Electoral Studies xxx (2014) 1–11

Contents lists available at ScienceDirect

Electoral Studies

journal homepage: www.elsevier.com/locate/electstud

A perfect match? The impact of statement selection on voting advice applications' ability to match voters and parties

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ARTICLE INFO

Article history:
Received 18 December 2012
Received in revised form 19 December 2013
Accepted 10 March 2014
Available online xxxx

Keywords:
Voting advice application
Statement selection
Issue voting
Political parties

ABSTRACT

This study examines how statement selection systematically affects the output of voting advice applications (VAAs). Does the statement selection influence how often voters are matched with parties that 'should be' close to them? Our benchmark is a classic account of issue voting, the proximity left–right model. We analyze the Belgian VAA *Do the Vote Test* and find that the output resembles the left–right model. When more left–right statements are included, more left-wing voters get the advice to vote for left-wing parties and the same is true on the right, while simultaneously advantaging parties with more extreme positions on this dimension. We also analyze issue saliency and find that parties are disadvantaged when more statements about salient issues are included. These findings imply tough choices for VAA builders.

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1. Introduction

Voting Advice Applications (VAAs) have enjoyed increasing popularity in Western Europe (Cedroni and Garzia, 2010). These on-line tools provide citizens with voting advice based on a comparison between the respondents' and the parties' opinion on a number of actual policy statements. Their popularity has spurred debate among political scientists about their methodology and the validity of their advice. Most debates concern the way in which party positions are determined and the answers voters can give (agree/disagree or a scale). Surprisingly, the elements that are central to all VAAs, the *statements*, have received less attention.

Prior research has found that statement selection—the set of statements presented to parties and voters—has consequences for the advice users get (Walgrave et al., 2009). Statement selection makes *a* difference. This paper goes further and gauges which features of a specific selection of statements matter for which parties, and how these interact with features of users and parties. We examine whether some parties benefit from a given selection of statements (more voters are given the message that the party matches their preferences) while others stand to lose (more voters get the signal that the party is a bad match). We also examine how statement selection affects the matching of specific voters to specific parties.

To accomplish this task, we need a benchmark. Even without a benchmark we could still compare aggregate VAA outputs with the actual election results, for example, and assess how parties' aggregate scores in VAAs relying on different statement selections relate to their actual electoral strength. However, since VAAs are exclusively geared towards issues and ignore all other voter motives, using actual election results as a benchmark is not a good idea. We rely on a classic mainstream theory of issue voting: the

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http://dx.doi.org/10.1016/j.electstud.2014.04.002
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Please cite this article in press as: Lefevere, J., Walgrave, S., A perfect match? The impact of statement selection on voting advice applications' ability to match voters and parties, Electoral Studies (2014), http://dx.doi.org/10.1016/j.electstud.2014.04.002

proximity model. It provides hypotheses about which parties should gain/lose with a specific batch of statements and generates expectations about which type of voter is matched with which type of party by which type of statement selection. Since many VAAs include issue salience—the importance of an issue to either voters or parties—in their calculations we also test its impact on VAA results.

We use data from a 2007 real-world VAA (*Do the Vote Test*) created in the Flemish region of Belgium and sponsored by the public broadcaster VRT. The final VAA consisted of 36 statements, but the builders tested a total of 50 statements. In this paper, out of the initial 50 statements, we take a random sample of 500 statement selections each consisting of 36 statements. Drawing on a sample of Belgian voters who took a survey answering all 50 issue statements we test to what extent statement selection makes a difference for the different Belgian (Flemish) parties and how statement selection affects the matching of voters to parties.

2. Statement selection in VAAs

Because they provide the information needed to match voters to parties, statements are the building blocks of all VAA calculations. But research on their effect is scarce. Statement selection has an effect on individual results as well as on the aggregate output across all users.

VAAs differ in the number of statements upon which they calculate their output (Wagner and Ruusuvirta, 2012). However, to select which statements are used, different criteria can be used. Statements should be clear and unambiguous. VAA builders agree that statements should cover current political debates. Also, since statements should discriminate between parties, it is useless to incorporate statements on which all parties (dis)agree. Furthermore, VAA builders aim for statements that are dispersed across issue domains. Finally, VAA builders also, implicitly or explicitly, link their selection to a theoretical issue-space defined by several dimensions. All statement selection choices are bound to have an effect on the output. Depending on the criterion—distinguishing parties from one another, preferring statements that load on a dimension, or another consideration—the statement selection will be different.

In the only academic publication on the subject, based on the same Belgian VAA we study here, Walgrave et al. (2009) show that VAA output differs greatly depending on the selection of statements, with parties receiving an 'advice' *seven* times as often in one batch of statements as in another. Some of these variations are undoubtedly random, since adding or removing any statement is bound to affect the output. However, in this study we depart from the idea that certain statement selection properties systematically (dis)advantage certain parties and that some are better in matching specific voters to specific parties. Walgrave et al. (2009) found that statement selection matters but did not specify which characteristics of statement selections lead to advantages or disadvantages for which parties, nor did they examine whether statement selections differ in their capacity to connect voters to the 'correct' party.

3. Proximity voting and the left–right dimension

In investigating the effect of statement selection, we draw on the proximity model of voting. The proximity model positions voters and parties on an underlying dimension and assumes that issue positions of parties give voters cues about parties' positions on that dimension. Voters minimize the distance between themselves and their party and cast a ballot for the closest party (Enelow and Hinich, 1984; Henning et al., 2007; Merrill and Grofman, 1997). Most VAAs emulate models of proximity voting (Wagner and Ruusuvirta, 2012). The more statements a voter and party agree upon, the smaller the distance and the higher the score of that party for that voter.

