mathbf{w}_i). \quad (2)$$

\mathbf{x}_i and \mathbf{w}_i are vectors of covariates for both components that can be identical, overlapping or completely different. π_i represents the mixture probability that measures the importance of the structured component in the mixture model. Thus, the observed response results from a discrete mixture of the placement and the uncertainty component.

For the placement component $P_M(Y_i = r|\mathbf{x}_i)$, any ordinal model would be possible. We use the following widely known cumulative logit model (see [Tutz, 2012](#)), also known as ordered or ordinal logit model:

$$\log \left(\frac{P(Y_i \leq r|\mathbf{x}_i)}{P(Y_i > r|\mathbf{x}_i)} \right) = \gamma_{0r} + \mathbf{x}_i^T \boldsymbol{\gamma}, \quad r = 1, \dots, k-1,$$

where γ_{0r} are the intercepts or thresholds and $\boldsymbol{\gamma}$ the estimated effects independent of r . Note that in the literature different notations of the cumulative logit model are used. Here a positive value of γ indicates that a lower category is more probable. The response style U follows a beta-binomial distribution, $U \sim \text{Beta-binomial}(k|\alpha, \beta)$ with the mass function

$$f(u) = \begin{cases} \binom{k-1}{u-1} \frac{B(\alpha+u-1, \beta+k-u+1)}{B(\alpha, \beta)} & u \in \{1, \dots, k\} \\ 0 & \text{otherwise,} \end{cases}$$

where $\alpha, \beta > 0$ are the parameters of the beta-binomial distribution. $B(\alpha, \beta)$ is the beta function defined as

$$B(\alpha, \beta) = \Gamma(\alpha)\Gamma(\beta)/\Gamma(\alpha + \beta) = \int_0^1 t^{\alpha-1}(1-t)^{\beta-1} dt.$$

Since α and β are not identical with the location and scale of the distribution, the following reformulation is necessary:

$$\mu = \alpha/(\alpha + \beta), \quad \delta = 1/(\alpha + \beta + 1).$$

Now the expected value $E(U)$ and the variance $\text{var}(U)$ are given by

$$E(U) = (k-1)\mu + 1, \quad \text{var}(U) = (k-1)\mu(1-\mu)[1 + (k-2)\delta].$$

As $\delta \rightarrow 0$, the beta-binomial distribution converges to the (shifted) binomial distribution $B(k, \mu)$ with mean μ and support $\{1, \dots, k\}$. The specific response styles characterized by a tendency to middle or extreme categories are determined by imposing the restriction $\alpha = \beta$, which lead to $\mu = 0.5$ and $\delta = 1/(2\alpha + 1)$. Thus, the location of the distribution is always fixed at the middle of support. The only flexible parameter is δ or rather α . The smaller α , the larger δ and therefore the variance. Figure 1 shows the different shapes of this restricted beta-binomial distribution.

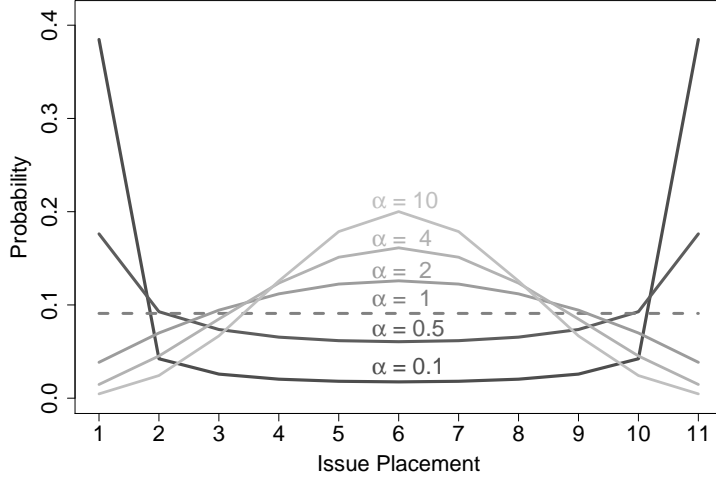


Figure 1: Probability mass on categories for various values of α for $k = 11$ categories.

α values larger than one correspond with a tendency to the middle categories, while α values smaller than one indicate a tendency to extreme categories. The distribution ranges from a (shifted) binomial distribution with the mode in the middle of support to almost a distribution with two equal point mass at the border of support. The first distribution corresponds with a strong tendency to the middle categories, the latter with a strong tendency to both extreme categories given by the minimum and maximum of k . All gradations between the two extreme cases are possible. The parameter α is linked to covariates \mathbf{w}_i by

$$\alpha = \exp(\mathbf{w}_i^T \boldsymbol{\alpha}) = \exp(\alpha_0) \exp(\alpha_1)^{w_{i1}} \dots \exp(\alpha_m)^{w_{im}},$$

where α is the parameter of the restricted beta-binomial distribution and α_j gives the effect of the j -th covariate linked with $\exp()$ to α . Thus, α changes by the factor $\exp(\alpha_j)$ when w_{ij} increases by one unit, given all other variables in the model are kept constant. The exponential function ensures that α is always positive, although the effects of the covariates may be positive or negative. Positive α_j values lead to α values larger than one and indicate a tendency to middle categories. Negative α_j values lead to α -values smaller than one and indicate the tendency to extreme categories. For example, an effect of $\alpha_j = 1$ leads to $\alpha = \exp(1) = 2.71$ showing a tendency to the middle categories for the j -th covariate. For $\alpha = 1$ ($\alpha_j = 0$) one obtains the discrete uniform distribution (dashed line in Figure 1) corresponding with a random choice of a category.

