

The effects of Voting Advice Applications (VAAs) on pre-voting citizens' political trust

Laura Uyttendaele
UCLouvain – UAntwerpen
laura.uyttendaele@uclouvain.be

Abstract

The *Stemtest/Test électoral éducatif* is a Voting Advice Application (VAA) providing citizens with personalized information on their ideological profile by comparing their stance on a selection of political issues with those of parties. While several scholars agree that VAAs are interactive tools to assist young people in familiarizing themselves with political issues and ideological positions and can be used as a teaching resource for citizenship education, field research examining the effects of VAAs on young people particularly is lacking. This study aims to explain the effects of a VAA on pre-voting citizens' political trust. We set up an original experiment that takes place in the classroom with 5th and 6th-year secondary pupils in schools all across Wallonia, in the French community of Belgium. First results showed that the intervention of a VAA in the classroom contributes to raising pupils' political trust. We use structural equation modeling to investigate two explanatory models of VAA effects on political trust: the information background model (including political information and political interest variable) and the socialization model (adding family background and political efficacy factors). We can state the effects of a VAA intervention on political trust are not driven by respondents' sense of political efficacy nor information but is indeed the most important factor in the models. Although VAA use does not affect respondents' sense of external political efficacy, the latter also plays a large role in shaping their political trust.

Keywords : Voting Advice Application, Political efficacy, Political trust, Youth, Citizenship education, Experimental design

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Introduction

Due to the transformation of political systems in liberal democracies that eventually lead to extensive depoliticization and political apathy of the mass population, today we are witnessing low levels of political knowledge, interest, trust, and participation especially on the part of young citizens (Moeller et al., 2018). For some years now, scholars also denoted youth's lack of sense of political efficacy: There is evidence of diminished civic norm of voting duty and civic attachment among youngsters (Hahn, 1999; Muxel, 2018; White et al., 2000). Yet, the effect of the early years and early socialization has been highly recognized as determining for the formation of political attitudes and identity. These structures tend to crystallize by the time an individual reaches adulthood, with relatively little change thereafter (Galston, 2001; Hooghe & Wilkenfeld, 2008; Nie et al., 1996; Rekker et al., 2017). In that respect, to make politics appealing to citizens at a young age is determining for their engagement in the long run and thus for the future vitality of democracy.

School and the media (and especially digital media platforms) are two main channels for delivering information about politics to pre-voting citizens, those right below voting age, which would contribute to raising levels of knowledge and understanding (Quintelier, 2015). The Internet offers many alternative information possibilities. It is within this framework that *Voting Advice Applications* (VAAs) were developed. The main goal of these tools is to link voters' preferences to parties' policy proposals; these tools then highlight the proximity between the user and the available political parties (Walgrave et al., 2009). In practice, users fill in a web-survey according to their opinions on a set of issues. By comparing their position with those of political parties, the applications generate voting advice and suggestions (Cedroni & Garzia, 2010; Garzia & Marschall, 2019). Among other tools, VAAs can be an answer to the lack of political information and to foster democratic attitudes. This original experimental research seeks to test evidence from previous VAA research applied to the specific population of pre-voting citizens.

VAAs are expected to be particularly popular among young voters and have the potential to increase voter turnout, political knowledge, and trust. While several scholars agree that VAAs can be potentially used as a tool of citizenship education (Fivaz & Nadig, 2010; Kristensen & Solhaug, 2017), very few studies have examined the effects of VAAs on young people particularly. VAA users are expected to feel better informed and better prepared than non-users (Boogers & Voerman, 2003; Enyedi, 2016). VAA usage appears to have an effect on electoral turnout particularly among people at lower educational levels, younger people and

citizens with low levels of political information or interest, with a weak or no party identification and limited political knowledge. Since these are voters that appear to be more difficult to mobilize in elections, the widespread use of VAAs seems to contribute to the functioning of representative democracy, for which the level of electoral turnout is considered an important indicator (Gemenis & Rosema, 2014; Rosema et al., 2014).

However, VAA research suffers from a recurring sample self-selection bias. VAAs are freely available online during election campaigns and usually attract, to a large degree, citizens with an already very high interest in politics. 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). VAAs are sometimes blamed for “preaching to the converted” (Boogers & Voerman, 2003; Fivaz & Nadig, 2010) and thus missing their target (Uyttendaele et al., 2020). If the aim is to claim about the causal effect using VAAs, a comparison of VAA users (experimental treatment group) to non-users (control group) should be made (Mahéo, 2016). In this case, the research aims to evaluate the potential of VAAs on pre-voting citizens' political trust. An experiment conducted in the field is thus the most reliable and soundest way to empirically isolate the effects of VAA usage, free of other confounding factors (Hooghe et al., 2010). Since the target population consists of pre-voting citizens, the device can be tested in classrooms. Unlike research conducted in decontextualized laboratory settings, classroom settings are relevant to natural contexts and the educational process.

This research thus aims at crossing literature on youth socialization and political attitudes under the scope of VAAs. Research on youth and political socialization highlighted that the period between the age of 16 and 18 is a key time for citizenship education: During this period just below the legal voting age, adolescents create their own opinion, are not so sensitive anymore to the opinions of their friends, and will soon have to vote from the age of 18 (Quintelier, 2008; Stiers, Hooghe, & Dassonneville, 2020). This category of the population can be defined as pre-voting citizens. Furthermore, studying political behaviors and attitudes of high school pupils should hold a great interest since they are the target audience for citizenship courses: Youth is expected to grow into adult citizens who regularly follow public affairs, cast informed votes, and sometimes take actions to influence decision (Hahn, 1999; R. G. Niemi & Hepburn, 1995).

The expected effect of the *Test électoral éducatif* on political trust

The current study aims at demonstrating the effects of a Voting Advice Application, *le Test électoral éducatif*¹, on the specific population of pre-voting citizens in a context of newly established citizenship education using an experimental design. Participating pupils are either assigned to use the VAA (intervention group 1), or to answer an opinion survey – with the same statements as the VAA but without receiving voting advice (intervention group 2), or to answer a survey on their leisure-time activities (control group). In order to assess within-person change, measurements are taken at three time points: a pre-intervention questionnaire was distributed (Wave 1); About a month later, the intervention, as well as post-intervention measurements, took place (Wave 2); a one-month post-intervention follow-up questionnaire was distributed (Wave 3). Pupils using the VAA are expected to show a higher level of political trust.

