Measuring the impact of Voting Advice Applications on Vote Choice

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Introduction

In almost all advanced democracies voting behaviour scholars observe a decline in party memberships and an increase of the number of swing voters. The explanatory power of party attachments for the vote choice has been reduced and voters might need new tools that will help them decide their electoral position. Voting Advice Applications (VAAs) are web applications that provide voters with information about which political party comes closest to their own political preferences. VAAs are based on the conceptions of Downs' proximity-model, but they use an extended version of it which can work with multiple parties competing on many issues. The theoretical background underlying Voting Advice Applications is the model of issue voting. According to the theory of issue voting, voters choose the party that is closest to their own preferences on a set of political issues.

Many voting advice applications present the results as a list of parties ranked according to their proximity with the voter, other VAAs provide both a ranked list and a diagram, and some offer only a diagram. Both outputs are useful: the ranked list displays the party that according to the theory of issue voting should be voter's first choice at the top of the list and the parties that promote policies that are against the political views of the voter at the bottom of the list. The diagram usually displays voter's position and the position of the parties on a political map and users are able to observe their distance from the parties on each dimension of the map.

VAAs have become very popular in many European countries and lately they have been applied successfully in countries outside the European continent. Given their constantly increasing popularity it is important to know if VAAs have an impact on vote choice (Andreadis & Chadjipadelis, 2011 Marschall & Schmidt, 2010, Pianzola, Trechsel, Schwerdt, Vassil and Alvarez, 2012, Ruusuvirta, &. Rosema, 2009, Wall, Krouwel, and Vitiello, 2012). The paper uses data from Switzerland, Germany, Netherlands, Finland and Greece. All these countries have post election surveys that include questions about the use of VAAs. In addition to data from post election surveys, we also use data collected from web surveys of VAA users.

The focus of this paper is to present the possible methods that can be used to measure the impact of VAAs on vote choice, to evaluate each method by enumerating their advantages and disadvantages and finally to present the outcome of the analysis of data from many countries in order to determine the magnitude of the impact and possible interactions with other variables.

Using national post-election studies

One hypothesis we would like to test is that VAAs increase electoral volatility. In order to test this hypothesis we need a variable that describes vote switching and a variable that describes vote use. Having these two variables, an initial attempt to test the hypothesis could be the analysis of a model with a binary (0, 1) variable on vote switching where value 1 indicates that the party that the respondent has voted for the current election is different from the party that the voter had selected for the previous election as dependent variable and another binary (0, 1) on VAA use where value 1 indicates that the respondent has used at least one of the VAA available for the current election.

All national election studies include questions regarding vote choice both for the current and the previous election. Thus, a possible path to follow could be to compare the vote choices between the current and the previous election and construct a new variable coded with 1 when the two choices are different and 0 when the two choices are the same. On the other hand, items regarding VAAs have appeared in a very limited number of national election studies questionnaires. We were able to find such items in studies from Finland, Germany, Switzerland, the Netherlands, and Greece.

Finland

There are three election studies from Finland which include items related to VAAs. These are the election studies of the Finnish elections of 2003, 2007 and 2011.

Finland 2003

This dataset includes 1270 rows. For the question "which party or group did you vote for in the previous parliamentary elections?" (i.e. 2003) there are 736 respondents who have indicated one of the eight named parties included in the codebook. Other responses are: Some

other party or alliance, I didn't vote, I cast a blank ballot, If aged under 18: I didn't have the right to vote, Can't say, Don't want to say. Finally, there are 205 missing values. For the question "which party or electoral alliance did you vote for in the 1999 parliamentary elections? (open-ended question)" there are 824 useful answers (i.e. naming a political party). There are 603 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (1999 and 2003) are different and 0 when the two vote choices are the same and we find 487 (80.8%) voters who have remained loyal to their previous (1999) vote and 116 (19.2%) voters who have abandoned the party they had chosen in 1999 and they used their 2003 vote to support another party.

