

Beyond young, higher educated males: A typology of VAA users

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Abstract

Voting Advice Applications are web tools that inform increasingly large groups of voters during election time. They clearly answer to voters' needs, but what needs exactly? Previous research has shown they are mainly used by higher educated and politically interested citizens. To analyze the different functions VAAs have for their users, we identify different user types on basis of cognitive characteristics. We draw on unique user data from the Dutch VAA *Kieskompas*. A latent class analysis results in three distinct user types, who use the VAA for different reasons at different points in time. Closer to election day, the VAA is increasingly often used by less efficacious and less certain voters who use the tool more often to get informed.

Keywords: VAAs, user typology, campaign dynamics, latent class analysis

Introduction

Over the past decade, Voting Advice Applications (VAAs) have played an increasingly important role in the elections in many, mostly European countries. By matching users' opinions to parties' stances on a selection of policy issues, these online communication tools generate a personalized voting advice. Such voting recommendations are being provided to large and increasing groups of voters; in recent years, VAAs have reached between 10% and 40% of the eligible voters in many European countries (Garzia & Marschall, 2012). Apparently, VAAs answer to voter's needs. But what needs are actually fulfilled? Which citizens use VAAs and for what reasons?

Previous research has repeatedly found that the typical VAA user is male, higher educated, and young (e.g., Boogers & Voerman, 2003; Hirzalla, Van Zoonen, & de Ridder, 2010; Hooghe & Teepe, 2007; Marschall & Schmidt, 2010; Ruusuvirta & Rosema, 2009). However, as many VAAs serve over a million users each election, there are presumably differences in the political backgrounds of VAA users and the reasons they use the VAA. It is therefore interesting to switch from the demographics of the 'typical' user to *types* of users in terms of their interests and motivations. Furthermore, up to now it is not clear *why* people use VAAs. Therefore, the aim of this study is to identify different types of VAA users and investigate whether they use these applications for different reasons over the course of an election campaign.

An indication that users might consult a VAA for different reasons, is the finding that there are differences in the moment at which voters decide whom to vote for (Gopoian & Hadjiharalambous, 1994). When taking the timing of consulting a VAA into account, an interesting pattern may be revealed. Citizens who feel attached to a party are found to make their voting decision much earlier than those who do not feel attached or identified with a party. The latter ones will often only decide about their vote in the last weeks or days before

election day (Fournier, Nadeau, Blais, Gidengil, & Nevitte, 2004; Gopoian & Hadjiharalambous, 1994; Irwin & Van Holsteyn, 2008). Typically, VAAs are available for four to eight weeks in the run-up to an election. Voters who have already decided before the start of a campaign might have a different reason to use a VAA than voters who make their decision during the election campaign. In other words: VAAs might be decision aids for some but have another function for others.

A second reason to analyze VAA usage for different types over time, is that it sheds a new light on the capability of VAAs to reach and inform those with lower levels of political understanding. In other words, are VAAs capable of bridging the digital (usage) divide (Norris, 2001)? Generally, VAAs were found to be serving those who were already engaged: men, higher educated and politically interested citizens (Fivaz & Nadig, 2011; Marschall & Schulze, 2012). However, mobilization effects were found for young voters (Hirzalla et al., 2010). Distinguishing different types of users may offer an additional insight into the mobilizing capacity of VAAs. Can other groups be identified for whom VAAs are an important political information source? For example, late-deciding voters are found to be less knowledgeable about and interested in politics, and VAAs might be informing the uninformed and undecided voters mostly in the last part of the campaign, as this is the point at which those voters make a decision.

In short, this study investigates the different functions of VAAs for their users. The analyses rely on data from the Dutch VAA *Kieskompas* for the 2012 Dutch parliamentary elections. We employ user log files ($N = 47,974$) to perform a latent class analysis on a set of users' cognitive characteristics and come to a typology of users. In this way, we can test our expectation about the differential use of the VAA across the campaign for different user types. In the next section, we discuss our choice for the indicators we base our typology on and our expectation for VAA usage over the course of a campaign.