Adolescents, nowadays, have only known social, economic, and political crises that threaten western societies for thirty years. On the one hand, this generation, torn between indifference and radicality, is characterized by a generalized mistrust. On the other hand, youngsters are also bearers of optimism related to their age and their hopes for the future. But due to the mistrust itself, they cannot find any motives for a solid and lasting political commitment (Muxel, 2018). However, political trust is one of those stable attitudes that can be developed during adolescence (Hooghe & Wilkenfeld, 2008; Uslaner, 2002). Political trust is one of the predictors of civic participation and engagement (Campbell, 2009). Trust is critical to democracy, it should be developed and acquired early during adolescence. Experiential theories of trust advocate that trust is strongly influenced by personal experiences regarding political institutions or actors. These experiences can spill-over to generalized political trust judgments (Bowler & Karp, 2004; Sønderskov & Dinesen, 2016). Information about single group members can be abstracted, generalized, and used as heuristics for group judgments. Political trust reflects current experiences with politicians and changeable (statelike) through information on that individual politician.

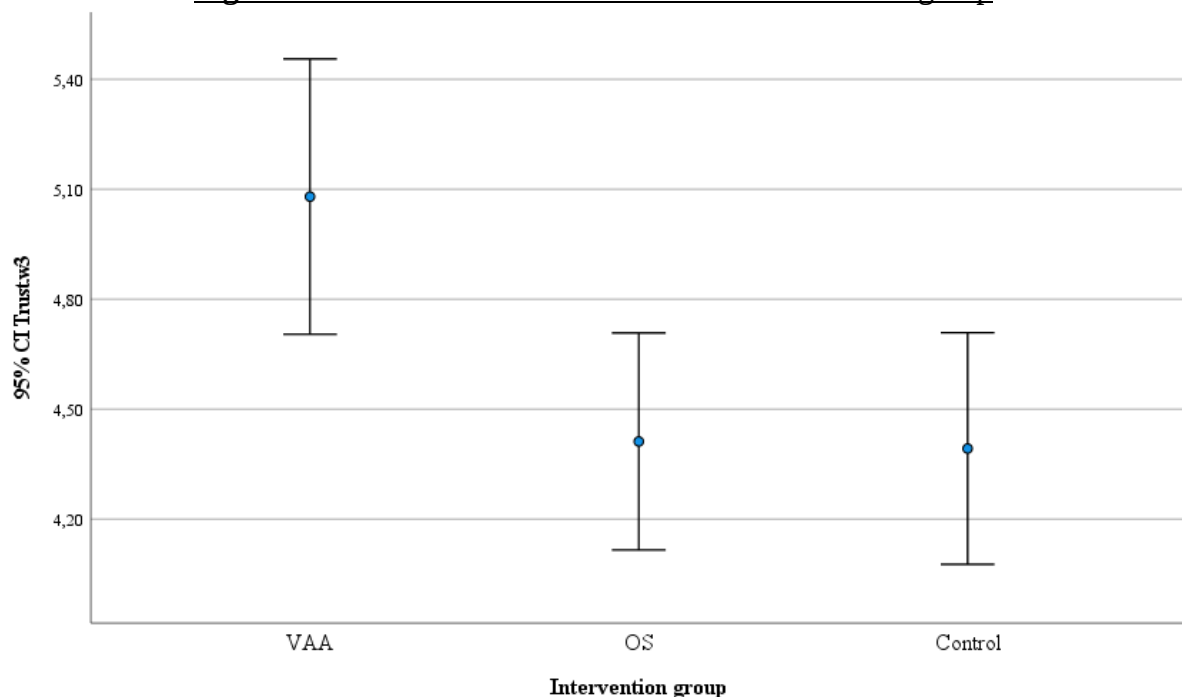
Voting Advice Applications not only serve to provide information during electoral campaigns but their designers also intend to encourage young users to develop their civic skills and political knowledge more particularly on political parties and candidates (Garzia & Marschall, 2014). By using a VAA, first-time voters and pre-voters put their opinions in

¹ Available online at www.testelectoraleducatif.be : The Stemtest/Test électoral is a VAA developed by academics from the University of Louvain and the University of Antwerp, in partnership with four Belgian media partners (VRT, RTBF, De Standaard and La Libre).

perspective into the political landscape, for some of them for the first time. Young users challenge their beliefs to a potential voting choice through their personalized VAA result and thus experience an active reflection on their ideological proximity with political parties. VAAs offer an important kind of information that measures ideological congruence between an individual citizen and the ideological position of parties (Mayne & Hakhverdian, 2017) and that conditions the mobilization or demobilization. Using a VAA can give one's perception that one's political views are to some extent echoed by at least one of the available political parties (Dinas et al., 2014) and thus enhance their trust in political institutions. VAAs have a particular role to play in users' levels of trust in the political parties - to which they directly compare their opinions, the parliament - the institution in which these parties operate, and the politicians - those who comprise these parties.

As can be seen on the error bar graphs (Figure 1 below), the VAA group indeed shows the highest score on the political trust scale. First results have shown that pupils who used a VAA in the classroom show higher levels of political trust compared to non-users, up to one month after the intervention. Respondents in the VAA group show a mean score of 5.08 (S.E. 0.19) on that scale. At the end of the study, the opinion survey (OS) and control groups show a similar level of trust in political institutions with a score of respectively 4.41 (S.E. 0.15) and 4.40 (S.E. 0.16).

Figure 1. Political trust at wave 3 for each intervention group



The following paper seeks to answer the following question: ***How can the impact of a VAA intervention in the classroom on pre-voting citizens' political trust be explained?***

First path: The information background model

Political knowledge is central to democratic citizenship. Political knowledge structures the way that citizens reason about politics (Popkin & Dimock, 1999). Ignorance is the parent of fear, and knowledge is the parent of trust. The more a citizen feels knowledgeable on political affairs, the less likely they are to experience mistrust of political institutions (Galston, 2001). This assumption is based on the idea that citizens use information shortcuts to evaluate political institutions. Citizens take their cue from their political knowledge for their evaluation of political institutions within a complex federal system such as the Belgian state. In such a context, those who feel better politically informed tend to show higher political trust.

Three kinds of VAA outputs contribute to achieving the goal of increasing users' knowledge (Garzia, 2010): Procuring information about the policy proposals of parties involved in an election; analyzing the information in terms of the fit with the user's own preferences; and assisting the user in applying this information, through an easy-to-understand "results" page, in deciding how to vote.

A VAA intervention in the classroom is thus expected to raise pupils' feeling of political knowledge, and in turn, their levels of trust in political institutions. We aim to test whether the assumption that citizens who feel better politically informed tend to show greater political trust, can be applied to our "politically inexperienced" population of interest. We might put forward the hypothesis that "The impact of a VAA intervention on pre-voting citizens' political trust is driven by their sense of political knowledge".

