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Individual attitudes towards internet voting: the case of France

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Abstract: Since the early 2000s, internet voting has developed considerably. However, there is still limited research that examines citizens' expectations regarding its use in the electoral process, particularly in countries that have not yet introduced internet voting. This article addresses this gap by studying the opinions of citizens about internet voting. We challenge existing preconceptions about their propensity to accept such a voting system. Our empirical analysis is based on a post-electoral survey in France. We demonstrate that French citizens broadly favor of the introduction of internet voting. The rejection of such a system is primarily due to political reasons or general social media usage. Indifference to the issue reflects the social divide traditionally observed in electoral and online political participation. Furthermore, we show that different groups emerge, depending on the arguments they use to support or oppose the introduction of internet voting.

Keywords: Internet voting; technology; political attitudes; France; political participation

1. Introduction

Since the early 2000s, internet voting has developed considerably, especially for local and national political elections (Kersting and Baldersheim, 2004; Alvarez and Nagler, 2000; Solop, 2001, von Nostitz et al., 2021). This development was partly inspired by its use within private companies (Darlington, 2017; Bérout and Dompnier, 2013; Haute, 2019). For example, internet voting systems have been introduced at various levels including local, regional and national elections in Estonia (Unt, Solvak and Vassil, 2017), Norway (Saglie and Seggaard, 2016), Canada (Goodman, 2014), Australia (Halderman and Teague, 2015), Switzerland (Germann and Serdült, 2017) and the United States (Gibson, 2001).

In this paper, we focus on internet voting, as a tool that allows people to cast their ballots remotely and without supervision over the Internet via a connected device (a computer or a smartphone), eliminating the need to visit a polling station (Neihouser, 2022b). It is distinct from electronic voting, which often includes the use of direct-recording electronic voting machines (DRE) usually installed in polling stations and thus physically supervised by some electoral management authority. More generally, electronic voting systems rely on electronic technology for their functionality and use electronic means to either aid or manage the casting and counting of ballots (Gibson et al. 2016; Krimmer and Barrat 2022). Depending on the implementation, e-voting may use standalone electronic voting machines or computers connected to the Internet. Internet voting is thus a specific subtype of electronic voting systems.

Internet voting is often presented by its advocates as potential remedy for many issues arising in electoral processes (for an overview see Germann and Serdült, 2017). For instance, internet voting is considered an instrument for combating abstention by encouraging the participation of groups that traditionally are less likely to vote (such as young people) and by facilitating access to the ballot box for specific voter groups (expats, people with disabilities, etc.). It is also praised for its ability to reduce election management costs (elimination of polling stations, speeding up the counting process, etc.). However, in a representative democracy, the electoral process must meet various conditions, in terms of both democratic norms and technical standards. In the latter respect (von Nostitz et al., 2021), the security of the ballot and its verification process must be ensured (Fitzpatrick and Jost 2022), as well as the management, ownership, hosting and control of the data resulting from the i-voting process. It is because of these legal and technical vulnerabilities that several countries have abandoned this voting option (the Netherlands) or ruled it out (Great Britain) (von Nostitz et al., 2021).

As part of the process of digital transformation of politics and society, internet voting raises more general questions about citizens' relationship with the electoral process. In some countries, the development of postal voting, early voting or proxy voting has already fragmented the electoral process and undermined its symbolic dimension (Coulmont, 2020). In others, going to the polling station to cast a ballot remains a well-rooted tradition. The dynamics of political engagement are evolving, especially among the younger demographic. Nevertheless, the traditional practice of in-person voting at a physical location, which symbolizes an individual's connection to a political body, continues to be the prevailing standard (Orr, 2015; Faucher and Hay, 2015; Coleman, 2013). In addition to fears about the security of such online polls, political opposition to this instrument - particularly at the extremes of the political spectrum - is developing (Lust, 2015). As a result, the political class may find itself divided over the introduction of internet voting.

In this context, there is still limited research that directly examines citizens' expectations in this area, particularly in countries that have not yet introduced internet voting (Neihouser et al., 2022a; Savani and Fisher 2023; Faraon et al., 2014). The aim of this article is to help fill this gap. By studying the opinions and perceptions of citizens about internet voting, we question existing preconceptions about their propensity to accept such a voting system. We develop the empirical analysis of this article by focusing on a case study, France. Based on a post-electoral survey we show that French citizens are broadly in favor of the introduction of internet voting. The rejection of this system is primarily due to political reasons and general social media usage. The lack of a clear stance on this issue reflects the traditional social divide observed in electoral and political participation. Additionally, we demonstrate that different groups emerge, distinguished by the arguments they employ to support or oppose the introduction of internet voting.

