A Look into the Mirror

Preferences, Representation and Electoral Participation

Elias Dinas[1]

Alexander H. Trechsel[2]

Kristjan Vassil[3]

[1] Nuffield College, University of Oxford

[2] European University Institute, Florence

[3] European University Institute, Florence

1.Introduction

The offer of online, web-based Voting advice applications (VAA's) during election campaigns is proliferating (Walgrave et al. 2009, Vassil 2011, Trechsel & Mair 2011). Today, VAAs have become standard attributes of elections in modern liberal democracies. An increasing number of these elections even give rise to competing VAAs being offered to the citizenry. In the Netherlands, in Sweden and elsewhere, numerous VAA providers court the voters in order to commercially exploit the popularity of these tools. Over time, one can thus observe a proliferation of both VAAs and their users. In addition, we can assume that citizens start using these tools repeatedly, and on a structural basis, before elections. In a way, for a growing part of the electorate these tools have become fully embedded elements of the electoral process.

Despite these developments little is known about the effects of such tools. If VAAs become as indispensable to voters as the ballots they fill in, do they affect political choices at the polls? And independently from their potential effects on vote choice, do they exert an impact on citizens' decisions to turn out in the election? We try to answer the first question in other research (Alvarez, Mair & Trechsel 2011, Dinas, Trechsel & Vassil 2011). In this paper we investigate this second question: does exposure to a VAA affect its user's probability to go to the polls or to abstain from voting? Are VAA users electorally mobilized by such tools or, to the contrary, rather convinced to abstain?

The present state of the art of VAA research has shown that VAAs exercise an influence on their users either by altering voting preferences, vote choice or individual level turnout. Indeed, in all those areas where effects were expected to occur, studies have found the latter. Boogers (2006) reports descriptive findings on the basis of the Dutch Stemwijzer users out of whom about one tenth reported an increased motivation to vote in the elections after obtaining the advice from the VAA.

A study investigating the impact of Wahl-O-Mat usage during the 2005 German national elections shows that 8 per cent of Wahl-O-Mat users claimed to be more motivated to vote than before consulting with the VAA. The corresponding portion of 'mobilized' voters in a similar study conducted during the 2009 German national elections was 7 per cent (Marschall, 2005).

Fivaz and Nadig (2010) demonstrate on the basis of Swiss Smartvote data that as much as 40 per cent of Smartvote users declared that the VAA usage had a 'decisive or at least slight influence on their decision to go to the polls' (Fivaz and Nadig, 2010, p. 184). While recognizing that the findings cannot be directly generalized over the entire population, the authors indicate that the overall turnout may have been 6 per cent lower had these voters not been mobilized by Smartvote (ibid). They conclude that even if it is difficult to causally link VAA usage and mobilization effects of new voters, websites like Smartvote still have the potential to increase general interest in elections and politics (Fivaz and Nadig, 2010, p. 185).

Ruusuvirta and Rosema (Ruusuvirta and Rosema, 2009) suggest on the basis of the Dutch 2006 Election Study that the usage of 'online vote selectors' led to an increase in turnout of about three per cent' (Ruusuvirta and Rosema, 2009, p. 15).

When moving beyond the descriptive self-reported measures, Kleinnijenhuis & van Hoof (2008) employ panel data in their study of several Dutch VAAs. They observe that more people made a choice for a particular party after consulting the VAA and thereby, they suppose, because VAAs make it easier for voters to choose between the parties it may also result in concomitant mobilization effects (ibid).

All in all, the studies conducted insofar assume that mobilization by means of VAA usage can occur through three basic processes. First, undecided voters reach a decision on what party to vote for (an assumption proposed by Kleinnijenhuis & van Hoof (2008). Second, easily accessible information provided by the VAA reduces the costs of gathering information, thereby increasing the likelihood of voting (Ruusuvirta and Rosema, 2009). Third,

VAAs get uninterested citizens to think about politics and thereby bring them closer to the act voting (ibid).

While these effects are generally observable indeed, we suspect that these sources only operate through a mechanism that is a much more fundamental in nature and works as a necessary precondition to any mobilization effects imposed by the VAA usage. With regards to party preferences, Alvarez, Mair & Trechsel (2011) argue that VAAs generate a particular form of "user tailored information". They show that the clarity of this information is the key factor in the causal link between exposure to VAAs and party preferences. In this paper we will argue that the same mechanism is also at play when causally linking exposure to VAAs and turnout.

The literature on turnout in elections has enormously grown over time and produced a number of rather commonly accepted insights. The aim here is not to offer a summary of these studies – this has been done elsewhere (see for instance Blais 2007). However, a number of studies were greatly beneficial to our theoretical reasoning behind the potential impact of VAAs, not only on preferences, but also on participation. In particular we are interested in the intersection of issue-based voting, campaigns and information.

2.Theory

Downs (1957) pioneered by theoretically connecting political preferences of voters to the probability of turning out at the polls. For Downs, an ideal world offer voters all the information needed for deriving his utility of voting for party A versus party B in terms of desired political outcomes. However, as the world is not perfect, voters generally lack this information and thus have to make partisan choices based either on their evaluation of the parties' former performance (later labeled "retrospective voting", see V.O. Key 1966, Fiorina 1981) or on the promises made concerning their future behavior (corresponding to prospective voting, a mechanism described by Downs himself). In either case a voter's decision at the polls will greatly depend on information a voter possesses on political parties' positions. And so does the very act of turning out: the more information, the higher turnout.

Many studies have tried to empirically test this assumption and effectively found evidence for the hypothesized link between information and voting. Things started off rather badly, though. In their groundbreaking study of the American electorate, Campbell, Converse, Miller and Stokes (1960) investigated the pre-conditions for a voter to cast an "issue-based" vote. They found that two-thirds of voters actually could position themselves on a certain issue and were familiar with the government's stance on this issue. Only about half of these "familiar" voters were finally able to perceive differences in party positions and their corresponding overlap with their own position on any particular issue. Campbell et al. (1960) pessimistically interpreted these findings and dismissed the issue-voter idea, privileging the party identification model based on socially determined factors – but not issues - instead (Alvarez 1997: 8 ff.). In their seminal study they underline that the same mechanisms are in play for explaining why people turn out and others not.

However, starting with V.O. Key's work, Downsian rational choice explanations of preferences, vote choice and turnout have spread. Many studies added further specifications to the original model when empirically measuring the latter. Most prominently a great variety of ever more sophisticated spatial models of voting emerged, trying to link the offer to the demand. Models of issue voting, retrospective, prospective, positional, directional or proximity-based in form became increasingly applied. Their common denominator is the linkage of some kind of idea about the voters demands to some kind of idea about the supply, be it positional, reputations, objective, subjective etc. In most of these models, voters have a position in an n-dimensional policy space and are able to perceive the political parties' or candidates' positions within this space. This ability will not only help them in making their vote choice but does affect their choice to vote or to abstain. Generally, the better informed, the better the ability of voters to perceive their own positions vis-à-vis the electoral offer and thus the higher their probability to turn out. As an influential study in this field has concluded: "[…] the information level of a voter has a strong effect on the likelihood the voter will vote" (Palfrey & Poole 1987).