Second path: The socialization model

Political trust understood as citizens' confidence in political institutions, is an ambivalent concept (Catterberg & Moreno, 2005). Both distrust and trust in political institutions can be seen as beneficial to a healthy representative democracy. Citizenry distrust might be the reflection of a critical outlook (Hooghe & Zmerli, 2011) meaning that citizens do not place blind faith in their trustees. Rather than the evidence of a critical citizenry, the erosion of political trust is also closely linked to disillusionment and disaffection (Catterberg & Moreno,

2005). Nevertheless, as citizens show a high level of political trust, this indicates that they perceive that their country is run for the benefit of all the people. Citizens' trust in the political institutions is their expression of a positive feeling towards public authorities (Catterberg & Moreno, 2005; Sharoni, 2012).

Those who are more trustful are those who are successful in social, economic, and political life (Zmerli & Newton, 2011). Winners in society have more reason to place their trust in the institutions that protect their success. Children learn to trust or distrust by experiencing how they are treated by others. Their individual socialization experiences influence their evaluation of institutions (Rose & Mishler, 2011). Political trust indeed hinges on one's perception of political institutions' performances, openness, and responsiveness. One's sense of political efficacy expresses one's confidence to effectively participate in politics and whether the system allows one to (Karp & Banducci, 2008; Richard G. Niemi et al., 1991). We thus posit that "The impact of a VAA intervention on pre-voting citizens' political trust is driven by their sense of political efficacy and their family background".

The Walloon context

Furthermore, since the beginning of the 2017 school year, an education in philosophy and citizenship has been organized in the French community of Belgium (*Communauté française de Belgique*)². It is therefore expected that all schools will participate in the acquisition of a range of skills related to citizenship. However, teachers, in various subjects, still struggle to appropriate the tools to transfer these skills. Thus, citizenship education often remains a textbook experience. Although education in philosophy and citizenship (*éducation à la philosophie et à la citoyenneté, EPC*) is organized, not all schools offer a course specifically dedicated to philosophy and citizenship. This is because the school system is organized into a number of school "networks"/groupings of schools according to funding and management type. The two main high school networks (both in terms of the number of pupils and schools) are the Community schools network (*réseau de la Communauté française*) and the subsidized free schools' network (*réseau libre subventionné*). Community schools are neutral in terms of religion, unlike free schools that are mainly supported by an organization affiliated to the Catholic Church. The latter are thus particularly hostile to the organization of a course of philosophy and citizenship (*Cours de philosophie et de citoyenneté, CPC*): the delivery of this course would be done at the expense of the religion course. Only community schools are

² Education in Belgium is regulated by the three federated communities (French, Flemish and German-speaking). Belgium has thus three autonomous education systems.

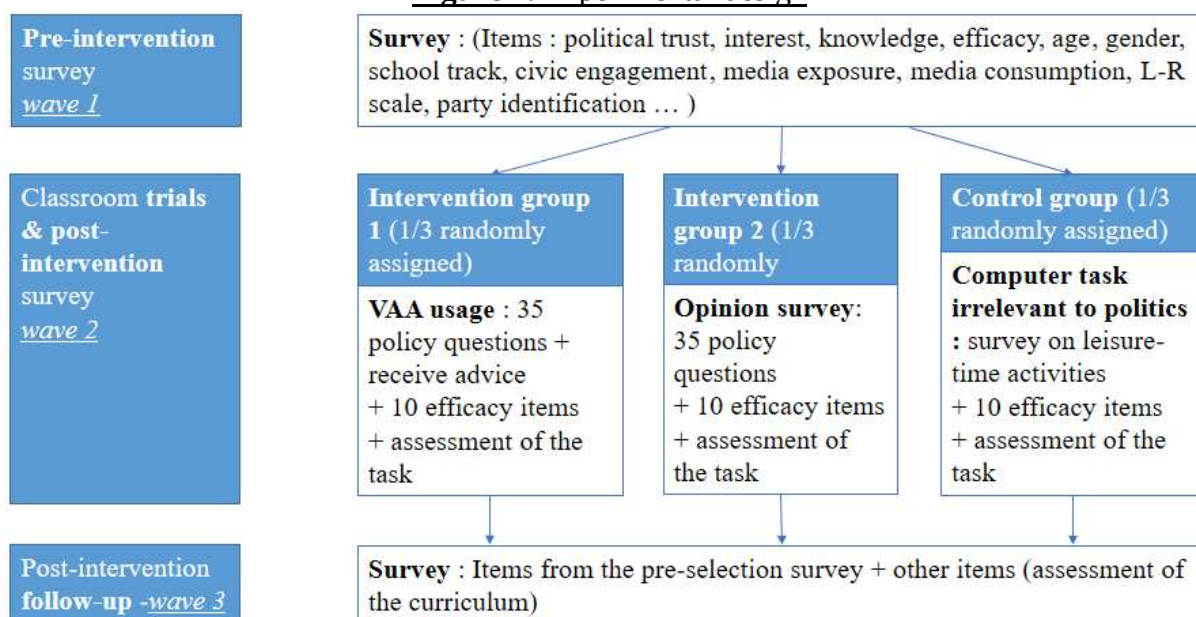
concerned by this course. Free schools keep their compulsory religion course but distill philosophy and citizenship through different courses – such as geography, social sciences, and French classes.

Moreover, assisting Belgian youngsters from the age 16 to form an opinion is a prominent issue, particularly since the establishment of the new Belgian federal government in October 2020. Lowering the voting age to 16 is one of the key objectives of the government agreement of Alexander De Croo's team. Indeed, the government has decided to grant the right to vote to teenagers to 16 years old during the 2024 European elections. Evidence from a 2018 case-study in Ghent shows that adolescents are indeed able to vote as congruently as adults (Stiers, Hooghe, & Goubin, 2020).

Methods

In order to isolate the effect of the use of a VAA from other variables in a natural classroom setting, I set up an original and replicable experimental protocol. This three-group *pretest-posttest design* (see Figure 2) is somewhere in-between survey experiments and experiments in the field: A survey treatment is part of the field intervention, which has an experimental intervention embedded. The experiment takes place in a natural classroom or computer room settings with 5th and 6th-year secondary pupils in high schools all across Wallonia. Recruited teachers were also surveyed to collect data on their years of experience, the course material they used with the participating pupils, etc.

Figure 2. Experimental design



Where lab experiments distort natural behaviors and fail to accurately simulate any real-life situations, field experiments genuinely integrate into natural settings (Druckman et al., 2006). Experimental approaches are the most suitable to answer causal research questions. A rigorous experimental design allows us to effectively establish causal relationships between variables (Slavin, 1999). In turn, cause can be confidently associated with effect in independent measures design. The latter design method consists of taking a measure from a control group and compare that against an experimental group who have received some sort of treatment (O'Donnell, 2005). The control provides the yardstick through which change can be assessed (Clark et al., 2019). The independent variable, or the levels in the IV, is the key component that differs between conditions.