Cognitive Characteristics of VAA Users

Voting Advice Applications are used by large numbers of citizens in many (mostly European) countries, but are a relatively new phenomenon. Most of the VAAs have been developed in the beginning of this century (Cedroni & Garzia, 2010). Consequentially, research on VAAs is also relatively young. One of the aspects that has been studied from the start, is the user: what is the background of VAA users and how interested in politics are they? These studies often focused on socio-demographic characteristics such as sex, age and education. The present study elaborates upon this research by taking a set of cognitive characteristics into account. In order to identify different types of users, we consider the characteristics *Need for Cognition*, *political interest* and *political efficacy*. In addition, we take into account whether someone already *decided about her or his vote* at the moment of visiting a VAA and the *reason to use the VAA*. The choice for these indicators is based on previous research into (political) media use (e.g., Kenski & Stroud, 2006; Liu & Eveland, 2005). We will discuss them below:

To begin with, Need for Cognition (NFC) is a character trait defined by Cacioppo and Petty (1982): people with a high NFC enjoy thinking about issues and have an inclination to “organize, elaborate on, and evaluate the information to which they are exposed” (p.117). Need for Cognition is regarded as a fundamental psychological need explaining motivations to inform oneself about news and politics (David, 2009). It is found to be related to political interest and media use for social utility and surveillance purposes (keeping up with issues; Condra, 1992; David, 2009). Including this trait in our analysis differentiates between those more fundamentally interested and those who are in need for information on the short term.

A second characteristic to be considered is political interest. As opposed to NFC, political interest is an attitude which more particularly explains the motivation to be informed

about politics. However, political interest is found to be highly stable over time as well (Prior, 2007). On the one hand, VAA use may be higher for those with more interest: politically interested citizens will follow political news more closely, and will therefore be the first to notice the availability of a VAA. Because VAAs are a medium of political communication themselves, and are often mentioned and discussed in other media during campaign time (Walgrave, Van Aelst, & Nuytemans, 2008), chances are higher that politically interested citizens take the effort to visit a VAA website. This expectation is supported by different findings from studies of VAA usage (Hooghe & Teepe, 2007; Marschall & Schmidt, 2010; Walgrave et al., 2008).

On the other hand, VAAs might also be interesting to those with less political interest who still want to make an issue-based, informed voting decision. In order to do that, one has to invest in becoming informed. In particular, this involves investment in 1) time and effort of gathering, selecting and transmitting data; 2) time and effort of analyzing the data; and 3) time and effort of relating the obtained information to specific goals in order to make an evaluation (Carmines & Huckfeldt, 1996). This process becomes increasingly complex if there are multiple parties running in an election and multiple issues are important. Those with less interest will be the first to turn away. As Garzia (2010) mentions, VAAs have gathered and selected the most relevant information on which issues are important and what the positions of all parties are on these issues, they offer a personalized analysis of this information to each user, and assist the voter in evaluating which party is closest to the user's positions on all issues. Hence, VAAs might be attractive to politically less interested citizens because they offer great possibilities to still make a (relatively) informed voting decision (assumed less interested citizens want to base their vote choice on policy issues). We conclude that political interest may be helpful in distinguishing both groups of users.

Certainty of one's vote is a third political characteristic that might be an important explanation of VAA use, especially by those with lower levels of political interest. The number of uncertain voters has increased over the past years (e.g., Irwin & Van Holsteyn, 2008). This goes hand in hand with an international tendency of loss in party loyalty (Dalton, 1984; Fournier et al., 2004) which is exceptionally present in the Netherlands (Mair, 2008; Van der Meer, Van Elsas, Lubbe, & Van der Brug, 2013). This might relate to an increasing need for other cues to decide about one's vote, such as information on parties' stances and relevant issues (Garzia, 2010). As discussed above, VAAs provide this information. Voter uncertainty is found to be higher for citizens with lower political interest (Adriaanse, 2011; Dassonneville, 2011; Van der Meer et al., 2013) who therefore may be attracted by VAAs.

A fourth possibly important factor to consider is political efficacy. This is the extent to which citizens have the feeling that they have the competence and power to affect political decision making. A distinction is made between internal efficacy – beliefs about one's own competence to understand and participate effectively in politics – and external efficacy – beliefs about how well governments and institutions respond to individual's needs and demands (Morrell, 2003; Niemi, Craig, & Mattei, 1991). As VAAs have the potential to provide crucial political information to their users, they could increase their users' political efficacy (Kenski & Stroud, 2006). This may be a reason for those with low efficacy to use a VAA, but people with high efficacy can also be expected to use a VAA because efficacy is found to be related to political use of the internet (Kenski & Stroud, 2006).

Finally, we consider the reason to use a VAA. Kaye and Johnson (2002) distinguish different motivations to use the internet for political information. The most important were guidance (voting advice) and surveillance (information seeking). Less often occurring motivations are social utilities and entertainment. As VAAs offer guidance to their users, such motivations for VAA use may often be observed. Kaye and Johnson (2002) found that

guidance and surveillance motivations were most often found among those with the highest efficacy, but their findings might not be applicable to the relatively new phenomenon of VAAs.