4.2 Survey Responses to Party Placements

We apply the model of party perceptions to the immigration issue contained in the 2017 German national election study (Rossteutscher et al., 2017). The respondents were asked to state where they perceive the parties on an eleven-point scale with the following endpoints: 1 “Immigration should be facilitated” (pro) and 11 “Immigration should be re-

stricted” (contra). We restrict our analysis to the seven most important German parties: the Christian Democratic Union (CDU), its Bavarian sister party the Christian Social Union (CSU), the Social Democratic Party (SPD), the Liberal Party (FDP), the Greens, the Left Party, and the Alternative for Germany (AfD). We also excluded respondents that provided no answer or opted for the ‘don’t know’ category. The stated positions of these parties on the immigration issue present the observed response R_i in Equation 2.

Figure 2 illustrates the distribution of party perceptions on the immigration issue. Since not all survey respondents were able to locate all the seven parties, the number of observations (out of 2179 total respondents) slightly differs. The minimum number of observations is 1387 for the FDP, and the maximum is 1949 for the CDU. For each of the eleven categories, the percentages are reported in Figure 2 so that the shape between the different parties are comparable even though the absolute numbers are not identical. We observe that the shape of the distributions is very different between the seven parties. Unsurprisingly, almost 70% of the respondents locate the AfD at the far right, resulting in a very skewed distribution. Also, the CSU is perceived as taking a rather contra-immigration stance, whereas the respondents place its sister party CDU closer to the middle categories without a clear modal value. The distributions of the perceptions for the FDP and SPD are more symmetric with modal values at 6 and 5, respectively. The perceptions of the Greens are skewed toward the pro-immigration pole, and the Left Party is perceived as taking the most pro-immigration stance. This data situation demands a flexible model that can handle all these different distributions, and therefore presents an ideal situation to demonstrate the benefits of the proposed mixture model.

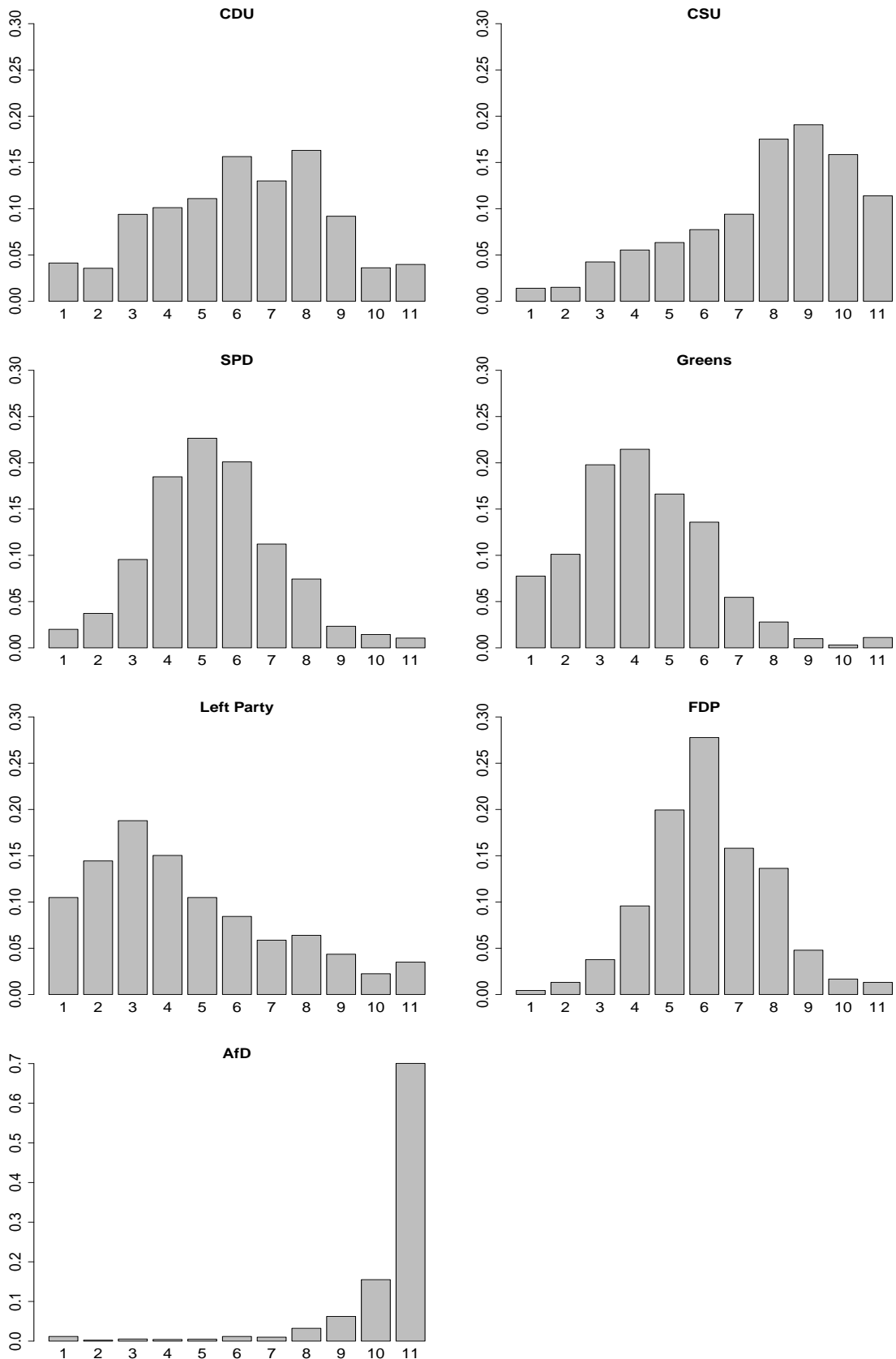
4.3 Predictors for Issue Placements and Issue Uncertainty