The left–right dimension is familiar to many voters and is the key cleavage in most party systems. Voters and parties can easily be positioned on it (Fuchs and Klingeman, 1990; Huber and Powell, 1994). The left–right dimension is often said to consist of two sub-dimensions. The first is the *socio-economic* left–right dimension (Lane and Ersson, 1987). It has been supplemented with a new dimension that does not revolve around economic growth, but rather opposes supporters and critics of post-materialist values such as self-actualization, global responsibility, and aesthetic needs (Inglehart, 1990). Given various names (Dalton, 1996; Kitschelt, 1994), we define this second dimension as *cultural* left–right (Hooghe et al., 2002).

Many parties are rooted in these left–right cleavages; their electoral fate depends on the vividness of 'their' conflict. When more statements in a VAA are relevant to the dimension on which the party holds a strong—a clear and extreme—position, the party should score higher. So, if the left–right cleavage, socio-economically or culturally, is a party's core business, we expect it to fare better when more statements deal with it. Note that VAA builders are constrained by a limited number of statements. Including more left–right statements results in fewer statements on other dimensions (e.g. in the Belgian context, there is the linguistic cleavage between Flemings and Francophones or the old cleavage between Catholics and freethinkers). In light of these considerations, our initial hypotheses can be formulated as follows:

H1a. Parties holding more extreme economic left–right positions are favored by statement selections with more economic left–right statements.

H1b. Parties holding more extreme cultural left–right positions are favored by statement selections with more cultural left–right statements.

The share of left–right statements in a VAA affects not only the aggregate score of parties but also the extent to which VAAs manage to link left- or right-wing voters to left- or right-wing parties. Respondents' positions in VAAs are often internally inconsistent (Walgrave and Lefevere, 2013). Voters oppose increasing taxes and at the same time refuse to accept budget cuts. Parties, in contrast, have to deal with trade-offs and need to present a balanced program as they are subject to public scrutiny. Respondents

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can simply take the best of both worlds and not align themselves with one side. The inclusion of more left–right statements should therefore lead to a higher score of left- or right-wing parties *only* among clearly left- and right-wing voters. More left–right statements should increase a VAA's ability to match left-wing voters to left-wing parties, and the same applies to right-wing voters and parties.

H2a. In statement selections with more economic left–right statements, economic left-wing parties score higher among economic left-wing voters and economic right-wing parties score higher among economic right-wing voters.

H2b. In statement selections with more cultural left–right statements, cultural left-wing parties score higher among cultural left-wing voters and cultural right-wing parties score higher among cultural right-wing voters.

4. Issue salience

Most VAAs allow users to indicate which issues are especially important to them and statements on those issues are given greater weight. Some VAAs also weight statements on the parties' side, on the basis, for example, of party manifestos. If parties devote a great deal of attention to an issue, then the agreement with voters on a statement covering it will have a greater weight compared to statements dealing with secondary issues. Hence, VAAs often incorporate aspects of the issue salience model. The issue salience (or issue ownership) model is not based on the idea that voters vote for parties whose position they share (proximity) but rather for parties with whom they share a similar issue *prioritization*. Issue ownership refers to the fact that voters link certain parties to certain issues. Ownership is more likely to make voters vote for the issue-owning parties if those voters consider the issue to be important (Bélanger and Meguid, 2008; Walgrave et al., 2012). When the issues that a party owns become more salient, that party benefits (Petrocik, 1996). Note that VAAs in essence rely on positional issues to which the salience aspect is added. VAAs do not include valence issues as these do not allow VAAs to distinguish parties. Still, most VAAs are not based only on the logic of proximity voting but also incorporate elements of the saliency model (Wagner and Ruusuvirta, 2012).

We expect VAA outputs to accord with the expectations put forth by the saliency model. Issue ownership theory holds that parties experience an across-the-board advantage on issues they own. Arising out of a history of attention to an issue (Petrocik, 1996), issue ownership refers to the long-term salience of issues for parties. With regard to parties, we focus on issue ownership since we have a good measure of this concept; however, we see no a priori reason to assume that our expectation would not apply for the more general concept of party salience. Issue ownership should have the largest effect on voters who care about the issue most. There is a well-documented effect of voter salience combined with issue-ownership perceptions on vote choice (Bélanger and Meguid, 2008; Walgrave et al., 2012). Furthermore, we expect that a VAA's ability to match issue-owning parties to issue publics increases as the number of statements on that issue increases.

H3. Issue-owning parties score higher among voters for which the owned issue is salient, than among voters for which it is not, and the difference increases as the number of statements on the issue in the statement selection increases.

5. Method

Before the Belgian 2007 elections, a CATI survey among a random sample of 1000 Belgian (Flemish) citizens was carried out. Respondents provided answers to fifty issue statements of which thirty-six were later used in the VAA, '*Do the Vote Test*'. Respondents indicated whether they agreed with the statement, disagreed, or had no opinion. Appendix A presents the fifty statements.

The nine political parties in Belgium (Flanders)[1] answered the same fifty issue statements. Our measure of party positions is thus based on a single, authoritative, binding and public statement of the party leader to each statement. There is some debate as to whether this method yields valid party positions (Laros, 2008) but we assume that the recorded party positions capture the real party stances, since their positions were widely publicized in the mass media. Also, we focus on differences between statement selections—the party positions are a constant in this equation. Nevertheless, our method of obtaining party positions may affect the impact of statement selection and we return to this point in the discussion.

Do the Vote Test had 36 statements.[2] From the fifty potential statements we drew a random sample of 500 batches of each 36 statements. These 500 statement selections form the units of analysis as we compare the output of these 500 selections and use features of these selections as predictors. For each of the 500 selections, the score for each party is calculated by comparing voters' and parties' answers to the 36 statements. If Party X matches voter A on all 36 statements, there is a hundred per cent match. If they do not agree on any of the 36 statements, they have a 0% match. Per statement the score is weighted based on both voter and party salience: if a party/voter considers an issue to be more important or less important, statements on those issues get a different weight.[3] For each respondent, a given selection yields nine scores, one for

[1] CD&V (christian-democrats), Sp.A (socialists), Open VLD (liberals), Spirit (social-progressives), N-VA (Flemish-nationalists), VB (radical-right), PvdA (extreme-left), LDD (neo-liberal), Groen! (greens).