Except for political interest, these individual characteristics have not been applied to explain VAA use before. However, they may broaden our understanding of the audiences of VAAs, and in particular differential use of VAAs by different types of users. Each of the characteristics discussed is expected to be relevant in explaining VAA use and in differentiating between different types of VAA users.

User Types and Campaign Dynamics

The needs VAAs fulfill and the types of users they attract will probably change over the course of a campaign. One of the clearest findings of campaign volatility literature is that the voters who decide in the final weeks or days before the elections are less partisan than voters who decided which party to vote already before the start of the campaign (Fournier et al., 2004; Gopoian & Hadjiharalambous, 1994; Irwin & Van Holsteyn, 2008). Less clear is to what extent campaign volatility, or the stability of vote choice during a campaign, depends on individual characteristics like political interest, efficacy and Need for Cognition. Gopoian and Hadjiharalambous (1994), Adriaansen (2011) and Dassonneville (2011) found that politically interested citizens decide earlier on which party to vote for, and that they switch party preferences less often than people with less interest in politics. However, Fournier et al. (2004) and Irwin and Van Holsteyn (2008) do not find differences in political interest between early- and late-deciding voters. Nevertheless, based on the former findings, we expect the most interested and efficacious type of voters to use a VAA relatively early in the campaign, and the most doubtful voters to use a VAA relatively late in the campaign.

A second reason to expect this is that politically interested citizens will be the first to be informed about the availability of a VAA, which are applications that should suit their interests. The findings of Hooghe and Teepe (2007) support these expectations. Hooghe and Teepe found that during the first days a VAA is online, men and higher educated people, who often are more politically interested, are overrepresented among the users. As election day came closer, they found the users of a Belgian VAA to be more representative for the Belgian electorate. But at the same time, party preferences did not crystallize; people who used the VAA closer to election day generally did not have clearer party preferences than those who used the VAA 40 days before the elections.

In short, this paper has two objectives. First, using the indicators discussed above we will establish a typology of VAA users, and investigate how user types relate to the socio-demographic variables considered in earlier studies of VAA usage. Second, we test our expectation, which will be spelled out in more detail after developing the typology, about how different user types use VAAs over time.

Method

Participants

We used unique data gathered in collaboration with the Dutch VAA *Kieskompas*. The application for the 2012 legislative Dutch elections was online for 29 days, from August 15 to Election Day, September 12. During this period, *Kieskompas* was accessed 1,215,916 times (and completed 757,052 times). For every visitor, a log file was recorded containing the answers users gave to all questions and statements, and additional information like the advice provided by *Kieskompas*, the date and time of visit and the time it took the user to answer all questions. On the first page of the application, users were asked to fill out their sex, year of birth, highest attained education and the certainty of their vote choice. After this, 30 political statements followed to which users could indicate their agreement: the *Kieskompas* advice is

based on users' answers to these statements. After answering these statements and before receiving the advice, users were asked to indicate the propensity to vote for each of the party included in the application (see Van der Eijk, Van der Brug, Kroh, & Franklin, 2006). One minute after the advice had appeared on the screen, an additional short survey popped up, containing questions on Need for Cognition, political interest, political efficacy, and the reason to use *Kieskompas*. This popup-questionnaire was filled out by 6.3% of the users (N = 47,974).

Our final sample consists of the users who answered the post-test popup questionnaire. This sample differs from the overall population of *Kieskompas* users in multiple respects. The percentage of females was 40.8% in the overall user population and 31.2% in the final sample. The mean age was 39.7 in the population and 45.7 in the sample, and 59.4% was higher educated among all *Kieskompas* users, compared to 63.8% in our sample¹.

Indicators

As mentioned above, the indicators included in our analysis of user types are selected on basis of previous VAA research and literature on political news use (e.g., Kenski & Stroud, 2006; Liu & Eveland, 2005). Because of space limitations, for some measures we selected only one item from validated question batteries. Need for Cognition was measured with the statement "I enjoy deliberating about issues even when they do not affect me personally" ($M = 4.02$, $SD = .77$), taken from the original Need for Cognition scale (Cacioppo & Petty, 1982). Political interest was measured by the question how intensely the respondent followed the election campaign, with the categories "very closely" (9.7%);

¹ Our sample should therefore be regarded to be possibly not representative for *Kieskompas* users. However, our aim is not to give a description of VAA users in general, but rather to explore different types of users. Our sample suits this purpose well.