As outlined above, the approach can model the placement and uncertainty structure of political perceptions by covariates \mathbf{x}_i and \mathbf{w}_i . For both components, we use the same set of predictors we describe next.

4.3.1 Political Sophistication

The first set of explanatory variables accounts for cognitive processes or information costs and relates to the concept of political sophistication (e.g., Luskin, 1987, 1990; Delli Carpini and Keeter, 1993). Going back to Downs (1957), it is frequently argued that citizens who possess lower information costs tend to be more informed about the positions parties offer on central policies. Therefore, individuals with higher levels of political information are presumed to be less uncertain about party platforms. To operationalize the concept of political sophistication and to identify segments that might exhibit different response styles due to uncertainty or place parties into a particular direction, we explore a subjective and an objective measure: the strength of political interest, and political knowledge.

The level of political interest is usually measured by relying on respondents’ self-reports. The 2017 German election study includes a question in which respondents were



Note: 1 “Immigration should be facilitated” (pro) and 11 “Immigration should be restricted” (contra)

Figure 2: Distribution of party perceptions on the immigration issue

asked to state their level of political interest on a five-point scale. We recoded the variable so that one gives the response “not interested at all” and five “very interested”. To mea-

sure the respondents' level of political knowledge we rely on factual knowledge questions with right or wrong answers. Several studies have shown that factual political knowledge questions present good empirical indicators for the concept of political knowledge (Luskin, 1987, 1990; Delli Carpini and Keeter, 1993).³ Based on the replies to five questions, we generated an additive knowledge score in which for each correct answer a value of one is assigned, whereas wrong answers and "don't know/no answer" responses give a value of zero. The first two questions concern the German electoral system.⁴ In addition, the respondents were confronted with pictures showing three politicians, and they were asked to state the party each politician belongs to.⁵ The answers are aggregated by counting the number of times a respondent correctly answered all five questions, resulting in a six-categorical variable running from zero to five (0 none correct, 5 all answers correct).

4.3.2 Party Attributes

One might also expect that respondents are more confident about where to place the party due to the relationship they have established with the respective party. The second set of covariates intends to capture the relationship between the respondent and the party to be located. One might expect that a long-standing leaning toward a party influences both where to place the party and the response patterns. So that those respondents who identify themselves with the party to be located are more certain about the position the party offers. On the contrary, when respondents do not identify themselves with the respective party, specific response styles due to uncertainty might be likely to occur. The same argument might apply to the sympathy of the parties' candidates. Party identification is a dummy variable with one indicating that the respondent identifies with the party to be placed and zero otherwise (i.e., no party identification or identification with any other party). For each of the seven parties, we generated such a dummy variable. As candidate evaluations, we consider feeling thermometers on eleven-point scales (1 very negative; 11 very positive).⁶

4.3.3 Issue Importance

Also, the issue itself might influence the respondents' perceived party placements and uncertainty. Respondents who consider the policy as important might have a clearer understanding of where to place the parties. When the issue is of personal importance, the respondent might have considered in more detail what the parties actually offer on it.

³For a recent comparative assessment, see Rapeli (2013).

⁴"Which one of the two votes is decisive for the relative strengths of the parties in the German parliament?"; "What is the percentage of the second vote a party needs to be able to definitely send delegates to the German parliament?"

⁵These politicians are Martin Schulz (SPD), Katrin Göring-Eckardt (Greens), and Christian Lindner (FDP).

⁶The candidates are Angela Merkel for the CDU, Horst Seehofer for the CSU, Martin Schulz for the SPD, Christian Lindner for the FDP, Cem Özdemir for the Greens, Sahra Wagenknecht for the Left, and Frauke Petry for the AfD.

Therefore, we might expect that as the level of personal issue importance increases, the respondents show less uncertainty response patterns. To identify the level of importance respondents ascribe to the immigration issue, we employ a common measure, self-reports. The 2017 German election study includes a question in which respondents are asked to state the importance of the immigration issue on five-point scales running from “not at all important” to “very important”.⁷

4.3.4 Standard Demographics

Finally, the models account for the effects of standard demographics, including age and gender. Since East/West Germany constituted for a long time a major explanation for differences in public opinion in Germany, the models also control for this east-west divide. The variables are coded as follows: Age: centered around the sample mean, measured in decades; Gender: 1 (female), 0 (male); Former West/East Germany: 1 (West Germany), 0 (East Germany). As with the party placements, we excluded missing values on all these variables.