Information, however, does not fall from the sky. While a lot of information on the political offer is generated during legislatures, for instance through voting on bills in Parliament, it is during campaigns preceding elections that the bulk of information on the electoral offer becomes visible. Starting with the pioneering work of the Columbia School (Lazarsfeld et al. 1944, Berelson et al. 1954), researchers tried to understand whether campaigns mattered for vote choice. The initial answer by the Columbia School was pessimistic (Alvarez 1997: 16 ff.) and is generally described as the "minimal effects" model according to which campaigns do not really lead to persuasion of voters. As with the socio-psychological model of the American Voter, this model was extremely influential. However, alike the American Voter, it was challenged by numerous studies, and more recently by the emerging literature on media's agenda setting effects (McCombs and Shaw 1972) through framing and priming mechanisms (Iyengar and Kinder 1987), the Receive-Accept-Sample model (Zaller 1992), the uncertainty and learning approach (Alvarez 1997, Lenz 2009) campaign responsiveness to wedge issues (Hillygus & Shields 2008) and others. This literature is primarily concerned with persuasion effects concerning preferences and vote choice rather than turnout. However, Kiousis and Devitt (XXXX) have recently linked agenda-setting theory to turnout and shown that the former increases the latter, in particular among young voters, through socialization mechanisms. Similarly, Ghirardato and Katz (2002) have shown the importance of the quality of information on turnout. Also, Sanders (2000) argues, in a similar vein, that uncertainty regarding candidates in elections does affect turnout. Overall, we believe there is room for further investigating the potential effects of information in campaigns on turnout. Our contribution tries to precisely offer this.

For their theoretical approach to the study of potential effects of VAAs on partisan preferences, Alvarez, Mair and Trechsel (2011) have built on both the issue-voting and agenda-setting/learning literature. By far the largest part of studies on the impact of campaign information on vote choice concerns the question of how information on, for example, issue positions of political parties is received and processed by the voter. It focuses on two categories of actors: the voters (demand) and parties/candidates (supply). Information is

generated by the supply side directly (through campaigning, platforms etc.) or indirectly (through the consumption of mass media, social interactions with others etc.), received and processed by the voter. This information increases the transparency of the offer and thus, through its interpretation by the voter, helps making an informed choice at the polls.

VAAs falls in this second category of information provision mechanisms: like media, they relay information about positions of political parties to the voters. They allow users to drastically reduce the costs of information gathering as the political offer, in the form of party positions is summarized by the VAA provider. Reducing the costs of information before an election partly explains the growing popularity of VAAs. But what the truly revolutionary aspect of this new form of political information acquisition is the revelation of matches between individual voter preferences and the preferences of the parties in the race. Voters do not simply go to a VAA website to inform themselves about parties' stances on political issues but to match their personal politics with politics offered by the parties.

Voting Advice Applications typically make their users answer a series of political questions or statements, i.e. "Same sex marriage should be liberalized". The system then matches the users answers with the previously coded positions of the parties running in the election. Through simple algorithms, the outcome is then presented to the user in various ways. Mostly, so called match-lists are proposed to the user, where parties are ranked from nearest to furthest from the user's own preferences.

Figure 1 is a screenshot from the VAA called "EU Profiler" that was running during the 2009 European Parliament Election campaign. It illustrates the match between a user and the parties running in the elections (in this example the parties in the UK). The user who was given the screenshot in *Figure 1* matched best with the Labour Party. 64.2% of this user's political preferences were identical with the positions of the Labour Party. The British National Party, at the other end of the rankings, was only matching 54.2% of the user's preferences.

Figure 1: Match-list for a EU Profiler user (UK)
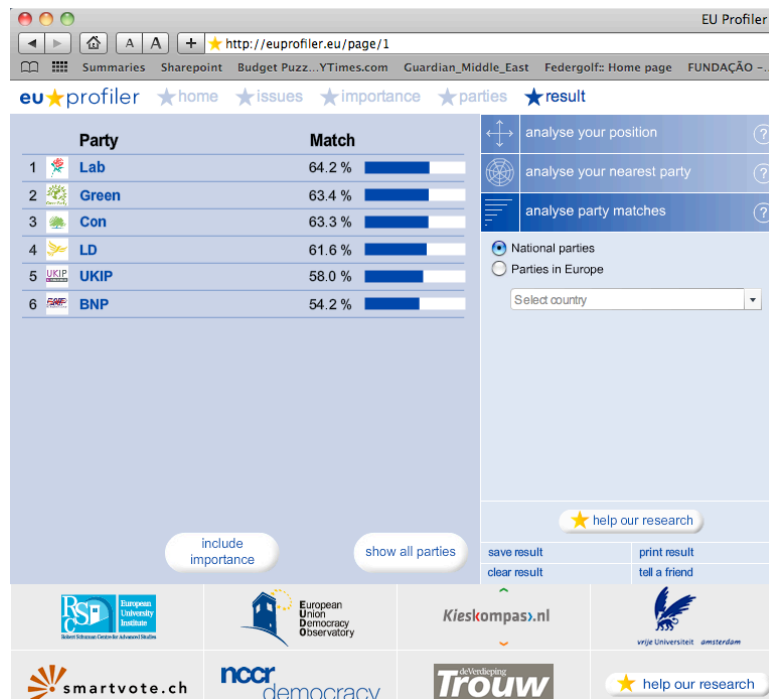
The form of information gathered by VAA users is thus radically different from the information so far given to voters directly by parties or relayed to them through the media or other intermediaries. This information is tailor-made for the user, in that it reveals to the user the structure of party competition in light of her own preferences. The result is a form of political matchmaking revealing "your picture", "your political mirror", "your parties", a customized view of the political supply.

Alvarez, Mair and Trechsel (2011) derive the concept of "representative deficit" from the degree with which a VAA user fails to match the offer: the lower the match, the higher the representative deficit, i.e. the less a voter's issue preferences are reflected by the political offer. To give an example: the representative deficit of the EU Profiler user whose match list is shown in *Figure 1* amounts to 35.8 (corresponding to 100-64.2). This means that one third of this user's preferences do not match the preferences of the Labour Party, his closest party. In other words, this voter can at best vote for a party that represents two-thirds of his interests as measured by the VAA.

Using data from the 2009 EU Profiler voting advice application, Alvarez, Mair and Trechsel (2011) find that this self-positioning mechanism has a highly significant effect on users' party preferences. A significant proportion of users even switch their allegiances for the number one party after exposure to the EU Profiler. Once their personal proximity to parties is revealed by the system, they learn from this and, under certain conditions, this learning process affects their party preferences. The representative deficit is precisely the conditioning mechanism that makes voters take their revealed preferences seriously. The lower the deficit, the stronger the self-persuasion, the higher the probability of "switching" party preference to the number one party in the match list. Thus, voters are sensitive to the VAA output and the extent to which their preferences match the supply. A low representative deficit is, in a way, a clear self-portrait. It shows the user that "their" party does indeed exist, i.e. a party that greatly overlaps with her personal politics. However, the vaguer the contours of the match between a voter and his number one party, the lower the probability of this picture exerting any effect on the voter's partisan preferences.