“closely” (44.5%); or “not closely or not at all” (45.9%) (see David, 2009). Internal political efficacy was operationalized with the statements “I feel that I have a pretty good understanding of the important political issues facing our country” ($M = 3.74$, $SD = .89$) from the scale by Kaid, McKinney and Tedesco (2007) and external political efficacy was tapped with the statement “There are so many similar parties that it does not matter whom I vote for” ($M = 1.82$, $SD = .89$) (see De Vreese and Semetko, 2004). The reason to use *Kieskompas* was measured with four answer categories: to gain more insight in the positions of parties (15.9%); to check if I agree with the party I intend to vote for (38.6%); to find out which party to vote for (17.2%); or as a fun test to think about or discuss with others (28.2%). A fourth category was “I will not vote at all”, but because only one percent of the users chose this category it was left out. Need for Cognition and political efficacy were measured with a 5-point Likert scale on which respondents could indicate their agreement. Respondents who indicated “I do not know” to any of these items were excluded.

Analytical strategy

The research question is answered in two steps. First, we investigate which types of VAA users can be distinguished, using latent class analysis (LCA). With a multinomial regression we studies how the chance that someone is a member of each of the user types depends on age, sex and education. Second, we investigated to what extent the different user types that will be identified consult the VAA at different points in the campaign, using a regression analysis of the frequency each type visits the VAA on the day of visit.

Latent class analysis (LCA) is an exploratory statistical technique that identifies underlying (latent) categories explaining different response patterns in a set of variables (Hagenaars & McCutcheon, 2002). In other words, with this technique different types of respondents can be identified on the basis of their responses to a set of questions. It differs from other classification techniques, such as cluster analysis, in that it fits a model to the data

rather than providing an *ad hoc* classification of the given data. In addition, it differs from factor analysis-related techniques such as multiple correspondence analysis in that it searches for a categorical latent class structure rather than continuous dimensions (Gross & Manrique-Vallier, 2012). LCA uses an iterative approach to find underlying categories which explain the observed response patterns to the indicator variables; it assumes that within these categories the indicators are independent. In other words, it strives for a solution in which the relationships between the indicator variables are explained completely by the classes. In our study, LCA is applied to model the associations between multiple user characteristic variables, so that these relationships are explained by a limited number of latent user types.

Results

Typology of Users

To obtain a typology of VAA users we ran a latent class analysis on cognitive characteristics (i.e., Need for Cognition, political interest, internal and external political efficacy, certainty of one's vote, and the motivation to use the VAA). A description of the procedure is given in Appendix A. We assessed measures of fit (loglikelihood, BIC and a bootstrapped likelihood ratio test), the classification quality indicator entropy, and the usefulness of the solution in terms of interpretability, parsimoniousness and proportionality of the classes. The fit statistics and entropy are shown in Table 1.

* Table 1 about here *

As is shown in Table 1, the BIC decreased with every increase of the number of types, and the bootstrapped likelihood ratio test also favored every solution over the one with less types (which may have to do with the very large sample size, leading to an extremely powerful test). However, both the absolute loglikelihood value and the BIC did not decrease much after the three-class solution; we can see a flattening out (see Nylund, Asparouhov, &

Muthén, 2007). Moreover, entropy was relatively high for the three-class solution. In addition, as discussed below the three-class solution gives a theoretically sensible interpretation as well. We therefore chose this solution as our final model.

Table 2 shows the profiles of each type by showing the marginal distributions for the categorical variables (reason to use the VAA, vote certainty, intensity of following the campaign) for each type, and the means for the continuous variables (Need for Cognition, internal and external efficacy). The proportion each type is represented with among the VAA users is given in the bottom.

* Table 2 about here *

The first user type is very uncertain which party to vote for: many of them do not know at all, although some of them have some preferences. Only a minority of them already decided. This may be the type of users that cares least about politics: they are not much interested in following the political news and have very low external political efficacy: they are cynic about their possibilities to influence politics. They use the VAA for many different reasons, but the most important is to find out which party to vote for. We can call this type the *cynic doubters*; they make up almost 10 percent of the VAA users.