[2] The final selection of statements used in DVT was based on the pretest. Basically, the creators try to come up with a statement selection that passes four criteria: the selection should cover the various issue domains equally, it should discriminate between all parties, it should not disproportionally (dis)advantage parties, and it should match at least a part of the electorate with the party they would vote for.

[3] The party weights are calculated based on the per cent of (semi-) sentences in the party program covering an issue; the voter weights are based on a survey question on which issues the respondent felt where most important. Adjustments made by the weights for each statement separately are small and do not shift the importance much (weights per statement are typically between 1 and 1.2).

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each party. The dataset thus contains 1000 (respondents) * 9 (parties) * 500 (selections) = 4.5 million data points.

As some respondents differ in their general agreement to all parties regardless of which selection was made, all scores are clustered, at the highest level of clustering, by respondent. Each respondent's 4500 scores (500 selections*9 parties) are taken as one cluster. Within each respondent, another cluster is added for the 9 parties: regardless of the selection that was made, some parties do better among some respondents. So, each party has 500 observations within each respondent. The lowest clustering level is the level of the 500 selections. We are mainly interested in variance at this lowest level: the between-selection variance. For each party-respondent combination this tells us whether, depending on the selection, the party scores better or worse for that respondent.

Each party scores a certain result for each respondent in each selection. This absolute party score is not what we were interested in; it means little that a party's score increases if all other parties gain as well. We were interested in the extent to which a party's score increases or decreases *compared* to the score of the other parties. Does the party pull away from the pack, or not? Therefore we first calculated, for each selection and each respondent separately, the mean score of the nine parties and then subtracted this mean score from the absolute score of each party. This yields what we call the parties' Mean Relative Score (MRS). This relative score tells us, for a given respondent and given selection, whether the party is leading (positive score) or trailing (negative score) compared to the mean party score for that selection and it tells us and how big the lead or setback is. This relative score is the dependent variable in our estimations.

Independent variables are situated at either the respondent, party or selection level. The economic/cultural left–right position of the respondents was calculated on the basis of their answers to the statements. For each of the statements, we coded whether it dealt with the cultural/economic left–right dimension or not, and whether agreeing with the statement indicated a left or a right position (see Appendix). For each respondent we added up the answers to these distinct left–right statements. A score of 0 means that the respondent gave an equal number of left- and right-wing oriented answers, negative scores indicate left-wing positions, and positive scores right-wing answers.

The survey included an issue-salience measure at the respondent level. Out of a list of fourteen issues, respondents were asked to tick a maximum of three issues they found particularly important. The fifty statements are matched to the fourteen issues so that we have a salience measure for each statement: important statements get a score of 1, the others 0. These scores were then summed for each respondent and each selection. As a result, we have a measure of how important the issues in a certain selection are for this respondent.

At the party level, we use the parties' left–right position as determined by the Chapel Hill expert survey of 2006 (Hooghe et al., 2002). These data do not provide cultural left–right measures separately, so we use the general left–right dimension as a proxy. For three parties no measures were available: we inferred the scores for these parties based on our reading of their manifestoes and communication: LDD was decidedly more economic and culturally right-wing than the traditional liberal party Open VLD, but not as extreme as the extreme-right party VB. Spirit was in an electoral alliance with the Socialists, so we assigned them identical scores; identical reasoning was followed for N-VA being in an electoral alliance with CD&V.

Table 1
Mean Relative Score (MRS) for each party across 500 36-statement selections.

Party	MRS	Std. dev.
Extreme left	−1.61	4.89
Greens	−.55	5.15
Socialists	8.04	4.55
Social-progressives	4.08	4.45
Christian-democrats	−1.43	4.03
Liberals	2.72	5.35
Flemish nationalists	−2.81	4.46
Neo liberals	−2.31	6.21
Extreme right	−6.12	5.85

Based on the 2009 Partirep survey (Deschouwer et al., 2010), in which voters were asked to indicate which party they primarily associated with a range of issues, each party received an issue ownership score for each selection. First, we tallied the per cent of voters associating each issue with each party. Then, this score was multiplied by the number of statements on the issue in a given selection. Finally, all separate issue-ownership scores were summed across all statements in a selection. The resulting variable indicates the extent to which the party owned the issues covered by the statements in a selection.

At the selection level, we calculated the absolute number of cultural/economic left–right statements per selection.[4]

We use fixed effects multi-level models accounting for the clustered nature of our dataset (Steenbergen and Jones, 2002). The models mirror the hierarchical nature of the dataset, with respondents being the highest level, then parties, and then selections. For readability of the coefficients, we multiply the dependent variable by 100.

6. Results

Across all respondents, do certain parties fare better than others? Consider the average relative scores per party (MRS) and their standard deviation across the random sample of 500 statement selections in columns 2 and 3 of Table 1.

In this particular VAA, some parties have better odds than others of coming out on top. Especially the socialists have an overall lead of about eight percentage points on the other parties across all voters and across all selections. The standard deviation (4.55) shows that this lead is present in almost all 500 selections. One party is the clear loser: the extreme-right trails by on average six percentage points.

[4] Each statement is assigned two issue codes. For example, a statement may entail both social security *and* work, or it may be solely about social security (in which case both issue codes are social matters). For each selection, we calculated the number of statements covering an issue; statements that covered two issues only counted as half a statement for each issue to avoid double counting.

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Table 2
Predicting VAA scores for nine parties. Multi-level statistical estimates.