2. Literature review and hypotheses

Scholarly research on internet voting has mainly focused on three main issues: the logistics/organization of ballots, issues relating to the security of ballots and the effects of the system on voter turnout. The first question that structures the literature on internet voting concerns its organization. Internet voting is supposed to reduce the organizational costs of voting - both human and financial - by decreasing the number of administrators involved in the voting process (Smith and Clark, 2005). Studies have thus aimed to establish the objectively lower costs of each ballot, for example, in Estonia (Krimmer, Duenas-Cid and Krivonosova, 2021). However, other research based on qualitative interviews with election administrators, seems to suggest that the cost-cutting potential of internet voting is more nuanced. Krivonosova (2022) argues that, in Estonia, there is little evidence to support the expectation that Internet voting decreases the administrative burden of local election officials, particularly because these officials must also organise and oversee physical voting in parallel with internet voting. In Canada, where the management of e-elections is highly localized, Goodman and Spicer (2019) point out that the challenges and costs associated with internet voting vary according to the size of the municipalities and, more generally, the cases studied (Goodman and Smith, 2017).

The security of the ballot is a second major issue. A number of shortcomings in countries that have introduced internet voting have been highlighted, including cryptographic weaknesses (Culnane et al., 2019), issues with analytics software from insecure external servers, and protocol flaws that affect vote verification (Halderman and Teague, 2015). In addition to the reliability of computer systems, literature also points out the challenges related to the use of software developed by private companies due to a lack of resources - as in Canada, for example - where standards in terms of cybersecurity and public responsibility are de facto delegated to companies (Cardillo, Akinyokun and Essex, 2019). Thus, if citizens are to use i-voting and positively evaluate its deployment, strong regulations on security of internet voting must be adopted both to ensure the highest technical and security standards before use and to establish clear protocols in case of problems. These regulations need to be perceived as adequate by the voters.

The consequences for voter turnout represent the third major issue surrounding internet voting (Neihouser, 2022a; 2022b). Research on this topic is somewhat contradictory (Germann and Serdült,

2017; Madise and Vinkel, 2014), perhaps due to the diversity of cases studied. Nonetheless, the general trend seems to suggest that internet voting only marginally promotes participation (Ehin, Solvak, Willemsen, and Vinkel, 2022; Serdült, Germann, Mendez, Portenier, and Wellig, 2015). It does not attract non-voters to the polls but may encourage those who vote only sporadically (Madise and Martens, 2006; Goodman, 2014). Furthermore, the traditional strong impact of social structures and socioeconomic status on turnout appears to be unaffected by this voting system (Unt, Solvak, and Vassil, 2017). In countries where it has been introduced, the acceptance and adoption of internet voting by the population is gradual, unfolding over several elections (Vassil et al., 2016). Moreover, it appears that once voters adopt it, they rarely abandon it (Solvak and Vassil, 2018).

As society undergoes an accelerated process of digitalization – with the development of e-commerce, online payments, digital administrative procedures, and remote medicine – digital technology becomes increasingly integrated into daily life. It is likely that public opinion, broadly, will also swiftly evolve in relation to internet voting. Furthermore, the pace at which internet voting gains acceptance may serve as an indicator of shifting perceptions regarding the electoral process, especially during a period when engagement with politics has undergone significant transformations, for better or worse (Dalton and Welzel, 2014; Inglehart, 1990).

Our first research question is thus the following: how do different groups of citizens in France, categorized by socio-economic profile, political attitudes, and technological literacy, perceive internet voting? Considering the findings in the literature regarding the relationship between internet voting and electoral participation that we summarized above, our first hypothesis pertains to the profile of individuals who support internet voting. We identify interest in politics, age, and educational attainment as the main explanatory factors determining the level of support for internet voting. This can be further divided into several sub-hypotheses:

H1a: Individuals with higher interest in politics and greater political involvement are more likely to support (i.e., favor it and be willing to use it if available) internet voting, while those with lower interest and less involvement are more likely to oppose it.

H1b: More educated individuals are more likely to favor internet voting, whereas less educated individuals are more likely to oppose it.

H1c: Younger individuals are more likely to favor internet voting, while older individuals are more likely to oppose it.

These hypotheses allow us to assess whether the ‘usual suspects’ who regularly participate in electoral politics are also those who would vote more frequently online, and whether the typical profile of the ‘super activist’ is more likely, overall, to adopt i-voting. Beyond the social and political factors that may influence individuals’ positions on internet voting, there has been so far little research into citizens’ rationales for (non)acceptance of internet voting (Neihouser et al., 2022a; Savani and Fisher, 2023). The few studies on the topic show that user perceptions of compatibility, usefulness, and trustworthiness of voting processes significantly impact their intention to use an electronic-voting system (Schaupp and Carter, 2005). Above all, the reasons given by citizens for their position on this system, such as accessibility or security issues, deserve to be explored in greater depth.

