Do Voters Follow the Recommendations of Voter Advice Application Websites? A study of the effects of Kieskompas.nl on its users’ vote choices in the 2010 Dutch legislative elections

Abstract
In this article we investigate the electoral effects of a prominent Dutch Voter Advice Application site (www.kieskompas.nl). To do so, we employ an innovative research design which combines factual data on the recommendations received by users from the site’s log files with users’ responses to pre-advice and post-election survey items, which gives us unprecedented insight into the causal effects of receiving vote advice online. We find that the effects of online recommendations on vote choice depend on the congruence of the recommended party with the users’ pre-existing party preferences. When the site recommended a party that was being seriously contemplated by the user, the user was demonstrably more likely to go on to vote for the recommended party. When the site recommended a party that the user was not seriously considering, the recommendation appears to have been relatively inconsequential for user vote choice.

Keywords:
Voter Advice Applications; Vote Choice; Voters/Citizens; Statistical Analysis; Netherlands.

1. Introduction
In this article we seek to investigate the effects of a Voter Advice Application (hereafter, VAA) website on the vote choice made by its users. The idea behind a VAA site is that a user visits the site, responds to several questions on political issues, and then receives personalised advice as to how their issue preferences compare to the policy stances taken by parties/candidates competing in an upcoming election. Such sites frequently attract millions of users during election campaigns in a growing number1 of established democracies (Walgrave et al., 2008) report that an expert survey of European political scientists revealed that such sites had featured in national elections in 18 European countries. Thus far, VAA sites have been most prominent in European elections which feature fragmented multiparty competition (Hooghe and Teepe, 2007; Walgrave et al., 2008). However, there is also evidence of diffusion beyond fragmented systems, for instance the US Presidential...
et al., 2008). Farrell and Schmitt-Beck (2008) argue that VAA sites are instances of a broader trend in the postmodern campaigning environment: the growing presence of non-party actors, who participate in and often shape electoral campaigns, without themselves running for office. VAA ‘campaigns’, however, differ from those of many other non-party actors because they produce voting advice that varies from individual to individual, rather than consistently supporting any one party, and they claim that their recommendations are specifically tailored to each individual’s policy preferences.

VAA sites are also the most widely consumed political science outputs in the world today, as they either implicitly or explicitly use theories, methods, and data derived from the work of political scientists. VAA designers make choices with regards to both party placement and party-user issue correspondence (Krouwel and Fiers, 2008; Treschel and Mair, 2009; Wall et al., 2009), and these choices are presented to the public as a means of simplifying policy competition in multiparty systems.

The objective of this study is to present new evidence and theory on how such websites may influence the vote choices made by their users. This line of enquiry is key to understanding the role played by VAA sites in modern election campaigns. Walgrave et al. (2008: 43) advocate for a focus on the electoral effects of VAAs by asking: ‘Why are VAAs relevant for political scientists? The straightforward answer is that VAAs may influence the voting behaviour of citizens’. In this article, we study the electoral effects of kieskompas.nl, one of the many VAA sites which covered the 2010 legislative election campaign in the Netherlands. The kieskompas.nl site generated over 800,000 separate vote recommendations during the campaign period.

The Dutch 2010 legislative election is a particularly apposite locus for a study of VAA effects, given that the VAA concept originated in the Netherlands, where there is now a (comparatively) long history of VAA sites achieving high user volumes (Walgrave et al., 2008). Furthermore, empirical evidence indicates that a highly stable and predictable ‘pillarized’ system of partisan loyalties which structured Dutch electoral politics up to the early 1960s has been replaced with considerably more volatile patterns of partisan sentiment and of voting behaviour (Andeweg and Irwin, 2002: 89-92). Many Dutch voters now appear to decide on which party to support during the course of the campaign (Dalton, McAllister and Wattenberg, 2000: 48; Irwin & Van Holsteyn, 2008). Furthermore, high levels of party system fragmentation (Dalton, 2000; Van der Brug and Pellikaan, 2003) mean that such voters have to choose among a large number of parties. In such a chaotic informational context, a clear, personalized vote recommendation may be more appealing to voters than it would be in a more stable, less fragmented system. In short, the 2010 Dutch elections provide optimal conditions for a VAA website to be politically influential. However, partisan dealignment and fragmentation are sufficiently widespread in other established democracies for these effects to be plausible elsewhere.

We can only hope to reliably address the question of VAA influence on vote choice by looking at the observable relationship between the recommendations that users receive when they visit the site, and their subsequent vote choices. In doing so, however, we face the classic social science problem of distinguishing causation from correlation, with a particular twist. If
VAA sites are expressly designed to identify the party that is ideologically ‘closest’ to the user, how then can we distinguish instances of the site exerting ‘influence’ from instances of the site correctly identifying the user’s voting intentions? Our research design addresses this challenge by taking advantage of the substantial benefits that the internet offers to social science researchers in terms of data collection. Records of the experiences of kieskompas.nl users were captured in site ‘log-files’ which preserve each user’s responses to the survey items and their advice received as a dataset. We were able to combine these log files with the responses of site users to pre-advice and post-election surveys.

This approach thus does not necessitate relying on user recall of and it gives us a handle on the temporal sequencing of events necessary to distinguish correlation from causation. The pre-advice survey included a question that asked site users to estimate the probability that they would ever vote for each of the main parties competing, using a formulation advocated by Eijk et al. (2006). The log files capture the recommendation received online; and the post-election survey asked users how they voted in the election. The combination of individual-level variables collected for this paper thus allows us to control for pre-advice electoral utility for each party-voter combination, so that the effect of the online advice content can be isolated and analysed.

