Young and Politicised: An Evaluation of VAAs' Impact on Young University Students[1]

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Abstract

Since the early 2000's, the study of Voting Advice Applications (VAA) has been rocketing. VAAs are widely used and are very popular. Multiple studies (Aarts & van der Kolk, 2007; Enyedi, 2016; Fivaz & Nadig, 2010; Garry et. al., 2018; Laaksonen et al., 2016; Ladner et al., 2012; Mahéo, 2017; Marschall, 2008;) have shown that the use of a VAA has an impact on political attitudes and behaviour. Furthermore, the widespread use of VAAs seems to particularly impact voters that appear to be more difficult to mobilise in elections such as youth, those with lower educational levels, women and those who are socially excluded.

In this exploratory study, we research the impact of the 'Stemtest', the Belgian VAA (designed for the 2019's European, Federal and Regional elections in Belgium) on a specific part of the population : Young University Students. On the one hand, students are expected to be impacted by the use of a VAA because of their young age. On the other hand, their rather high level of political interest might mute the impact of VAAs. We use an experimental design to test the effects of the use of VAAs on Belgian students' political knowledge, political attitudes and behaviour. Our results show that using a VAA does not have an impact on students' knowledge of parties' issue positions, or on their political attitudes. Nonetheless, the Stemtest has significant effect on students' support for political parties.

[1] This is a very first version of the paper, all suggestions and comments are welcome!

[2] In the spirit of the article, the order of the authors' names was chosen randomly.

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Introduction

Since the early 2000's, the study of Voting Advice Applications (VAA) has been rocketing. VAAs are highly valued as informative tools using interactivity and entertainment. VAAs show parties' viewpoints on various issues and they aggregate, synthesize and structure this political information. In addition to displaying what differentiates parties from each other, personalized information allows the user to map the political space and to locate himself in it with his or her standpoints. Thanks to readily accessible and directly comparable information, citizens can match their preferences with the parties' programs. Since the end of the 90s, VAAs are widely being used and are popular tools during election campaigns.

Multiple studies (Aarts & van der Kolk, 2007; Enyedi, 2016; Fivaz & Nadig, 2010; Garry et. al., 2018; Laaksonen et al., 2016; Ladner et al., 2012; Mahéo, 2017; Marschall, 2008) have shown that the use of a VAA has an impact on the intention to cast a ballot, the vote choice, the propensity to seek for further information and on discussions about politics. Moreover, the widespread use of VAAs seems to particularly impact voters that appear to be more difficult to mobilise in elections such as, youth, those with lower educational levels, those who are socially excluded and women.

Using an experimental research design similar to the one conducted by Valérie-Anne Mahéo (2017), our research seeks to test the impact of using a VAA (the Belgian VAA 'Stemtest' ("Vote Test") on political knowledge, political attitudes and political behaviour. We focus on a specific part of the population: young citizens in higher education, during the Federal and European elections (of the 26th May 2019) in the three Regions of Belgium. This subset of the population is interesting because they are young (and therefore, more prone to be impacted by the use of the VAA) but also politically interested (and therefore less prone to be impacted by the use of the VAA). The question that we want to answer in this study is the following: **What is the impact of using a VAA on young citizens in higher education?** More specifically, what are the impacts of the tool on students' knowledge of parties' issue positions, their political attitudes (such as political interest, enthusiasm to go to vote, and the motivation to seek for further information) and their political behaviour (support for political parties)?

In order to answer our research question, we rely on a sample of undergraduate University students from three different campuses in Belgium (Antwerp, Brussels and Louvain-la-Neuve) located in at least two different political systems, Flanders and Wallonia (Swenden, Brans, & De Winter, 2006). This exploratory research lays the foundation for further and larger-scale work on VAAs impact on the general Belgian population.

The article is structured as follows: First, we start with the theoretical framework and the state of the art which help us to formulate and introduce the hypotheses that are going to be tested in the next sections. We formulate three hypotheses : H1(a, b, c) on the impact of the "Stemtest" on students' knowledge and certainty of parties' issue positions at the Federal and European level ; H2 (a, b and c) on the impact of the "Stemtest" on political interest, on enthusiasm to cast a ballot and to follow the campaign; and finally H3 (a, b and c) on the impact of the "Stemtest" on the propensity to vote for political parties suggested by the VAA, in general and particularly if it gives confirming or disconfirming advice. After describing the Data and the Methods, we present our analyses and results in the third part of the paper. Finally, the fourth part of the article discusses the results with the aim to explain why some of the hypothesis worked on the sample while the others did not, before ending with a concise conclusion.

Theoretical framework : VAAs and their effects on cognitions, attitudes and behaviours

VAAs can be defined as online databases of parties' positions on various fundamental political issues (Cedroni & Garzia, 2010). Users fill in a web-survey according to their opinions on these issues. The application compares the users' opinions with those of the political parties and generates voting advice and suggestions (Cedroni & Garzia, 2010). VAAs show parties' viewpoints on various issues. In addition to displaying what differentiates parties from each other, personalized information allows the user to map the political space and to locate himself in it with his standpoints. Thanks to readily accessible and directly comparable information, citizens can match their preferences with the parties' programs. VAAs also provide specific knowledge of parties' positions on a selection of issues. Especially in Belgium, VAAs have become important players in the information environment of electoral campaigns (Cedroni & Garzia, 2010; Laaksonen, Nelimarkka, & Haapoja, 2016; Lefevere & Walgrave, 2014; Mahéo, 2016).