Our second research question reads therefore as follows: what factors explain the patterns of acceptance or non-acceptance of internet voting across different groups of citizens, differentiated by socio-economic profile, political attitudes, and technological literacy? While the literature may not primarily focus on internet voting, it still offers insights into potential explanations. We use these insights here, fully aware of the limitations when extrapolating them to internet voting. For instance, research indicates that demographic groups differ in their relationship with digital technology. For example, older individuals tend to have lower digital skills compared to their younger counterparts (van Dijck and Hacker, 2003), which may contribute to their reluctance to embrace internet voting. Conversely, in France, individuals who possess advanced computer and internet skills, engage in diverse online activities, and have a higher education level are more likely to use online administrative services (Bacache-Beauvallet, Bounie and François, 2011). Their familiarity with online processes might explain their favorable disposition towards internet voting.

On the other hand, individuals with higher skepticism towards politics may reject internet voting due to concerns about the technological security of this method. For example, studies have demonstrated that individuals with far-right political orientations or those who support populist parties exhibit lower trust in politics (Billiet and De Witte, 1995; Denmark and Bowler, 2002; Pauwels, 2010). Consequently, their distrust in the political system might justify their opposition to internet voting. Our second hypothesis revolves around the reasons that individuals put forth to justify their stance on internet voting. This hypothesis is grounded in the most recent literature discussed above. Among proponents of internet voting, we hypothesize that:

H2a: Younger, more educated individuals are more likely to emphasize their familiarity with online processes and the convenience these offer as reasons for their support.

H2b: Older, politically engaged individuals are more likely to stress the security of internet voting as a reason for their support.

Among those opposed to internet voting, we hypothesize that:

H2c: Older, less educated individuals are more likely to highlight their lack of digital skills and limited experience with online procedures as reasons for their opposition.

H2d: The most politically engaged individuals, especially those with extreme political ideologies, are more likely to emphasize the security risks associated with internet voting as reasons for their opposition.

To test these hypotheses, we will focus on the case of France and on survey data, as detailed in the next section.

3. Research Design

Case Selection

In recent years, internet voting has often been mentioned as a solution to declining turnout in France¹. The President of the Republic, Emmanuel Macron had planned in his 2017 electoral manifesto to "generalize electronic voting by 2022"². While the promise was not kept, the context of the health crisis and the subsequent widespread social distancing rules have led many political actors to speak out in favor of internet voting³. Additionally, the massive abstention in recent years⁴, with 26% in the first round of the 2022 French presidential election, further fueled interest in internet voting as a potential solution. Although it was never used in any French presidential elections, internet voting is already used in the country, for example in intra-party elections, in primary elections (Barberà et al., 2021), in union elections (Haute, 2019; Bérout and Dompnier, 2013), or for the vote of French citizens living abroad during the last legislative and consular elections (Dandoy and Kernalegenn, 2021; von Nostitz, 2021). What's more, France has used electronic voting with DRE machines in several constituencies (up to 82 municipalities) for local, presidential and European elections since 2002. Finally, as in all European countries, the use of digital technology has largely become standard practice in France, particularly in terms of administrative procedures, online payments and access to bank accounts (Pasquier, 2022).

However, assessing the opinions of French citizens on the possible introduction of internet voting in the presidential election is particularly interesting given that the country is strongly marked by its republican tradition. When French voters visit the polling booth (as postal voting and early voting are not options in France), they are expected to shed their social connections and assume the role of a rational citizen. Nevertheless, internet voting potentially undermines this detachment from everyday life, a process that is facilitated by physically attending a polling station. The confidentiality of the vote, along with its individualization, becomes more constrained, as the polling booth can no longer inherently assure them. Given these circumstances, the shift towards internet voting in France may, on a broader scale, signify an alteration in individuals' connection to the act of voting and its symbolic significance (Tiberj, 2017; 2020). That is why France represents a particularly appropriate case study for analyzing the nature and rationales of citizens' perceptions of internet voting.

Data collection and participants

¹ A parliamentary report aimed at identifying the drivers of abstention and measures to boost electoral participation was drafted by Xavier Breton and Stéphane Travert and submitted on December 8, 2021. The authors make 28 recommendations in this report, including the experimentation of internet voting (Rapport Parlementaire, Assemblée nationale, no 4790). See <https://www.vie-publique.fr/rapport/282928-ressorts-de-l-abstention-et-les-mesures-pour-renforcer-la-participation>

² <https://en-marche.fr/emmanuel-macron/le-programme/vie-politique-et-vie-publique>

³ <https://www.ouest-france.fr/elections/presidentielle/presidentielle-2022-et-si-on-pouvait-tous-voter-en-ligne-a77c2402-7458-11ec-ac16-2e31ae11eb47>

⁴ https://www.lemonde.fr/les-decodeurs/article/2022/04/11/sept-cartes-et-graphiques-pour-comprendre-l-abstention-au-premier-tour-de-la-presidentielle-2022_6121706_4355770.html#:~:text=A%201%E2%80%99issue%20du%20premier%20tour%20de%201%E2%80%99%C3%A9lection%20pr%C3%A9sidentielle,les%20listes%20%C3%A9lectorales%2C%20soit%2012%2C8%20millions%20de%20personnes