In the following sections, we present and empirically examine theoretical arguments as to the nature of the influence that VAA sites exert on their users. We argue that the influence of a VAA site’s advice is most likely due to their heuristic clarification of available vote choice options for the site user. However, we go on to argue that the effect of VAA advice on users is not likely to be a fixed property, but rather one that varies as function of the congruence of the recommendation with the pre-existing preferences of the user. We find that, if the site recommends a party that the user is already seriously considering, the likelihood that the user will go on to vote for that party is demonstrably higher than if such a party is not recommended. However, when the recommended party was not being considered as a vote option by the user, there is little appreciable difference in the likelihood that the user will go onto vote for the recommended party.

2. Studying the effects of VAA websites on vote choice.

VAA sites are a comparatively novel political phenomenon, and consequently political scientists have only recently started to investigate how they function, what sort of advice they produce, and who visits them (Hooghe and Teepe, 2007; Jeitziner and Fivaz 2005; Fivaz and Schwarz 2007; Walgrave et al., 2009; Wall et al., 2009). However, within this nascent field of enquiry, Ladner et al. (2010) have identified a ‘second wave’ of VAA studies, which have investigated VAAs by asking at the same fundamental questions of them that political scientists have asked of previous campaign innovations: ‘What are their effects on voting behaviour?’, and ‘How do they relate to the realisation of democracy writ large?’. We focus

---

2 These investigations have cast some doubt over the accuracy of VAA sites’ predictions regarding how users should vote, which tend to diverge dramatically from national electoral outcomes and the individual vote intentions of users (Walgrave et al., 2009; Wall et al., 2009) as well as demonstrating that the aggregate recommendations issued by VAA sites are sensitive to the selection of ‘issue statements’ that users are compared to parties over (Walgrave et al., 2009).

3 In terms of user demographics, analyses have consistently shown that VAA users are more male, more urban, and more educated than national populations as a whole (Hooghe and Teepe, 2007; Ruusuvirta and Rosema, 2009; Wall et al., 2009). However, there are indications that the gap between VAA users and the rest of the population is narrowing over time (Fivaz and Schwartz, 2007).
here on studies that have investigated the influence of VAA use on vote choice, that is, the specific party/candidate that individuals vote for, rather than their influence on turnout or broad political engagement⁴.

Several studies investigating the effects of VAAs on vote choices have employed post-election surveys of users (sometimes as part of larger surveys which also include non-users), where respondents provided their own subjective evaluations of whether their vote choice was influenced by their visit to a VAA site (Carlson and Strandburg, 2005; Aart and van der Kolk, 2007; Ladner et al., 2010; Marschall and Schmidt, 2010; Walgrave et al., 2008). These surveys have varied dramatically in their estimates of the importance attributed by users to VAA sites. A lack of standardisation in the field to date means that the specific questions used to elicit estimates of site influence vary across studies, which may help to explain some of the disparity of findings. Estimates of percentages of users who feel that their eventual decision was influenced by their visit to a VAA vary from a low of 6% (Marschall, 2005) to a high of 67% (Lander et al., 2010).

However, subjective evaluations of the extent to which a website was influential, while informative, are regrettably not reliable sources of information as to the actual influence that the website may have exercised. The agenda-setting, priming and framing literatures in communication and media studies, for instance, have uncovered the existence of politically influential behaviours that rarely register in the consciousness of voters (Scheufele and Tweksbury, 2007). Several studies have therefore used panel surveys to compare the behaviour of users to non-users of VAAs in terms of their proclivity to ‘switch’ their first preference vote choice during the campaign and/or to ‘switch’ party support compared to their previous vote (Ladner et al., 2010; Ruusuvirta and Rosema; 2009; Walgrave et al., 2008). Walgrave et al. (2008) find little support for the contention that VAA users were any more likely to switch vote intentions than non-users during the campaign, whereas Ladner et al. (2010) and Ruusuvirta and Rosema (2009) both conclude that VAA users are significantly more likely to switch than non-users. Ruusuvirta and Rosema’s analysis is particularly insightful, they argue that the content of the advice (confirming or disconfirming existing preferences) has to be considered in investigating VAA effects, and they find that those who reported receiving preference-disconfirming advice when they used a VAA were nearly 3 times more likely to switch vote intention during the campaign than those who received preference-confirming advice.

In spite of these advances, research designs that seek to infer an estimate of the effects of VAA sites on voting behaviour using such data face major difficulties. The first problem is one of causal endogeneity. VAA sites can attract high numbers of unaligned or wavering voters (Ladner et al., 2010). Analyses of whether users of VAA sites exhibit higher in-campaign or between-election volatility than non-users may therefore tell us more about the type of audiences that VAAs attract than about the effects that they may be said to exert. Similarly, if a user receives disconfirming advice, this may be because changes in either the user’s opinions or the party’s position mean that there are objective reasons why that user should decide to switch parties during the campaign. Again, it is difficult to distinguish instances of a VAA site exerting an influence from those where the site identifies a change in preferences that has already taken place (Ruusuvirta and Rosema, 2009).