Although VAAs aim to make politics intelligible for a broad audience, they usually attract, to a large degree, citizens that are already quite interested in politics (Fivaz & Nadig, 2010). The typical VAA user has a profile similar to that of the Internet user: young, male, higher educated and with an above-average income (Fivaz & Nadig, 2010; Ladner, Fivaz, & Pianzola, 2012). Thus, VAAs are sometimes blamed for "preaching the converted" (Boogers & Voerman, 2003, p. 22 ; Fivaz & Nadig, 2010, p. 170) and "missing their target" (Mahéo, 2016, p. 406) in spite of their initial educational purpose. These tools nevertheless reach a relatively large number of undecided voters.

With regard to the cognitive effects of VAAs, Fivaz & Nadig (2010) find that VAAs increase the political knowledge of their users. Moreover, these knowledge effects appear to be larger among young users of VAAs. However, Fivaz & Nadig (2010) did not verify whether the use of a VAA actually increases voters' objective political knowledge. Instead, they asked respondents whether "[u]sing smartvote helped to vote for candidates/parties on an improved information basis" (p. 188). Although this might be an indication of the increase in political knowledge, we think this is more of an evaluation of VAAs rather than a question concerning political knowledge. In line with Delli Carpini and Keeter (1996), we define "*political knowledge* (sic) as the range of **factual information** (emphasis added) about politics that is stored in [...] memory" (p. 10)[4].

[4] We diverge slightly from the definition of Delli Carpini and Keeter (1996) who refer specifically to "long-term memory". Since we can only make claims about the short-term in this study we choose not to refer to the duration by which the information is stored in respondents' memory.

We focus on a specific form of political knowledge, namely knowledge of parties' issue positions. We suppose that VAAs might increase users' knowledge of issue positions because VAAs provide aggregate information on political issues, which reduces the costs of acquiring political information (Mahéo, 2017). Furthermore, this information is synthesized and structured which also reduces the costs of information processing (Garzia, Trechsel, & De Angelis, 2017). Therefore, we expect that **using the federal elections VAA enhances students' knowledge on parties' positions on federal issues** (H1a). Likewise, we should observe that **using the European elections VAA enhances students' knowledge on parties' positions on European issues** (H1b).

Closely related to voters' knowledge of party positions is their certainty of parties' issue positions (Koch, 2003). However, knowledge and certainty are not the same concepts. Citizens might think that they know more about parties' positions than is actually the case. Indeed, research in psychology has found that people think they know more than is the case (Kuklinski, Quirk, Jerit, Schwieder, & Rich, 2000; Nisbett & Ross, 1980). In both the studies of Koch (2003) and van der Meer, Walter, and Van Aelst (2016), the authors find support for the positive effect of the availability of information on candidates or parties on citizens' certainty of candidates' or parties' positions. Therefore, we expect that **using a VAA will increase students' certainty of parties' issue positions** (H1c).

VAAs also have an effect on users' political attitudes. Information acquired by using a VAA can stimulate political interest (Fivaz & Nadig, 2010; Mahéo, 2017). Political interest can be defined as "the willingness of a citizen to pay attention to political phenomena at the likely expense of other subjects" (Lupia & Philpot, 2005). Political interest being a conative[5] component of the attitudinal system (Breckler, 1984), it is a prerequisite for political engagement (Hadjar & Schlapbach, 2009; Weinschenk & Dawes, 2017). Hence, VAAs activate citizens' engagement with the electoral campaign because they foster users' intention to actively seek for political information on the elections and to follow discussions of public affairs in the media (Garzia & Marschall, 2012; Gemenis & Rosema, 2014; Mahéo, 2016). However, users are not uncritical of the voting advice provided by VAAs. They rather use VAAs as a starting point for gathering further information (Ladner et al., 2012). Thus, we hypothesize that **using a VAA raises the level of political interest** (H2a) and that **using a VAA boosts motivation to seek for further political information** (H2b).

Third, Garzia, Trechsel, & De Angelis (2017) recognize that turnout rates are higher among VAA users than non-users. In Belgium however, voting is compulsory. Compulsory voting is one of the most effective rules for stimulating voting since it can impose a small inducement that is enough to neutralize the cost of voting (Karp &

[5] The term "conation" is a concept of psychology defining the "mental processes concerned with striving and purposive action. Comprises drives, desires, instincts, and motives of all kinds. One of the three aspects of the mind according to early psychologists. The other two are cognition and affection." (Corsini, 1999).

Banducci, 2008; Lijphart, 1997). Since all respondents are obliged to show up at the ballot box, we decide to test respondents' enthusiasm to cast a ballot. In line with the research on turnout rates, we hypothesize that **using a VAA improves enthusiasm to cast a ballot (H2c).**

Concerning the behavioural effects of VAAs, VAAs have an impact on partisan support too. Indeed, previous research has found that voters are likely to change their vote intention after using a VAA (Aarts & van der Kolk, 2007; Ladner et al., 2012; Walgrave, van Aelst, & Nuytemans, 2008). This effect is a little more pronounced for those who do not know which party they will vote for initially (Garry et al., 2018; Wall, Krouwel, & Vitiello, 2014) and for younger voters (Fivaz & Nadig, 2010; Ladner, Fivaz, & Pianzola, 2012). In addition, VAAs are useful in multi-partisan and fractionalized contexts, where the salience of traditional cleavages and partisan identification have declined (Garry et al., 2018; Mahéo, 2016). Moreover, VAAs may be particularly relevant for voters who are less attached to particular parties (Mahéo, 2016). Furthermore, we know that greater ideological closeness with a party is associated with greater propensity to support that party (Downs, 1957; Garry et al., 2018). Since VAAs help citizens to identify the parties closest to their own ideological preference, we expect that **using a VAA should increase the propensity to vote for the parties that are suggested by the Stemtest** (H3a).