SEM analyses were conducted in the software STATA 16. SEM allows us to disentangle indirect from direct effects on outcome variables. Moreover, it is used for analyses of latent variables, in this case, a latent construct of political trust (cf. *Measure* section below)

Location and timescale

This *longitudinal experiment* is carried out in a natural classroom setting. The filling-in of questionnaires and the performance of one of the three computer tasks take place in the classroom or the computer room during the class hours of the teachers recruited over Wallonia. The 20 different participating schools are located in the 5 different Walloon provinces in both rural and urban areas.

This experimental research also involves the collection of data at different times (see Table 1. *Measurement instrument matrix* in the appendix). Data were collected during the first quarter of 2020. The first questionnaire (pre-intervention, wave 1) was carried out from January 20th to 29th. About a month later, from February 17th to 21st, pupils performed one of the three computer tasks and filled a post-intervention questionnaire (post-intervention, wave 2). And last, as regards the third wave, the last survey and debriefing in the classroom began from March 9th onward (post-intervention follow-up, wave 3). I was personally present in schools when the students filled in the short post-intervention follow-up survey and then the debriefing within the same one-hour class. However, after one week of data collection in the classroom, schools in the French community of Belgium have closed from March 16th onward as a result of measures taken to curb the spread of Covid-19. Further data collection has continued remotely, and respondents completed their last questionnaire from home. Thus, the third wave of data collection is spread out from March 9th to April 18th.

About 2 to 3 months elapse between the launch of the first questionnaire and the post-intervention follow-up. Although the experiment takes place outside the electoral campaign period, political issues are nonetheless a hot topic at the beginning of the year 2020. This first trimester was indeed marked by numerous attempts to form a federal government, as elections were held in May 2019. There was also considerable uncertainty as to whether a new election will be held if no government is formed. Declarations from both Flemish and francophone political parties are widely covered in the media since they have to work together to form a federal government. In such a puzzle, teachers genuinely wish to provide their pupils with the tools to decipher reams of information.

Interventions

The participants in this study are pupils either in the 5th or the 6th (final year) of high school.³ Pupils are assigned either to the main intervention group, to the second intervention group, or the control group. The intervention to which students are submitted is presented to them as a computer task to be performed in the classroom. All the interventions were designed to last (almost) as long as the main intervention. Pupils in the classes assigned to group 1 are invited to use the *Test électorale* on the 2019 federal elections. Pupils in the classes assigned to group 2 are invited to give their opinion (agree/disagree) on the 35 statements of the *Test électorale fédérale*. This intervention is presented to them as an opinion survey on public policies that affect their daily lives or those of their relatives. The content is the same as that of the VAA, but pupils do not receive a ‘voting advice’ as an outcome. Pupils in this group do not benefit from the interactive effect of the VAA. This intervention is intended to verify whether the interactive aspect of the VAA has a greater effect on pupils, or whether the simple political information stimulus included in this so-called opinion survey is sufficient to improve their sense of political efficacy, ability to evaluate parties, political information, and trust. Pupils in the classes assigned to the control group are invited to fill out a survey on their leisure time activities. This intervention, irrelevant to politics, allows assessing the extent to which the regular curriculum has an impact on students' sense of political efficacy.

Measures

Primary data sourced from pupils is collected through online surveys in three waves. The participating teachers were also surveyed once. Table 1 in the appendix shows the measurement instrument matrix and provides the source and timing at which each measurement

³ See « Participants and sampling » section in the appendix for further information

was taken. I further develop below the items used to measure the variables of interest in this paper.

Latent variable: Political trust

Political institutions play an important role in shaping a democratic society, and it is assumed that trust in these institutions is strongly related to a more comprehensive evaluation of the political system (Hooghe et al., 2015; Marien, 2017). Respondents were asked to rate their level of trust in each of the four following political institutions on a scale from zero to ten: Political parties; the federal parliament; Politicians; and the European Union (0-10 scale: 0 = Absolutely no confidence; 10 = Complete confidence). A four items construct would reliably capture political trust. However, the European Union issue is not tackled within the framework of this experiment since the intervention at stake focuses on using a VAA related to federal elections. **Political trust** – or trust in political institutions – latent construct is thus captured by three items: Trust in the Political parties; the federal parliament; and Politicians. A mean score of 4.20 (S.D. 1.75) was reported at pre-intervention.

Observed variables

The first model regards pupils' information background effect on their political trust. Citizens' knowledge of political issues is critical for their engagement, especially among the youngest (Verba et al., 1995). School is not only expected to transmit information about the political system but also to give pupils the keys to interpret it. This information allows pupils to have a better understanding of the political system and to take an active part in it (Hooghe et al., 2015). In turn, greater support for the system is likely to result from this better understanding of political issues. **Political information** is measured on a scale ranging from (0)=Not at all informed to (10)=Very informed. Pupils are asked to which extent they think they are informed about current events and political issues. These measurements were taken in waves 1 and 3. A mean score of 4.78 (S.D. .09) was reported at pre-intervention. It is assumed that the more informed respondents feel, the more trust they show. One's sense of political information is thus expected to be positively related to political trust.

Using a VAA in the classroom is expected to result in both direct and indirect effects (via political information) on political trust. VAAs, considered as education tools, do not only transmit information on parties options and their standpoints but also synthesize and structure this information thanks to the personalized “political profile” results page which allows the user to process this information (Ladner et al., 2012; Mahéo, 2016, 2017; Schultze, 2014). Youth individuals indeed make gains in terms of political knowledge when information is formatted

in simple and creative ways (Eveland & Scheufele, 2000). VAAs contribute to raise pupils' awareness of political issues and lead them to reflect on their future political choice (Garzia et al., 2017). Pupils who were submitted to use a VAA are thus expected to feel better informed about political issues.

Moreover, mistrust of political institutions is reinforced by a negative mass media environment while youth has grown distrustful of politicians, skeptical about democratic institutions like political parties. Governments, and more generally politics, are often depicted in the media as irrelevant, ineffective, and crooked. This discourse affects both young and old and devalues the public sector (Galston, 2001). It is within this context that VAAs became important players in the information environment, even outside election campaigns (Fivaz & Nadig, 2010). VAAs are independent and non-partisan websites that participate towards a strengthened trust in the political system, more particularly in multipartisan and fractionalized systems. VAAs are thus expected to have a direct and positive effect on users' political trust. A dummy variable for whether respondents were submitted to the **VAA intervention** was included in the models.