The second type of VAA users is also unsure about their vote; most of these users do have clear preferences but almost none of them decided already. They are the least interested in the political campaign, relatively least often consider themselves to understand politics well enough to be able to participate, and do not have a very high Need for Cognition. Still, they are not as pessimistic as the cynic doubters about their ability to influence politics. This group might be the most serious VAA users: more so than other types, they use the application to find out which party to vote for, suggesting that they leave a large part of their decision to the application, and less often than other types they use the VAA as a fun test. We therefore call this type the *seeking doubters*. Thirty percent of the users belongs to this type.

The third and final type of VAA users is the most interested and certain type. Half of them already made a decision about which party to vote, and half of them have clear preferences. They have the highest values for internal and external political efficacy and for Need for Cognition. Moreover, they are highly interested in politics and in the election campaign. Hardly any of them is interested in the voting advice provided by the VAA: the majority of the users of this type indicates either to use *Kieskompas* to check their agreement with their favorite party, or as a fun test – which suggests they do not use the application very seriously. This is the largest user type with 60%, and we may call them the *efficacious checkers*.

To assess the robustness of this analysis, we performed a similar analysis on a subsample of the data, which was representative to the population of *Kieskompas* users with respect to age, gender and education. The results were very similar to the results presented in Table 2, both with regard to the response patterns as the proportion to which each of the classes is present. In addition, a cluster analysis (using Ward's linkage and the Gower measure for similarity) showed similar patterns per type but different proportions being present.

Relations With Socio-Demographic Characteristics

A multinomial regression is performed to investigate the chance of being a member of each user type as a function of sex, age and education. The results are shown in Table 3.

* Table 3 about here *

The multinomial regression shows that age positively relates to being member of the efficacious checkers type of users, and the cynic doubters type of users. This effect is not very strong though; the different types occur in all age groups. There is a stronger effect for education: people with higher education are more likely to be efficacious checkers than one

of the other types. Furthermore, men are most likely to belong to the efficacious checkers; women are most likely to be member of the seeking doubter type of VAA user.

Socio-demographic characteristics are only weak predictors of the user type one belongs to. This is also reflected in the pseudo- R^2 : 3% is a very low value.

User Types and VAA Use Over Time

In the theory section, we formulated the expectation that the most interested and efficacious type of voters would use the VAA relatively early in the campaign, and that the most doubtful voters use a VAA relatively late in the campaign. Figure 1 shows the presence of each user type over the course of the campaign. As mentioned above, *Kieskompas* was online for 29 days during the 2012 Dutch parliamentary election campaign. The last day in the plot is Election Day (September 12, 2012). Figure 2 shows how often the questionnaire was completed divided per user type; the dotted line represents the total number of visits to the application's website (on a different scale). Each day, about the same portion of *Kieskompas* users filled out the questionnaire.

* Figure 1 about here *

The figures confirm that the efficacious checkers are the most prominent VAA user, but more importantly, some substantial changes are visible over the course of the campaign. During the first days the VAA is available, more than 70 percent of the users belongs to the efficacious checker type. Over time, this overrepresentation decreases, until on Election Day, little more than 50 percent of the users belong to this type. This relative decrease is mainly due to the increase of users of the seeking doubter type. This is partly in line with our expectations; however, the presence of the cynic doubter type, which is also expected to increase over time, is quite stable.

* Figure 2 about here *

As Figure 2 shows, the frequency of consulting *Kieskompas* varies greatly over time. The peak in the beginning is for a large part because of the efficacious checkers. This confirms our expectations: they are the first to notice the availability of the VAA. The large peak in the last two or three days of the campaign (including Election Day) is largely due to an increase in visits by users from the seeking doubter type, which is also in line with our expectation. However, the peak in visits between the 8th and the 4th day before election day is mostly because of an increase of visits of the efficacious checker type of users. This may coincide with an increase of media attention for the campaign; there were two important TV debates in this period. OLS regression analyses showed that the day of visit explains 13.8% of the variance in presence (frequency of visits) of the cynic doubters, 33.8% of the variance in presence of the seeking doubters, and 7.4% of the variance in presence of the efficacious checkers².

Discussion

This study investigated the differential usage of a Voting Advice Application by different types of users over the course of an election campaign. By developing a typology of users, we could analyze the different reasons voters have to use the VAA, which varied over time. Using latent class analysis, we identified three types of VAA users: 1) *cynic doubters*, who are characterized by being uncertain about their vote and having little political interest and very little external political efficacy; 2) *seeking doubters*, who are also uncertain about their vote and have little political interest, but have clearer party preferences and are looking for guidance by the VAA; and 3) *efficacious checkers*, who are very politically interested and efficacious, relatively certain which party they would vote for, and seem to use the VAA more for entertainment purposes than the other types. They are least interested in the voting advice that is provided by the application. The latter type is the most frequent VAA user:

² Percentages are R²

around 60% of the VAA users belong to this type. The seeking doubters were represented by 30% and the cynic doubters by 10%.