In addition, based on studies in political psychology, we examine whether receiving advice that confirms or disconfirms initial preferences affects vote choice. It is difficult to make people change their behaviour and individuals with fixed preferences are thus likely to mostly accept congruent information and to discard incongruent and counter-attitudinal information, which tends to reinforce their behaviour (Cacioppo, Petty, Feinstein, & Jarvis, 1996; Taber & Lodge, 2006; Zaller, 1992). VAA users who have clear party preferences are therefore expected to accept an advice confirming their initial preferences and to disregard an advice contrary to their initial choice (Ladner et al., 2012; Mahéo, 2016). Thus, we make the hypothesis that **using a VAA should not increase the propensity to vote for parties that are suggested by the VAA disconfirming the user's initial preferences** (H3b) **and that using a VAA should increase the propensity to vote for parties suggested by the VAA confirming the user's initial preferences** (H3c).

The literature mentioned above is proof of the vibrant academic interest in VAAs that has expanded together with the the proliferation of these tools (Garzia & Marschall, 2012). VAA research scholars have made many assumptions about VAAs' effects on democratic attitudes but often struggle to isolate these effects from other factors (e.g. other information sources) (Garry et al., 2018). Furthermore, VAA research suffers from a major bias of self-selection which is why some researchers have opted for experimental designs, and more specifically for field experiments (Garry, Tilley, Matthews, Mendez, & Wheatley, 2018; Mahéo, 2017). Indeed, VAAs are freely accessible online and the user him-or herself instead of the

researcher decides whether or not to use a VAA. This absence of random assignment makes it hard to exclude other factors (Garzia & Trechsel, 2015; Hooghe, Stolle, Mahéo, & Vissers, 2010).

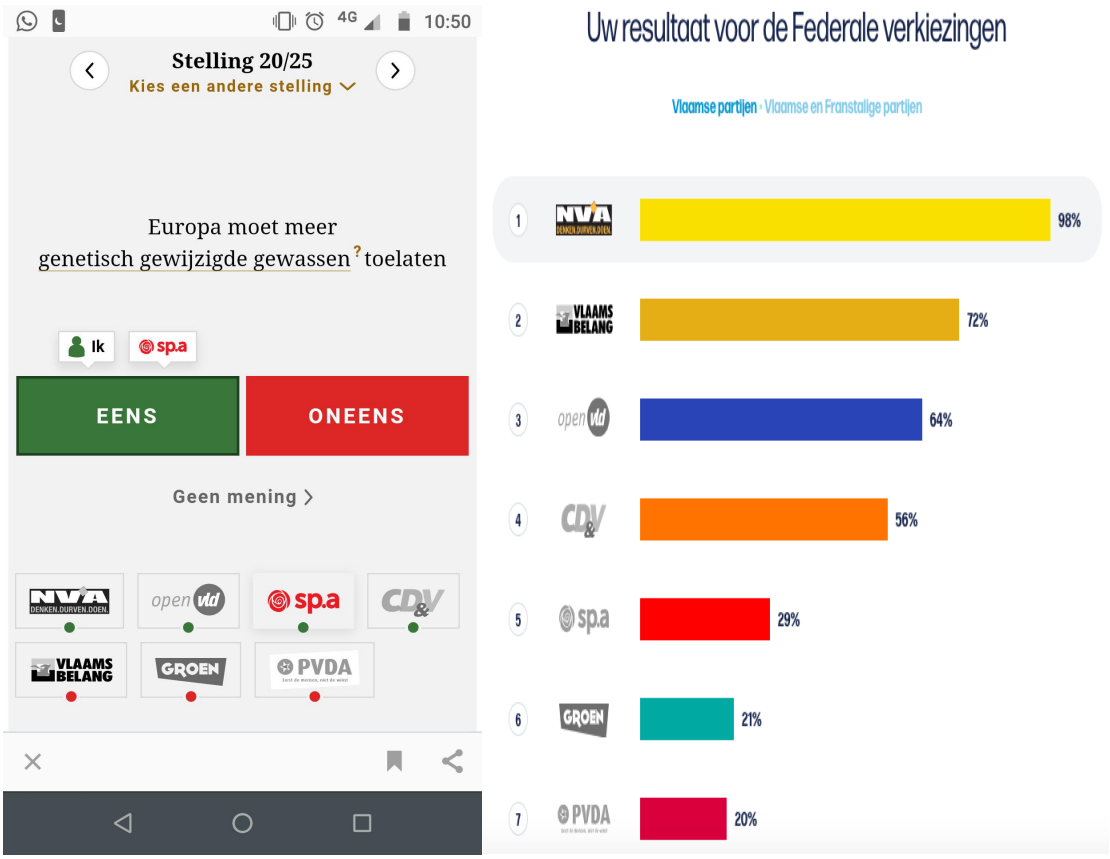
The aim of experimentation is to increase internal validity by randomising the assignment of comparable units to treatment or control conditions (O'Donnell, 2005). In this way, the researcher tries to eliminate the impact of factors other than the one he or she is interested in. Problems with the selection of participants can constitute biases that pose a threat to internal validity. Our research aims to evaluate the potential of VAAs on cognitions, attitudes and behaviours and to test causal claims that other methodologies could not fully address (Druckman, Green, Kuklinski, & Lupia, 2006). We selected a homogeneous group of respondents, namely young university students. However, this comes at the cost of external validity (Cook & Campbell, 1979; Eisner, 1999).