5 Empirical Results

For each party, we specified a separate BetaBin model. The models are estimated with the EM-Algorithm as described by [Tutz and Schneider \(2017\)](#). The result presentation is divided into three parts: We begin by examining the role uncertainty plays in the party perceptions on the immigration issue. Then, we present the estimates for the placement and the uncertainty part of the model. Finally, we systematically compare the proposed BetaBin model with the traditional cumulative model without uncertainty component based on performance measures.

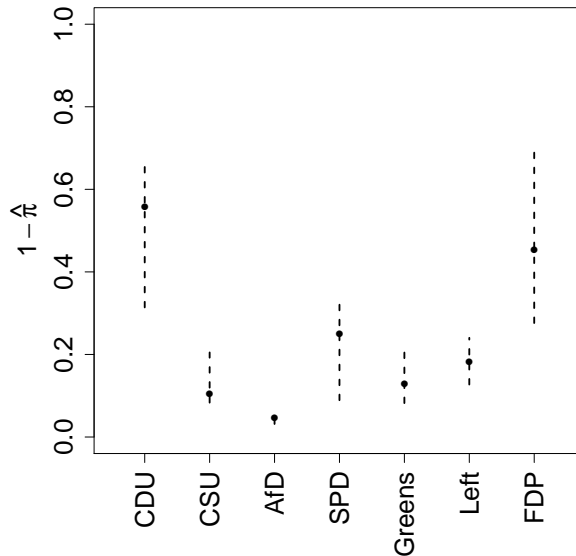
5.1 The Role of Uncertainty in Perceived Party Platforms

Let us first examine the mixture probability that measures the importance of the uncertainty part in the mixture model. $1 - \hat{\pi}$ is an estimate for the weight of the uncertainty component and can be interpreted as a measure of how clear or unambiguous the respondents perceive the party positions. The weight takes values between zero and one. A value of zero represents the traditional cumulative model without mixture and indicates the absence of any response styles, i.e., no tendency to the middle of the scale, no tendency to extremes, and no random party perception. A value of one gives a model without placement structure, i.e., no structure in placing the parties on the policy scales is detected. The higher the value of $1 - \hat{\pi}$, the stronger the uncertainty.

Figure 3 displays the estimated $1 - \hat{\pi}$ values for the seven German parties. The dotted lines correspond to the 2.5% and 97.5% bootstrap quantiles. As expected, we detect

⁷Corresponding question: “How important is this issue to you personally?”.

the weakest uncertainty weight (0.05) for the location of the AfD. This indicates that respondents expressed a clear preference where to place the AfD on the immigration issue. Regarding the two Christian Democratic parties, the respondents exhibit much more uncertainty, 0.56 and 0.11, respectively. A higher level of uncertainty for these two right-of-center parties seems plausible because of the internal divisions on the immigration issue. The chancellor and leader of the CDU Angela Merkel, Thomas de Maizière (Minister of the Interior and member of the CDU), and Horst Seehofer (leader of the CSU) expressed quite different opinions about migrants and refugees. Thus, the respondents are more uncertain about both positions. However, the CSU could offer a much clearer position, as suggested by the considerable difference in uncertainty between the CDU and CSU. The behavior on the side of the parties is reflected in the uncertainty weights we estimate. Our model also estimates a large uncertainty weight for the FDP. Apparently, respondents show enormous difficulties in placing both the CDU and the FDP on the immigration issue, whereas the strength of uncertainty is in the middle range for the remaining parties, except for the AfD. Note that the uncertainty weight illustrates the strength of the uncertainty component regardless of whether the perceived party position is pro or contra immigration.



Note: Dotted lines correspond to the 2.5% and 97.5% bootstrap quantiles.

Figure 3: Importance of the uncertainty component ($1 - \hat{\pi}$)

5.2 Party Placements and Response Style Effects

Table 1 and Table 2 give the results for the placement and uncertainty components of the models. The estimates for the placement part ($\hat{\gamma}$) are displayed at the top, the estimates for the uncertainty response style effects ($\hat{\alpha}$) at the bottom. We report for each effect the 2.5% and 97.5% quantiles of 500 non-parametric bootstrap samples. An estimate is considered as significant at the 5%-level when the bootstrap confidence intervals cover

the estimate but not zero. The estimates for the preference part ($\hat{\gamma}$) are interpreted in the following way. Positive estimates indicate that lower categories become more likely meaning that the respondents tend to place the party toward pro immigration. Negative values indicate a tendency to locate the party in a higher category on the issue scale corresponding with contra-immigration stances.