In this paper we theorize further, predicting an effect of the representative deficit on the subjectively perceived mobilization effect of VAAs. The simultaneous and cognitively easy-to-grasp revelation of one's match with the supply may affect individual participation patterns in two orthogonal ways. First, if there is no representative deficit and the user finds a perfect match, he may feel encouraged by this exogenous outcome and incited to participate at the polls. In simple commercial terms, if the offer displayed in the vitrine matches the demand, the context for entering the shop is favorable. To the contrary, if a user finds out that the representative deficit is so high that she is literally in a corner of the political space where no party can be found, some kind of party-less space, the resulting feeling of "political solitude" may have a negative effect on one's desire to take part in the elections. From this follows our set of working hypotheses:

H1:   The smaller the representative deficit, the higher the probability of being incited to turn out.

H2:   The higher the representative deficit, the higher the probability of wanting to abstain from voting.

In sum we hypothesize that the probability of a respondent to report her willingness to participate in elections is a function of the representative deficit. *Figure 2* demonstrates graphically the two hypotheses jointly.

Figure 2: Graphical representation of the core hypothesis
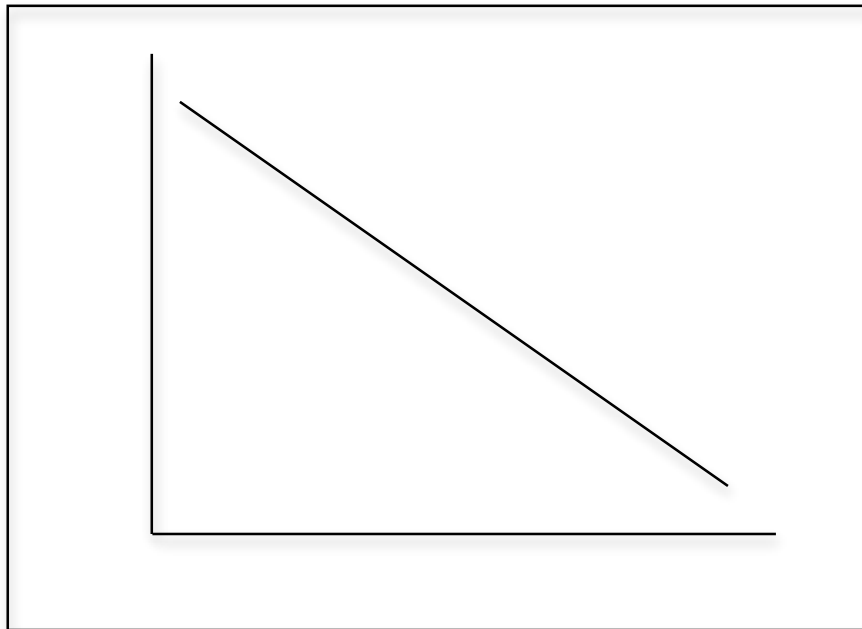
Since VAA users are a particular subsample of normal probability sample, in the following section we offer a short overview to which extent VAA users differ from the representative sample of the electorate. Subsequently we will test our hypotheses empirically.

3. VAA users and political participation

Recent studies have demonstrated that VAA users tend to have higher levels of political participation than an average individual in the electorate. To be explicit about the direction in which causality affects VAA usage, studies agree that one usually disposes of a certain level of political interest before

becoming a VAA user. Several studies have been able to demonstrate this on the basis of different cross sectional surveys (Ladner et al., 2010; Ruusuvirta and Rosema, 2009).

In order to make use of triangulation to verify the presence of this bias in the sample, we go beyond the studies relying on single cross-sectional evidence. In particular, we employ comparative survey data from the European Election Study of 2009, in which the question on VAA usage was for the first time included into a large-N survey of 27 European Union member states[4]. In so doing, our aim is to verify whether the VAA users are indeed more interested in politics than non-users. *Table 1* displays descriptive statistics of VAA users by their turnout in the European Parliament election of 2009.

Table 1: VAA usage and turnout

	VAA usage		
Turnout	Yes	No	Total
Voted	1,633	17,273	18,906
	87.6%	69.9%	71.1%
Abstained	232	7,450	7,682
	12.4%	30.1%	28.9%
Total	1,865	24,723	26,588
	100.0%	100.0%	100.0%

The EES data has generally oversampled voters, but their over-representation is particularly pronounced among those who have used VAAs prior to elections. In other words, VAA users are indeed more inclined to vote than non-users.

We also estimate a multivariate maximum likelihood (*logit*) model using a dichotomous dependent variable coded 1 if a respondent voted in the 2009

---

[4] The survey question that was included into the EES 2009 reads as following "There are websites offering advice on how to vote in the European Parliament elections on the basis of your ideas, values and policy preferences. In the weeks before the European Parliament elections, did you visit such a website?" Answer categories included "yes" and "no".

European Parliament elections and 0 otherwise.[5] Based on the results of previous studies and Table 1 above, we expect the effect of VAA usage on the probability to turn out to be positive and statistically significant.

In our model we also control for gender (1 male, 0 female), age (continuous variable from 18 to 99), education (14 categories from no education to university degree standardized over 27 countries), partisanship (4 categories from no partisanship to strong party affiliation), participation in the past EP election in 2004 (1 yes, 0 no), and the political activity score (11-unit additive index of 5 various political activities that a respondent was engaged in before elections[6]). The highest variance inflated factor occurs for political activity (1.19), which is well below the limits to be concerned with multicollinearity among the independent variables.

Table 2 contains our findings. The effect of the main variable of interest - VAA usage - is indeed positive and significant. This indicates that even when controlling for a set of demographic, attitudinal and behavioral variables VAA usage is positively associated with turnout. More specifically, expressed in terms of average marginal effects, the probability to participate in elections is about 13.65 per cent higher for VAA users as compared to non-users (when holding all other variables at their mean).[7]

---

[5] The amount of VAA users in the sample is 1,872 (7%) and the non-users 24,861 (93%).

[6] How often did you: (1) watch a program about the election on television, (2) read about the election in a newspaper, (3) talk to friends or family about the election, (4) attend a public meeting or rally about the election, (5) look into a website concerned with the election? Answer categories include "often", "sometimes", and "never".

[7] Additionally, in order to control for country level unobserved heterogeneity, we estimated a model with fixed effects, which yielded no markedly different results from the main model reported in *Table 2*.