There is only one VAA related question in the main part of the survey. More specifically, there is a question asking Finnish voters how much they have followed the 2003 parliamentary elections in different media. This questions includes 10 items and one of them is "Candidate selectors on the Internet" (this is the term used for Voting Advice Applications in Finish National Election Studies questionnaires). The possible answers are: "A great deal", "Quite a lot" "Not very much", "Not at all" and "Can't say". This item can be converted to a new variable regarding VAA use by recoding the categories: "A great deal", "Quite a lot" and "Not very much" to 1 (indicating VAA use – 21,8%) and the other two categories to 0 (indicating no VAA use).

The Finnish NES 2003 consists of two parts which were collected with the help of face-to-face interviews and a supplementary, self-administered questionnaire. The supplementary part was completed by a limited subset of the respondents. In this part of the survey there are other VAA related questions but they suffer by a large number of missing values. The most useful question for our task is the following: "Did you use candidate selectors on the Internet to find a suitable candidate?". Unfortunately this question appears near the end of the self-administered part of the survey. Questions that appear near the end of long self-administered surveys are associated with larger item non-response rates. As a result, this item includes 834 (65.7%) missing values. Table 1 shows the relationship between this variable and the "VAA use" variable which we have created after recoding the question about how much voters have followed VAAs. The figures on the table provide evidence that there is a strong agreement between the extracted VAA use and the reported VAA use. This evidence enables us to use

the extracted VAA use (which is available for the whole sample) instead of the reported VAA use (which is available for about one third of the sample only).

Table 1. Relationship between reported VAA use and extracted VAA use

	Extracted VAA use (recoding VAA following)	
	No	Yes
Used one or more VAAs	9,2%	90,8%
None	91,5%	8,5%

Table 2 examines the relationship between VAA use (extracted) and vote switching. Among people who have not used a VAA the rate of vote switching is 16,9%. In the group of VAA users the vote switching rate increases to 25,6%. The Pearson Chi-Square test rejects the hypothesis that VAA use and vote switching are independent variables.

Table 2. Extracted VAA use and Vote Switching in Finland 2003

		Vote Switching	
		No	Yes
Extracted VAA use	No	83,1%	16,9%
	Yes	74,4%	25,6%
Total		80,8%	19,2%

Pearson Chi-Square:5,720, d.f.: 1, p=0,017

Finland 2007

There are 1422 respondents in this study. For the question "The candidate of which party (or political group) did you vote for in these parliamentary elections?" (i.e. 2007) there are 1022 respondents who have named a party. For the same question for the 2003 parliamentary elections there are 1020 useful answers (i.e. naming a political party). There are 944 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2003 and 2007) are different and 0 when the two vote choices are the same and we find 729 (77,2%) voters who have remained loyal to their 2003 vote choice and 215 (22.8%) voters who have defected from the party they had chosen in 2003.

In this study there is no direct question regarding VAA use (not even in the supplementary part). Thus we use again the "Candidate selectors on the Internet" item from the question asking Finnish voters how much they have followed the 2007 parliamentary elections in different media. We follow the same procedure to create the "VAA use" variable, i.e. we recode the categories: "A great deal", "Quite a lot" and "Not very much" to 1 (indicating VAA use – 29,3%) and the other two categories to 0 (indicating no VAA use).

Table 3 examines the relationship between VAA use (extracted) and vote switching. Among people who have not used a VAA the rate of vote switching is 19,8%. In the group of VAA users the vote switching rate increases to 29,6%. The Pearson Chi-Square test rejects the hypothesis that VAA use and vote switching are independent variables.

Table 3. Extracted VAA use and Vote Switching in 2007

		Vote Switching	
		No	Yes
Extracted VAA use	No	80,2%	19,8%
	Yes	70,4%	29,6%
Total		77,2%	22,8%

Pearson Chi-Square:10,973, d.f.: 1, p=0,001

Finland 2011

There are 1298 respondents in this study. For the question "The candidate of which party (or political group) did you vote for in these parliamentary elections?" (i.e. 2011) there are 1021 respondents who have named a party. For the same question for the 2007 parliamentary elections there are 921 useful answers (i.e. naming a political party). There are 845 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2007 and 2011) are different and 0 when the two vote choices are the same and we find 551 (65,2%) voters who have remained loyal to their 2007 vote choice and 294 (34,8%) voters who have defected from the party they had chosen in 2007.