Data and methods

We study the effects of VAAs in Belgium, a rather complex democracy where citizens might benefit from the use of VAAs. Firstly, Belgium is a multiparty system (Swenden, Brans, & De Winter, 2006). In 2014, a total of 13 parties were elected in the federal parliament. Indeed, voters have to perform a rather heavy task in choosing among a wide variety of parties. Furthermore, the Belgian federation actually comprises two distinct party systems, one in Flanders and one in Wallonia (Swenden, Brans, & De Winter, 2006). These party systems overlap in Brussels and join each other on the federal level. Thirdly, in Belgium voters are obliged to show up at the ballot box because of compulsory voting laws. In this way the country differs from most other countries were elections are not compulsory. Lastly, the use of VAAs is widespread, especially in the Flemish region where a VAA has been established since 1999 (Walgrave, van Aelst, & Nuytemans, 2008). The francophone version of this VAA was launched in 2014 for the first time.

The VAA in question is the Belgian Stemtest/Test électoral. This VAA is developed by academics from the Catholic University of Louvain and the University of Antwerp, in partnership with four Belgian media partners (VRT, RTBF, De Standaard and La Libre Belgique). It was launched on April 3rd 2019, more than a month before the Federal, Regional and European elections on the 26th of May. The Stemtest/Test électoral actually consists of multiple VAAs because of the multiple levels of government and the existence of two party systems. In fact, a total of 8 VAAs were made for the 2019 elections (2 European VAAs, 2 VAAs for Brussels, a Flemish VAA, a Walloon VAA and 2 federal VAAs). Both Flemish and francophone parties were asked to give their positions on a wide range of policy propositions. The builders then selected a set of 25 or 35 policy propositions for each VAA. Users could either "Agree" or "Disagree" with these propositions. After answering the set of propositions, they could decide to give extra weights to specific

policy questions before getting their results. In the result section, users got to see the score for every party that was included in the VAA. Also, they got the chance to compare their position on the different policy statements with those of the parties. The pictures below demonstrate how the test was (on the left) and what the result section of the Stemtest looked like (on the right).



The population under study consists of young university students aged 18 to 25. Most of these subjects are first-time voters for the federal and European elections[6]. VAA research demonstrated that young people just entering political life, women and citizens with lower levels of political interest are those strongly affected by VAA exposure (Garzia & Trechsel, 2017). Our research aims to understand if the general finding that young people are more impacted by the use of a VAA holds for youngsters more interested in politics.

[6] Nonetheless, it is worth noting that Belgium held local elections in October 2018.

In order to minimize the effect of the electoral campaign and to maximize the number of people who had not yet done the Stemtest, we conducted the field experiment on the launching date of the VAA April 3rd until the 6th of April. After cleaning the data we were left with 387 students. Of these students, 141 had a residency in Flanders, 186 in Wallonia and 60 in Brussels (of which one indicated Dutch as his or her first language). So in total, we have 142 Flemish respondents and 245 francophone respondents in our dataset.

We asked students in Humanities from the three universities (ULB, UCLouvain and UAntwerpen) to fill in a short online questionnaire on their political knowledge during lecture. Students that had already done one of the VAAs were filtered out of the survey. After asking a few socio-demographic questions, respondents were randomly assigned either to the EU elections VAA, the Federal elections VAA or to watch a YouTube video about US politics[7]. Those who were redirected to a VAA were part of our treatment group and the others were part of our control group. Flemish respondents were redirected to Flemish versions of the VAA and francophone students were redirected to the French version[8]. In the cleaned dataset, 149 students got no VAA (but a video treatment), 123 students got the European VAA and 115 students got the federal VAA.

Results

Impact of the VAA on political knowledge

To answer the question of political knowledge, we asked respondents to indicate all parties that agreed with 8 presented VAA statements (See appendix for statements). 4 of these statements were present in the European VAA and 4 were present in the Federal VAA. People that live in Flanders had to position 7 Flemish parties that were present in 'de Stemtest'. People with a residency in Wallonia were asked to indicate 7 francophone parties. People living in Brussels either had to indicate the francophone or the Flemish parties, depending on their first language. Since we know the exact positions of these political

[7]We used a video about US politics because the questions in the survey were all related to politics. On the one hand, a task that had nothing to do with politics would have been strange for the respondent. On the other hand, a video or article about national or European politics might have primed the students and would have made it more difficult to disentangle the effects between control and treatment group. The video used during the experiment can be accessed using the link below:
https://www.youtube.com/watch?v=lrk4oY7UxpQ&feature=youtu.be

[8] The Flemish and French versions of the federal and European VAAs largely overlap. The federal VAAs have 23 out of 35 policy statements in common. The European VAAs have 17 out of 25 statements in common.

parties on the questioned statements, we can clearly compare the party answers with the perceived party answer of respondents. People who did not indicate any party on the 8 statements were filtered out of the analysis.

There was no 'don't know' option so we could not tell the difference between wrongly not indicating the party or not knowing the position of the party. Because of this issue, we decided to only compare the answers of parties that agreed with the statement with the respondent's answer for that party on that respective statement. In this way, we can clearly distinguish a wrong answer from a correct answer. The disadvantage of this method is that we do not look at the answers for parties that did not agree with the statement.