Based on findings from literature on inter-election and campaign volatility (Fournier et al., 2004; Van der Meer et al., 2013), we expected the efficacious checker type to be more prominent among the early users of the VAA, and the cynic doubters and seeking doubters to be more prominently present close before Election day. We found support for these expectations, except for the cynic doubter type: their presence was stable over the course of the election campaign. The findings indicate that in the beginning of the campaign, next to an informing function, VAAs relatively often also seems to have an entertaining function for people who do not base their voting decision on the voting advice provided by the tool. However, as election day came closer, VAAs were increasingly often used by voters who seem to take the voting advice more seriously. In the final days before election day there was a dramatic increase in VAA use, especially among the seeking doubter type who seem to make their final voting decision relatively late.

The results from this study are congruent with findings from earlier studies of VAA users which found that young, higher educated men are overrepresented among VAA users and that VAA use is more likely if someone is more politically interested (e.g., Garzia & Marschall, 2012; Hooghe & Teepe, 2007). Our results show that men and higher educated people are indeed more likely to be of the efficacious checker user type, to which the majority of users belongs. However, younger people and women are more likely to belong to the seeking doubter user type, which may be the group of users profiting most from VAA use in terms of getting informed about politics (see Hirzalla et al., 2010).

This study demonstrates the value of analyzing VAA use from a cognitive perspective rather than looking at socio-demographic features alone. Need for Cognition, political interest and efficacy, and usage motivations have been used in research on media consumption

before, and our study shows that they also explain use – and differential use – of VAAs. The weak relation between belonging to particular user types and socio-demographic characteristics like age, sex and education implicates that these characteristics do not suffice in describing the audience of VAAs. New insights are offered by focusing on cognitive characteristics. For example, we found that during a campaign, VAAs seem to be an important source of political information for a group of citizens who have low political efficacy and need for cognition, and who are unsure about their vote. This may be the group that profits most from VAA usage in terms of gains in knowledge and understanding.

Two issues should be kept in mind when interpreting the results from these analyses. First, we rely on a sample of people who selected themselves into filling out the exit survey of the VAA. They are not representative of *Kieskompas* users in general, and *Kieskompas* users are possibly not representative of VAA users in general. We dealt with the first problem by running a robustness check on a subsample that is representative for *Kieskompas* users, which confirmed our results. It would be preferable to do a similar analysis on a sample that is representative of all eligible voters of a country, to see whether our findings could be replicated. Second, due to space limitations in the survey we measured some concepts with one item, whereas most studies use a scale of multiple items yielding more reliable measurements.

For future research, it would be interesting to study the extent to which VAAs increase understanding and knowledge of politics. Our results indicate that especially users with lower political efficacy might profit from the tailored information VAAs offer. If increasing political understanding is what VAAs aim at (see De Graaf, 2010) more research is also required on possible ways to tailor VAAs to the specific needs of this group of less interested and efficacious users. As political efficacy is found to be related to voter turnout (e.g. Kaid, McKinney & Tedesco, 2007), increasing political understanding and efficacy of

this group might result in more political participation. In addition, our findings suggest that the influence of VAA advices on the eventual vote choice might be largest among those who are least interested and efficacious, all the more if they use the VAA shortly before they go to the ballots. In future research on the influence of VAAs on voting decisions, cognitive characteristics and the time at which the VAA is consulted should be taken into account.

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Appendix A: Procedure of latent class analysis

Using Mplus version 6, we performed a Latent class analysis to identify the underlying user types of VAAs using the variables: Need for Cognition, political interest, internal and external political efficacy, vote certainty and reason to use *Kieskompas*. Reason to use *Kieskompas*, vote certainty and political interest were specified as nominal variables. The LCA is carried out six times in order to compare which solution best fits the data: the one with one latent user type, two types, and so on. To avoid local maxima, which is a well-known pitfall of LCA, multiple random starting values for estimated model parameters are specified.