In terms of data collection and methodology, we conducted a representative online survey of the French population registered to vote, which included question items on i-voting. This post-electoral survey, dedicated to social media and politics, was carried out directly after the second round of the French presidential election. The survey was conducted online (respondents could answer via smartphone or computer) from 25 April to 9 May 2022 among a sample of 1978 respondents who are representative of the French population aged 18 and over, and registered to vote, selected according to the quota method (gender, age, socio-professional category, category of urban area, region). This sample was provided by Dynata France, a polling company regularly used for conducting socio-political surveys (Bazart & Blayac, 2022; Lewis et al., 2022). Dynata ensured that each person could only answer the questionnaire once. The survey comprised 61 questions and was financed by CERAPS, ESPOL-LAB and LEM research centres⁵. We used the "*icarus*" R package (Rebecq, 2019) to compute post-stratification weights in order to match the marginal distribution of the sample to known population margins, using gender, age, socio-professional category (after recoding the declared profession), level of education and vote in the first round of the 2022 presidential elections.

Methods, measures and analyses

The paper uses two multinomial logistic regression models to analyse our data in order to identify the variables determining 1) the respondents' position on the adoption of internet voting⁶ and 2) their willingness to use it if it were introduced⁷. In line with the above-mentioned hypotheses, for both regressions we use the following independent variables:

- sex (binary);
- age;
- educational level;
- occupation (assessed through a binary variable that distinguishes between higher or intermediate and lower occupations);
- political interest;
- political positioning (i.e. ideological self-positioning on the right-left spectrum);
- participation in at least one round of the 2022 presidential elections;
- online political activities (assessed through a binary variable that measures the frequency of viewing, sharing, or commenting on political information related to the 2022 French presidential elections campaign on social media);

⁵ François Briatte (ESPOL) and Étienne Farvaque (LEM) also coordinated this survey. Mathilde Desjeunes, Eugene Gimenez-Mailhes and Anthonia Vercoutre recoded the declared profession as student trainees. For a detailed presentation of the project, see: <https://espol-lille.eu/recherche/people-2022>

⁶ The question posed was: "In certain European countries, such as Switzerland and Estonia, it is feasible to cast votes in elections through the Internet. Do you support or oppose implementing a similar voting mechanism for the French presidential election?" Various response options were provided: '1. Strongly agree', '2. Somewhat agree', '3. Somewhat disagree', '4. Strongly disagree', '5. Don't know'.

⁷ The question asked was: "If an Internet voting mechanism for the presidential election were available in France, how inclined would you be to use it?" Various response options were provided: '1. Very likely', '2. Rather likely', '3. Rather unlikely', '4. Very unlikely', '5. Don't know'.

- offline political activities (assessed through a binary variable that measures the frequency of participating in electoral meetings or engaging with activists in person);
- general social media usage (assessed through a binary variable that measures the frequency of liking, commenting on, or sharing posts, photos of friends or family, or sharing information related to sports or culture (such as music, outings, etc.).

The dependent variables included in the analyses are the degree of agreement of respondents with the introduction of internet voting in the first regression and their willingness to use it if it were introduced in the selected country in the second regression.

In the second part of the paper, in order to study the individual rationales for (not) supporting the adoption of i-voting, we use a latent class analysis (LCA) to identify different sub-groups in the sample and their respective reasons for (not) accepting i-voting. This clustering method, not often used in France (Coulangeon et al., 2012; Alexandre et al., 2019; Gonthier, 2023), is widely used internationally, including for studying online political participation (Oser et al., 2013). This method makes it possible to identify groups of respondents that choose the same response categories on a set of questions, i.e., in our case, the six or seven reasons offered to respondents to justify their (un-) willingness to use internet voting. Based on an inductive logic, this method may seem fairly close to multiple correspondence analysis (MCA) and the clustering methods that apply to it, even though its mathematical foundations are very different (Alexandre et al., 2019). Given the size of the two sub-populations used for our two LCA models ($n=1214$ respondents declaring that they would vote online if possible and $n=606$ respondents declaring that they had no intention of doing so), we retained 3-class models for each of these populations, without seeking to minimize the BIC statistic (Schwartz's Bayesian information criterion). The analysis was carried out using the R package "poLCA" (Linzer and Lewis, 2022).

4. Results and analysis

Before presenting our two regression models, we first establish that a majority of the French population is open to using internet voting if it were officially adopted for political elections. According to our survey data, 60.3% of respondents agreed or strongly agreed with the proposal to implement i-voting in France for the presidential elections, while only 30.7% disagreed. Similarly, 60.8% of citizens stated that they would use this option if it were available for voting in the presidential election, compared to 30.7% who would not use it. The responses to these two questions are highly correlated: approximately 91% of those who agree are very likely to use it, and 79% of those who disagree are unlikely to use it. To delve deeper into these initial findings, we developed two multinomial logistic regression models (see Tables 1 and 2).