We observe that the effects of political sophistication vary between the different parties. When the respondents' political interest increases, they tend to locate the SPD, the Greens and the Left closer toward pro-immigration stances. Higher political knowledge leads to a location of both Christian Democrat parties closer to contra-immigration positions, whereas the opposite is the case for the Greens and the Left. These results suggest that for the majority of the parties political sophistication does provide an explanation of placement structures. Regarding our second set of predictors, we find that candidate images are significant for all parties, except for the Left and FDP. However, the estimates differ in direction. Whereas an increase in candidate sympathy leads respondents to locate the CSU and the AfD toward pro-immigration positions, it yields placements closer to contra-immigration stances for the CDU, SPD, and the Greens. By contrast, party identification only impact on the placement of two parties, namely the CSU and the Greens. When respondents identify themselves with the Greens, they show a tendency to locate the party closer at pro-immigration stances. In the case of the CSU, the effect is negative so that CSU-party identifiers tend to place their party closer to contra-immigration positions. Concerning issue importance, there are almost no significant findings. By contrast, the demographics exhibit some interesting findings. We observe significant negative age effects for several parties. This implies that the older a person, the stronger the tendency to ascribe the parties more contra-immigration positions. In addition, females show a tendency to locate the Left closer at contra-immigration stances, whereas respondents based in former West Germany tend to shift the SPD, the Greens and the Left toward contra-immigration positions.

The uncertainty component contains the estimates for the shape of the uncertainty distribution (determined by $\hat{\alpha}$), displayed at the bottom of Tables 1 and 2. Here, positive values indicate a tendency to the middle categories, whereas negative values suggest a tendency to the extremes of the scales. As in the placement structure, measures of political sophistication also show some significant effects on the response style dimension. The higher the political knowledge, the more respondents tend to locate the CDU, the CSU, the SPD, and the Left in middle categories. By contrast, political interest does not seem to influence the response styles. Examining the predictors that relate to the relationship between the respondent and the party to be located, we find the strongest effects for candidate images, whereas party identification shows no significant effects. We observe that an increased satisfaction with the candidate leads to a tendency to locate the CDU, the AfD, and the Left in middle categories. Also, issue importance only marginally impacts on response styles. Surprisingly, most demographic variables do not exhibit any

significant effects. We observe that older people tend to locate the CDU toward more extreme positions, females show a tendency to place the Greens in middle categories, and respondents from former West Germany ascribe extreme positions to both the AfD and the Left.

Table 1: Parameter estimates of BetaBin model I

	CDU			CSU			AfD		
	Estimate	BS.2.5	BS.97.5 sig	Estimate	BS.2.5	BS.97.5 sig	Estimate	BS.2.5	BS.97.5 sig
<i>Placement Part</i>									
Political Interest	-0.281	-0.454	0.049	-0.131	-0.278	0.018	-0.147	-0.299	0.006
Political Knowledge	-0.234	-0.374	-0.064 *	-0.340	-0.462	-0.233 *	-0.079	-0.198	0.029
Party Identification	0.423	-0.120	0.909	-0.771	-1.712	-0.127 *	0.055	-0.560	0.784
Candidate Images	-0.183	-0.372	-0.065 *	0.164	0.113	0.238 *	0.250	0.198	0.296 *
Issue Importance	-0.091	-0.521	0.212	-0.068	-0.206	0.067	-0.127	-0.277	0.016
Age	-0.167	-0.285	-0.053 *	-0.194	-0.283	-0.150 *	-0.145	-0.226	-0.065 *
Gender	-0.414	-0.748	0.006	-0.218	-0.468	0.024	-0.201	-0.471	0.050
West Germany	-0.044	-0.463	0.314	-0.050	-0.245	0.204	0.183	-0.068	0.468
<i>Uncertainty Part</i>									
Political Interest	0.127	-0.293	0.611	-0.123	-3.236	1.381	0.843	-2.930	6.211
Political Knowledge	0.385	0.191	1.183 *	1.038	0.043	3.974 *	-0.417	-3.420	1.613
Party Identification	0.230	-0.381	3.891	10.80	-1.063	255.78	1.176	-10.38	8.248
Candidate Images	0.163	0.071	0.448 *	0.254	-0.697	1.761	0.545	0.768	2.711 *
Issue Importance	-0.264	-1.574	0.029	-0.485	-4.050	1.577	-1.088	-5.934	1.100
Age	-0.192	-0.572	-0.069 *	-0.378	-1.872	0.633	0.202	-1.091	2.119
Gender	-0.049	-0.845	0.704	0.818	-2.451	5.068	-0.365	-6.158	4.866
West Germany	0.323	-0.532	1.083	-0.009	-3.813	3.082	-1.763	-8.680	-0.979 *
$1 - \hat{\pi}$	0.558	0.314	0.657 *	0.106	0.083	0.205 *	0.047	0.032	0.065 *
N		1949			1872				1715

Note: Cut points of the placement part and intercept of the uncertainty part are not displayed.