⁴ For promising research on these topics, which indicates that VAA site use can increase both turnout and political engagement among users, see: Marschall and Schmidt (2010); Ruusuvirta and Rosema (2009).
A further problem for such analyses is that a visit to a VAA site is not a mass-mediated ‘campaign event’ in the typical sense of the phrase, because the informational output of a VAA site (i.e., the ‘vote advice’) is not identical for each user. As such, even when researchers incorporate panel designs into their studies of VAA users, the dichotomous variable: ‘used/didn’t use a VAA’ is a rather clumsy proxy for each user’s experience. Unfortunately, this is not a problem that can be resolved by incorporating a survey item asking users to recall the specifics of the advice that they received. We can compare users’ recall of the vote advice that they received with objective data from their log files. We find that user recall of advice received is rather unreliable: 53.8% of users recalled receiving advice that was different from the advice recorded in their log files. Furthermore, it appears that user recall is consistently biased: respondents who did not correctly recall the advice recorded in their log files were far more likely to ‘recall’ the party that they voted for than any other party. Of the over 2,000 incorrect recalls, with 11 parties to choose from, 749 individuals (34.4% of users who incorrectly recalled the advice received) stated that they had been advised to vote for the party which they had voted for in the election. This observed bias means that using respondent recall to measure VAA advice risks inflating estimates of the extent to which VAA users ‘followed’ the advice that they received. Consequently, a recall-based research design may lead to significant overstatements of the causal importance attributable to VAA site advice. This finding re-enforces Vavreck’s (2007) conclusion that voter recall data can substantially over-estimate the effects of campaign events.

Researchers thus face significant difficulties in estimating the electoral effects of VAA use. We argue that the approach outlined in this paper overcomes several of these problems. The use of log files gives us objective data on the experience of each site user, while the combination of pre and post-advice survey items with log file data provides greater insight than previous studies into the casual process that connects voting advice received online to actual voting behaviour. However, challenges remain for future studies: we cannot reliably extrapolate an overall estimate of the importance of VAA sites for the Dutch voting population on the basis of these data – a problem that we return to in our conclusions.

In the next section, we argue that visiting a VAA site during a campaign offers voters access to a cognitive short cut, which comes in the form of a personalised voting recommendation. We examine how such information may be expected to influence vote choice, and develop two testable hypotheses from our theoretical discussion. We then test these hypotheses in the paper’s analysis section.

3. Theorising on the effects of VAA sites

VAA sites represent a uniquely personalised and directed source of political information that voters access during campaigns which are often suffused with tracts of indigestible data coming from a baffling array of political and media actors. Walgrave et al. (2008) argue that the potential for VAAs to influence their users lies in their informative effect. VAAs purport to substantially reduce the cognitive cost needed for a voter to engage in informed issue voting, which was previously prohibitively costly due to the time and effort required. This cognitive price tag is particularly exorbitant in highly fragmented, multidimensional party

---

5 It is possible, of course that the users visited the site before or after the visit where they left their email address (i.e. the visit for which their log file was recorded). This may mean that our user ‘error’ figures are slightly inflated. Nonetheless, absent any other evidence, the proclivity of users to ‘recall’ their advice being the party for whom they voted when their visit records indicate that this was not the case, poses a significant methodological problem for user recall-based VAA studies.
systems such as the Netherlands. Walgrave et al. conclude that ‘the fact that VAAs seem to be popular, especially in countries with a large and fragmented, and thus complicated, party system, indicates that information is key’ (p.43).

Public opinion research going back to the earliest uses of scientific public surveys in political science (e.g., Campbell et al., 1960) has consistently grappled with findings that indicate low levels of voter information in established democracies. Lau and Redlawsk (2001: 951), for instance, argue that ‘the widespread ignorance of the general public about all but the most highly salient political events and actors is one of the best documented facts in all of the social sciences’. Given the complexity of day-to-day politics at the nation-state level, and the apparent lack of political information possessed by voters, many analysts have asked whether the political opinions of ordinary citizens can be considered as reasonable and rational, reviving a debate that dates back to the very origins of democratic theory: how can the people decide on a political direction when they lack the expertise necessary to understand the issues at hand? Do low levels of public knowledge on political issues mean that the public should be proscribed in their capacity to shape public policy by a ‘responsible’ political elite, because highly participatory democracy ‘marginalizes the wise’ (Held, 1996: 31)?

A focus on the cognitive processes that operate when individuals make decisions with little information has lead several analysts to conclude that voters employ ‘heuristics’ or ‘cognitive short cuts’ to arrive at decisions that are rather similar to those that they would have made had they investigated the issue in depth (Lupia, 1994; Lupia and McCubbins, 1998). Such short cuts can allow voters wish to make preference-maximizing political choices without the excessive cost in time and energy that complete knowledge demands. This optimistic interpretation has been challenged by those who believe that candidates, parties, and media actively distort the heuristic signals received by voters, persuading them to vote differently than they may have done with complete information (inter alia Bartels, 1996; Lau and Redlawsk, 2001; Vavreck, 2001).

There are numerous potential shortcuts available to voters; Lau and Redlawsk (2001) provide a comprehensive overview of the types of heuristics that may be used by a voter during a campaign. Evidently, party identification is the most straightforward simplifier of political life, however as partisanship is in decline (Dalton and Wattenburg, 2000), voters are increasingly forced to look elsewhere for vote cues. Fiorina (1981) proposed that one’s personal circumstances and experiences provide all voters with a powerful heuristic for evaluating incumbents6. In majoritarian systems 7, public opinion polls can provide a useful cue as to the electoral viability of individual candidates or parties (Lau and Redlawsk, 2001). Personality-based evaluations of individual candidates or party leaders also offer an important heuristic (Marcus, Neuman, and MacKuen, 2000; Popkin, 1991). Anthony Downs (1957) envisioned ideology as a cost-effective cognitive shortcut which enables voters to understand the broad inclinations of parties without having to learn their detailed policies. Finally, political endorsements by interest groups, or by one’s family or peers, also have a powerful heuristic role – as they provide a specific voting recommendation, although individuals face difficult choices when endorsements conflict (Mcdermott, 2006).