Parameter	Model 1			Model 2		
Fixed effects						
Party economic left–right position (curvilinear)	39.74	(5.24)	***	39.03	(5.42)	***
Party cultural left–right position (curvilinear)	−111.61	(4.30)	***	−176.68	(4.44)	***
Number of economic L/R statements	.32	(.11)	**	.72	(.24)	**
Number of cultural L/R statements	−.06	(.11)		−10.31	(.20)	***
Respondent economic left–right position	.00	(1.24)		.00	(1.24)	
Respondent cultural left–right position	.00	(.98)		.00	(.99)	
Party Ownership of Issues in Selection	−.11	(.00)	***	−.14	(.00)	***
Party economic left–right position (curvilinear) * Number of economic L/R statements				−.13	(.09)	
Party cultural left–right position (curvilinear) * Number of cultural L/R statements				4.55	(.07)	***
Intercept	183.21	(16.12)	***	338.69	(16.70)	***
Random effects						
Level 1 (between-selection) res. Variance	106,686			106,591		
Level 2 (between-party) res. Variance	292,378			294,957		
Level 3 (between-respondent) res. Variance	0			0		
Log likelihood	−3,24,67,440			−3,24,65,485		

Note: Entries are unstandardized regression coefficients with standard errors in parentheses.
* = $p \leq .05$; ** = $p \leq .01$; *** = $p \leq .001$.

This is strong proof that the initial selection of 50 statements—and subsequently the random samples of 36—are strongly tilted in favor of the center-left parties. The initial batch of fifty statements was not selected haphazardly or light-heartedly: professors of various universities collaborated to select these statements in order to provide a broad spectrum of statements that covered all key issues. Various reasons, some worse than others, may explain why there are systematic distortions. First, Flemish voters might be more inclined to take left-wing positions having been habituated to the Belgian system with its well-established social security provisions and heavily funded educational systems. Second, the VAA creators may have (unwillingly) introduced too many statements on which left-wing parties can take advantageous positions. Third, especially the center-left parties may have strategically adopted positions that maximized their results. Whatever the case, we should keep in mind when examining the effects of statement selection that the initial batch of statements is tilted towards the center-left.

We began by testing the two hypotheses about the scores of parties irrespective of voters' features. H1a and H1b state that increasing the number of economic/cultural left–right statements increases the scores of extreme left–right parties. Table 2 presents the results. Model 2 presents the interaction effects—which is what we are interested in

Table 3
Predicting VAA scores for nine parties: multi-level statistical estimates.

Parameter	Model 1			Model 2			Model 3		
Fixed effects									
Party economic left–right position	−.97	(2.98)		−17.66	(2.71)		−10.53	(2.71)	
Party cultural left–right position	−70.62	(2.94)	***	−76.27	(2.69)	***	−59.97	(2.69)	***
Number of economic L/R statements	.32	(.11)	**	−2.50	(.22)	***	−.19	(.22)	
Number of cultural L/R statements	−.06	(.11)		4.24	(.22)	***	9.77	(.22)	***
Respondent economic left–right	.00	(1.21)		−37.33	(2.18)	***	−1.26	(2.24)	
Respondent cultural left–right	.00	(.96)		−63.52	(1.76)	***	−8.21	(1.81)	***
Number of cultural L/R statements*Party cultural left–right position				−.08	(.00)	***	−.08	(.00)	***
Respondent cultural left–right*Party cultural left–right position				−.88	(.04)	***	−2.01	(.04)	***
Respondent cultural left–right*Number of cultural L/R statements				13.02	(.31)	***	1.68	(.33)	***
Number of economic L/R statements*Party economic left–right position				.00	(.02)		−3.85	(.03)	***
Respondent economic left–right*Party economic left–right position				.59	(.04)	***	.09	(.04)	*
Respondent economic left–right*Number of economic L/R statements				8.00	(.40)	***	.27	(.42)	
Number of cultural L/R statements*Party cultural left–right position *Respondent cultural left–right							−2.50	(.04)	***
Number of economic L/R statements*Party economic left–right position*Respondent economic left–right							.79	(.01)	***
Party Ownership of Issues in Selection	−.11	(.00)	***	.00	(.02)		.54	(.01)	***
Intercept	375.06	(12.86)	***	474.43	(12.48)	***	361.68	(12.51)	***
Random effects									
Level 1 (between-selection) res. Variance	106,686	(71)		106,665	(71)		106,194	(70)	
Level 2 (between-party) res. Variance	280,221	(4193)		215,966	(3238)		215,976	(3238)	
Level 3 (between-respondent) res. Variance	.00	(.00)		.00	(.00)		.00	(.00)	
Log likelihood	−3,24,67,249			−3,24,65,633			−3,24,55,690		

Note: Entries are unstandardized regression coefficients with standard errors in parentheses.
* = $p \leq .05$; ** = $p \leq .01$; *** = $p \leq .001$.