Furthermore, combined with the use of quality media for political information, a strong political interest is a predictor that positively influences political knowledge (Schultze, 2014; Sharoni, 2012). Those who express interest in politics are those who engage the most in politics and tend to be more trustful of the political institutions (Catterberg & Moreno, 2005). We also include a political interest variable that captures an individual's psychological involvement in politics as a control in the political information background (see Figure 3 below). Among other things (sports, fashion, cooking, societal issues, environmental issues, etc.), respondents were asked the extent to which they were interested in politics. (0 = Not interested ; 10 = Very interested). **Political interest** is thus based on respondents' self-rated interest in politics. Respondents' political interest was measured at wave 1 and thus refers to their initial level of political interest. Respondents' political interest is expected to be positively related to political trust and information.

We can draw one last path in our first model. We expected that the more pupils feel politically informed, the more trustful they are. Those who feel like they understand the workings of the political system and issues demonstrate a greater level of trust in institutions. As they have a better grasp of institutions and the roles of their incumbents, citizens perceive public authorities as being more trustworthy (Erber & Lau, 1990). Respondents' feeling of political information is thus expected to have a direct positive effect on political trust.

The second model taps into pupils' socialization and the family background's impact on political trust. Political socialization experiences should not be ignored as concerns the development of political attitudes although its influence weakens over the years (Corbetta et al., 2013). Socio-structural variables, as well as both aspects of political efficacy, are investigated in the socialization model. Four additional factors are taken into consideration in this second model: respondents' socio-economic status (SES), in-person political discussion with parents, internal, and external political efficacy. The hypothesized paths and models are described below (also see Figure 4).

Figure 3. Hypothesized information background model

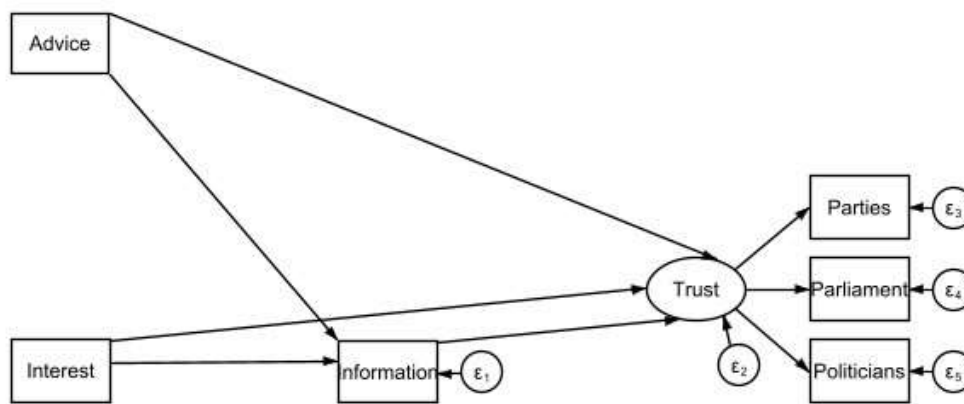
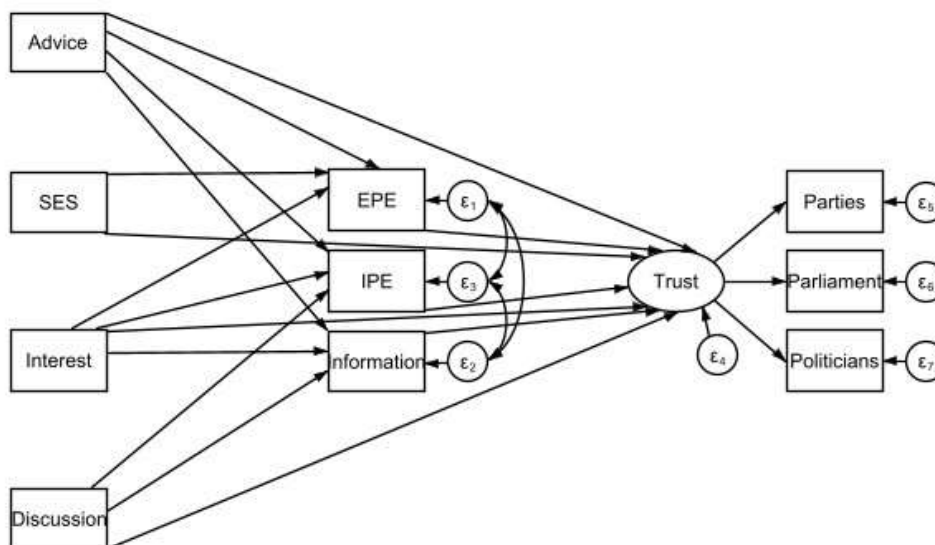


Figure 4. Hypothesized socialization model



An estimate of the household financial and material conditions (1= Very difficult conditions; 6= Very easy conditions) is used as a proxy for respondents' **socio-economic status**. Socioeconomically disadvantaged citizens tend to show lower trust in political institutions compared to advantaged citizens. The greater the financial conditions, the greater the support for established authority (Catterberg & Moreno, 2005). The most advantaged individuals are inclined to support the system that protects their privileges and to show greater confidence in incumbents. In the same way, they tend to feel their interests are better represented than less advantaged individuals and thus show greater levels of external political efficacy. Respondents' socio-economic status is expected to have both a direct and indirect (via external political efficacy) positive effect on political trust.

Moreover, we include respondents' rating of how often they **discuss politics with their parents**, measured on a 1 (never) to 5 (every day) scale. Pupils discussing politics with their parents tend to feel having a better grasp of political issues (Almond & Verba, 1963; McIntosh et al., 2007). In-person political discussions with parents participate in mitigating adolescents' feelings of political alienation in the sense that they feel more able to influence politics (Gniewosz et al., 2009). Pupils having discussions on political issues with their parents also appear to be more trusting of the political institutions (Gniewosz et al., 2009; Newton, 2001). Political discussion is thus expected to be positively related to political information, internal political efficacy, and political trust.

We could expect both internal and external political efficacy feelings to be neutral among a politically inexperienced population. However, adolescents' family background and media environment influence their sense of political efficacy. Scholars often recourse to the concept of political efficacy to understand distrust towards political authorities or political disinterest. Two dimensions generally capture the concept of political efficacy. Internal efficacy is a self-reported evaluation of one's competence, knowledge, and ability to participate effectively in politics – e. g. to take part in an election as a candidate, to feel having a good understanding of political issues, etc. (Karp & Banducci, 2008; Richard G. Niemi et al., 1991). It differs from the external efficacy, which concerns citizens' perceived effectiveness of the institutions to meet their needs or to consider their concerns. A low level of external efficacy indicates apathy towards politics and a feeling of being misrepresented (Niemi et al., 1991). Conversely, when the citizens' sense of external efficacy increases, the democratic deficit decreases.