---

6 However, in multiparty systems with low identifiability of executive responsibility like the Netherlands, such heuristics may be less easily available.

7 This information is less relevant in political systems like the Netherlands which employ highly permissive proportional representation electoral systems, meaning that all but the smallest parties are electorally viable
VAA sites are, fundamentally, heuristic-generating instruments. The heuristics that they generate for their users are most analogous to endorsements (with each individual given a specific party endorsement by the site), but they also have an element of ideological heuristic content (because voters are given a simplifying indication of their overall issue-based similarity to the competing parties). The fact that the output of the site is presented as reflecting the user’s own opinions, rather than the opinions of any particular group or party, gives the site endorsement/recommendation a powerful persuasive element. Furthermore, as demonstrated in Figure 1, the advice is typically easy to understand: the ‘closest’ party, according to the VAA measurement procedure, is clearly identified for each user. Thus a VAA’s advice provides a sense of personalisation and neutrality combined with clear presentation – making it potentially very persuasive. This line of reasoning leads us to anticipate that at least some voters will be swayed by the vote recommendation provided by their visit to a VAA site. Specifically, we develop the following hypothesis:

H1: The effects of VAA site advice on users should lead them to be more likely to vote for parties recommended by the VAA site than for non-recommended parties, ceteris paribus.

**FIGURE 1 ABOUT HERE**

However, the classic ‘minimal effects’ counter-argument to the contention that campaign information can change voters’ preferences holds that people do not absorb political information in an undifferentiated manner, nor do they easily change their partisan preferences on the basis of new information. Rather, a rich tradition in public opinion and voting behavior research going back to the work of Berelson, Lazarfield, and McFee (1954) has argued that political information is differentially processed according to each individual’s partisan and value-based predispositions, meaning that individuals tend to absorb information that is congruent with their predispositions more frequently and readily than they absorb ideologically or politically incongruent information (Zaller, 1992). Iyengar and Simon (2000: 158-161) contend that the traditional ‘hypodermic’ model of campaign effects fails to capture this aspect of voter cognition, and they prefer the more recent ‘resonance model’, which views campaign messages as interacting with the prior predispositions of voters. One of the key insights of the resonance model is that ‘messages that are counter-attitudinal will be actively resisted, whereas that are consonant will be accepted’ (ibid.: 159).

We would therefore be surprised if VAA users uncritically followed the advice given to them online, no matter how much it simplifies political decision making, if that advice runs radically contrary to their prior political predispositions. VAA recommendations are just one of a number of competing information sources to which a voter may be exposed during a campaign. When such cues provide conflicting advice, it is the voter herself who must decide which information to accept (Lupia and McCubbins; 1998: 40). Zaller’s (1992) Resistance Axiom, the insights of the communications, political psychology and electoral behaviour literatures, and, indeed, common sense would lead us to anticipate that users will resist integrating highly incongruent information into their political considerations far more than they will resist information that chimes with their existing preferences. As such, we consider it unlikely that users will vote for a party that they had previously completely ruled out, just because of the advice of a VAA site.

We therefore argue that the most likely political effect of a VAA recommendation should be to increase one’s inclination to vote for the recommended party, when one is already seriously contemplating voting for that party. When the recommended party has been deemed
electronically off-limits by the user, we do not expect the advice to influence their vote choice. As such, we argue that the impact of the information received by users on VAA sites will be largely confirmatory, rather than persuasive. This leads us to specify a second hypothesis:

H₂: VAA recommendations will be most influential when the recommended party is already being seriously considered as a potential vote choice by the user, and will have little or no influence when the recommended party is not being considered as a potential vote choice by the user.

4. Analysis

4.1 Methods and Data

Our research design is as follows: each user of kieskompas.nl between the site launch date (April 27th, 2010) and the day of the election (June 9th, 2010) created a ‘log file’, which is a row in a data matrix that keeps a record of the details of their visit to the site. Immediately before they received their recommendation (i.e., the party that was deemed ‘closest’ to them by the VAA), users were asked to estimate the likelihood that they will ever vote for each of the main parties competing in the election. Eijk et al. (2006) demonstrate that this survey item is a useful way to operationalize the electoral utility that a voter attaches to each party competing for their votes at the election. Responses to this item were constrained to natural numbers ranging from 0 to 10, where 0 means ‘not at all probable’ and 10 means ‘very probable’ (all 11 parties were evaluated on this scale by the respondent). Users’ stated probabilities to vote (hereafter, PTVs) for each party were recorded, along with the specific advice that they received, in their log files.

The second stage of our data collection relied on the site’s ‘extra survey’ feature. This was an opt-in section of the site where users could register their email addresses and indicate their permission to be contacted for subsequent surveys. Of the over 800,000 unique visits generated by the site, just over 8,000 users left emails and indicated permission to be contacted. The email addresses of users were recorded in their log files, in the same row of data that contained the other details of their site visit (including their PTVs for all parties and the advice that they received). The authors sent a post-election survey to these users, which included an item on how they had voted, and items asking respondents for their perceptions of the influence that visiting kieskompas.nl had on their vote choices⁸. The survey elicited a response rate of just over 52%, generating an N of 4,257 respondents.