Similar to 2007, in this study there is no direct question regarding VAA use. Thus we use again the "Candidate selectors on the Internet" item from the question asking Finnish voters how much they have followed the 2011 parliamentary elections in different media. We follow the same procedure to create the "VAA use" variable, i.e. we recode the categories: "A great deal", "Quite a lot" and "Not very much" to 1 (indicating VAA use - 43%) and the other two categories to 0 (indicating no VAA use).

Table 4 examines the relationship between VAA use (extracted) and vote switching. Among people who have not used a VAA the rate of vote switching is 19,8%. In the group of VAA users the vote switching rate increases to 29,6%. The Pearson Chi-Square test rejects the hypothesis that VAA use and vote switching are independent variables.

Table 4. Extracted VAA use and Vote Switching in 2011

		Vote Switching	
		No	Yes
Extracted VAA use	No	70,1%	29,9%
	Yes	59,2%	40,8%
Total		65,2%	34,8%

Pearson Chi-Square:10,945, d.f.: 1, p=0,001

Germany (2009)

This dataset includes 2115 rows. For the question regarding 2009 vote choice: "You were entitled to vote twice in the Bundestag election. First for a candidate from your constituency and second for a party. This is an example ballot paper which is similar to the one you were given for the federal election. Where did you place your crosses on your ballot paper? Please tell me the applicable number for your first and for your second vote" there are four variable: a short and a long list of parties for the first and the second vote. We use the second vote and the version with the long list of parties. There are 1526 respondents who have named a party. For the question regarding previous vote: "Can you remember how you voted? Please tell me the applicable number on this example ballot paper for your first and for your second vote" we also use the second vote with the long list of parties. There are 1399 useful answers (i.e. naming a political party). There are 1260 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2005 and 2009) are different and 0 when the two vote choices are the same and we find 958 (76%) voters who have remained loyal to their previous (2005) vote and 302 (24%) voters who have abandoned the party they had chosen in 2005 and they used their 2009 vote to support another party.

This study includes a direct question on VAA use: "And what about special sources of information about the federal election, such as 'Wahl-o-mat' or 'Kandidatenwatch'? Have you used sites of this kind?" but unfortunately this question is asked only to a limited number of survey participants, because another question: "On how many days of the week did you use the Internet to inform yourself about political parties and the federal election during the election campaign?" is used as a filter. More specifically, the question on VAA use is asked only to people who have answered that have been using the Internet to inform themselves about political parties and the federal election during the election campaign at least one day per week and the majority i.e. 1626 (78.7%) of the respondents have been cut by the filter. Of course this underestimates the absolute number of VAA users because there are a lot of VAA users who do not use the Internet for political information on a regular basis. On the other hand, the relative frequency of VAA users may be overestimated because in this group of people who regularly seek for political information on the Internet, the rate of VAA users should be higher that within the rest of the sample. Thus, only 441 respondent were asked if

they have used a VAA and only 202 have given a positive answer, but their relative frequency is high (46,1%).

Table 5 examines the relationship between VAA use and vote switching. Among people who have not used a VAA the rate of vote switching is 26,3%. In the group of VAA users the vote switching rate increases to 32,3%, but the hypothesis that VAA use and vote switching are independent variables cannot be rejected by the Pearson Chi-Square test.

Table 5. VAA use and Vote Switching in Germany 2009

		Vote Switching	
		No	Yes
Extracted VAA use	No	73,7%	26,3%
	Yes	67,7%	32,3%
Total		70,7%	29,3%

Pearson Chi-Square:1,341, d.f.: 1, p=0,247

Netherlands

Netherlands 2002-2003

This dataset includes both the Dutch National Elections Studies for 2002 and 2003. For the question regarding 2003 vote choice there are 2432 respondents who have named a party. For the question regarding previous vote (2002) there are 2419 useful answers (i.e. naming a political party). There are 2355 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2002 and 2003) are different and 0 when the two vote choices are the same and we find 1692 (71,8%) voters who have remained loyal to their previous (2002) vote and 663 (28,2%) voters who have abandoned the party they had chosen in 2002 and they used their 2003 vote to support another party.