There are a number of consideration one can use to decide on the optimal number of latent classes (user types). First, some model fit statistics can be considered. The Bayesian Information Criterion (BIC) decreases as the fit becomes better; one should assess whether the solution with more classes improves the fit substantively. In addition, a bootstrapped likelihood ratio tests whether a model improves significantly from the model with $K - 1$ classes (Asparouhov & Muthén, 2012; Hagenaars & McCutcheon, 2002; Nylund, Asparouhov, & Muthén, 2007). A second way to decide which solution is best is to evaluate the entropy, which reflects how well an individual's class membership can be predicted based on her answers to the indicator questions. A higher entropy indicates a higher classification certainty (Eynon & Malmberg, 2011; Hagenaars & McCutcheon, 2002). A third consideration when deciding on the number of classes is the usefulness of the resulting model: can the types be clearly interpreted, is the model parsimonious, how many individuals are in each class (Nylund et al., 2007; Vaughn, DeLisi, Beaver, & Howard, 2008).

Table 1

Fit indices of different LCA solutions

No. of classes	LL	BIC	Npar	BLRT <i>p-value</i>	Entropy
1	-356000.903	712143.220	13	N/A	N/A
2	-344510.399	689281.871	24	.000	0.643
3	-338732.254	677845.239	35	.000	0.711
4	-336369.426	673239.242	46	.000	0.682
5	-333645.818	667911.684	57	.000	0.719
6	-331891.662	664523.032	68	.000	0.689

Note: LL = log likelihood, BIC = Bayesian Information Criterion, Npar = number of parameters, BLRT = Bootstrapped Likelihood Ratio Test

Table 2

Distributions of indicator variables for each class

	<u>Cynic</u> <u>doubters</u>	<u>Seeking</u> <u>doubters</u>	<u>Efficaciou</u> <u>s checkers</u>
	<i>% / M</i>	<i>% / M</i>	<i>% / M</i>
Reason to use the VAA			
To gain more insight in the positions of parties	20%	17%	15%
To check if I actually agree with the party I intend to vote for	26%	31%	44%
To find out which party to vote for	29%	38%	5%
Fun test to think about or discuss with others	25%	14%	36%
Vote certainty			
I already decided which party to vote for	18%	9%	50%
I doubt between two or more parties	46%	59%	45%
I don't know which party to vote for	36%	32%	5%
Internal efficacy	3.3	3.2	4.1
External efficacy	1.2	3.1	3.5
Need for Cognition	3.8	3.6	4.2
Intensity of following campaign			
Very intensely	7%	1%	15%
Intensely	33%	24%	56%
Not very intensely / not at all	60%	75%	29%
Proportion of each type	0.095	0.304	0.601

Note: Reason to use the VAA, vote certainty and intensity of following the campaign are nominal variables; the percentages sum up to 100 per variable. Internal and external efficacy and Need for Cognition are measured on a scale from 1 to 5. Higher values mean more efficacious / more NFC.

Table 3

Multinomial regression of user type on age, education and sex

	Efficacious Checkers vs. Seeking Doubters	Cynic Doubters vs. Seeking Doubters	Cynic Doubters vs. Efficacious Checkers
Age	0.004 (0.001)**	0.004 (0.001)**	0.001 (0.001)
Education	0.224 (0.008)**	-0.036 (0.014)*	-0.261 (0.013)**
Female	-0.810 (0.023)**	-0.730 (0.043)**	0.080 (0.042)
Intercept	-0.361 (0.064)**	-1.053 (0.107)**	-0.692 (0.101)**

Note: Unstandardized coefficients with standard errors in parentheses. Pseudo- $R^2 = .031$. * $p < .01$ ** $p < .001$