Table 1. Opinions on the introduction of internet voting and individual features and attitudes

Variable	% Agree	% Disagree	Log-odds (SE)	Odds ratio	% Don't know	Log-odds (SE)	Odds ratio
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Full sample		60,4	30,3			9		
Sex	Male	61,3	31,7	ref	ref	7	ref	ref
	Female	59,5	29,7	0,08 (0,11)	1,09	10,8	0,24 (0,19)	1,27
Age	18-24	68,1	26,9	0,12 (0,21)	1,12	5,1	-0,14 (0,41)	0,87
	25-34	65,4	25	0,03 (0,19)	1,03	9,6	0,44 (0,31)	1,55
	35-44	63,1	29,5	0,23 (0,16)	1,26	7,4	0,27 (0,33)	1,32
	45-54	64,1	27,6	ref	ref	8,2	ref	ref
	55-64	53,8	36,2	0,43* (0,17)	1,53*	10	0,40 (0,28)	1,49
	65 or more	55,1	34	0,28 (0,16)	1,33	10,9	0,42 (0,26)	1,54
Level of education	Less than high school	56,7	32,1	0,02 (0,14)	1,02	11,2	-0,06 (0,24)	0,94
	High school	60,8	30,7	ref	ref	8,5	ref	ref
	Higher education (Diploma)	66,5	28	-0,14 (0,19)	0,87	5,5	0,20 (0,27)	0,82
	Higher education (BA or higher)	68,9	28,3	-0,10 (0,18)	0,91	5,8	-0,20 (0,33)	1,23
Socio-economic status	Lower occupation or never worked	56,9	31	ref	ref	12,1	ref	ref

	Higher or intermediate occupation	65,1	30,2	-0,11 (0,12)	0,90	4,7	-0,91*** (0,23)	0,40***
Interest in politics	None	51,9	26,2	ref	ref	21,9	ref	ref
	A few	62,9	30	-0,04 (0,17)	0,96	7,1	-0,91*** (0,23)	0,40***
	Some	61,3	32,3	0,07 (0,19)	1,09	6,4	-0,70* (0,28)	0,50*
	A lot	61	34,4	0,14 (0,21)	1,15	4,6	-0,90* (0,36)	0,40*
Self-placement on left-right scale	Far-left	59,9	35,5	0,48 (0,31)	1,62	4,6	0,73 (0,73)	2,07
	Left	63,5	30,4	0,15 (0,17)	1,17	6,1	0,56 (0,39)	1,74
	Center	68,7	27,6	ref	ref	3,7	ref	ref
	Right	64,1	31,4	0,19 (0,18)	1,21	4,5	0,23 (0,41)	1,25
	Far-right	53,2	39,7	0,61** (0,22)	1,85**	7,1	1* (0,46)	2,71*
	No answer	53,2	28,4	0,25 (0,18)	1,29	18,4	1,37*** (0,36)	3,95***
Vote at least in one round of the 2022 presidential elections	No	55,8	31,1	ref	ref	13,1	ref	ref
	Yes	64,9	30,2	0,14 (0,14)	1,15	4,9	0,40 (0,22)	1,50

View, comment on, or share political information related to the 2022 presidential elections campaign on social media	No	58,1	31,7	ref	ref	10,2	ref	ref
	Yes	67,7	27,3	0,06 (0,12)	1,06	5	-0,51* (0,23)	0,60*
Participation in electoral meetings or engagement with activists in person	No	62	26,3	ref	ref	11,7	ref	ref
	Yes	59,9	31,7	-0,20 (0,14)	0,82	8,3	-0,10 (0,27)	0,91
Like, comment on, or share posts, photos of friends or family, or share information related to sports or culture on social media	No	51,6	34,8	ref	ref	13,6	ref	ref

	Yes	65,5	28,2	-0,39** (0,12)	0,68**	6,3	-0,69*** (0,19)	0,50***
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The reference category of the dependent variable is that of agreement with the proposal of implementing i-voting in France for the presidential elections. Baseline categories of independent variables are marked as “ref”. Both models are estimated on survey-weighted observations using the multinom function of the “nnet” R package. Design-based standard errors for the log-odds are shown in brackets. *** : $p < 0.001$. ** : $p < 0.01$. * : $p < 0.05$.