The study includes a direct question of VAA use: " During the campaign did you consult one of the so-called 'stemwijzers' or 'kieswijzers' on the internet?" There are 2556 valid responses. From these responses 819 (32%) are positive and 1737 (68%) are negative.

Table 6 examines the relationship between VAA use and vote switching. Among people who have not used a VAA the rate of vote switching is 26,3%. In the group of VAA users the vote switching rate increases to 32,3%. The hypothesis that VAA use and vote switching are independent variables is rejected by the Pearson Chi-Square test.

Table 6. VAA use and Vote Switching in Netherlands 2003

		Vote Switching	
		No	Yes
VAA use	No	74,5%	25,5%
	Yes	66,6%	33,4%
Total		71,9%	28,1%

Pearson Chi-Square:16,098, d.f.: 1, p<0,001

Netherlands 2006

This dataset includes 2806 rows. For the question regarding 2006 vote choice there 2310 respondents who have named a party. For the question regarding previous vote (2003) there are 2204 useful answers (i.e. naming a political party). There are 1963 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2003 and 2006) are different and 0 when the two vote choices are the same and we find 1225 (62,4%) voters who have remained loyal to their previous (2003) vote and 738 (37,6%) voters who have abandoned the party they had chosen in 2003.

This study includes a direct question on VAA use: "Did you fill in seriously one or more tests of political preference previous to the elections?" There are 1444 valid answers. 903 (62,5%) respondents have answered that they have used a VAA and 541 (37,5%) have given a negative response. The large percentage of VAA users is artificial, because it is calculated on the people who have given a positive answer to the following question: "Do you know one or more tests of political preference on the internet, where people can find out which party they agree with most?" A figure closer to reality would be 32,2%.

Table 7 examines the relationship between VAA use and vote switching. Among people who have not used a VAA the rate of vote switching is 34,4%. In the group of VAA users the vote

switching rate increases to 45,5%, The hypothesis that VAA use and vote switching are independent variables is rejected by the Pearson Chi-Square test.

Table 7. VAA use and Vote Switching in Netherlands 2006

		Vote Switching	
		No	Yes
VAA use	No	65,6%	34,4%
	Yes	54,5%	45,5%
Total		58,9%	41,1%

Pearson Chi-Square:14,294, d.f.: 1, p<0,001

Netherlands 2010

This dataset includes 2621 rows. For the question regarding 2010 vote choice there 2025 respondents who have named a party. For the question regarding previous vote (2006) there are 2042 useful answers (i.e. naming a political party). There are 1713 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2006 and 2010) are different and 0 when the two vote choices are the same and we find 959 (56%) voters who have remained loyal to their previous (2006) vote and 754 (44%) voters who have abandoned the party they had chosen in 2006.

This study includes a direct question on VAA use. There are 1422 valid answers. 897 (63,1%) respondents have answered that they have used a VAA and 541 (36,9%) have given a negative response. The large percentage of VAA users is artificial, because it is calculated on the people who have given a positive answer to the following question: "Do you know one or more tests of political preference on the internet, where people can find out which party they agree with most?" A figure closer to reality would be 34,2%.

Table 8 examines the relationship between VAA use and vote switching. Among people who have not used a VAA the rate of vote switching is 38,5%. In the group of VAA users the vote switching rate increases to 54,8%, The hypothesis that VAA use and vote switching are independent variables is rejected by the Pearson Chi-Square test.

Table 8. VAA use and Vote Switching in Netherlands 2010

		Vote Switching	
		No	Yes
VAA use	No	61,5%	38,5%
	Yes	45,2%	54,8%
Total		51,2%	48,8%

Pearson Chi-Square:27,988, d.f.: 1, p<0,001

Swiss (2011)

This dataset includes 4391 rows. For the question regarding 2011 vote choice there 2728 respondents who have named a party. For the question regarding previous vote (2007) there are 1927 useful answers (i.e. naming a political party). There are 1698 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2007 and 2011) are different and 0 when the two vote choices are the same and we find 1309 (77,1%) voters who have remained loyal to their previous (2007) vote and 389 (22,9%) voters who have abandoned the party they had chosen in 2007.