In each questionnaire, pupils had to position themselves on 10 statements measuring IPE and EPE. Each of the 10 items is scored on a Likert-type scale that ranges from (1)= Strongly disagree to (5)= Strongly agree.⁴ The following item captures respondents feeling of **internal political efficacy (IPE)**: *When political issues or problems are being discussed, I usually have something to say*. This measure describes an individual's motivation to engage on the subject of politics and predicts their sense of political trust (Sharoni, 2012). **External political efficacy (EPE)** is captured by the following item and relates to what citizens think and want, and whether they think leaders are listening (Amnå et al., 2004): *"The government cares a lot about what all of us think"*. A high level of external political efficacy express a positive feeling towards authorities and perceived responsiveness from delegates (Richard G. Niemi et al., 1991; Sharoni, 2012). Both internal and external aspects of political efficacy are therefore expected to be positively linked with political trust. It is to be noted that respondents tend to feel a greater sense of IPE than they perceive responsiveness from the authorities. Descriptives of the observed variables are provided in Table 2 below.

Young people are citizens in the making. Hence, they represent the population on which VAAs have the greatest potential. Using such tools might trigger a positive impact on pre-voting citizens' perceptions. The possibility to introduce a VAA, *Smartvote*, as a citizenship educational tool has already been studied in the case of Switzerland by Fivaz and Nadig in 2010. Using VAAs in classrooms should offer many learning opportunities. Pupils can discuss the parties' positions and reflect on various political issues as well. Since school is one of the major places of future citizens' socialization, it has a great part to play in the implementation of a political learning project (Lafaye, 2008). Political information within the schools' curriculum is likely to enhance adolescents' understanding of the functioning of democracy and in turn their democratic attitudes (Marien, 2017), but also create a sense of internal political efficacy. Those who have a greater sense of internal political efficacy, in other words, greater confidence in their ability to participate in political processes, are those who have greater competence to recognize, understand and reflect on political issues. In that respect, we make the hypothesis that using a VAA raises pre-voting citizens' sense of internal political efficacy.

⁴ This measure contains items from the IEA Civic Education Study (IEA CES) of 14-year-olds data collection 1999–2000 such as *"I know more about politics than most people my age," "When political issues or problems are being discussed, I usually have something to say," and "I am able to understand most political issues easily."* (Internal political efficacy). External efficacy is captured by five items: *"The government cares a lot about what all of us think" "The government is doing its best to find out what people want" "The powerful leaders in government care very little about the opinions of people" "The politicians quickly forget the needs of the voters who elected them" and "When people get together to demand change, the leaders in government listen."*

Furthermore, VAAs relay information on parties' programs. VAAs also offer an important kind of information that measures ideological congruence between an individual citizen and the ideological position of parties (Mayne & Hakhverdian, 2017) and that conditions the mobilization or demobilization. Using a VAA can give one's perception that one's political views are to some extent echoed by at least one of the available political parties (Dinas et al., 2014) and thus enhance their sense of external political efficacy. Three kinds of VAA outputs contribute to achieving the goal of increasing users' knowledge (Garzia, 2010): Procuring information about the policy proposals of parties involved in an election; analyzing the information in terms of the fit with the user's own preferences; and assisting the user in applying this information, in light of an easy-to-understand "results" page, in deciding how to vote. In that respect, we make the assumption that using a VAA raises pre-voting citizens' sense of external political efficacy.

In the same way, Those who express interest in politics are those who engage the most in politics and tend to feel a greater sense of political efficacy in the sense that they feel better able to take an active part in political activities (Catterberg & Moreno, 2005). Citizens' confidence in their ability to participate in politics, in other words, their sense of IPE, as well as their perception of institutions responsiveness (EPE) are grounded in their interests for political issues (Karp & Banducci, 2008). As individuals show great political interest and engage on the topic, they develop positive attitudes towards the system. It is therefore posited that political interest is positively related to both senses of internal and external efficacy.

Table 2. Descriptives of the observed variables in the analyses (N= 330)

	Mean	S.D.	Min	Max
Political trust at wave 3 : Parties	4.28	1.96	0	10
Political trust at wave 3 : Parliament	5.29	2.03	0	10
Political trust at wave 3 : Politicians	4.19	2	0	10
Political information	5.9	1.86	0	10
IPE	3.34	1.05	1	5
EPE	2.57	0.87	1	5
Voting Advice Application	0.22	0.42	0	1
Conditions at home	4.49	0.99	1	6
Political interest	4.23	2.74	0	10
Discussions about politics with parents	2.93	1.04	1	5

Results

Figure 1 provides suggestive support for a substantial difference in trust depending on the intervention group. Proceeding with SEM analyses, the first model, the “information background” model (see Figure 5 and Table 3 below), shows a significant direct effect of using a VAA ($B=0.81$) and political interest ($B=0.14$) on political trust. Respondents’ feelings of political information do not influence their level of political trust. It is to be noted that respondents’ political interest is indeed positively related to their sense of political information ($B=0.32$) while using a VAA does not have a significant impact on it. As expected, political trust is positively driven by using a VAA and political interest, but this effect is not mediated by respondents’ sense of political information. Pupils who used the *Test électoral éducatif* in the classroom and those who show higher initial levels of political interest are those who show higher political trust levels.