Source: PEOPLE2022 online survey, weighted data, $n=1978$, $AIC=3395.62$

Table 2. Willingness to use of internet voting if it were introduced and individual features and attitudes

Variable		% Yes	% No	Log-odds (SE)	Odds ratio	% Don't know	Log-odds (SE)	Odds ratio
Full sample		60,8	30,7			8,5		
Sex	Male	61,9	30,6	ref	ref	7,5	ref	ref
	Female	59,9	30,7	0,08 (0,11)	1,08	9,4	0,08 (0,19)	1,08
Age	18-24	61	35,9	0,42* (0,21)	1,52*	3,1	-0,55 (0,49)	0,56
	25-34	65	25,9	0 (0,19)	1	9,1	0,38 (0a32)	1,47
	35-44	61,9	31,1	0,27 (0,19)	1,31	6,1	0,30 (0,34)	1,35
	45-54	64,2	27,9	ref	ref	7,9	ref	ref
	55-64	56	32,6	0,31 (0,17)	1,36	11,4	0,57* (0,28)	1,76*
	65 or more	59	31,6	0,19 (0,16)	1,21	9,4	0,23 (0,27)	1,26
Level of education	Less than high school	57,5	32,3	0,11 (0,24)	1,11	10,2	-0,14 (0,24)	0,87

	High school	61,3	30,2	ref	ref	8,6	ref	ref
	Higher education (Diploma)	63	32,2	0,14 (0,19)	1,15	4,8	-0,41 (0,38)	0,67
	Higher education (BA or higher)	68,2	25,9	-0,15 (0,18)	0,86	5,9	-0,03 (0,33)	0,96
Socio-economic status	Lower occupation or never worked	57,8	31,6	ref	ref	10,7	ref	ref
	Higher or intermediate occupation	65	29,5	-0,07 (0,12)	0,93	5,5	-0,58** (0,22)	0,56**
Interest in politics	None	47,8	33,4	ref	ref	18,8	ref	ref
	A few	64,5	29,1	-0,40* (0,16)	0,67*	6,4	-0,84*** (0,24)	0,43***
	Some	60,6	32,5	-0,21 (0,18)	0,81	6,9	-0,39 (0,29)	0,68
	A lot	65,2	29,2	-0,42* (0,21)	0,66*	5,7	-0,44 (0,35)	0,65
Self-placement on left-right scale	Far-left	58,1	40,6	0,71** (0,31)	2,25**	1,2	-1,01 (1,21)	0,36
	Left	65	29,4	0,30 (0,18)	1,35	5,6	0,21 (0,26)	1,23
	Center	71,8	23,5	ref	ref	4,7	ref	ref
	Right	63,2	32,4	0,49** (0,18)	1,63**	4,4	0,07 (0,39)	1,07

	Far-right	55,9	40,3	0,81*** (0,22)	2,25***	3,8	0,05 (0,50)	1,05
	No answer	52	29,9	0,45* (0,18)	1,56*	18,1	1,31*** (0,33)	3,71***
Vote at least in one round of the 2022 presidential elections	No	57,8	30	ref	ref	12,2	ref	ref
	Yes	63,9	31,4	0,04 (0,14)	1,03	4,7	-0,05 (0,22)	0,95
View, comment on, or share political information related to the 2022 presidential elections campaign on social media	No	60	30,5	ref	ref	9,4	ref	ref
	Yes	64,4	31,2	0,15 (0,12)	1,16	5,5	-0,36 (0,22)	0,70
Participation in electoral meetings or engagement with activists in person	No	57,6	29,7	ref	ref	12,7	ref	ref
	Yes	61,6	30,9	0,04 (0,13)	1,04	7,4	0,18 (0,26)	1,19

Like, comment on, or share posts, photos of friends or family, or share information related to sports or culture on social media	No	53,5	33,2	ref	ref	13,3	ref	ref
	Yes	65,1	29,2	-0,42*** (0,12)	0,66***	5,7	-0,76*** (0,20)	0,47***

The reference category of the dependent variable is that of acceptance to use internet voting if it were officially adopted. Baseline categories of independent variables are marked as “ref”. Both models are estimated on survey-weighted observations using the multinom function of the “nnet” R package. Design-based standard errors for the log-odds are shown in brackets. *** : $p < 0.001$. ** : $p < 0.01$. * : $p < 0.05$.

Source: PEOPLE2022 online survey, weighted data, n=1978 respondents, AIC=3355.39

These models allow us to assess our first hypothesis, which pertains to the characteristics of individuals based on their stance regarding internet voting. As reported in Table 1, individuals who express disagreement with the introduction of internet voting exhibit several distinct characteristics. Notably, they tend to be older (the odds ratio is higher than 1 and significant for the 55-64 years category). Politically, they lean towards the far-right (the odds ratio is higher than 1 and significant for the far-right category), and are less frequent users of social media in general (the odds ratio is lower than 1 and significant). Conversely, individuals who remain undecided about their stance on internet voting are less likely to hold managerial positions (the odds ratio is lower than 1 and significant for higher or intermediate professional categories). These individuals also exhibit lower interest in politics (the odds ratios are less than 1 and significant in the 'a few/some' categories). Also, they tend to lean more to the right (the odds ratio is higher than 1 and significant for the far-right category), or do not align with the traditional political spectrum (the odds ratio is higher than 1 and significant for the 'no answer' category). Moreover, they engage less in online political activities (the odds ratio is lower than 1 but not significant for the 'yes' category) and use social media less frequently (the odds ratio is lower than 1 and significant for the 'yes' category) compared to supporters of internet voting.