Table 2: The effect of VAA usage on turnout (EES 2009)

	Model 1
VAA users*	13.65***
	(1.71)
Male*	0.06
	(0.49)
Age	19.98***
	(2.38)
Education	2.53
	(2.54)
Party identification	19.10***
	(1.72)
Turnout in the previous EP election*	17.06***
	(0.84)
Political activity score	58.98***
	(2.92)
Observations	20140
Pseudo R-squared	0.187
Log Likelihood	-10121

Marginal effects, clustered standard errors by country in parentheses

* for dummy variables

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

In this short detour into the realm of VAA usage patterns our goal was to demonstrate how this particular subpopulation of people - the VAA users - differ from the representative electorate. However, the main goal of this study is to detect to which extent VAA usage per se has the capacity to mobilize its users. In other words, if a citizen intends not to vote in the coming elections, then under which conditions can these citizens be mobilized by a VAA?

4. Data and variables

We make use of the data generated by the EU Profiler, the largest Pan-European voting advice application that was created to cover the 2009 European Parliament Elections.[8] EU Profiler was visited 2.5 million times between its launch in early April and Election Day (June 7, 2009). It was

---

[8] http://www.euprofiler.eu

offered in 30 national contexts (the EU27 plus, for simulation reasons, in Turkey, Switzerland and Croatia). Users could first choose their country and the corresponding language (the application was offered in 24 languages). For all countries, an English version was offered by default. Users could position themselves on 30 statements, ranging across a wide range of political dimensions, of which 28 were identical across all 30 countries and two statements were country-specific in order to capture national specificities of the campaign. The answers could be given on a five-point scale going from "completely agree" to "completely disagree" (for more details see Trechsel and Mair 2011). In total, roughly 900'000 users fully filled out the 30 statements across Europe. They were offered a voting advice that came in three different forms: two graphical representations of their position in the party landscape and a simple match-list, where one's overlap with the parties in the race was shown in an ordered fashion, from the best-matching party to the least-matching one.

EU Profiler users, after they had received a voting advice, were also asked to "help our research" by filling out an extra-questionnaire - a survey designed to assess the usage of EU Profiler application. Only about two percent of users who received a voting advice also filled out this questionnaire. This, however, still represents over 20'000 cases for which we have full information. Among other survey items, we asked the users whether, according to their subjective evaluations, the EU Profiler made them want to participate in the coming elections[9] or whether it made them want to abstain[10]. In this paper we use the answers to these questions to construct our dependent variable.

Our dependent variable

We code our dependent variable "1" for those who indicated that the EU Profiler made them want to participate in elections and it takes the value "0" for those who claimed that it made them want to abstain. *Table 3* displays the distribution of respondents by the two outcomes: mobilized versus demobilized.

---

[9] The EU Profiler made me want to participate in the EP elections. Answer categories: yes, no.

[10] The EU Profiler made me want to abstain in the EP elections. Answer categories: yes, no.

Table 3: Dependent variable - self-reported effects on mobilization

	Frequency	Per cent
Made me want participate	6,166	91.9%
Made me want to abstain	540	8.1%
Total	6,706	100.0%

We are not, at this point, interested in interpreting the distribution of our dependent variable. For this, we would have had to also account for respondents who were not affected in their probability to turn out or who did not answer the "effect on turnout" questions altogether. There are too many problems linked to self-selection mechanisms in the survey to make us feel comfortable in such substantive interpretations as "the EU Profiler made people participate" and the like. Moreover, we are not interested in the effects of any of the independent variables that are contained in the extra-questionnaire per se. What we are, however, very much interested in is the *mechanism* through which a respondent either feels mobilized or demobilized by the EU Profiler. And we focus on a particular variable that is exogenously given – the representative deficit. It is rather difficult to argue that the representative deficit can be endogenous to reporting about the EU Profiler's effect on one's willingness to participate or abstain in the elections. The correlation between the two is only -0.12. Therefore, we are inclined to proceed as the main quantity of interest is exogenous and avoids endogeneity problems by design.

Our main independent variable: the representative deficit

Our main explanatory variable is the representative deficit as explicated in the theoretical section of the paper. It is operationalized as the degree to which political preferences of each individual in our sample overlap with the political offer of the parties. Recall the logic by which the EU Profiler issued a voting advice. The single most important feature of this advice is a match list expressed in percentages. These percentages demonstrate the congruence of issue preferences between the voters and parties. The more you overlap with the party, the higher the congruence between issue preferences and conversely, the less you overlap with the party, the lower the congruence.

We argued, in the theory section, that the representative deficit might have profound consequences of individuals' willingness to participate in elections, because voters assess the choices that are available to them conditional on the degree to which these choices match their political preferences. The EU Profiler's match list captures exactly this concept. The gap that remains between one's cumulative political preferences and the political offer is the deficit that each voter has to cope with when making a vote choice.

We code our main independent variable as 100 minus the overlap between the voter and her closest party, that is

$$100 - overlap = X$$

where X is the measure of the *representative deficit.* X is a percentage that ranges between 0 in the event of maximum representative deficit (no congruence) and 100 in the event of no representative deficit (perfect congruence). *Figure 3* displays the distribution of the values of the representative deficit variable graphically.

Figure 3: Distribution of the representative deficit
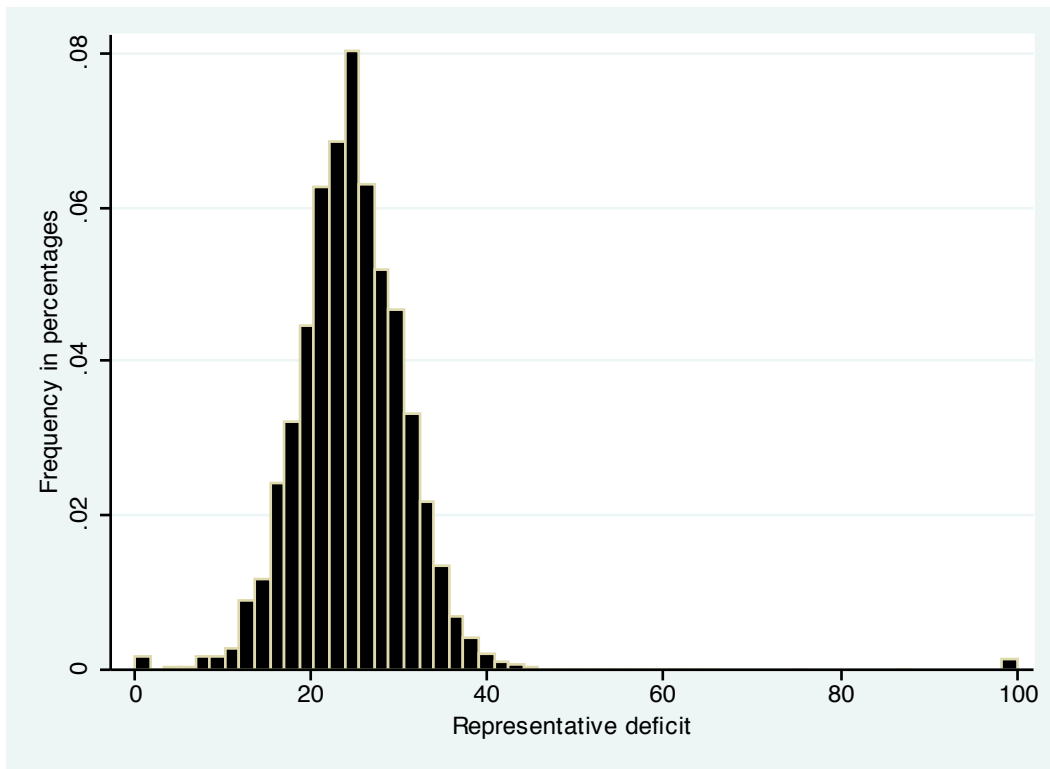
The mean value for the representative deficit is 0.23, which tells us that on the average there is a gap of 23 per cent in issue congruence between the closest party and the EU Profiler users. According to our theory and the hypotheses we expect those who felt that the EU Profiler made them want to abstain from elections to have a higher representative deficit than those who felt that it made them want to participate in elections. *Table 4* displays the mean values of the representative deficit by the categories of the dependent variable. Though fairly small, these differences do indeed appear across these two groups of respondents and they also work in the expected direction.