This study includes a direct question on VAA use (Use of the online election aid smartvote). There are 4379 valid answers. 496 (11,3%%) respondents have answered that they have used a VAA and 3883 (88,4%%) have given a negative response.

Table 9 examines the relationship between VAA use and vote switching. Among people who have not used a VAA the rate of vote switching is 38,5%. In the group of VAA users the vote switching rate increases to 54,8%, The hypothesis that VAA use and vote switching are independent variables is rejected by the Pearson Chi-Square test.

Table 9. VAA use and Vote Switching in Switzerland 2011

		Vote Switching	
		No	Yes
VAA use	No	78%	22%
	Yes	70,1%	29,9%
Total		51,2%	48,8%

Pearson Chi-Square:6,504, d.f.: 1, p=0,011

Greece 2012

This dataset includes 1031 rows. For the question regarding 2012a vote choice there 694 respondents who have named a party. For the question regarding previous vote (2009) there are 752 useful answers (i.e. naming a political party). There are 599 respondents who have named the political party they have voted in both elections. For these respondents we calculate a new variable that describes vote switching coded with the value 1 when the two vote choices (2009 and 2012a) are different and 0 when the two vote choices are the same and we find 295 (49,2%) voters who have remained loyal to their previous (2009) vote and 304 (50,8%) voters who have abandoned the party they had chosen in 2009.

This study includes a direct question on VAA use: "Have you used HelpMeVote?" 112 (10,9%) respondents have answered that they have used HelpMeVote, 289 (28%) have given a negative response and 630 have replied that they do not know what HelpMeVote is.

Table 10 examines the relationship between VAA use and vote switching. Among people who have not used a VAA the rate of vote switching is 48,8%. In the group of VAA users the vote switching rate increases to 57,7%, The hypothesis that VAA use and vote switching are independent variables cannot be rejected by the Pearson Chi-Square test.

Table 10. VAA use and Vote Switching in Greece 2012

		Vote Switching	
		No	Yes
VAA use	No	51,2%	48,8%
	Yes	42,3%	57,7%
Total		49,7%	50,3%

Pearson Chi-Square:1,674, d.f.: 1, p=0,433

Clarifications about the relationship of VAA use and Vote Switching

From cross-tabulations presented in the previous section it seems that, in all 9 cases under study, vote switching is larger in the group of VAA users than in the group of people who have not used a VAA. In 7 cases vote switching differences between VAA user and non-users

are large enough to reject the hypothesis of independence. In two cases Germany 2009 and Greece 2012 the difference is smaller and the hypothesis of independence cannot be rejected, but the trend is still there.

Do the aforementioned findings mean that there is a strong positive correlation between VAA use and Vote Switching? Table 11 can provide some answers. Germany 2009 appears with the largest rate of VAA users but the rate of reported vote changes from the previous election is one of the smallest in the table. On the other hand, the smallest rate of VAA use appears in Greece 2012 and it is associated with the largest percent of voter defections.

Table 11. VAA use and Vote switching rates

	VAA use	Vote Switching
Finland 2003	21,80%	19,20%
Finland 2007	29,30%	22,80%
Finland 2011	43,00%	34,80%
Germany 2009	46,10%	24,00%
Netherlands 2003	32,00%	28,20%
Netherlands 2006	32,20%	37,60%
Netherlands 2010	34,20%	44,00%
Swiss 2011	11,30%	22,90%
Greece 2012	10,90%	50,80%