We made a knowledge measure for both the European and the Federal level. Thus, we made two sets of dependent variables, two for the Flemish respondents and two for the francophone respondents. For each political party available in the Stemtest, respondents were asked to indicate which parties they thought supported each political statement. For the European level, both Flemish and francophone respondents had to indicate 18 parties out of 28 to get a maximum score on EU knowledge. On the federal level, Flemish respondents had to indicate 10 parties out of 28 and francophone respondents 8 out of 28. We then made scales going from 0 to 100 by dividing the amount of parties the respondent indicated correctly by the total amount of parties that agreed on the statements and multiplying by 100. To pool both Flemish and francophone respondents we merged these two sets of measures into two measures.

To answer the question of the effect of participation in a VAA on political knowledge, we use T-tests to compare the mean differences between the experimental groups. We made two dummy variables to distinguish the treatments given to respondents, that is, a federal treatment or an EU treatment. The purpose of these tests is to see whether political knowledge is higher for groups that participated in the VAA compared to groups that did not. If this were the case, this would indicate that VAAs might actually increase political knowledge. We compared the means of two dependent variables: political knowledge on federal issues and political knowledge on European issues. For the first dependent variable, we compare respondents who participated in the federal VAA (treatment) versus respondents who did not (control). For the second dependent variable, we compare subjects who did not take the European VAA (control) and subjects who did (treatment).

Firstly, let us look at some descriptive statistics. It appears that students are better informed on federal issues than on European issues. This is true both for Flemish students and francophone students (see in appendix). The average Belgian student in our sample indicated 46,71% of the parties correctly on federal issues and 37,81% on European issues. Secondly, we notice that there is a slight increase in political

knowledge for each respective treatment. This might be a first indication that there is an actual increase in political knowledge. However, when we split this out according to language group we notice that for francophone students the knowledge on European issues drops after the European treatment (see appendix).

Table 1: Descriptive statistics of political knowledge among the respondents

Treatment		EU knowledge 0-100 (st. deviation)	Federal knowledge 0-100 (st. deviation)
Control group	Mean	37,88 (16,87)	45,45 (21,54)
	N	137	133
European treatment	Mean	38,69 (16,94)	45,98 (22,64)
	N	112	110
Federal treatment	Mean	36,77 (15,85)	49,20 (21,08)
	N	105	100
Total	Mean	37,81 (16,57)	46,71 (21,64)
	N	354	343

We run two independent T-tests to compare respondents who were assigned to one of the VAAs and respondents who did not fill out a VAA. We find no evidence that there is a significant difference in knowledge between students who did not get a VAA (control group) and students who did (treatment group). Indeed, we find no significant difference between students who did not do the federal VAA ($\bar{x}$ control = 45,69) and students who did ($\bar{x}$ FederalTreatment = 49,20). Similarly, we notice no significant difference between students who did not do the European VAA ($\bar{x}$ control = 37,40) and students who did

the European VAA (x̄ EU-Treatment = 38,69). Since both tests show that the differences in means are not significant we cannot rule out that these fluctuations are due to chance.

Table 1.1: T-test on party issue position knowledge among the respondents

Dependent variables	Mean target group 0-100 (st. deviation)	Mean control group 0-100 (st. deviation)	Number of observations N =	Significant differences? (Independent T-test)
Fed issue position knowledge	45,69 (21,83)	49,20 (21,08)	343 (243 control group & 100 target group)	Sig = .1724 Not significant
EU issue position knowledge	37,40 (16,41)	38,69 (16,94)	354 (242 control group & 112 target group)	Sig = .4952 Not significant

To strengthen the robustness of these results, we also split them out according to language group. Since different political parties operate in the different regions, the measures of political knowledge might not be truly comparable. We find similar results as before with no significant differences in means for most tests. However, on the Flemish level we do find a significant difference in means between respondents who did not fill out the EU VAA (x̄control=37,99) and respondents who did (x̄EUTreatment=44,84). This implies that the difference in means is not due to chance and can be attributed to taking part in the European VAA. This finding is surprising since the sample size for this subgroup is small (n=135). Further, we see that the slight drop in knowledge on EU issues for francophone students after use of the European VAA is insignificant and hence might be due to chance.

Based on these results, we reject the hypothesis that that the use of the federal VAA has a positive impact on the user's knowledge of parties' issue positions on federal matters (H1a). Regarding the effect of the European VAA on voters' knowledge of parties European issue positions we are more cautious. Both on the aggregated level (Flemish and francophone respondents together) and for francophone students alone we do not find any significant effects. However, on the Flemish level our results indicate that there might

be a significant positive effect from using a VAA on voters' knowledge of parties' European issue positions (H1b).

Table 1.2: T-test on party issue position knowledge among the respondents according to their language

Language group	DV	Mean Control group (st. deviation)	Mean Treatment group (st. deviation)	Number of observations n=	Significant differences? (Independent T-test)
Flemish	Fed issue position knowledge	53,43 (20,21)	58,89 (19,09)	135 (99 control group & 36 target group)	Sig = 0,1618 Not significant
	EU issue position knowledge	37,99 (14,54)	44,84 (17,06)	135 (93 control group & 42 target group)	**Sig = 0,0179**
French	Fed issue position knowledge	40,36 (21,36)	43,75 (20,29)	208 (144 control group & 64 target group)	Sig = 0,2853 Not significant
	EU issue position knowledge	37,02 (17,51)	35,00 (15,87)	219 (149 control group & 70 target group)	Sig = 0,4123 Not significant

Further, we also asked students how certain they felt while indicating the positions of political parties. They had to place themselves on a ten-point scale. Not surprisingly, students indicated that they felt rather uncertain. The average student in our sample would indicate a position of 4,77 on a scale to 10 (Me=5). The T-test shows us that people who did one of the VAAs are slightly more uncertain than people who did not do a VAA. However, there was no significant difference in means between respondents who did not fill out a VAA ($\bar{x}_{control}$=4,8201) and respondents who did get a VAA ($\bar{x}_{Treatment}$ = 4,7339). Hence, we cannot state that participation in a VAA increases the feeling of certainty on party positions (H1c).