Each survey request was marked with a unique identifier number, which was identical to the identifier number in each respondent’s log file entry. Using Excel’s ‘VLOOKUP’ command, we were able to use these unique identifiers to merge users’ responses to the post-election survey with their individual log file entries. This approach meant that we captured the three vital elements required for constructing a plausible individual-level analysis of the effects of a VAA on user vote choice: 1) each user’s pre-advice party electoral utilities, 2) an objective measure of the advice received by each user, and 3) recall data on the vote choice of each user. Data analysis was performed on STATA 11 and SPSS 18 statistical packages, and replication do files and data sets are available from the authors.

---

⁸ The post-election survey also asked users to recall the advice that they received, which enabled us to analyse recall data for accuracy and bias in section 2.
4.2 Descriptive analysis

We begin by looking at the evaluations made by users themselves of the influence that their visit to kieskompas.nl exerted on their vote choices. $H_1$ would lead us to anticipate that a large portion of users should consider that the site exerted some sort of influence on their vote choice, while $H_2$ suggests that this influence should primarily one of preference confirmation (rather than preference conversion). $H_2$ also implies that those who received advice that was congruent with their partisan predispositions should attribute greater influence to their visit to the site than those who received incongruent advice.

Table 1 presents the response frequencies for a categorical survey item, which asked users to characterise what, if any, effect kieskompas.nl had on their vote choice. We can see that, while the second largest group, at 29%, stated that their visit had ‘no effect’, 71% of users choose options indicating that they consciously experienced some form of VAA ‘effect’. Just over 30% indicated that the experience of one of preference confirmation, while 26.1% stated that their visit presented them with previously unconsidered options. A smaller number indicated that the visit directly shaped their vote choice – either by helping them to choose among several parties that they were considering (9.2%) or by leading them to vote for a previously unconsidered party (1.2%).

**TABLE 1 ABOUT HERE**

Figure 2 describe users’ perceptions of the strength of the kieskompas.nl effect on a 0-10 scale, where 0 is ‘no effect’ and 10 is ‘a very strong effect’. Figure 2 separates users who were advised to vote for a party which they had given a PTV of 6 or higher$^9$ (designated ‘congruent’ users) from those who were advised to vote for a party to which they had given a PTV of 5 or lower (designated ‘incongruent’ users). Overall, ‘0’, which was the response of 35.3% of users, is the largest category in terms of frequency. Nonetheless, a clear majority of respondents estimated that the site had influenced their vote to some extent. Very few voters attributed the highest level of influence to their visit to the site: less than 1% scored the influence of their visit as a ‘10’.

**FIGURE 2 ABOUT HERE**

Looking at the difference between the ‘congruent’ and ‘incongruent’ user groups, we can see in Figure 2 that these groups are more similar than we may have expected under $H_2$. While the ‘incongruent’ group’s average impact evaluation is significantly smaller than the ‘congruent’ group’s average (with 99% confidence, using a one-tailed t-test), these differences are not very pronounced: the ‘incongruent’ group average is 3.1, while the ‘congruent’ group average is 3.4. Overall then, our descriptive analysis provides reasonable support for $H_1$ and rather less emphatic support for $H_2$.

4.3 Inferential Analysis

A logical starting point for our inferential analysis is to look at how many respondents voted for the party that kieskompas.nl recommended to them. In the discussion that follows, for the sake of simplicity, we adopt a reductive nomenclature. Those respondents who reported

---

$^9$ We use this value as a cut-off point indicator that a voter is seriously considering a party, following the approach developed by Eijk et al. (2006: 432-439).
voting for the party that kieskompas.nl recommended to them are described as ‘followers’. The term ‘non followers’ designates respondents who voted for any party other than the one recommended to them. Among all survey respondents, 26.5% were followers. The obvious implication is that 73.5% were non followers, and so advice ‘following’ was not a majority phenomenon among the users surveyed. Of course, raw numbers of followers versus non followers tell us little about whether the site exercised any discernible influence of user vote choice. We therefore cannot say that 26.5% of the respondents ‘followed’ the advice that they received online. Taken in isolation, these figures could simply mean that the site correctly identified the vote intentions of 26.5% of its users on the basis of their policy positions.

The crucial element for understanding the nature of the influence exerted by the kieskompas.nl site on its users is the interplay between users’ pre-existing preferences and the advice that the site generates. A simple cross tabulation, provided in table 2, tells much of the story that we develop in more detail in this analysis. In table 2, we give the percentages of ‘followers’ and ‘non-followers’ of kieskompas.nl advice for two groups. As with figure 2, we divide respondents according to the relationship between the advice given and each user’s pre-advice political preferences, separating those who received ‘congruent’ voting advice (i.e., advice to vote for a party to whom they a given a PTV of 6 or higher) from those who did not. Table 2 shows that people were only likely to ‘follow’ the advice issued to them when the recommended party was one that they were strongly considering voting for already. Only 157 survey respondents (just under 4% of the entire sample) followed the site’s advice when they had estimated their pre-advice likelihood of ever voting for the advised party at 5 or lower on the 0-10 PTV scale.

**TABLE 2 ABOUT HERE**

The next step in our analysis requires that we restructure our data;\(^\text{10}\) representing our variables of interest over 40,524 observations, where each observation is a user-party dyad (i.e., 3,684\(^\text{11}\) respondents multiplied by 11 evaluated parties). This restructuring allows us to split voter-party dyads into two groups: ‘recommended’ dyads (where the party in the dyad was recommended to the user by kieskompas.nl) and ‘not recommended’ dyads. Each voter can thus be represented as 1 ‘recommended’ voter-party dyad, and 10 ‘not recommended’ voter party dyads. Overall, this means that we compare a group of 3,684 ‘recommended’ voter-party dyads to a group of 36,840 ‘not recommended’ voter-party dyads. Each dyad also has a value for ‘PTV’, capturing the respondent’s self-reported pre-advice likelihood of ever voting for the party in the user-party dyad, taken before the site’s recommendation was issued.