Germany is an example that indicated that VAA popularity does not depend on high levels of electoral volatility. Wahl-o-Mat (the main VAA in Germany) has already been applied in elections before 2009 and all these years it is supported by the Federal Agency for Civic Education that facilitates the promotion of the tool. On the other hand, 2012 was the first time that HelpMeVote was applied for parliamentary election in Greece and its promotion was based on the Facebook network of two people (with more than 20% common Facebook connections) and some press announcements sent to news websites and political blogs. The bottom line is that we can find heavily used VAAs in cases of low electoral volatility (for long – established, strongly supported and adequately funded VAAs) and we can also find high rates of vote switching in countries where VAAs are new and not funded and VAA use is still limited, because even if we accept that vote switching is affected by VAA use, this only one of a number of factors that could have an impact on vote switching, e.g. the

dealignment thesis, government performance, low or negative economic growth, importance of the electoral outcome, strategic voting, personal voter characteristics, e.t.c (see: Herrnson, and Curry, 2011, Evans and Chzhen, 2013, Marsh, 2009).

Another issue with the way the analysis has been done in the previous section is that with the variable VAA use, we cannot discriminate among VAA users those who have been advised to vote for a different party by those who have been advised to vote again for the same party they have voted in the previous election. This is a very significant factor that changes the role VAA use has on vote switching. This can become clear with the following example:

The questionnaire of the Dutch National Election Study of 2006 includes a question about the advice provided by the vote matcher (another name for VAAs). More specifically, survey participants are asked to indicate the parties which have been proposed by the VAA (multiple parties are allowed). This dataset gives the opportunity for a much better setting regarding the analysis of the impact of VAAs on vote choice: Table 12 shows that, if the VAA suggests the same party that the user has voted in 2003 the probability to vote for the same party in 2006 is 0,739. If the VAA does not suggest it, the probability to vote for the same party drops to 0,402.

Table 12. VAA advice and Vote Switching in the Netherlands 2006

		Vote Switching	
		No	Yes
VAA advice the same with vote in 2003?	No	40,2%	59,8%
	Yes	73,9%	26,1%
Total		54,6%	45,4%

Another example is the questionnaire of the Dutch National Election Study of 2010 which also includes a question about the advice provided by the VAA. Table 13 shows that, if the VAA suggests the same party that the user has voted in 2006, the probability to vote for the same party in 2010 is 0,692. If the VAA does not suggest it, the probability to vote for the same party drops to 0,285, i.e. the odds ratio to vote for the same party is greater than 2.4!

Table 13. VAA advice and Vote Switching in the Netherlands 2010

		Vote Switching	
		No	Yes
VAA advice the same with vote in 2006?	No	28,5%	71,5%
	Yes	**69,2%**	30,8%
Total		45,8%	54,2%

Another interesting result we can get by this dataset is the answer to the following question: when voters switch their vote choice, was their new vote choice suggested by the VAA? In Table 14, we can see that when VAA advice is not the same with the previous vote in almost half of the cases (45,3%) the new vote was suggested by the VAA. Comparing this table with the previous it also interesting to point out that 86,6%-69,2%= 17,4% were suggested both the party they have voted in the previous election and at least one additional party and they have decided to vote for one of the additional parties.

Table 14. VAA advice and Vote Switching in the Netherlands 2010

		VAA advice the same with vote in 2010?	
		No	Yes
VAA advice the same with vote in 2006?	No	54,7%	45,3%
	Yes	13,4%	**86,6%**
Total		37,1%	62,9%

From the aforementioned findings it is obvious that we cannot precisely measure the impact on vote choice, if we do not know the advice provided by the VAA. VAA impact on vote choice can be towards both directions: i) enhancing voter loyalty by giving an advice to vote for the same party and ii) provoking voter defection by giving an advice to vote for another party. VAA users seem to agree with this notion because when they report that they have been influenced by a VAA this does not necessarily indicate vote switching. As it is shown in Table 15, 44,3% of the VAA users who report that they have been influenced by VAA, have remained loyal to their vote choice in the previous election.