Table 1.3: T-Test on the certainty of answer given by the respondents.

Dependent variables	Mean control group (st. deviation)	Mean treatment group (st.deviation)	Number of observations N =	Significant differences? (Independent T-test)
Certainty	4,82 (2,18)	4,73 (2,23)	357 (139 control group & 218 target group)	Sig = .7200 Not significant

Impact of the VAA on political attitudes

Using the experimental method, we asked different questions about political participation such as the motivation to go to cast a ballot (were they enthusiastic?), the motivation to follow the campaign, and their political interest. In order to test the impact of the use of a VAA on those variables, we conducted an independent T-test comparing the mean value of the control group and the mean value of the target group.

Table 2: T-test on some dimensions of political participation (H2)

Dependent variables	Mean control group (st. deviation)	Mean target group (st. deviation)	Number of observations N =	Significant differences? (Independent T-test)
Enthusiasm to go to vote	6.13 (2.80)	6.08 (2.72)	358 (139 control group & 219 target group)	Sig = .862 Not significant
Motivation seek for further information	5.85 (2.37)	5.86 (2.58)	358 (139 control group & 218 target group)	Sig = .973 Not significant
Political interest	6.23 (2.08)	6.28 (2.39)	358 (139 control group & 219 target group)	Sig =.825 Not significant

Our results show that there are no significant differences between the target and the control group on the variables of interest. Indeed, the differences are small between the two groups. This suggests that the impact of the VAA on the motivation[9] to go to vote, to follow the campaign and on political interest is irrelevant for our sample.

Considering these results, we can reject hypothesis H2 and all of its sub-hypothesis (a, b, c), surprisingly, the results go against what is predicted by the literature. Nonetheless, when we look at the means of each group (target and control), we can see that, except for certainty, the mean scores are not low (between 5.85 and 6.28).

Impact of the use of a VAA on the propensity to vote:

Interestingly, the use of a VAA seems to have an impact on people's propensity to vote for political parties. As we measure the propensity to vote (PTV) for a certain party as the self-reported measure of likelihood of a respondent to vote for this party, we asked our respondents to give their propensity to vote for each party on a 0-10 scale, before and after using the VAA. Using a paired T-test, the results demonstrate that there are significant slight increases in the propensity to vote for the top three parties suggested by the 'Stemtest'. The table below summarizes the results of the T-tests.

Table 3: Impact of the use of the 'Stemtest' on the propensity to vote for the parties suggested by the VAA

	Number of observations N=	General Mean before VAA use 0-10 scale (st. deviation)	General Mean after VAA use 0-10 scale (st.deviation)	Mean Difference [10; 11] (st.deviation)	Paired T- stat value	Significance (Paired T-test)

[9] operationalized as the "enthusiasm" to go to vote considering Belgium's institutional design and its compulsory voting system.

[10] When we exclude the people who answered 10 we still have significant changes at more than 1‰(top1 (n=196) =.68367; top2 (n=212) =.467; top3 (n=214) = .397) but of less importance.

[11] When we exclude those who answered 0 or 10; we still find significant results for Top1 and 2. (Top 1 (n= 157); .618 sig = 0,000 ; top 2 (n=154) ; +.487 sig = 0,001; top 3 (n=154) = .197 sig = 0,105

First party assigned	225	5.28 (3.47)	5.82 (3.40)	+.547 (1.72)	4,77	**.000 significant**
Second party assigned	225	4.31 (3.37)	5.73 (3.38)	+.427 (1.58)	4,04	**.000 significant**
Third party assigned	225	3.69 (3.36)	4.04 (3.28)	+.351 (1.54)	3,43	**.001 significant**

It seems that using the VAA had a significant effect on the propensity to vote for the parties suggested by the Voting Advice Application. Therefore, our hypothesis (H3a) "using a VAA should increases the propensity to vote for the parties that are suggested by the Stemtest" is corroborated by the data. Nonetheless, we should highlight that the effects are marginal considering the fact that the effects are between 0,35 and 0,55 on a scale from 0 to 10.

In order to test our hypotheses H3b "using a VAA should not increase the propensity to vote for parties that are suggested by the VAA but not expected by the user" and H3c "using a VAA should increase the propensity to vote for parties suggested by the VAA which are expected by the user "; we examine the self reported propensity to vote (PTV) for parties suggested by the Stemtest. If the PTV was equal or lower than five we assume that the result was unexpected by the user and that if the results was between 6 and 9[12] the result was expected.

TABLE 3.1: Disconfirming advice's impact on users (Propensity to vote *ex-ante* equal or lower than five)

	Number of observations N=	General Mean before VAA use 0-10 scale (st. deviation)	General Mean after VAA use 0-10 scale (st. deviation)	Difference (st. deviation)	Paired T-Test Value	Significance (Paired T-test)
First party assigned	110	2,17 (1.94)	3,16 (2.67)	+.990 (2.03)	5.109	**.000 significant**
Second party assigned	127	1,76 (1.96)	2,50 (2.58)	+.732 (1.77)	4,650	**.000 significant**

[12] We voluntarily excluded the people who answered 10 since, it is not possible to increase the PTV above 10. It is worth noting that our results were not significant using a 6-10 scale.