Table 2: Parameter estimates of BetaBin model II

	SPD			Greens			Left			FDP		
	Estimate	BS.2.5	BS.97.5 sig	Estimate	BS.2.5	BS.97.5 sig	Estimate	BS.2.5	BS.97.5 sig	Estimate	BS.2.5	BS.97.5 sig
<i>Placement Part</i>												
Political Interest	0.347	0.185	0.544 *	0.426	0.310	0.588 *	0.405	0.276	0.584 *	0.039	-0.353	0.309
Political Knowledge	0.100	-0.004	0.204	0.266	0.180	0.380 *	0.240	0.140	0.333 *	-0.214	-0.545	0.047
Party Identification	0.211	-0.039	0.511	0.375	0.034	0.681 *	-0.195	-0.525	0.233	0.396	-0.860	1.505
Candidate Images	-0.080	-0.156	-0.022 *	-0.184	-0.254	-0.118 *	-0.010	-0.068	0.042	0.135	-0.004	0.613
Issue Importance	0.014	-0.133	0.246	0.095	-0.061	0.281	0.085	-0.049	0.240	-0.325	-1.020	-0.047 *
Age	-0.135	-0.198	0.054	-0.015	-0.074	0.050	-0.187	-0.253	-0.127 *	-0.090	-0.279	0.023
Gender	-0.264	-0.493	0.001	-0.134	-0.368	0.097	-0.442	-0.677	-0.231 *	-0.067	-0.616	0.667
West Germany	-0.257	-0.572	-0.014 *	-0.342	-0.603	-0.095 *	-0.870	-1.144	-0.615 *	0.249	-0.416	0.857
<i>Uncertainty Part</i>												
Political Interest	0.116	-0.938	2.048	-0.259	-2.110	3.162	0.638	-0.541	2.482	-0.468	-1.908	0.100
Political Knowledge	0.410	0.130	2.724 *	0.840	-0.683	2.598	1.325	0.321	2.129 *	0.530	-0.086	1.426
Party Identification	-0.338	-3.615	2.891	-3.867	-7.972	13.73	-1.065	-6.663	3.798	7.921	-1.045	90.53
Candidate Images	0.150	-1.061	1.105	0.440	-0.767	1.251	0.895	0.343	1.564 *	0.402	-0.273	1.466
Issue Importance	-1.156	-4.253	1.466	-3.505	-4.907	1.490	-3.818	-5.044	-0.870 *	-0.022	-1.532	2.345
Age	-0.461	-1.740	0.005	-0.728	-1.853	0.239	-0.234	-1.219	0.480	-0.234	-0.710	0.113
Gender	-0.546	-3.498	3.071	5.846	0.505	8.671 *	0.341	-2.642	2.402	-0.102	-1.580	1.550
West Germany	0.778	-2.612	3.635	1.927	-1.805	8.687	-4.534	-7.096	-1.843 *	0.736	-0.323	4.328
$1 - \hat{\pi}$	0.249	0.089	0.336 *	0.128	0.082	0.205 *	0.181	0.127	0.240 *	0.454	0.276	0.711 *
N		1813			1621			1527			1387	

Note: Cut points of the placement part and intercept of the uncertainty part are not displayed.

5.3 Model Comparisons

Finally, we demonstrate that the mixture model outperforms the traditional cumulative model based on performance measures. In Table 3, we compare the performances of the proposed BetaBin model with the cumulative model without uncertainty component. We measure model performance by the Log-Likelihood and the AIC. The latter is defined by

$$AIC = -2l(\hat{\theta}) + 2m,$$

where m is the number of model parameters and $l(\hat{\theta})$ is the log-likelihood function computed at the maximum of the estimated parameter vector $\hat{\theta}$. We see that the mixture model improves all considered performance measures as compared to the cumulative model without any uncertainty component. All AIC values are lower for the mixture than for the pure cumulative model. While the pure cumulative model is based on 18 parameters (10 intercepts and 8 covariables), the mixture model is based on a total of 28 parameters: 18 parameters for the placement part, which is identical with the pure cumulative model, 9 parameters for modeling the shape of the uncertainty distribution (1 intercept and 8 covariables) and 1 parameter to estimate the mixture weight π . Even though the mixture model is much more complex, the performance measures indicate that it yields not only a better likelihood but also to a better model fit measured by AIC. Since the number of observations differs among parties, the values can only be compared across the different models but not across parties.

Table 3: Model comparisons based on performance measures

Model	N	LogL		AIC	
		Mixture	Cumulative	Mixture	Cumulative
CDU	1949	-4314.096	-4370.631	8684.191	8777.262
CSU	1872	-3926.739	-3941.070	7909.478	7918.140
AfD	1715	-1706.051	-1723.742	3468.102	3483.484
SPD	1813	-3620.930	-3637.966	7297.860	7311.933
Greens	1621	-3153.747	-3171.438	6363.494	6378.875
Left	1527	-3299.113	-3326.538	6654.227	6689.075
FDP	1387	-2652.197	-2675.003	5360.394	5386.006

6 Discussion and Outlook

Political perceptions play an important role in the decision-making process. In this paper, we have applied a special mixture model, the so-called BetaBin model, to the perception of party placements on ordinal policy scales. The model consists of two components, a

placement part and an uncertainty part. The latter enables us to model response styles to the middle categories as well as to extreme categories. For the placement part, a cumulative model is used, and for the uncertainty part, we rely on a restricted beta-binomial distribution. We applied the model to the immigration issue in the occasion of the 2017 German national election. Our results demonstrate that the respondents' perceptions of most parties on the immigration issue are strongly influenced by uncertainty. We detect the lowest uncertainty in locating the AfD and the highest in placing the FDP and the CDU. Regarding the predictors we examined, we find that particularly political sophistication and candidate images influence both where to place the party and the uncertainty response patterns. Especially interesting are also the age effects we detect. The older the respondents, the more they tend to locate the parties toward the contra-immigration pole. Finally, our model outperforms traditional cumulative models without uncertainty structure based on model performance.