Table 15. Influenced by VAA and Vote Switching in the Netherlands 2003

		Vote Switching	
		No	Yes
Influenced by VAA?	No	71,8%	28,2%
	Yes	44,3%	55,7%
Total		66,5%	33,5%

A final note on using NES data only: We cannot be sure that the users have switched their vote choice because of VAA use. It is possible that they have switched their vote before visiting the VAA. In this case we would find a VAA impact on vote choice which would not be real. The best way to learn what was the vote intention exactly before the VAA use is to ask them directly before presenting the VAA output. This leads us to the next section which is dedicated to onsite surveys.

Onsite survey

The impact of VAAs on vote choice depends on whether the VAA user had chosen a party before using the VAA. If voters have not chosen a party, then the VAA can help them learn the positions of the parties on the issues of the electoral competition and choose the most suitable one to represent them. If a citizen has chosen a political party before using the application, then there are the following possibilities: i) The pre-selected party appears first in the list of VAA results (absolute matching), ii) VAA shows that the voter is close to his/her pre-selected party, but there is another party that appears first in the list (partial matching) and iii) VAA advice differs significantly from the pre-selected voting behavior (significant deviation). In the first case, the potential impact of using VAA is to enhance the user's intention to vote for the pre-selected party. In the third case, the possible effect of VAA will be in the opposite direction, i.e. instead of strengthening, the VAA recommendation would undermine user's initial selection, and if the influence is strong enough, it can lead to a change of voter's position. In the second case, the possible impact could be towards both directions because it depends on how the voter interprets the output.

Thus, first of all we need the vote intention of the users before we show them the VAA output. HelpMeVote in Greece does exactly this: in the last screen before the presentation of the output, it asks users to provide some demographic information and their vote intention. Of

course a lot of VAA users are undecided. Among HelpMeVote 2012 users the percentage of undecided voters was about 40% and this percentage remained constant from the beginning of HelpMeVote up to Election Day.

After vote intention has been collected there are possible paths. One path is to use an exit web survey and ask users about the impact on their vote choice. For HelpMeVote 2012 this was the followed path. The findings: Of those who indicated that they were undecided before using HelpMeVote, 35.2% said that HelpMeVote helped them choose the party they would vote in the election. In absolute values, this percentage corresponds to circa 70,000 voters, i.e. more than 1% of the valid votes for the election of May 2012.

Table 16. Impact on Initial Vote Choice (HelpMeVote 2012)

Matching	No impact	Enhance initial choice	Undermine initial choice	Change initial choice
Absolute (27%)	56.7%	43.3%		
Partial (48%)	57.0%	35.2%	5.9%	1.9%
No (25%)	82.1%		15.5%	2.5%

Table 16 shows the impact on the initial vote choice for each group. Among the users in the "absolute matching" group, 43.3% answer that HelpMeVote has enhanced their intention to vote for their pre-selected party. Of those who belong to the second group (partial matching) 35.2% report that HelpMeVote reinforced their intention to vote for the pre-selected party but 5.9% of the partial matching group indicate that HelpMeVote has undermined their faith in their original selection, and 1.9% report that will probably change their initial choice, following the advice of HelpMeVote. In the latter group (significant deviation) 83.2% indicate that HelpMeVote had no effect on their voting behavior, 15.5% say that their faith to their initial selection was undermined, and 2.5% claim that they will rather follow the proposal of HelpMeVote.

Of course this approach has two disadvantages. The first is the possible bias from self-selection to the web survey. More specifically, there are worries that satisfied users would be more willing to participate to the web survey than unsatisfied users. The second is that with

the instant web survey we ask the user to report the impact as he/she anticipates it and since we are before the election day, we can only ask vote intention which can change again until the Election Day. Regarding the first disadvantage, it seems we can measure the possible impact of self – selection and control it (Andreadis, 2013). With regard to the second disadvantage, we could collect email addresses and send invitations for a post-election web survey.

Conclusion

This article has shown that in order to measure the impact of VAAs on vote choice we have to:

i) Use NES that follow the paradigm of Dutch Parliamentary Election Studies 2006 and 2010 which ask respondents to indicate the parties VAA(s) have proposed

ii) Ask VAA user to provide their vote intention before the presentation of the advice
   a. Follow up with an exit survey and collect vote intention or
   b. Collect email address and follow up with a post election web survey

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