Third party assigned	143	1,49 (1.82)	2,12 (2.21)	+.629 (1.63)	4.617	**.000 significant**

Our results are challenging Taber and Lodge's (2006) work since we see that despite a low *ex-ante* PTV for the three parties suggested by the VAA, we see a significant increase *ex post* from .629 to .990 in mean which, again, is marginal. Therefore, we see that despite being politically interested, having disconfirming advice do not lead to the rejection of the VAA. The hypothesis H3b can be rejected.

TABLE 3.2: Confirming advice's impact on users (Propensity to vote *ex-ante* between six and nine)

	Number of observations N=	General Mean before VAA use 0-10 scale (st. deviation)	General Mean after VAA use 0-10 scale (st. deviation)	Difference (st. deviation)	Paired T-Test Value	Significance (Paired T-test)
First party assigned	86	7.65 (1.06)	7.94 (1.25)	.290 (.852)	3.163	**.002 significant**
Second party assigned	85	7,24 (1.23)	7,31 (1.50)	.070 (1.24)	.524	.602 Not sig.
Third party assigned	71	7.15 (1.02)	7.08 (1.68)	-.070 (1.26)	-.472	.638 Not-sig.

Our results for H3c are also interesting since our hypothesis is partly confirmed. Indeed, the users who had a high PTV before taking the Stemtest did not increase their PTV for the second and third parties suggested by the VAA. Nonetheless, there is a low but significant increase of .290 which partly confirm the fact the hypothesis that using a VAA should increase the propensity to vote for parties suggested by the VAA which are expected by the user.

Discussion

We find little support for most of our hypotheses in our analysis. First of all, we do not find convincing support for the positive effect of VAAs on voters' knowledge of parties' issue positions. We suspect that

this absence might (partly) be due to flaws in the data. Firstly, our sample is quite small. This might explain why we do not find significant effects. A future replication of this study with a larger sample might reveal different results. Secondly, our dataset was composed of both Flemish and francophone students. As explained above, both live in different party systems with different political parties. And although the issues at stake might be the same in Flanders and francophone Belgium, the perception and salience of issues might diverge which might have had an impact on political knowledge. Lastly, the experimental setting is not a natural setting. Students were asked in class to fill in the VAA. Most of them did probably not take the time to explore the VAA and parties' positions. Indeed, the average time of a student to fill out both our survey and the VAA was rather fast, 11 min 36 sec. In addition, people had to go out of the survey in order to fill in the VAA. Therefore, we had no strict control over students' actions.

We do find some small indication that Flemish students learned more about parties' EU positions because of the European VAA, considering a small sample of 135 Flemish students (93 control group & 42 target group). The European level would be the most expected level where learning could take place. Our respondents where less knowledgeable about this level of government compared to the national level of government. Therefore, there was more leeway to learn something. However, we cannot duplicate these findings in francophone Belgium or on an aggregated level.

Likewise, we also did not find any significant effects of VAAs on students' certainty of parties issue positions. Both an increase and a decrease might be interesting. Suppose that subjects certainty would have increased. On the one hand, such an increase might be encouraging if the accuracy of subjects knowledge would also rise. If this were not the case than an increase in certainty due to the use of a VAA might be worrisome because respondents would be more certain while not having gained more knowledge. A decrease in certainty would also be interesting. Koch (2003) writes that citizens with a low certainty of candidates issue positions might be more motivated to seek further information up until the point that they feel comfortable with their certainty level. In this way, the purpose of VAAs might also be attained.

Further, we do not find any evidence that using a VAA increases subjects' enthusiasm to cast a vote, the motivation to follow the campaign and the political interest. We think the absence of such effects can in part be attributed to ceiling effects. Most studies show that VAAs especially have an impact on marginalized, less educated, and young citizens with low political interest. Our sample had a particular composition. We mostly had access to students from Humanities. These subjects are in higher education and are interested in politics. Indeed, the mean for political interest in our sample is equal to 6,38 (Me=7) on a scale to 10. This is quite high if you consider that the mean for political interest among the general

population is equal to 5,49 (n=7584) and 5 for citizens between 18 and 25 years old (n=840)[13]. Even more, most students planned to follow the campaign and were enthusiastic about the vote. In addition, previous research has demonstrated that education is strongly correlated with the propensity to look for political information, the level of news consumption and the level of political knowledge (Mahéo, 2017). It is difficult to raise attitudes that are already quite high. Therefore, we think ceiling effects hinder the positive effect of VAAs on students' political interest, their motivation to follow the campaign and enthusiasm to cast a vote.

Nonetheless, despite a lack of impact by the VAA on several dimensions, the VAA test does have significant impacts on students' propensity to vote. Indeed, our analysis shows that the top 3 of parties assigned by the VAA to the respondent helped to improve the respondent's evaluation of these parties. However, despite its high significance this effect is quite limited.

The results also helped to see how users react to disconfirming advice. Using their self-reported value of propensity to vote for the parties suggested by the VAA before taking the test, we separated them in two groups: those who attributed a score equal or lower than five (we assume that the results were unexpected for them) and those who attributed a score between six and nixe (we assume that the results were expected for them). It seems that having unexpected results increases the PTV ex-post while having expected results only has an impact on the first party suggested by the VAA. The results for counter-attitudinal suggestions by the VAA goes against some of the findings from political psychology and should be tested on a larger sample, taking into account the political interest of the respondents.