Table 4: Mean levels of representative deficit

	Frequency	Mean
Made me want to abstain	712 (8.66%)	26.5
Made me want participate	7,507 (91.34%)	23.6
Total	8,219	23.84

When trying to assess the differences in practical terms we follow Rosenthal et. al (2000) and calculate the effect size by converting the t-value reported by the

t-test into the r-value (effect size). With a value of 0.13 we have a medium sized effect that is also statistically significant. Thus, although the mean differences are fairly small, the effect remains sizable.

Before digging deeper and refine our assessment of this apparent relationship we need to address a number of theoretical and empirical issues relevant to our analyses. Most notably, a series of controls need to be taken into account.

Our controls

We have two major concerns that need to be addressed by adding controls to our basic model. The first concern we are confronted with has to do with the question as to what extent the EU-Profiler-generated representative deficits are linked to one's structure of partisan preferences. Whether one has a clear-cut and strong preference for one party or, to the contrary, a weak one, may affect the level of one's representative deficit to begin with. In other words, if a user is, from the outset, unclear about his party preferences, she may be more distant from the partisan offer and hence display a larger representative deficit. If this was true, then we would expect the effect of the representative deficit to be preconditioned by the intensity of a user's number one party preference. To see whether the effect of the representative deficit is already accounted for by prior preferences, we need to also control for the latter. We thus use the propensity to vote measures given by the users before being exposed to the EU Profiler results.[11] In particular, we include all PTV scores as given for all parties as dummies. Missing values (some people have skipped this part of the application) are treated as reference categories. In so doing we are agnostic about particular attitudes toward particular parties, but still control for the heterogeneity imposed by prior preferences as such.

The second concern is that the level of the representative deficit might be related to the saliency attached to individual statements over others. If, for example, someone thinks a number of issues is clearly more important than

---

[11] The EU Profiler asked users the following question: „How probable is it that you will ever vote for the following parties?" The system displayed a list of parties running in the European Parliamentary Elections of 2009 and included in the EU Profiler. Users could indicate, on a 11-point (0 to 10) scale, how they ranked parties.

some others, the representative deficit might be higher than for a person with a more equally distributed set of opinions on the statements. For example, individuals who believe socioeconomic policies are not particularly important to them, but that European integration related issues really matter more, then it might be more difficult for them to find a party close to their own views in various political systems. Thus, the representative deficit, as revealed by the EU Profiler, could be the result of systematic differences in the amount and the character of issues some people might find more important. To account for this possibility, we include all indicators about the saliency of each one of the issue statements[12]. Analogous to the procedure we used in order to account for party preferences, we fully factorized each of the saliency variables (one per statement), using missing values as a reference category.

Before we move to the results, let us underline that we refrain from including any indicators available in the extra-questionnaire. All the information contained in the extra-questionnaire is provided by the user once she received the voting advice from the EU Profiler. Information in the extra-questionnaire is therefore to be considered post-treatment and including it is likely to bias the estimated effect of the representative deficit. To give an example: one could argue that an individual's level of political involvement or political interest could qualify as confounders and thus such measures, contained in the extra-questionnaire, should be included in the model. However, it is equally likely that these responses are themselves affected by the results from the advice. Note, finally, that it is believed that the information provided by the two sets of controls (prior configuration of party preferences; perceived issue saliency) should also help to distinguish people in terms of their politicization levels.

Country-specific heterogeneity, always likely to be an issue with pooled datasets, is addressed through a hierarchical analysis whereby individuals are

---

[12] Immediately following the 30 statements, the EU Profiler asked users the following question: „You now have the opportunity to indicate how important you consider the different issues. Select the '-' button to indicate that the issue is not that important to you, the '=' button for moderate importance, or the '+' button for great importance." The system displayed a list of all statements and users could either indicate the saliency of issues or skip this step. A large majority of users did indicate how important issues were to them.

nested within countries (or political contexts). In particular, a mixed-effects logit model is used to estimate the effect of the representative deficit on the likelihood of being discouraged to vote by the EU-Profiler.[13]

5. Results

Let us now turn to our results stemming from the two-level logit model estimation. The first column of the *Table 5* shows the effect of representative deficit on the probability of being discouraged to vote in the 2009 elections for the European parliament without adding any of the controls described above. The effect, the size of which cannot be readily evaluated from this table, is negative, as expected: the higher the gap between one's preferences and parties' positions the more likely she is to be disappointed from the current alternatives in her political context. This effect varies substantially across countries, as shown by the random part of the model. Yet, on average, the main hypothesis tested here seems to hold: the extent to which the voting advice application mobilizes users to actually participate or to abstain in the elections partly depends on the outcome of the advice. In spatial terms, the more isolated users realize they are in their political system, the more likely they are to report their intention to abstain because of this outcome.

---

[13] A still unresolved issue in this study is the question of whether we should be concerned with inferential statistics. The analysis includes all EU Profiler users who have filled in the extra-questionnaire. These people are self-selected both to the VAA and to its final step, i.e. the survey that followed the advice. The selection problem is addressed in the last part of the analysis. However, the more general question here is whether standard errors are of any substantial value. To the extent that different VAA users are similar in various respects, one could argue that inference applies to all VAA users who would also fill in an extra-questionnaire would there be one. That said, and as will be shown in the next section, given that our results hold even when we correct for non-random sample selection, we may justifiably argue that these findings might apply across all VAA users, which then makes inference statistics meaningful. It is on these grounds that we use and comment on standard errors and confidence bands in the results.