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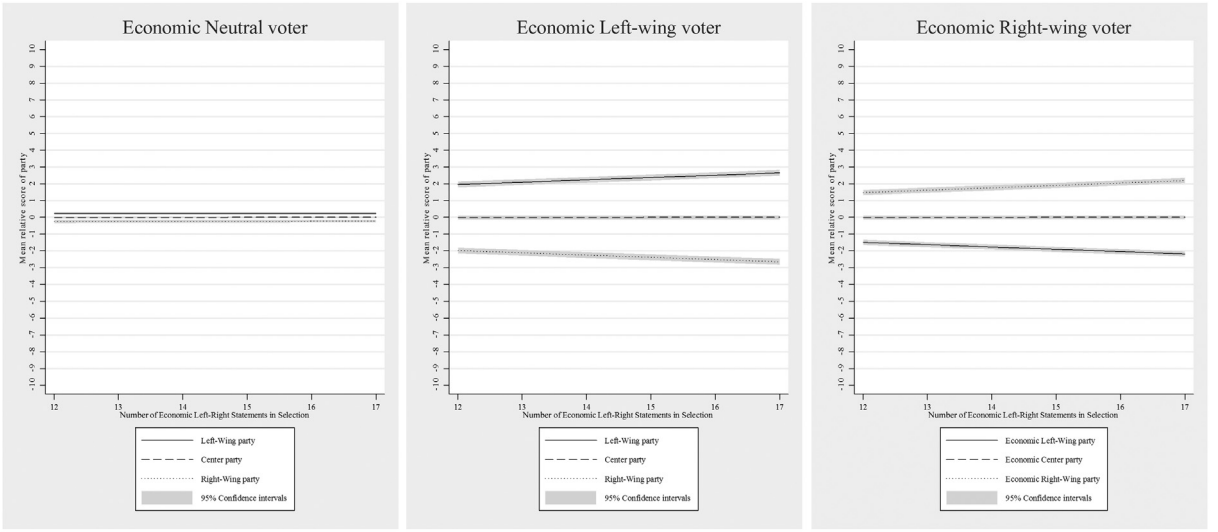
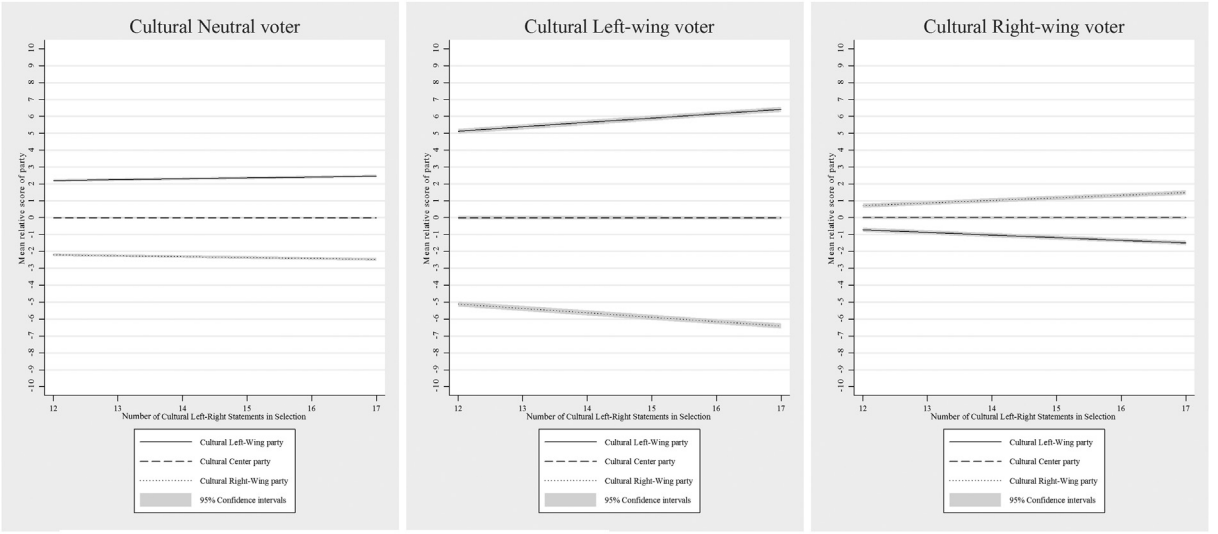


Note: All other variables are kept at their mean or median value.

Fig. 1. Predicted values for Left-, Center-, and Right-wing Economic parties, for three groups of voters.



Note: All other variables are kept at their mean or median value.

Fig. 2. Predicted values for Left-, Center-, and Right-wing Cultural parties, for three groups of voters.

here. We converted parties' economic and cultural left–right position to a curvilinear scale ranging from 0 (center party) to 5 (extreme-left *or* extreme-right). We included the left–right position of the respondents as a control.

The intercept-only model is not shown but indicates[5] that the variance in the dependent variable—a party's relative score in a given selection—is situated mainly at the party and the selection level: party scores are substantially affected by the selection. Model 1 confirms that especially the economic extreme-right and left parties received lower scores across the initial batch of fifty statements (39.74 (5.24), $p < .000$)—and the 36-statement selections made from it—while center-left parties received higher scores. More culturally extreme left–right parties received, on average, lower scores (−111.61 (4.30), $p < .000$); bivariate checks indicate that this is caused by the very low scores of the Vlaams Belang, which held a particularly extreme

[5] Intercept-only model: Residual between-selection variance: 106708 (71.21). Residual between-party variance: 307629 (4589.42) Residual between-respondent variance: .00 (.00). Log likelihood: −32468130.

position along this dimension. Conversely, the economic left–right dimension has a positive valence: parties with a more extreme economic profile managed to come out on top; this effect was caused by the socialists, who have a higher score in general and an outspoken economic left profile. An interesting finding is that, across the board, issue ownership matters, but the valence is negative. When a selection favors issues a party has greater ownership on, it is likely to earn *lower* relative scores. In selections with a greater number of environmental statements, for example, the greens are likely to have worse scores.

Model 2 tests whether including more left–right statements in the selection helps parties that are more culturally or economic extreme. Confirming H1b, the valence of the interaction is positive which means that including more statements on this dimension aids culturally extreme-left or extreme-right parties. H1a regarding the economic left–right dimension receives no support from the data, the interaction effect is not significant. More economic left–right statements do no boost the score of economically more extreme parties.

Hypotheses H2a and H2b stated that selections with more left–right statements are better able to connect left voters with left parties and right voters with right parties. We estimate another model using not the party extremity left–right score but the mean centered party left–right score obtained by subtracting the mean of all parties from the score of a specific party. For parties as well as for voters, negative scores imply left-wing positions while positive scores mean right-wing positions. Since we used multiplicative interaction terms between party and voter position, the interaction term is positive for both left- and right-wing voter/party combinations, and negative for the other combinations (e.g. a left-wing party score for a right-wing voter). Model 1 in Table 3 estimates the direct effects of all variables, Model 2 adds two-way interactions, and Model 3 three-way interactions. It is these three-way interactions in Model 3 that we are interested in here.