[13]The data mentioned here originate from the Belgian RepResent project funded by EOS. RepResent is a partnership between five Belgian universities (UCLouvain, KULeuven, ULB, VUB and UAntwerpen). The project examines the 2019 elections in Belgium, the campaign that precedes it and the term that follows. Using a large variety of methods all with a dynamic component and ranging from traditional panel surveys, over content analyses and experiments, to focus groups and interviews, RepResent aims to dig deep into one of the root causes of the widespread democratic resentment characterizing current politics.

Conclusion

In this short article, we examined the impact of the 'Stemtest', the Belgian Voting Advice Application, on young university students ahead of the Federal and European legislative elections of 2019. The targeted population was specifically chosen because of its level of education and the assumption that the population was interested in politics which should *a priori* reduce the effect of the VAA. Using an experimental design in which the respondents of our survey were randomly redirected to a VAA or not, we tested the impact of the VAA on users' knowledge and certainty of parties' issue positions, the propensity to vote for each party, the motivation to go to vote, the motivation to follow the campaign and their political interest.

We find support for a significant positive effect of using a VAA on students' support for political parties suggested by the VAA, although this effect is marginal. Furthermore, our analyses go against current literature on (in)congruent information and the effects on attitudes: we find that unexpected results increase the propensity to vote for the parties suggested by the VAA while having expected results only increases the propensity to vote for the first party suggested by the tool. Second, we do not find convincing support for the positive effect of VAAs on voters' knowledge and certainty of parties' issue positions. Lastly, surprisingly, the use of a VAA does not increase university students' enthusiasm to vote, their motivation to follow the campaign or their political interest. Indeed, despite the general agreement in the literature about the impact of the VAA on those variables, it seems that it did not work for our young citizens in higher education. We think ceiling effects for the variables of interest among this particular population might (partly) explain the absence of a VAA impact (Mahéo, 2017).

This research faced a few limitations. First of all, our sample was quite small. This might have had an impact on the absence of significant VAA effects on our subjects. A replication of this study with a larger sample might reveal significant effects on political knowledge in particular. Furthermore, despite assessing the fact that the control and target groups were randomly assigned, the population for our study was not representative due to a lack of resources to reach this kind of sample. Lastly, to assess the impact of the VAA on the variables of interest in the long-term, it would have been better to conduct a panel study with a wave before the elections (as we have done) and a wave after the election. This was not possible due to the EU's General Data Protection Regulation. Nevertheless, this exploratory research shows quite interesting results and opens the way to further research on a young population, both politically interested and uninterested.

Finally, the effects of the VAA on the propensity to vote (PTV) for political parties are highly interesting and suggest going further than the duplication of the studies on a larger representative sample. Indeed, it is still unclear how the VAA has an impact on the propensity to vote and the mechanisms behind the change. It would be interesting to dig deeper in order to know the implications that a VAA can have on users on party choice.

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Appendix

Political knowledge

Comparison of political knowledge between Flemish and francophone students

Language group	DV	$Mean_{Control}$	$SD_{Control}$	$Mean_{Treatment}$	$SD_{Treatment}$	t	Df	p	$n_{Control}$	$n_{Treatment}$
Flemish	General knowledge	0,4267	0,1516	0,456	0,1757	-1,04764	128,6766	0,2973	56	82
	EU knowledge	0,3799	0,1454	0,4484	0,1706	-2,257	69,0089	0,0272**	93	42
	Federal knowledge	0,5343	0,2021	0,5889	0,1909	-1,445	65,4617	0,1532	99	36
Francophone	General knowledge	0,378	0,1884	0,3697	0,1643	0,3312	152,6502	0,7409	82	137
	EU knowledge	0,3702	0,1752	0,35	0,1587	0,8514	148,024	0,3959	149	70
	Federal knowledge	0,4036	0,2135	0,4375	0,2029	-1,0926	126,7737	0,2766	144	64

Political participation

Comparison between the treatment and the control group for the second hypothesis

Dependent Variable	$Mean_{Control}$	$SD_{Control}$	$Mean_{Treatment}$	$SD_{Treatment}$	t	Df	p	$n_{Control}$	$n_{Treatment}$
Enthusiasm to go to vote	6.13	2.80	6.08	2.72	.174	356	.862	139	219
Motivation to look for further information	5.85	2,37	5.86	2.58	-0.33	355	.974	139	218
Political interest	6.23	2.08	6.28	2.39	-.221	323.51	.825	139	219

Propensity to vote

Paired T-test to test changes in the propensity to vote for the parties suggested by the Stemtest

Propensity to vote	Party	$Mean_{before}$	SD_{before}	$Mean_{after}$	SD_{after}	t (paired)	Df	p	n
General	First Party assigned	5.28	3.47	5.822	3.40	4.771	224	.000	225
General	Second party assigned	4.31	3.37	4.73	3.38	4.037	224	.000	225
General	Third Party assig	3.69	3.359	4.04	3.27	3.426	224	.001	225

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Confirming Advice	First Party assigned	7.65	1.06	7.94	1.25	3.163	85	.002	86
Confirming Advice	Second party assigned	7.23	1.03	7.31	1.50	.524	84	.602	84
Confirming Advice	Third Party assigned	7.15	1.02	7.08	1.68	-.472	70	.638	71
Disconfirming Advice	First Party assigned	2.17	1.94	3.16	2.67	5.109	109	.000	110
Disconfirming Advice	Second party assigned	1.76	1.96	2.50	2.58	4.650	126	.000	127
Disconfirming Advice	Third Party assigned	1.49	1.82	2.12	2.20	4.617	142	.000	143