Table 5: The effect of the representative deficit

|	Did the EU-Profiler discourage you from voting?	
Fixed Effects		
Representative Deficit	-.083 (.013)	-.050 (.007)
Controls	Not Included	Included – not shown
Random Effects		
Intercept	1.28 (.446)	1.51 (.385)
Representative Deficit	.038 (.014)	.022 (.010)
N (N of countries)	7940 (29)	7793 (29)
Fit statistics		
Log-Likelihood	-2225.833	-2305.525
AIC	4461.667	3832.477
BIC	4469.565	3999.541

Note: Entries are ML estimates, standard errors in parentheses. An unstructured pattern for the covariance matrix has been used for the estimation of the random part of the model, REML is used for the estimation. Some cases are dropped because within the cells created by the PTV or the saliency dummies, they perfectly predict failure of the occurrence of the event of interest.

The second column of *Table 5* presents the same model that now includes all the controls mentioned above. First, and rather unsurprisingly, including these controls reduces the variance of the dependent variable not to be accounted for by our key independent variable. More importantly, the effect of the representative deficit, though slightly declining, remains largely robust to the introduction of this long list of dummies. Evidently, the conclusions generated in the previous column remain unchanged. This is reassuring in that it is the effect of the advice that is reflected in this pattern, rather than individual heterogeneity with respect to attitudes towards the parties or the degree of saliency attributed to the statements contained in the application.

In order to assess the size of the effect let us first see whether we can treat it as globally linear: does a one-percentage change across the representative deficit scale produce an approximately equal effect irrespective of the position of each observation in this distribution? To examine this question, we estimate the same effect through a

Generalized Additive Model (GAM, see Wood 2006), using a binomial family and a logit link function. With the use of GAMs we can have a clear visualization of how the effect of the representative deficit varies across the range of values this variable can take (*Figures 4a* and *4b*).

Figures 4a and 4b: The effect of the representative deficit on the probability of being mobilized to vote as a result of the EU Profiler, estimated through a Generalized Additive Model.
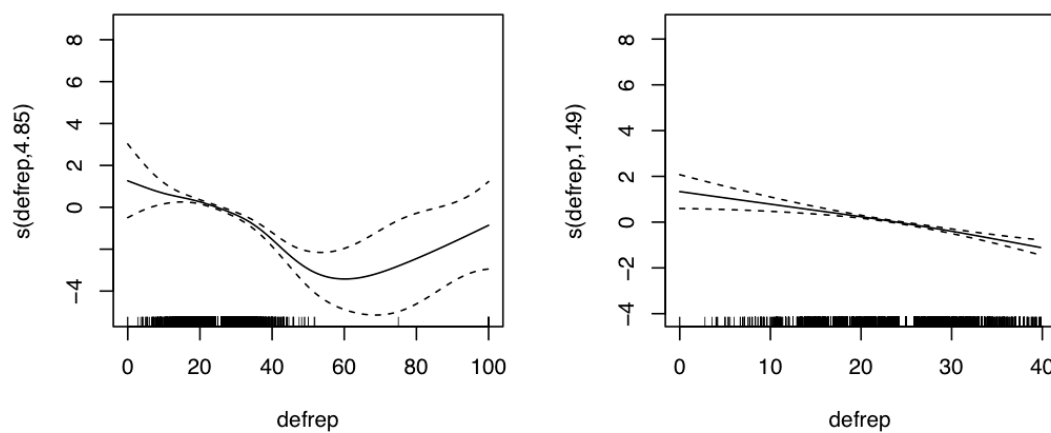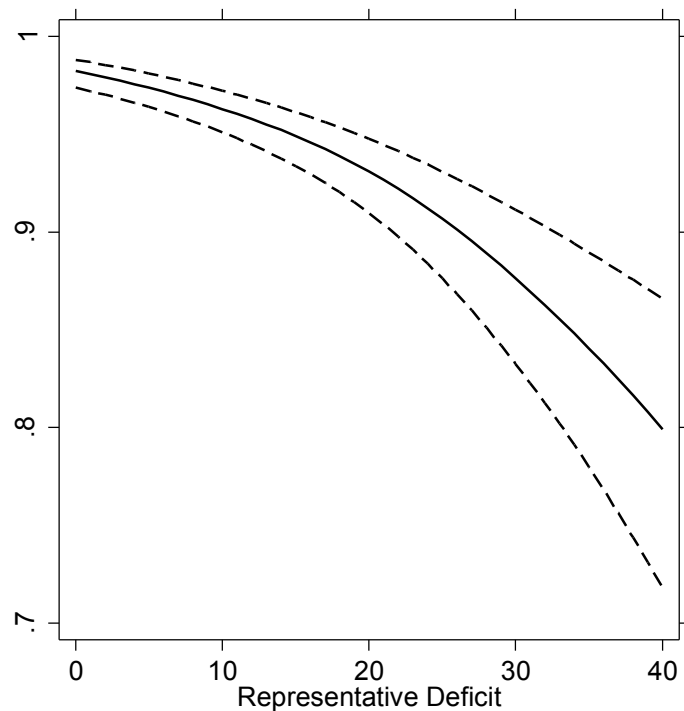

Note: The solid curve presents the coefficient of representative deficit, estimated through a logit link function, across the range of its values. The dashed curves represent the 95% confidence bands. Both smoothed terms are significant at the p<.001 level.

The pattern of *Figure 4a* is somewhat problematic. Although for the bulk of cases it seems safe to assume a linear descending pattern, the very few outliers at the right extreme of the scale cause this U-shaped curve. As one can already see in *Figure 3* only very few representative deficits extend beyond 40 percent. Indeed, over 99% of the cases are in the area between 0 and 40. There are 60 observations (.070%) with values greater than 40 in the 0 to 100 percent deficit scale, where 100 implies absolute disagreement with all parties. *Figure 4b* shows that when these cases are excluded the pattern is clearly monotonic and could be justifiably summarized through a linear approximation.

With that in mind, let us now look at the effect of the representative deficit in terms of predicted probabilities.

22

Figure 5: The predicted probability of being mobilized to vote across all points from 0 to 40% in the representative deficit scale.

Note: The solid curve presents the estimated probability at each point of the representative deficit scale, the dashed curves indicate the 95% confidence intervals. Predicted probabilities have been estimated with CLARIFY (King et al. 2000).

Figure 5 shows that a change from complete overlap of one's preferences with the partisan offer to 40% per cent of disagreement generates an almost 20% decrease in the probability of declaring that "The EU-Profiler made me want to participate in the EP election". This effect ranges slightly across the values of the representative deficit scale and becomes steeper for the group of cases where most users are clustered, i.e. around the area between 20-40%[14].

---

[14] Although in order to save on space these results are not reproduced here here, it needs to be mentioned that we get substantively identical results when we use a rare events random effects logit model (given that 0s constitute 9 per cent of the sample) for the estimation of these effects.

Trying to unpack the mechanism: related outcomes of interest

As a next step, we try to pin down the mechanism generating this effect. First, if this result reflects an actual reduced probability of turnout, we should observe also an effect of representation deficit on the actual probability to participate in the election. One of the questions in the extra-questionnaire asks respondents to name the party they are most likely to vote for in that election. One of the options given to users is the following: "I do not intend to vote in the elections." Is it the case that users declaring that they intend to abstain also have a higher representative deficit?