Next steps will be to apply the model to other policy scales and contexts. Another interesting aspect would be to examine all parties simultaneously in a multivariate model. In the proposed model, we use covariates to model the uncertainty structure and the placement part, but not to model the mixture weights π . There are other approaches (e.g., [Tutz et al., 2017](#)) which use covariates in the placement part and the mixture weights, but not in the uncertainty part. Including covariates in all three components of the mixture model may lead to identifiability issues which have not been discussed yet. In future research, we also intend to develop a voter choice model that relies on the model of survey responses we proposed here. A voter choice model that is based on the party placement and uncertainty estimates of the mixture model will then add to our understanding of how uncertainty impacts on policy-oriented decision making and its electoral consequences. Then it will also be possible to examine and test for behavioral implications of uncertainty in political perceptions.

References

- About-Chadi, Tarik. 2015. Niche party success and mainstream party policy shifts – how green and radical right parties differ in their impact. *British Journal of Political Science* 46 (2): 417–436.
- Aldrich, John H., Richard G. Niemi, George Rabinowitz, and David W. Rohde. 1982. The measurement of public opinion about public policy: A report on some new issue question formats. *American Journal of Political Science* 26 (2): 391–414.
- Alonso, Sonia and Sara Claro Da Fonseca. 2012. Immigration, left and right. *Party Politics* 18 (6): 865–884.
- Alvarez, R. Michael. 1999. *Information and Elections*. Ann Arbor: University of Michigan Press.
- Alvarez, R. Michael and John Brehm. 1995. American ambivalence towards abortion policy: Development of a heteroskedastic probit model of competing values. *American Journal of Political Science* 39 (4): 1055–1082.
- Alvarez, R. Michael and John Brehm. 1997. Are Americans ambivalent towards racial policies? *American Journal of Political Science* 41 (2): 345–374.
- Alvarez, R. Michael and John Brehm. 1998. Speaking in two voices: American equivocation about the internal revenue service. *American Journal of Political Science* 42 (2): 418–452.
- Alvarez, R. Michael and John Brehm. 2002. *Hard Choices, Easy Answers: Values, Information, and American Public Opinion*. Princeton: Princeton University Press.
- Alvarez, R. Michael and Charles H. Franklin. 1994. Uncertainty and political perceptions. *The Journal of Politics* 56 (3): 671–688.
- Art, David. 2011. *Inside the Radical Right: The Development of Anti-Immigrant Parties in Western Europe*. New York: Cambridge University Press.
- Bale, Tim. 2003. Cinderella and her ugly sisters: The mainstream and extreme right in Europe’s bipolarising party systems. *West European Politics* 26 (3): 67–90.
- Bale, Tim. 2008. Turning round the telescope. Centre-right parties and immigration and integration policy in Europe. *Journal of European Public Policy* 15 (3): 315–330.
- Bale, Tim, Christoffer Green-Pedersen, André Krouwel, Kurt Richard Luther, and Nick Sitter. 2010. If you can’t beat them, join them? Explaining social democratic responses to the challenge from the populist radical right in Western Europe. *Political Studies* 58 (3): 410–426.

- Bartels, Larry M. 1986. Issue voting under uncertainty: An empirical test. *American Journal of Political Science* 30 (4): 709–728.
- Baumgartner, Hans and Jan-Benedict Steenkamp. 2001. Response styles in marketing research: A cross-national investigation. *Journal of Marketing Research* 38 (2): 143–156.
- Berinsky, Adam J. and Jeffrey B. Lewis. 2007. An estimate of risk aversion in the U.S. electorate. *Quarterly Journal of Political Science* 2 (2): 139–154.
- Campbell, Angus, Philip E. Converse, E. Warren Miller, and Donald E. Stokes. 1960. *The American Voter*. Chicago: University of Chicago Press.
- Davis, Otto A., Melvin J. Hinich, and Peter C. Ordeshook. 1970. An expository development of a mathematical model of the electoral process. *The American Political Science Review* 64 (2): 426–448.
- De Vries, Catherine and Marco R. Steenbergen. 2013. Variable opinions: The predictability of support for unification in European mass publics. *Journal of Political Marketing* 12 (1): 121–141.
- D’Elia, Angela and Domenico Piccolo. 2005. A mixture model for preference data analysis. *Computational Statistics & Data Analysis* 49 (3): 917–934.
- Delli Carpini, Michael X. and Scott Keeter. 1993. Measuring political knowledge: Putting first things first. *American Journal of Political Science* 37 (4): 1179–1206.
- Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper & Row.
- Enelow, James M. and Melvin J. Hinich. 1981. A new approach to voter uncertainty in the Downsian spatial model. *American Journal of Political Science* 25 (3): 483–493.
- Gill, Jeff. 2005. An entropy measure of uncertainty in vote choice. *Electoral Studies* 24 (3): 371–392.
- Givens, Terri E. 2005. *Voting Radical Right in Western Europe*. New York: Cambridge University Press.
- Harbers, Imke, Catherine E. De Vries, and Marco R. Steenbergen. 2013. Attitude variability among Latin American publics: How party system structuration affects left/right ideology. *Comparative Political Studies* 46 (8): 947–967.
- Harvey, A. C. 1976. Estimating regression models with multiplicative heteroscedasticity. *Econometrica* 44 (3): 461–465.