Model 3 allowed us to test H2a and H2b, which state that specific statement selections favor specific parties, for specific voters. Both interactions are highly significant. To understand their meaning we plotted the MRS of a left-, center-, and right-wing party for both the cultural and economic dimension.[6] We did this for three types of voters: a clear left-, center-, and right-wing voter. Finally, we varied the number of statements on the left–right dimension. Results are presented in Fig. 1. The *x*-axis records an increasing number of left–right statements in the selection; the *y*-axis charts parties' MRS.

H2a is confirmed. As the number of economic left–right statements in a selection increases, right-wing parties get a higher score among right-wing voters. The relative scores of left-wing parties among right-wing voters go down by including more economic left–right statements. If a VAA respondent consistently picks the right-wing position on the economic left–right statements, the 'bars' of the right-wing parties in his/her VAA output are larger than the bars of the left wing parties, and the gap between these bars increases as more economic left–right statements are included in the selection. Left-wing parties see a similar increase in support among economic left-wing voters as more economic left–right statements are included. The slopes in Fig. 1 are slight, however, and this indicates that the effect of statement selection is small. A selection's ability to match economic left-wing voters to left-wing parties, and the same on the right, does not increase strongly with the inclusion of more economic left–right statements.

A similar story transpires from Fig. 2 dealing with H2b. The hypothesis is confirmed. The more cultural left–right statements are included, the more a selection yields higher scores to culturally left-wing parties for culturally left-wing voters (middle pane of the figure), and the same is true for right-wing parties and right-wing voters (right pane). There is one important difference, though. The effect of statement selection is not symmetrical as was the case with the economic left–right dimension. Rather, it is asymmetrical. Culturally left-wing parties have more to gain from more culturally left–right statements than right-wing parties. Regardless of statement selection, cultural left-wing parties have higher scores due to the initial batch of statements. Left-wing parties not only score highest among the culturally left voters, but also enjoy a clear advantage among culturally neutral voters (Fig. 2, left pane). Conversely, culturally right-wing parties received consistently lower scores and their scores among 'their' right-wing voters are only slightly higher (Fig. 2, right pane). Including more culturally left–right statements allows a selection to more clearly link culturally left-wing voters to left-wing parties, right-wing voters to right-wing parties. But, adding more left–right statements does not manage at all to circumvent the fact that overall, due to the initially biased nature of the batch of statements, culturally left-wing parties had on average higher scores compared to right-wing parties.

Finally, we tested H3, thinking that the inclusion of more statements on issues owned by specific parties would increase those parties' scores more among voters who consider these issues to be important than among those who do not consider these issues important, and that this effect would increase as the number of statements on the owned issue increases. We ran the regressions separately for each party that had a clear ownership on an issue—more than thirty per cent of the Partirep respondents associated it with the issue: Greens & environment (87%), Radical-Right & crime (35%) and Radical-Right & immigration (49%), Liberals & budget (45%), Nationalists & state reform (33%), Socialists & work (41%) and Socialists & social affairs (49%). Estimating the model per party reduces the size of the dataset and eliminates the party level. Table 4 reports only the three coefficients of interest: the two direct effects (Respondent Issue Importance and Number of Statements on the Issue), and the interaction between them. The models include all control variables that were included in the previous models.[7]

[6] The center party received the mean score on the left–right dimension; the left-wing party, the mean minus one standard deviation; and the right-wing party, the mean plus one standard deviation.

[7] These models are available from the authors.

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Table 4
Effect of statement selection on issue ownership in VAA.

	Model 1			Model 2		
Green Party – Environment						
Respondent Issue Salience	−15.18	(16.43)		9.69	(17.43)	
Number of statements on issue	−86.64	(1.51)	***	−81.72	(1.90)	***
Number of statements on issue*Respondent Issue Salience				−12.86	(3.01)	***
Liberal Party – Budget						
Respondent Issue Salience	36.90	(24.30)		50.70	27.46	
Number of statements on issue	−33.80	(1.27)	***	−33.20	(1.38)	***
Number of statements on issue*Respondent Issue Salience				−3.48	(3.22)	
Nationalist Party – State Reform						
Respondent Issue Salience	265.08	(42.28)	***	252.21	(44.07)	***
Number of statements on issue	−65.29	(1.05)	***	−65.52	(1.08)	***
Number of statements on issue*Respondent Issue Salience				4.53	(4.37)	
Socialist Party – Social Affairs						
Respondent Issue Salience	−27.98	(21.18)		−16.38	(24.41)	
Number of statements on issue	8.57	(.89)	***	9.00	(.99)	***
Number of statements on issue*Respondent Issue Salience				−1.82	(1.90)	
Socialist Party – Work						
Respondent Issue Salience	26.03	(17.95)		6.22	(19.58)	
Number of statements on issue	−96.52	(1.69)	***	−99.96	(2.15)	***
Number of statements on issue*Respondent Issue Salience				8.13	(3.21)	*
Extreme Right Party – Crime						
Respondent Issue Salience	4.34	(18.51)		5.39	(20.39	
Number of statements on issue	180.64	(1.22)	***	−12.61	(2.14)	***
Number of statements on issue*Respondent Issue Salience				−.54	(4.46)	
Extreme Right Party – Immigration						
Respondent Issue Salience	1.25	(20.30)		−24.75	(24.19)	
Number of statements on issue	−20.83	(1.55)	***	−21.98	(1.66)	***
Number of statements on issue*Respondent Issue Salience				7.00	(3.56)	*

Note: Entries are unstandardized regression coefficients, with standard errors in parentheses.
* = $p < .05$; *** = $p < .001$.