Figure 5. Hypothesized information background model

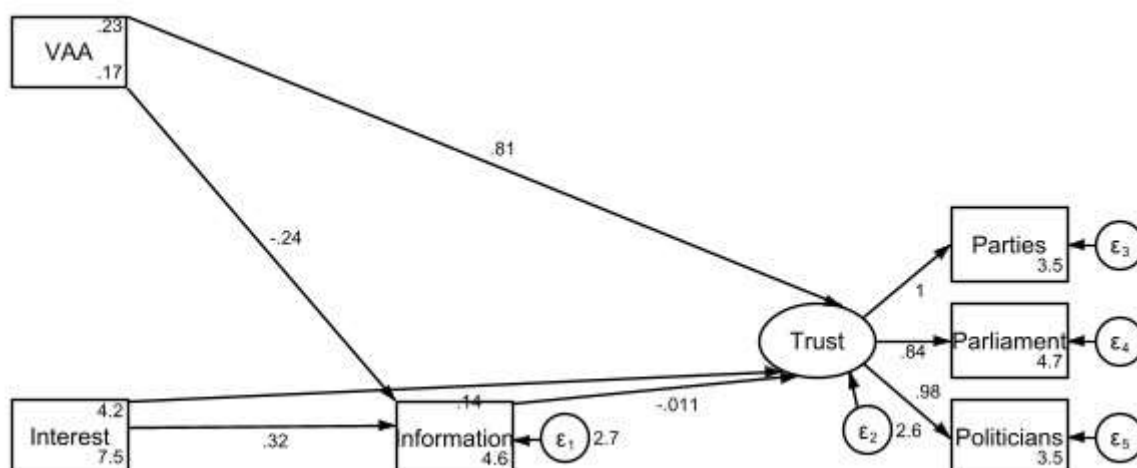
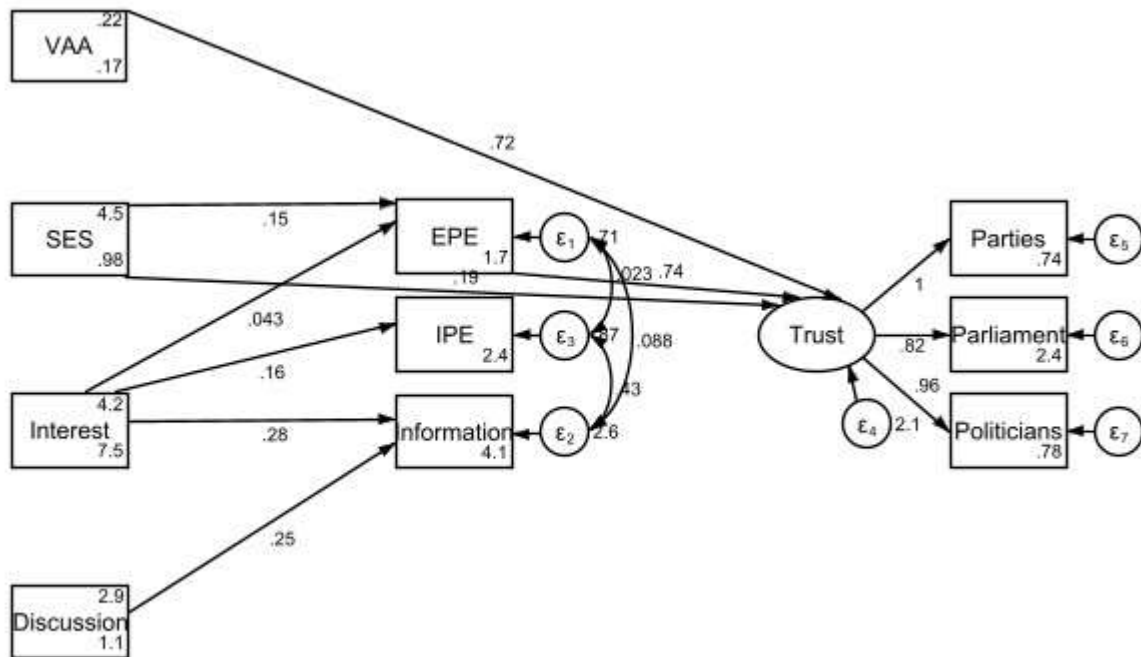


Figure 6. Significant paths socialization model

We investigate socialization and family background effects on political trust in Table 3 (also see Figure 6 for significant paths between observed variables and political trust). Pupils who used the VAA show greater political trust levels ($B=0.72$) but none of the specific indirect VAA effects are significant. As we investigate total effects of our observed variables on political trust, we can see that using a VAA is the most influential factor in our model ($B=0.86$). It is to be noted that the direct effect of political interest on political trust is not significant in this second model. However, political interest is significantly and positively related to political information ($B=0.28$), IPE ($B=0.16$), and EPE ($B=0.04$). We can see no significant effect of political discussion except that the more often respondents have political discussions with their parents, the more they feel politically informed ($B=0.25$).

All the expected effects of respondents' SES are confirmed. Favorable financial and material conditions at home are positively related to EPE ($B=0.15$) and to political trust (Total effect $B=0.3$). SES has thus both a direct effect and a partially mediated effect by EPE on political trust. Furthermore, respondents' EPE has a strong direct effect on political trust ($B=0.74$). EPE is the second strongest predictor of political trust in this model. Both effects of IPE and political information on political trust are insignificant.

Table 3. Path models for effects on political trust (unstandardized)

	<i>Information background model I</i>		<i>Socialization model II</i>	
	B	SE	B	SE
<i>Direct effect on political trust</i>				
VAA	0.81 ***	0.24	0.72 ***	0.22
SES			0.19 *	0.09
Interest	0.14 ***	0.04	0.08	0.04
Discussion			0.06	0.1
EPE			0.74 ***	0.11
IPE			0.1	0.1
Information	-0.01	0.06	-0.04	0.06
<i>Direct effect on political information</i>				
VAA	-0.24	0.22	-0.23	0.22
Interest	0.32 ***	0.03	0.28 ***	0.04
Discussion			0.25 **	0.09
<i>Direct effect on IPE</i>				
VAA			0.1	0.12
Interest			0.16 ***	0.02
Discussion			0.09	0.05
<i>Direct effect on EPE</i>				
VAA			0.17	0.11
SES			0.15 ***	0.05
Interest			0.04 *	0.02
<i>Indirect effect on political trust</i>				
VAA	0	0.01	0.14	0.09
SES			0.11 **	0.04
Interest	0	0.02	0.04	0.02
Discussion			0	0.02
<i>Total effect on political trust</i>				
VAA	0.81 ***	0.24	0.86 ***	0.23
SES			0.3 **	0.1
Interest	0.14 ***	0.04	0.18 **	0.04
Discussion			0.06	0.09
EPE			0.74 ***	0.11
IPE			0.1	0.1
Information	-0.01	0.06	-0.04	0.06
RMSEA	0.059		0.042	
N	333		330	

Unstandardized coefficients and standard error reported, *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Conclusion

This study aimed to evaluate the effects of a VAA, *le Test électoral éducatif*, on pre-voting citizens' sense of political trust in the medium run. As anticipated, the VAA group shows the highest level of political trust one month after using the VAA in the classroom. Pupils in the VAA group stand out strongly when it comes to trust in political institutions. Pupils who used a VAA do not feel better politically informed nor more efficacious. VAA users show greater political trust but this effect is not driven by the posited expected mediating factors. VAA use remains the most important factor related to political trust, pupils' sense of external political efficacy comes second. Pupils also reported being more trustful as they reported favorable conditions at home. Furthermore, the more interested a pupil is in politics, the higher their level of political trust.