A first step in our analysis looks at the distribution of PTV scores for voter-party dyads in the recommended and not recommended groups. These distributions are shown in table 3. On

---

\(^{10}\) For this part of our analysis, the dataset has been ‘stacked’ on the Vote, Advice, and PTV variables. This means that we restructured the dataset so that each user-party relationship of interest is considered as an observation in its own right, occupying a row in the data structure. With 11 parties being considered, each individual respondent is therefore represented as 11 ‘observations’ in the data. The advantage of this approach is that it allows us to consider the relationships between variables such as ‘Advice’, ‘PTV’ and ‘Vote’ across all parties in a single analysis, rather than having to analyse each relationship over all 11 parties. In the conventional ‘wide’ dataset structure, which we used to produce tables 1 and 2 and Figure 2, each respondent is considered as a single observation, denoted by their occupation of a single row in the dataset with separate columns capturing the relationship between that respondent and each party. See Eijk et al. (2006) for details on the stacking procedure.

\(^{11}\) Respondents who did not rate one of the parties on the PTV survey item, who did not vote, who did not recall their vote, or who reported a vote for ‘Other’ were dropped from this part of our analysis.
average, as we would anticipate, given that the kieskompas.nl VAA sought to match users with ideologically ‘close’ parties in its recommendations, the recommended dyads have a higher PTV than the not recommended dyads. The average value PTV value for recommended dyads is 5.3, while the average for not recommended dyads is 3.2, a difference which is statistically significant over our 40,524 observations with 99% confidence using a t-test. This finding means that we must hold PTV constant to isolate any causal effects that may be attributable to the VAA advice. However, as we can see in table 3, there are a large number of instances of users being advised to vote for parties to which they had given very low PTV values, meaning that there are large enough numbers to compare ‘recommended’ and ‘not recommended’ dyads at all 11 values of PTV.

**TABLE 3 ABOUT HERE**

Our goal in collecting and transforming these data was to investigate the relationships between ‘Recommended’ and ‘Vote’, while holding ‘PTV’ constant. ‘Vote’ is thus the dependent variable, it is dichotomous and is coded ‘1’ when a respondent reported voting for the party, and ‘0’ when they did not. ‘Recommended’ is the independent variable of interest, it is a dichotomous variable that is coded ‘1’ when kieskompas.nl recommended the party in a voter-party dyad and ‘0’ when it did not.

The empirical implications of H1 for these data are that user-party dyads where ‘Recommended’ equals ‘1’ should be more likely to be ‘Voted’ than dyads where ‘Recommended’ equals ‘0’, when PTV is held constant. H2 leads us to anticipate that the differences between the ‘recommended’ and ‘not recommended’ dyads should be most pronounced where high PTV values indicate that the advised party was being seriously considered during the election campaign, and less pronounced among dyads with small PTV values.

In order to test whether these empirical implications are borne out, we segment the data according to the PTV of the user-party dyads. This computation allows us to compare ‘recommended’ versus ‘not recommended’ user-party dyads at each value of PTV. For each value of PTV, we report a Pearson’s chi-squared statistic and associated p-values with 1 degree of freedom for the proposition that the proportions of ‘voted’ and ‘not voted’ dyads are identical for the groups of ‘recommended’ and ‘not recommended’ dyads. We take p-values of .05 or smaller as a cut-off point for considering the difference in proportions across groups statistically significant. Table 4 shows the results of this analysis. Figure 3 maps these proportions (and the differences between groups) for ease of visual interpretation.

We can see from table 4 and figure 3 that recommended parties are significantly more likely to become voted parties than not-recommended parties (confirming H1), and this effect is principally observed at PTVs of 6 or higher (confirming H2). The scale of the effect is largest at PTV values of 8, 9, and 10, where recommended user-party dyads are ‘voted’ dyads 18.2%-22% more often than not recommended dyads. The VAA effect is smaller, but still statistically significant at PTVs of 6 and 7, where recommended dyads are voted 7.7% and 8.5% more often than not recommended dyads, respectively. For values of PTV lower than 6, only one category (3) shows any significant difference across groups, and the difference here is small, at 2.6%. For other low PTV values, there is no discernible difference between the recommended and not-recommended dyads in terms of their likelihood to be ‘voted’ dyads, meaning that we cannot identify any VAA ‘effect’ for these values of PTV.
These findings accord with our characterisation of the effects of a VAA recommendations on user vote choice in H1 and H2. We can see that VAA users rarely have their prior preferences radically overturned due to getting a recommendation online, but it appears that a congruent recommendation can help to firm up a voter’s mind when they are already leaning towards the recommended party.

5. Conclusions

In this article, we have looked at the effects of a very specific and compellingly political use of the internet: VAA websites. Are VAA sites widely used, but seen simply as ‘toys’ by their users? Or are they politically influential campaign actors, which a large numbers of users consider seriously when deciding how to vote? If the former scenario were true, perhaps VAAs could be considered as being neither more nor less politically important than the millions of other websites that populate the internet. However, given the findings presented in this paper, it seems that VAA sites are politically relevant entities, with both subjective and objective evidence demonstrating that a substantial portion of kieskompas.nl users in the Dutch 2010 legislative elections took their online voting advice quite seriously when deciding how to vote.