- Iannario, Maria and Domenico Piccolo. 2016a. A comprehensive framework of regression models for ordinal data. *Metron* 74 (2): 233–252.
- Iannario, Maria and Domenico Piccolo. 2016b. A generalized framework for modelling ordinal data. *Statistical Methods & Applications* 25 (2): 163–189.
- Ignazi, Piero. 2003. *Extreme Right Parties in Western Europe*. Oxford: Oxford University Press.
- Inglehart, Ronald. 1997. *Modernization and Postmodernization: Cultural, Economic, and Political Change in 43 Societies*. Princeton: Princeton University Press.
- Ivarsflaten, Elisabeth. 2008. What unites right-wing populists in Western Europe? Re-examining grievance mobilization models in seven successful cases. *Comparative Political Studies* 41 (1): 3–23.
- Kedar, Orit. 2005a. How diffusion of power in parliaments affects voter choice. *Political Analysis* 13 (4): 410–429.
- Kedar, Orit. 2005b. When moderate voters prefer extreme parties: Policy balancing in parliamentary elections. *The American Political Science Review* 99 (2): 185–199.
- Kitschelt, Herbert and Anthony McGann. 1995. *The Radical Right in Western Europe: A Comparative Analysis*. Ann Arbor: University of Michigan Press.
- Luskin, Robert C. 1987. Measuring political sophistication. *American Journal of Political Science* 31 (4): 856–899.
- Luskin, Robert C. 1990. Explaining political sophistication. *Political Behavior* 12 (4): 331–361.
- Mauerer, Ingrid. 2016. A party-varying model of issue voting. A cross-national study (doctoral dissertation). *University of Munich (LMU), Germany* .
- Mauerer, Ingrid, Paul W. Thurner, and Marc Debus. 2015. Under which conditions do parties attract voters' reactions to issues? Party-varying issue voting in German elections 1987-2009. *West European Politics* 38 (6): 1251–1273.
- McLachlan, Geoffrey J. and David Peel. 2000. *Finite Mixture Models*. New York: Wiley.
- Meguid, Bonnie M. 2005. Competition between unequals: The role of mainstream party strategy in niche party success. *The American Political Science Review* 99 (3): 347–359.
- Mudde, Cas. 2007. *Populist Radical Right Parties in Europe*. Cambridge: Cambridge University Press.

- Norris, Pippa. 2005. *Radical Right: Voters and Parties in the Electoral Market*. New York: Cambridge University Press.
- Pardos-Prado, Sergi, Bram Lancee, and Iñaki Sagarzazu. 2014. Immigration and electoral change in mainstream political space. *Political Behavior* 36 (4): 847–875.
- Rapeli, Lauri. 2013. *The Conception of Citizen Knowledge in Democratic Theory*. Basingstoke: Palgrave Macmillan.
- Rossteutscher, Sigrid, Harald Schoen, Rüdiger Schmitt-Beck, Bernhard Wessels, Christof Wolf, Ina Bieber, Lars-Christopher Stövsand, and Melanie Dietz. 2017. Pre-election cross section (GLES 2017). ZA6800 Data file Version 3.0 Cologne: GESIS Data Archive.
- Rozenas, Arturas. 2013. Inferring ideological ambiguity from survey data. In *Advances in Political Economy: Institutions, Modelling and Empirical Analysis*, eds. Norman Schofield, Gonzalo Caballero, and Daniel Kselman, 369–382. Berlin, Heidelberg: Springer.
- Shepsle, Kenneth A. 1972. The strategy of ambiguity: Uncertainty and electoral competition. *The American Political Science Review* 66 (2): 555–568.
- Stoetzer, Lukas F. 2017. A matter of representation: Spatial voting and inconsistent policy preferences. *British Journal of Political Science* Advance online publication.
- Tomz, Michael and Robert P. Van Houweling. 2009. The electoral implications of candidate ambiguity. *American Political Science Review* 103 (1): 83–98.
- Tutz, Gerhard. 2012. *Regression for Categorical Data*. Cambridge: Cambridge University Press.
- Tutz, Gerhard and Micha Schneider. 2017. Mixture models for ordinal responses with a flexible uncertainty component. Technical Report 203, Department of Statistics, University of Munich (LMU), Germany.
- Tutz, Gerhard, Micha Schneider, Maria Iannario, and Domenico Piccolo. 2017. Mixture models for ordinal responses to account for uncertainty of choice. *Advances in Data Analysis and Classification* 11 (2): 281–305.
- Vaerenbergh, Yves Van and Troy D. Thomas. 2013. Response styles in survey research: A literature review of antecedents, consequences, and remedies. *International Journal of Public Opinion Research* 25 (2): 195–217.