The results, shown in the fist column of *Table 6*, indicate that this is indeed the case. Importantly, this question reflects behavioral change, which is typically less frequent than attitudinal change, and shows that the EU Profiler might actually decrease the chances of voting if the issue preference profile of the user does not match well with the configuration of parties' positions in a given political system.

Table 6: The effect of the representative deficit on the intention to vote in the EP elections of 2009 and on users' attitudes towards political parties

	'Does not intend to Vote'	Diff = $ptv_{maxt} - ptv_{maxt-1}$
Fixed Effects		
Representative deficit	.045 (.005)	-.269 (.044)
Random Effects		
Representative deficit	.011 (.007)	.102 (.371)
Intercept	.899 (.217)	7.79 (1.19)
N (N of clusters)	22010 (29)	21850 (29)
Fit statistics		
Log-Likelihood	-2711.347	-111608
AIC	5432.694	223224
BIC	5472.691	223526

Note: both equations have been fitted through a mixed effects model. ML estimates are shown with standard errors in parentheses. Controls are the same as those used in the second column of *Table 5*.

When transforming the log odds shown in the table into actual probabilities, we see that between two individuals with a 20% and a 35% representative deficit

respectively, the first was 5% (4.1% - 6.2%) more likely to turnout in the 2009 EP election.

If this effect is due to the disappointment of the user with the positions of the parties in her political context, this pattern should be also reflected in how individuals with a higher representative deficit evaluate the parties after the advice has been revealed to them. Again, we can empirically gauge whether this is the case by using the set of PTV questions given to users in the extra questionnaire. The latter are identical with those offered to users before the advice is revealed to them. Does a high representative deficit also impact on the propensities to vote for a party? If this was the case, then higher representative deficit should lead to lower maximum PTV score as a function of being exposed to the EU Profiler. If for example there was a party that was given a score of 8, 9, or 10, after the results are displayed it should be given a lower score. We therefore compare the maximum PTV scores given by users before and after the advice. Subtracting the first from the second, we expect the resulting outcome to be lower as the policy gap increases. The resulting dependent variable ranges from -9 to 9. The findings from this exercise appear in the second column of *Table 6*. As is shown, a one-percentage increase in the representative deficit is indeed associated with a -.242 points decrease in the highest PTV score given after receiving the vote advice. When transforming this ML estimate into a marginal effect, we get a decrease of -.189 points on the -9 to 9 scale.[15]

Correcting for the nonrandom selection mechanism

Finally, we must deal with a potential self-selection problem. Insofar, we have exclusively focused on those individuals who have completed the extra-questionnaire. The latter is proposed to users once the representative deficit was revealed to them. Overall, this is only a very small proportion - approximately 2 per cent in any country - of the total number of users. A high representative deficit may evoke two types of responses. On the one hand, for some people it may simply denote that parties' positions have not been coded appropriately by the EU-Profiler. Alternatively, these users may hold critical stances with regard to the choice of statements or/and the

---

[15] Although these graphs are not shown to save space, the GAM curves summarizing the effects of representative deficit in both outcome variables used in *Table 6* largely reveal a monotonic and clearly descending pattern.

wording that has been used in each country. For all these reasons, they may simply discard the information coming from the EU Profiler and thus avoid completing the extra-questionnaire. For others, however, the result does not affect the way they evaluate the application but rather influences their attitudes towards the parties and the elections more generally. These people might be more likely to fill in the extra-questionnaire. Thus, if the decision to fill in the questionnaire predicts also whether the EU Profiler results have affected people's stances about the parties and the ensuing election, examining only the subgroup of individuals who have filled in the extra-questionnaire may generate an upward bias in the effect attributed to the representative deficit.

To examine whether our findings are critically conditional on the decision or not to complete the extra-questionnaire, hence the nonrandom selection of the subsample used in the analysis, we estimate the effect of the representative deficit by trying to account for this exact decision. We achieve this by using a probit sample selection model. The selection equation relates to whether the individual has filled in the extra-questionnaire. The outcome is the same dummy dependent variable used in the previous analysis, denoting whether the user has been mobilized to vote in the election. If the equations are interrelated, i.e. if completing the questionnaire predicts whether people will be affected by the advice, the previous results might be erroneous since they incorporate the bias produced by ignoring the question about what makes a user devote this extra time to fill in the last 'help our research' formula.

To identify this two-step model we need to employ an exclusion restriction – a variable that only helps to predict the selection decision but remains orthogonal with respect to the outcome. For this purpose we use the number of 'Don't Know' responses (DKs) a user has given to the 30 issue questions. A high number of DKs is a good indicator of individuals' propensity to disclose information about their values, opinions and also probably about their demographic profile. This means that people with a higher number of DKs should be less likely to actually move to the final questionnaire. All other controls are included in both stages of the model.

Table 7: Correcting for the nonrandom selection of EU-Profiler users through a probit sample selection model.

	Selection equation Did the user complete the extra-questionnaire?	**Outcome equation** Was the user mobilized to vote?
Representative deficit	-.007 (.0007)	-.029 (.004)
DKs	-.049 (.003)	
Controls	Included – Not shown	
ρ	.661 (.157)	
N	779447	
Censored	772201	
Uncensored	7246	

Note: Entries are ML estimates, robust standard errors in parentheses. Controls are all ptv and Saliency dummies used throughout the analysis, together with a variable measuring the amount of time the user has spent on the EU Profiler website.

The results are displayed in *Table 7*. First, notice that the positive and large ρ shows that two equations are indeed interrelated. Thus our concern about the sample selection mechanism is valid. The significant ρ indicates that focusing only on the subsample of EU Profiler 'afficionados' may generate a bias in the estimation of our coefficients of interest. Its relatively large positive value indicates that going for the final step, i.e. filling out the extra-questionnaire, is a good predictor that one will also declare being mobilized by the VAA. Interestingly, but hardly surprisingly, getting a voting advice that indicates a high representative deficit reduces the likelihood of filling in the extra-questionnaire. That said, as it is shown by the effect of the representative deficit in the two steps of the model, even when this intercorrelation is taken into account, we get a negative effect of the representative deficit. Although it is now half of what it was in the simple model, it is still highly unlikely to come from a true null. We arrive at the similar finding even when controlling for the selection mechanism. It seems that getting a result that indicates significant distance from the existing parties does not simply drive negative evaluations about the device, but, most importantly, it also influences the way users perceive the parties and hence their likelihood of voting in the coming election.

6. Conclusions

The internet becomes an ever more important platform for election campaigns in modern, liberal democracies. It has become unthinkable for any candidate or party to solely campaign "traditionally", i.e. without any ICT-based component. The proliferation of digital technology has profound effects on campaigning. One of these effects is the growing loss of control candidates and parties have over the message. Not unlike in other areas of life, voters have certain demands they want to satisfy and online-tools enable them to do so pragmatically and efficiently, independently from the party-led campaigns. It becomes increasingly common for voters to compare their own positions with the political offer. Internet-based self-evaluation tools, such as voting advice applications, proliferate and are intensively used before elections. Voters can look into their political mirror and detect a summary of their preferences, neatly matched with the parties and/or candidates running in the elections. With millions of voters looking into the mirror it becomes necessary to assess whether such glances impact on voters preferences and behavior. One of the potential effects of such processes is that voters may be encouraged or, to the contrary, discouraged from participating in the elections.