Furthermore, Table 2 illustrates that individuals who are reluctant to use internet voting, if it were available, display distinctive characteristics. They are notably younger (the odds ratio is higher than 1 and significant for the 18-24 category) and less interested in politics (the odds ratios are lower than 1 and significant for the 'a few' and 'a lot' categories). Additionally, they are more inclined towards extreme right-wing positions, or are unable to position themselves on the left-right scale (the odds ratios are higher than 1 and significant for the far-left, right, far-right, and 'no answer' categories). Moreover, they use social media less in general (the odds ratio is lower than 1 and significant for the 'yes' category) if compared to individuals who are open to the idea of using internet voting. On the other hand, individuals who remain undecided about their willingness to use internet voting if it were available are older (the odds ratio is higher than 1 and significant for the 55-64 years category). They are also less likely to hold managerial positions (the odds ratio is lower than 1 and significant for the higher or intermediate occupation category). Additionally, they are less likely to position themselves on the left-right scale (the odds ratio is higher than 1 and significant for the 'no answer' category) compared to those who express a willingness to use it.

Our H1a hypothesized that individuals with higher interest in politics and greater political involvement are more likely to support (i.e., favor it and be willing to use it if available) internet voting, while those with lower interest and less involvement are more likely to oppose it. This hypothesis is partially supported by the data. When assessing the probability of using internet voting if it were available, those who express reluctance to use it tend to have lower levels of interest in politics. The effect of the degree of political participation (having voted or not) is not statistically significant. However, when considering the general position (support or opposition) towards internet voting, neither the level of interest in politics nor political participation (having voted or not) are statistically significant.

Secondly, H1b is not supported by our data. More educated individuals are not more likely to favor internet voting, and less educated individuals are not more likely to oppose it. In fact, there is no statistically significant relationship between the level of education and the position in favor or against internet voting, or the likelihood of adopting it or not if it were available. On the other hand, those who have no opinion on the matter tend to have lower levels of education compared to those in favor of internet voting and those willing to use it.

Thirdly, H1c posits that younger individuals are more likely to favor internet voting, while older individuals are more likely to oppose it. This hypothesis is partially supported by our data, although there are some contradictions within our results. Specifically, individuals in the 55-64 age group are significantly more likely to oppose internet voting. However, individuals in the 18-24 age group are also significantly more likely to express reluctance to use internet voting if it were available.

In our survey, we also measured the rationales for supporting or rejecting the use of i-voting if it were adopted. We offered the respondents a wide array of response categories, but some are much more frequently cited than others. The Table 3 below outlines the reasons why individuals would be willing to use (or not) internet voting.

Table 3. Reasons why people would or would not use internet voting if it were available for presidential elections

Reasons for using internet voting	in %	Reasons against using internet voting	in %
Internet voting is more secure than voting at a polling station	16.4	Internet voting is less secure than voting at a polling station	61.1
With Internet voting, election results would be known more quickly	29.7	Voting by Internet would take you longer than going to your polling station	5.7
Voting by Internet would take less time than going to your polling station	46.9	Voting by Internet would be less comfortable for you than voting at a polling station	13.3
Voting by Internet would be more comfortable for you than voting in a polling station	t	You have never used Internet voting before	20.7
You have already used Internet voting in other contexts (e.g. for primary or professional elections)	10.3	You think you do not have the technical skills to vote by Internet	7.6
You think you have the technical skills to vote by Internet	33.2	You use the Internet as little as possible	7.2
You use the Internet a lot in your daily life	46		

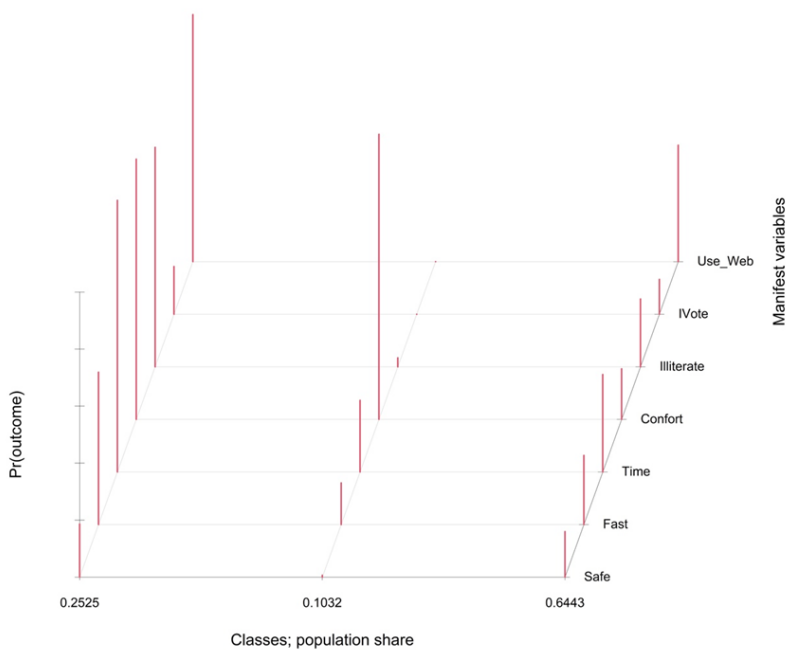
Source: PEOPLE2022 online survey, n=1214 for columns 2 and n=606 for column 4, weighted data.