Table 4 presents a mixed bag. One of the significant interaction coefficients is negative (Greens & environment), while two are positive (Radical-Right & crime and Socialists & work), and four are not significant. An issue-owning party's score among the issue public is not necessarily higher with an increasing number of statements on this issue. Hence, H4 must be rejected. Other results in the table confirm what we found earlier: issue owners do *not* score higher by having more statements on their issue in the selection. In five out of seven cases, there are significant and *negative* coefficients for the number of owned issue statements.

7. Discussion and conclusion

Our goal was to examine whether statement selection in VAAs systematically alters which parties are 'recommended' to which voters. We moved beyond Walgrave et al. (2009) by disaggregating the effect of statement selection: Are specific parties (dis)advantaged by including or excluding specific statements? And, are some statement selections better than others in connecting voters to parties that 'should' be close to them? Our benchmark was based on the proximity left–right voting model. We also tested whether the inclusion of salience into the calculation generated results in line with the salience/issue ownership model.

Overall, we found that the output resembles the proximity left–right model. However, the salience aspect has unexpected consequences. The hypothesis regarding issue-ownership/salience was rejected while three of the four hypotheses based on the proximity left–right model received support.

Statement selection matters, and it matters according to the logic of the proximity model. The more the statements included in a VAA are situated on an underlying dimension—in this study, particularly the cultural left–right dimension—the greater the likelihood that parties with a clear profile on that dimension get high scores. Also, the more statements are included on a given dimension, the more voters with a clear position on that dimension get the advice to vote for a party with a similar position on that dimension. This pattern corresponds with findings of Wagner and Ruusuvirta (2012) that increasing the number of statements covering an issue is almost never detrimental. The more politics is 'dimensionalized' for both parties and voters and the more a VAA taps into these dimensions, the more valid the voting advice it produces.

However, even though our models were able to predict some of the variance between statement selections, they were unable to account for the majority of between-selection variance. Either our expectations neglect factors that are important for the effect of statement selection, or many of the effects of statement selection are essentially random. Our analysis does not allow for a definite answer to this question, but our sense is that the latter is probably true and that many of the effects of statement selection are random, or at least exceedingly hard to predict. The randomness impedes our ability to provide surefire guidelines as to what constitutes the 'best' statement selection. That said, we do discern two measures that at least mitigate the potentially arbitrary impact of statement selection.

Firstly, VAA builders should pretest the final batch of statements and preferably all statements that can

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potentially be included. A pretest involves field-testing the statement questionnaire and gathering responses of a representative sample of voters. Doing so provides data on the possible output of the VAA *before* it is launched. While this procedure does not solve the randomness of statement selection, it at least avoids ignorance about its effects. If statements severely advantage or disadvantage some parties, VAA builders can at least knowingly include or exclude them. Seeing the large differences in output caused by statements selections that differ only by one or two statements should sensitize VAA builders to the importance not only of the statement selection itself, but also of formulating statements according to standard practice in surveys—by avoiding double-barreledness, for example (Gemenis, 2013).

Secondly, including more statements increases a VAA's accuracy. The plots showed that more statements on the left–right dimension makes VAAs better able to connect voters with parties in a meaningful way (see also Wagner and Ruusuvirta, 2012). How many statements are needed is a tricky question, though. There is no hard and fast way to ascertain the minimum threshold. However, there is one certainty: the more parties there are, the greater the number of statements needed to enable a VAA to meaningfully discern between parties. A comparative study of 27 VAAs yielded large differences in the number of statements included—the lowest number of statements was 18, the highest 75, and most use between 30 and 40 statements (Van Camp et al., 2014). In terms of measurement, more statements are never a bad thing, but there are practical considerations. More statements may reduce participation because users are turned off by the lengthy questionnaire. This brings us back to the core of our paper: there are unavoidable trade-offs regarding statement selection. Increasing the number of statements on one dimension or issue inevitably decreases the number of statements on others. Statement selection of statements is a balancing act without clear guidelines.

Our study yielded other interesting findings. When statements regarding specific dimensions increase in number, VAAs become more disadvantageous for center-parties. In contrast, extreme parties tend to benefit when dimensional statements are added. Center-parties, by definition, do not hold extreme positions and pay the price when a certain dimension prevails in the selection. A second finding, probably most challenging for VAA builders, is that there probably is an inevitable initial bias in *any* batch of policy statements. In the Belgian VAA we studied here, center-left socialist and social-progressive parties received high scores regardless of statement selection, while the extreme-right received low scores. Almost all VAAs based on this initial batch of statements would boost some parties and pull down others. In our case some of the selections dampened this effect, but no selection was able to compensate for it entirely. This 'skew' in the initial batch is not necessarily problematic: some parties may have more popular stances than others. But VAA builders should be aware of this by directly assessing public opinion via a survey before making a final selection.

We also tested whether VAAs' output conforms to what one would expect on the basis of saliency/issue-ownership theory, and the results strongly suggest that it does not. Parties whose 'owned' issues are amply covered in VAAs do not get a generally more favorable output, and even for voters who care more about a party's owned issues, party support is not associated with a large number of statements dealing with the issue. The reverse seems to be true. Parties are disadvantaged when 'their' issues are prominently present in a VAA.