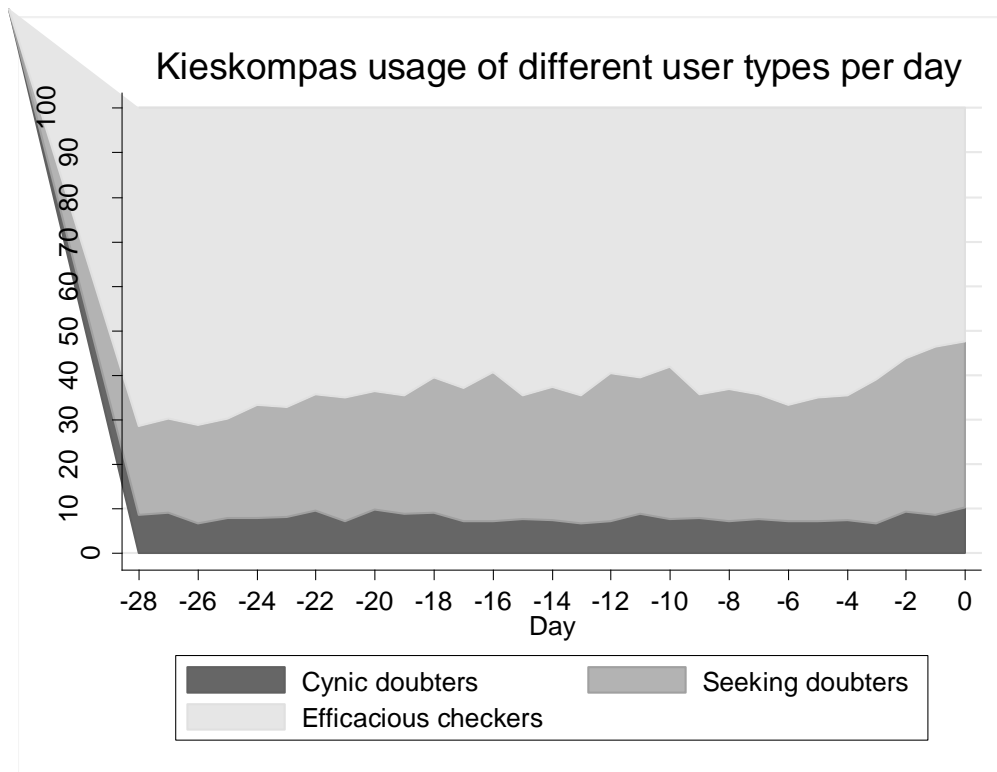


Figure 1. Presence of user types using *Kieskompas* per day of the 2012 campaign.

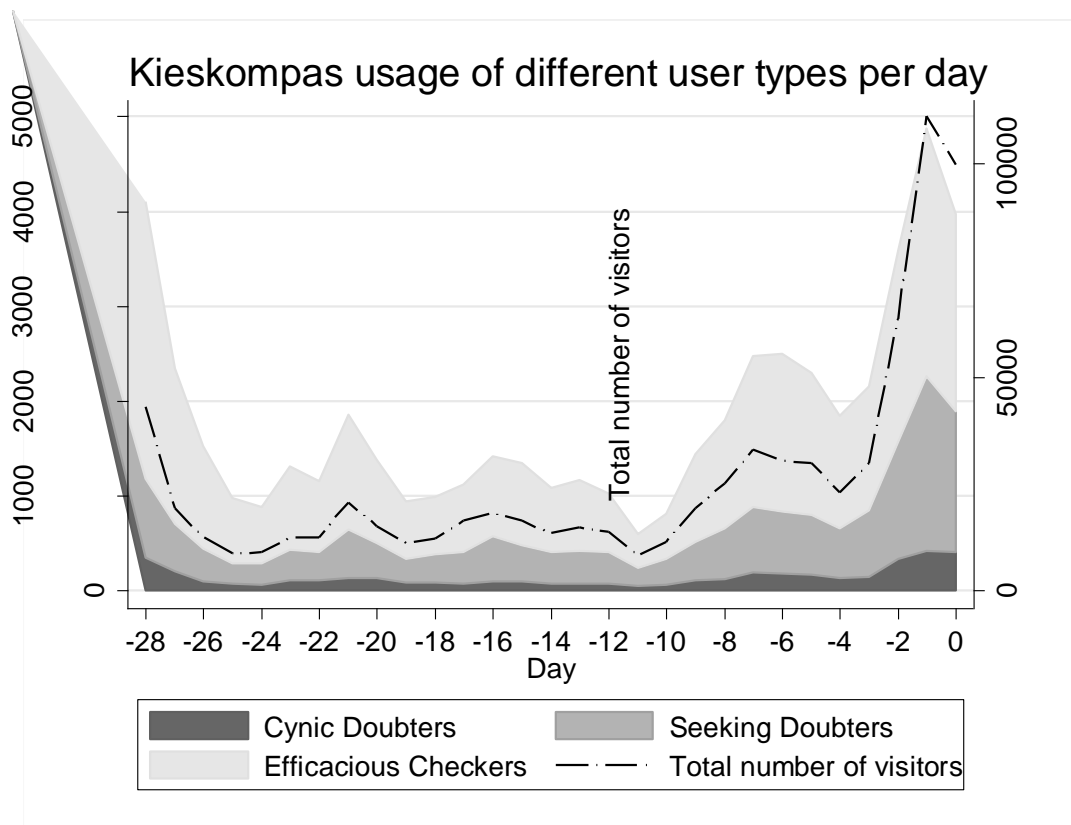


Figure 2. Frequency of visits per day of the 2012 campaign, divided by user type.