If VAA websites are both widely consumed and substantively influential for user vote choice, then political scientists as a group should be closely involved in monitoring and improving the quality of VAA outputs. Political science as a field has much to contribute to the design and assessment of VAA sites: scrutinising their placement of parties, their selection of statements, and the algorithms that they use to compare voters and parties. Given the evidence presented here, there appears to be scope for a deliberately biased VAA to swing a number of voters to choose a particular party. Thus, the political science community must police such sites, and total transparency of party coding and advice generating procedures must be the standard for a VAA site to be considered credible.

It is worth inserting some caveats about our findings. The survey analysed in this article does not benefit from the statistical and analytical advantages of being based on a randomised selection of site users. In order to maximize the number of participants, the option of signing up for future surveys and leaving an email address was made open to all users. In the event, 8,125 site users left viable emails and gave permission to be contacted post election, and just over 50% if these users completed our questionnaire. The site log file recorded over 800,000 unique visits during the campaign, so this self-selecting sample evidently represents a tiny portion of the population of site users, who were not randomly selected. These limitations of our data make it impossible to extrapolate from our findings to the Dutch electorate as a whole with confidence, and we will therefore not attempt to do so here. Furthermore, we have to take account of the adaptive capacities of VAA designers, who may choose in future to redesign the ‘advice’ elements of their sites, which are typically designed with citizen education, rather than citizen persuasion as their goal. This may mean that future VAAs exert less of an active influence on vote choice than the site studied here.

We hope, however, that this research has demonstrated that there is evidence for the existence of a causal VAA ‘effect’ on user vote choice. Secondly, and more importantly, we have tried
to describe the nature of this effect. The explanation of how we investigated VAA effects provided in this article will help researchers interested in VAA effects to see if they are similar in other electoral contexts. Ultimately, the findings reported in this article are relatively straightforward – it appears that our survey respondents were influenced by the automated advice that they received on kieskompas.nl, but that they did not follow the site’s advice when the recommended party was not seen as a contender for their vote (as indicated by a low PTV score) before the advice was received. Being advised by a VAA to vote for a party which one was already seriously considering appears to crystallise that pre-existing preference, making it demonstrably more likely that the site user will go on to vote for the recommended party. Incongruent advice appears to be, for the most part, disregarded by site users when they vote.

As we conclude, it is worth pausing to consider that the type of human-computer interaction that VAA websites provide was, literally, the stuff of science fiction only decades ago. In his short story The Franchise (1955), Isaac Asimov imagined how American elections might proceed in 2008. The story centres on the interaction that takes place between Norman Muller and the computer ‘Multivac’. Muller is a US citizen, while Multivac is an enormous computer with hardware sprawling for miles under the earth’s surface. Muller must shoulder the heavy burden of being the single citizen who is deemed by Multivac to be ‘representative’ of the American population. Based solely on the opinions that it elicits from Muller, Multivac will project the results of the national election – which will then stand in their entirety. Muller is taken to an interface with Multivac in a hospital ward, where he is quizzed for three hours on various issues, including banalities such as the price of eggs, while his verbal responses (as well as unconscious signs of emotion indicated by voice timbre) are recorded and analysed by Multivac. The story ends with Norman feeling tired and rather confused, but nonetheless proud of his participation in the democratic process, as he and his family wait at home for Multivac to announce the election results.

While the most apparent theme of The Franchise is the reductio ad absurdum scenario of an entire election being based on projections derived from a single ‘representative’ voter, it also interesting to note that Multivac never directly asks Muller for his opinion on the candidates or parties running. Instead, the computer imputes logical political preferences from Muller’s opinions. Thus a deeper theme of the story is the extent to which humans may someday be prepared to abdicate political autonomy to computers. Amazingly, we are currently living in a world where this theme is relevant, and, indeed, researchable. According the research presented here it appears that, while citizens are taking note of the advice that they receive online, there is little evidence that many site users follow this advice blindly when it runs against their existing partisan predispositions. We may be much closer to the age of Multivac now than when Asimov penned The Franchise, but we have not yet arrived at a point where citizens let the computers make their decisions for them.
Table 1. Responses of survey group to the question: ‘Which of the following best describes the influence that visiting kieskompas.nl had on your vote choice?’

<table>
<thead>
<tr>
<th>Type of Influence</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed my preferences</td>
<td>1,195</td>
<td>30.2</td>
</tr>
<tr>
<td>No Effect</td>
<td>1,145</td>
<td>29.0</td>
</tr>
<tr>
<td>Showed me other options, but didn't change my mind</td>
<td>1,032</td>
<td>26.1</td>
</tr>
<tr>
<td>Helped to choose among several parties</td>
<td>365</td>
<td>9.2</td>
</tr>
<tr>
<td>Lead me to vote for a party I had not previously</td>
<td>45</td>
<td>1.1</td>
</tr>
<tr>
<td>considered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>171</td>
<td>4.3</td>
</tr>
<tr>
<td>Total</td>
<td>3,953</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Was VAA advice ‘followed”? Congruent versus non-congruent advice (column percentages in parentheses).

<table>
<thead>
<tr>
<th>Did the respondent vote for the party recommended by kieskompas.nl?</th>
<th>Did the respondent rate their likelihood to vote for the advised party at 6 or higher out of 10?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>No</td>
<td>2,456</td>
</tr>
<tr>
<td></td>
<td>(94.0%)</td>
</tr>
<tr>
<td>Yes</td>
<td>157</td>
</tr>
<tr>
<td></td>
<td>(6.0%)</td>
</tr>
</tbody>
</table>
Table 3. Distributions of ‘PTV’ for recommended versus not recommended voter-party dyads.