The culprit, we think, is that VAA statements are drafted not only to be representative for the policy space but also to *distinguish* parties from one another. Statements sometimes cover policy positions on which one party—often the issue owner—takes a divergent position. Oftentimes this is an unpopular position resulting in worse scores for the issue owner. Especially for smaller, niche parties, statements on their core issues most likely cover unpopular policy positions, since including these statements allows VAAs to differentiate these parties. For example, the evidence we used here included a statement asking whether car gas should become more expensive (CO_2 tax). Undoubtedly, agreeing with the statement is the more unpopular stance, but the issue owner (Green party) nevertheless adopted it. The fact that VAA builders incorporate party salience into their calculations exacerbates this effect because the disadvantageous statement gets greater weight in the calculation for the owner. In other words, the statement selection criteria of representativeness and discriminating power are at odds with each other, and the discrimination criterion tends to disadvantage the issue owner. Discriminating power is a more important criterion for statement selection in crowded party systems so this last problem may be typical for VAAs in countries like Belgium, the Netherlands, or Switzerland.

This brings us to the weaknesses of our study. It draws on one country only, and on a single batch of fifty statements. Can we generalize our findings beyond the case of *Do the Vote Test* in Belgium? We cannot know for sure. Yet, the problems and trade-offs we highlighted in this paper also confront any other VAA and apply to any statement selection process. Any set of VAA statements probably suffers from an initial skew; in any kind of VAA, defining dimensions and attributing statements to dimensions favors parties with extreme positions on this dimension; the requirement of having discriminating statements probably disadvantages the issue-owners in all VAAs; and so on. The specific impact will differ, of course, but the general tendencies are probably the same. Our data were unique in the sense that we had evidence that included more statements than a typical VAA contains and that we had public opinion data that allowed us to directly test whether statement selection makes a difference. We call for more work using similar designs.

One further limitation caused by the single-case nature of our study is that we cannot draw conclusions about the impact of the number of parties on the findings reported here. From both a theoretical and technical point of view we expect that in less densely populated party systems it is easier for a VAA to meaningfully match voters to parties. In multiparty systems the distinctions between parties are often small, whereas in two party systems the parties differ on many issues.

In conclusion, our evidence and analysis suggest that VAA builders should take particular care in selecting both

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their initial batch and their final selection of statements. Although the whole process of building a VAA may seem systematic and 'scientific'—especially if the calculation of the score for each party for a given user is done very carefully—the crucial selection of statements is mostly an unsystematic, not very transparent, and unreplicable process. This is awkward, as statement selection is definitely the most important and consequential aspect of the VAA building effort. This paper may contribute in turning it into a more conscious and systematic activity. Minimally, field-testing a given statement selection before going public should be standard practice.

Appendix A

Table A
The fifty statements, and their economic/cultural left–right assignments and slant

#	Statement	Cultural L–R	Economic L–R
1	If young people of 16 years commit a felony, they should always be judged by a regular (adult) court.	1	0
2	Justice has to give tax fraud more attention compared to normal theft.	0	−1
3	If someone burglars your house or store, you can shoot the burglar.	1	0
4	Prisoners always have to serve their entire sentence.	1	0
5	Those who profit from the stock market, should pay taxes on those profits.	0	−1
6	Income should be taxed using one single rate.	0	1
7	The taxes on fuel should drop more rapidly if the price gets too high.	1	1
8	The government cannot use sale and lease-back operations on her buildings.	0	0
9	People should pay more taxes on what they buy than on what they earn.	0	0
10	The minimum age for early retirement has to be raised.	0	1
11	People that keep working after they've reached an age of 65 should get a higher pension.	0	1
12	The welfare benefits should get a big raise.	0	−1
13	The minimum pension of the self-employed should become identical to that of the employees.	0	0
14	The social benefits have to increase with the wages.	0	−1
15	Smoking also has to be banned in bars.	0	0
16	Doctors should be forced to prescribe the cheapest drugs.	0	−1
17	Supermarkets should be allowed to open on every Sunday.	0	1
18	Shops have to be able to decide for themselves when to have a sale.	0	1
19	There should be no more additional shopping malls outside of the cities.	−1	−1
20	The noise regulations for airplanes should become a national government competence once more.	0	0
21	All Flemish people should be able to vote for Walloon politicians as well.	0	0
22	The national and Flemish elections should be held on the same day.	0	0
23	Flanders should be independent.	0	0
24	On candidate lists for the elections, there should be alternating men and women.	−1	0
25	A drivers' license with penalty point should be introduced.	0	0
26	Heavy cargo traffic on the road should be done overnight as much as possible.	0	0
27	Car drivers that do not commit traffic violations should be rewarded with lower traffic taxes.	0	1
28	Trucks can never pass cars on the highway.	0	0
29	Gasoline and diesel should become more expensive through a CO2-tax.	−1	−1
30	The Belgian nuclear power plants have to close from 2015 onwards.	−1	0
31	Unemployment benefits have to be limited in time.	0	1
32	If you have never worked, you cannot get an unemployment benefit.	0	1
33	Unemployment benefits should only be paid by the government, not the unions.	0	1
34	The limitations on night- and weekend work should be lifted.	0	1
35	Wearing a head kerchief behind the counter in the town hall should be forbidden.	1	0
36	Declined asylum seekers that are integrated, should be allowed to stay in Belgium.	−1	0
37	We must be allowed to use real-life tests to be able to prove racism.	−1	0
38	It should become harder to obtain the Belgian nationality.	1	0
39	Immigrants that have come here because of family reunification cannot have other relatives transferred here.	1	0
40	Belgium must again allow immigrants in to fill gaps in the labor market.	−1	0
41	Turkey should be able to become a member of the European Union.	−1	0
42	Together with a small group of other countries, Belgium should proceed towards more European integration.	0	0
43	There cannot be any nuclear arms stored on Belgian soil.	−1	0
44	The next government should increase spending for development aid to .7% of the national income.	−1	0
45	The Belgian army should entirely merge into a European army.	0	0
46	Delivering letters should remain an exclusive task for the Post.	0	−1
47	The NMBS should be privatized.	0	1
48	Euthanasia should also be legal for minors.	−1	0
49	Gay couples have to be able to adopt children.	−1	0
50	The abortion laws should become stricter again.	1	0

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