In this paper we have developed a theoretical model for analytically assessing the link between individual level turnout and ones' subjective understanding of how well her political preferences are reflected in the political offer. Does the congruence between offer and demand, or, expressed differently, the overlap between one's preferences and any particular party in a given polity affect one's intention to participate in the elections? This overlap tells the user how strongly his preferences are reflected by the partisan offer. We call the gap between the actual overlap with a user's number one party and the maximal overlap theoretically reachable the "representative deficit". In our theoretical model we have argued that the intentions of VAA users to participate or to abstain in elections may be fundamentally linked to this deficit. The lower the deficit, the higher the probability of voting and conversely, the higher the deficit the more likely one is to abstain.

We have tested our theoretical model on the basis of the data from the EU Profiler and found that indeed a theorized relationship between the representative deficit and subjectively perceived mobilization is present and performs in the hypothesized fashion. We did so by also taking into account the selection problem linked to the subsample in the data that we are using. In all the analyses our models perform according to the hypothesized link between the representative deficit and the intention of turning out.

We are inclined to think that the concept of representative deficit has profound implications for the way we understand and tend to explain individual propensities to turn out at elections. The internet allows each voter to reveal to herself an exact political self-portrait, matched with all the portraits of the political parties running in elections. Never before was this possible on such a large scale and in such detail. The popularity of these voting advice applications shows to what extent voters are asking for such short-cuts which complement or even bypass the parties' direct campaigning. And as our research shows, they pay attention to the projected image. The less blurred it is, the higher the probability of believing in the elections and therefore participating. This, in turn, has strong underpinnings to the way representative democracy works. If taking part in elections becomes a function of the overlap between the partisan offer and personal issue preferences of voters, the part of the electorate that is further removed from this offer may become disenfranchised. In its extreme, such a development would lead to a system in which only those participate that are well represented. The jury is out there, or let's at least say it's beyond this paper's scope to address the question whether this would make democracy better or worse. As the personalization of elections progresses, amongst others because of the internet, political science has to be attentive to these developments – with this paper we take a small step into this direction.

References

Alvarez, R. M. (1997). *Information and elections*. Ann Arbor: University of Michigan Press.

Alvarez, R. M., Mair, P. and Trechsel, A. H. (2011). The effect of Voting Advice Applications on Party Preferences. Mimeo.

Baum, C. F. (2006). *An Introduction to Modern Econometrics Using Stata*. Stata Press.

Berelson, B., Lazarsfeld, P., and McPhee, W. (1954). *Voting: A study of opinion formation in a presidential campaign*. University of Chicago Press.

Blais, A. (2007). *Turnout in elections*. Oxford: Oxford University Press.

Boogers, M. (2006). Enquête bezoekers Stemwijzer. *Universiteit van Tilburg*.

Campbell, A., Converse, P., Miller, W., and Donald, E. (1960). *The American Voter*. New York: Wiley.

Dinas, E., Trechsel, A. H., and Vassil, K., 2011. Does the advice matter? Evidence from a regression discontinuity design. Paper presented at the 2011 MPSA conference, Chicago.

Downs, A. (1957). *An economic theory of democracy*. New York: Harper.

Fiorina, M. (1981). *Retrospective voting in American national elections*. Yale University Press.

Fivaz, J. and Nadig, G. (2010). Impact of Voting Advice Applications (VAAs) on Voter Turnout and Their Potential Use for Civic Education. *Policy & Internet*, 2(4):7.

Ghirardato, P. and Katz, J. (2006). Indecision theory: Quality of information and voting behavior. *Journal of Public Economic Theory*, 8(3):379–399.

Hillygus, D. and Shields, T. (2008). *The persuadable voter: wedge issues in presidential campaigns*. New Haven: Princeton University Press.

Iyengar, S. and Kinder, D. (1987). *News that matters*. University of Chicago Press.

Key, V. (1966). The Responsible Electorate: rationality in presidential voting, 1936-60. *New York: Vintage*.

Kiousis, S., McDevitt, M., and Wu, X. (2005). The genesis of civic awareness: Agenda setting in political socialization. *Journal of Communication*, 55(4):756–774.

Kleinnijenhuis, J. and van Hoof, A. (2008). The influence of internet consultants. In *Conference 'Voting Advice Applications (VAAs): between charlatanism and political science', May 16, 2008, Antwerp (Belgium)*.

Ladner, A., Fivaz, J., and Pianzola, J. (2010). Impact of voting advice applications on voters' decision-making. In *Paper to be presented at the Conference "Internet, Politics, Policy 2010: An Impact Assessment" September 16-17 at the Oxford Internet Institute (OII), University of Oxford*.

Lazarsfeld, P., Berelson, B., and Gaudet, H. (1944). *The people's choice: How the voter makes up his mind in a presidential campaign*. New York, Columbia University Press.

Lenz, G. (2009). Learning and Opinion Change, Not Priming: Reconsidering the Priming Hypothesis. *American Journal of Political Science*, 53(4):821–837.

Marschall, S. (2005). Wahl-O-Mat Bundestagswahl 2005. Ergebnisse der Online-Befragung. Technical report, Bundeszentrale für politische Bildung.

McCombs, M. and Shaw, D. (1972). The agenda-setting function of mass media. *Public opinion quarterly*, 36(2):176.

Mood, C. (2009). Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It. *European Sociological Review*.

Palfrey, T. and Poole, K. (1987). The relationship between information, ideology, and voting behavior. *American Journal of Political Science*, 31(3):511– 530.

Rosenthal, R., Rosnow, R. L., and Rubin, D. B. (2000). *Contrasts and effect sizes in behavioral research: a correlational approach*. Cambridge University Press, Cambridge, U.K.

Ruusuvirta, O. and Rosema, M. (2009). Do online vote selectors influence electoral participation and the direction of the vote? In *ECPR General Conference, September*, pages 13–12.

Sanders, M. (2001). Uncertainty and turnout. *Political Analysis*, 9(1):45.

Trechsel, A. H. and Mair, P. (2011). When parties (also) position themselves: an introduction to the EU Profiler. *Journal of Information Technology & Politics*, 8(1):1–20.

Vassil, K. (forthcoming). *Voting Smarter? The Impact of Voting Advice Applications on Political Behavior*. PhD thesis, European University Institute.

Walgrave, S., Van Aelst, P., and Nuytemans, M. (2008). Do the Vote Test: The Electoral Effects of a Popular Vote Advice Application at the 2004 Belgian Elections. *Acta Politica*, 43(1):50–70.

Zaller, J. (1992). *The nature and origins of mass opinion*. Cambridge University Press.