This result suggests that the *Test électoral éducatif* might be a well-suited course material to enhance pupils' political trust. We can claim that higher levels of trust are due to the specific VAA intervention. Results show that the standard curricula are less effective at contributing to pupils' political trust. However, a VAA intervention does not neutralize the inequalities in the family background among teenagers. The most advantaged pupils still report higher political trust levels and perceive greater responsiveness from the authorities. Moreover, the VAA does not contribute to making pupils feeling more knowledgeable of political issues. Further analyses would allow studying whether the VAA creates a feeling of uneasiness and/or lead young users to carry out an in-depth reflection on their ideological preconceptions which could explain mitigated efficacy and knowledge feeling.

The data collected in this study allows us to investigate the other potential factors of VAA effects. For instance, pupils in the first group were asked whether they were surprised by their VAA result, we can also link their results to their a priori party identification measured in wave 1. VAA research found that the impact of such tools is influenced by the user's subjective evaluations of the tool and its content (whether users find it neutral, reliable, and trustworthy) (Enyedi, 2016). Therefore, all three groups are asked to assess the task they had just performed. A list of every primary data and their timing of collection can be found in Table 1 in the appendix.

To determine whether it can be posited that the *Test électoral éducatif* is a well-suited tool to be implemented in citizenship education, refined analyses must be conducted. A one-shot VAA intervention is indeed not a panacea for shaping youth democratic attitudes. Just as

all citizenship education tools, VAA use must be paired with a stimulating and open classroom environment conducive to learning. The designers of the *Test électoral éducatif* specifically aim at providing a gateway to political learning and invite the user to seek for further information sources to form an opinion. Multilevel regression analyses allow controlling for initial levels of trust, classroom effect, school effect, as well as differences between individuals in the change over time with age or time as level 1 variables. Mediation moderation analyses can also be conducted to have a better grasp of the mechanisms by which VAA effects occur. The present analysis could also be refined using latent constructs for IPE, EPE, or political discussion.⁵ This experimental study allows us to investigate both within and between-subjects effects. We can test and adjust models to the data collected at pre-intervention or conduct intergroup comparisons.

Limitations

The reliability and validity of the study critically depend on how the researcher collects, measure, analyze, and interpret the data. A valid research must be led to produce generalizable knowledge. The study is thus carefully designed with a representative sample of pupils and controlled variables that can be replicated by other researchers. The internal validity of the experiment is maintained by ensuring the random assignment of participants to experimental conditions (O'Donnell, 2005). The experimental setting and procedure are controlled to better represent circumstances in “real life” where a multitude of factors can vary. Otherwise, the internal validity of the study may be so compromised that one is unable to obtain significant results or is unable to identify which factor or factors have created differences in the DV. Thus a balance between the internal and external validity is found so that changes in the DV due to the IV can be confidently assessed and that the findings are relevant to other situations and populations (Adams & Lawrence, 2019).

Despite the precautions taken to ensure reliability, validity, and generalizability, this research is not free of bias. As regards the sampling methods, this research suffers from a self-selection bias, which is a recurring bias in education research. Batches of emails were sent to school principals of High school in the two main school networks in Wallonia. They chose whether they wanted to forward my request to their teachers. In turn, teachers were free to contact me if they wanted to participate with their pupils. It involves sampling bias, at several levels, since some members of the population are more likely to participate than others and

⁵ Respondents were asked how often they discuss news and politics with the following persons : Parents/legal guardian; Family; Friends; School peers; And teachers.

therefore be overrepresented (Adams & Lawrence, 2019). As a consequence, the participating teachers are probably more computer-literate and show a higher degree of openness than the general population of teachers. The dropout and attrition rate was limited, at least during the pre-pandemic period, since this population shows fewer risk factors. Nevertheless, we did not anticipate or prevent attrition due to the sanitary situation. Statistical analyses may be conducted to adjust for the effects of attrition. Adjustment techniques (such as bootstrapping or matching techniques) may be used to limit the effects of a participation loss. These participant losses are not random since some groups suffer more than others in wave 3 with dropouts at the teacher level.

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Appendix

Table 1. Measurement instrument matrix.

Instrument	wave 1	wave 2	wave 3	teacher survey
Date of birth / Age	x	x	x	x
Gender	x	x	x	x
Province/country of residence	x	x	x	
Educational track	x			
Specialization/option	x			
Willingness to pursue higher education	x		x	
Head teacher	x	x	x	
IPE & EPE (10 items)	x	x	x	
Political information	x		x	
left-right placement	x		x	
Party identification	x		x	
Political trust (4 items)	x		x	
Interests (including pol. Interest)	x		x	
Fin. and material conditions at home	x			
Parents' education level	x			
Associative activities	x			
Political discussion	x			
Media use	x			
Intervention (computer task)		x		
Duration of the task completion		x		
Surprised by the VAA result		x (VAA group)		
VAA results		x (VAA group)		
Heard and use of the VAA		x (VAA group)	x	
Evaluation of the task		x		
Voted in 2019			x	
Classroom climate (4 items)			x	x
Classroom discussion (7 items)			x	x
Teaching style & classroom activities (6 items)			x	x
Course material			x	x
School SES				x
Teacher's political participation				x
Teacher's years of experience				x
Class size				x
Class' academic level				x

Participants and sampling

The participants in this study are pupils either in the 5th or the 6th (final year) of high school. They are enrolled either in general education or with options in humanities or management subjects in technical education. Thus, the training of the pupils included in the study are either focused on theory and general knowledge in preparation for the transition to higher education (general education) or focused more on practice and technical teaching, preparing pupils for either a profession or further studies (technical education).

The recruitment process described below is intended to gain access to the population of interest and in turn to obtain a large and homogeneous sample to maximize our ability to reject the null hypothesis. The recruitment process was done by email directly to school principals. Those who welcomed my proposal then forwarded my request to the teachers in their schools. Recruitment after screening teacher replies, therefore, retained 22 teachers before the start of the first wave. With only one dropout by a teacher, the number of participating pupils in the first wave amounts to 790. The study, therefore, continues with these pupils and 21 teachers in 20 different schools.

However, this study suffers from a large dropout rate in wave 3. An in-class workshop facilitated by myself was set up with participating teachers for each of their participating classes. Unfortunately, this only actually took place for a quarter of the participants before school closures. I, therefore, suggested as an alternative to the teachers to distribute the last questionnaire via any distance-learning platform implemented by their school. The source of this high dropout rate is therefore twofold: some of the pupils or teachers appeared to be unavailable following the school closure. I did not hear back from two teachers whose - respectively 34 and 44 - pupils were assigned to the VAA group, despite reminders. The great majority of the participating teachers complied with the changing requirements, but some teachers did not hear from some of their pupils either for their requests related to my study or those related to other school activities. The three intervention groups thus show slight variations on a number of socio-demographic characteristics pre-intervention assessment because of attrition. Only pupils who participated in all three waves of survey are included for the sake of analysis.