<table>
<thead>
<tr>
<th>PTV</th>
<th>Recommended dyads</th>
<th>Not recommended Dyads</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>14.1% (521)</td>
<td>3.1% (1,140)</td>
</tr>
<tr>
<td>9</td>
<td>9.9% (364)</td>
<td>3.8% (1,399)</td>
</tr>
<tr>
<td>8</td>
<td>11.7% (432)</td>
<td>6.5% (2,383)</td>
</tr>
<tr>
<td>7</td>
<td>9.5% (351)</td>
<td>7.8% (2,877)</td>
</tr>
<tr>
<td>6</td>
<td>8.7% (320)</td>
<td>8.0% (2,957)</td>
</tr>
<tr>
<td>5</td>
<td>8.6% (316)</td>
<td>7.9% (2,906)</td>
</tr>
<tr>
<td>4</td>
<td>5.2% (192)</td>
<td>5.7% (2,105)</td>
</tr>
<tr>
<td>3</td>
<td>4.5% (167)</td>
<td>5.6% (2,067)</td>
</tr>
<tr>
<td>2</td>
<td>4.7% (174)</td>
<td>6.15 (2,253)</td>
</tr>
<tr>
<td>1</td>
<td>4.3% (157)</td>
<td>6.8% (2,512)</td>
</tr>
<tr>
<td>0</td>
<td>18.7% (690)</td>
<td>38.7% (14,241)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (3,684)</td>
<td>100% (36,840)</td>
</tr>
</tbody>
</table>

Average PTV: 5.3 | 3.2
Table 4. Proportions of ‘voted’ user-party dyads for ‘recommended’ and ‘not recommended’ dyads for each value of PTV (N for each proportion in parentheses, statistically significant differences in boldface).

<table>
<thead>
<tr>
<th>PTV</th>
<th>% ‘Voted’ dyads</th>
<th>% ‘Voted’ dyads</th>
<th>% Difference</th>
<th>Chi-Squared test results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Recommended</td>
<td>Not Recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>84.1% (438/521)</td>
<td>65.9% (751/1,140)</td>
<td>+18.2%</td>
<td>(\chi^2(1, \ N = 1,661) = 58.18, \ p = .00)</td>
</tr>
<tr>
<td>9</td>
<td>62.6% (228/364)</td>
<td>40.6% (568/1,399)</td>
<td>+22.0%</td>
<td>(\chi^2(1, \ N = 1,763) = 56.64, \ p = .00)</td>
</tr>
<tr>
<td>8</td>
<td>43.5% (188/432)</td>
<td>24.5% (584/2,383)</td>
<td>+19.0%</td>
<td>(\chi^2(1, \ N = 2,815) = 66.41, \ p = .00)</td>
</tr>
<tr>
<td>7</td>
<td>21.9% (77/351)</td>
<td>13.4% (385/2,877)</td>
<td>+8.5%</td>
<td>(\chi^2(1, \ N = 3,228) = 18.75, \ p = .00)</td>
</tr>
<tr>
<td>6</td>
<td>13.1% (42/320)</td>
<td>5.4% (159/2,95)</td>
<td>+7.7%</td>
<td>(\chi^2(1, \ N = 3,277) = 30.13, \ p = .00)</td>
</tr>
<tr>
<td>5</td>
<td>4.7% (15/316)</td>
<td>3.3% (96/2,906)</td>
<td>+1.4%</td>
<td>(\chi^2(1, \ N = 3,222) = 1.78, \ p = .18)</td>
</tr>
<tr>
<td>4</td>
<td>1.6% (3/192)</td>
<td>1.5% (32/2,105)</td>
<td>+.1%</td>
<td>(\chi^2(1, \ N = 2,297) = .00, \ p = .96)</td>
</tr>
<tr>
<td>3</td>
<td>3.6% (6/167)</td>
<td>.9% (18/2,067)</td>
<td>+2.7%</td>
<td>(\chi^2(1, \ N = 2,234) = 10.77, \ p = .001)</td>
</tr>
<tr>
<td>2</td>
<td>1.7% (3/174)</td>
<td>1.2% (26/2,253)</td>
<td>+.5%</td>
<td>(\chi^2(1, \ N = 2,427) = .44, \ p = .51)</td>
</tr>
<tr>
<td>1</td>
<td>.6% (1/157)</td>
<td>.5% (13/2,512)</td>
<td>+.1%</td>
<td>(\chi^2(1, \ N = 2,669) = .04, \ p = .84)</td>
</tr>
<tr>
<td>0</td>
<td>0% (0/690)</td>
<td>.4% (51/14,241)</td>
<td>-.4%</td>
<td>(\chi^2(1, \ N = 14,931) = 2.47, \ p = .12)</td>
</tr>
</tbody>
</table>
Figure 1. Advice screen of Kieskompas.nl 2010 Dutch legislative elections (closest-party advice circled).
Figure 2. Response frequencies of ‘congruent’ versus ‘incongruent’ user groups to the question: ‘How would you rate the impact of the advice received on kieskompas.nl on your vote on a scale from 0-10, where 0 is no effect, and 10 is a very strong effect?’.
Figure 3. Line plot of proportions of ‘voted’ user-party dyads by whether party was ‘recommended’ or ‘not not recommended’, and the difference between recommended and not recommended group proportions as PTV increases.
References