Among the respondents saying they would use internet voting in the presidential election if it were offered to them, the main reasons provided are: the regular use of Internet in their in everyday activities (46%), the time saving effect of internet voting (46.9%) and the comfort of this method (42.7%) compared to going to a polling station. Having (sufficient) digital skills and finding out about electoral results more quickly are reasons less often put forward, while security and the experience of internet voting are the least mentioned reasons. Essentially, the importance of incorporating the habit of engaging in various daily online activities, irrespective of their connection to voting, along with the reduced voting costs in terms of time and travel, appear to constitute the primary arguments put forth by prospective online voters.

Conversely, those who say they would not use internet voting if it were available during the presidential elections mainly argue that it is less secure than voting at the polling station (61.1%). A smaller proportion of respondents also said they would not use i-voting because they had never used the Internet to vote before (20.7%). The reluctance to use i-voting is not a question of comfort, time, skills, or low internet literacy. Instead, the security of the ballot and, to a lesser extent, a lack of familiarity with internet voting are the two main arguments of those who would not use it.

In order to develop further our analyses, we carried out a double latent class analysis (LCA) (see Figures 1 and 2) to test our H2 hypothesis. Taking into consideration both respondents who would use internet voting and those who would not within our sample, we employed latent class analysis to capture the combinations of reasons for adopting or not adopting internet voting, according to respondents' respective socio-political profiles.

Figure 1. Results of the first LCA on individuals who would use i-voting if it were implemented



Source: PEOPLE2022 online survey, $n=1214$ respondents, no weights applied.

N. B. The coefficients of each class are slightly different from those cited in the paper because no weights were applied on the data used for generating the graph, but they were used in the LCA analysis mentioned in the text.

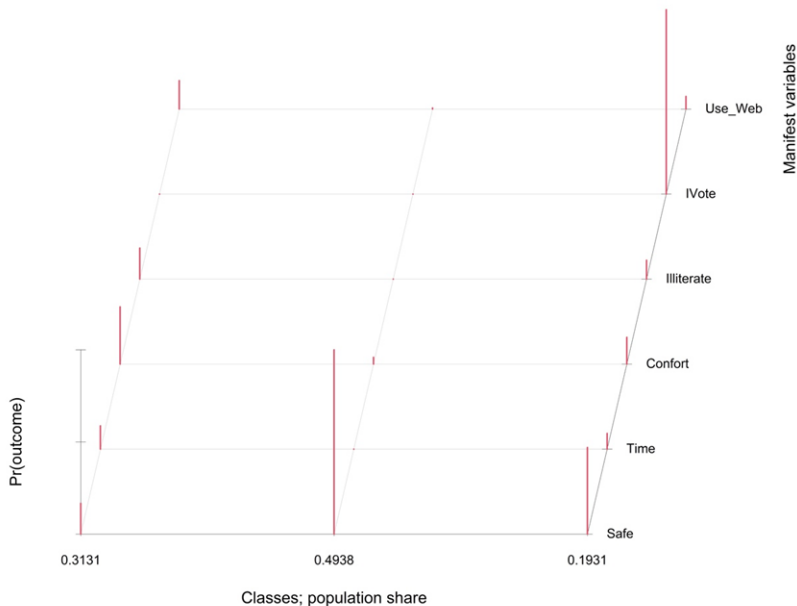
Explanation: the vertical bars represent the different reasons given by individuals in each class. The higher the bar, the more frequently the reason is mentioned by the individuals in that group. For example, individuals in the second group frequently cite confort ('confort') as a justification for their intention to use Internet voting if it were implemented. In contrast, they mention the time saved by not having to go to the polling station ('Time'), and the speed of obtaining results ('Fast'), much less often. They also seldom mention the fact that they already make extensive use of the web in their daily lives ('Use-Web').

Our first LCA divides our first sample of individuals stating that they would use internet voting if it were available into 3 classes (Figure 1). The first group comprises 23.5% of individuals. This is the 'connected' group: comprising more females, more educated and younger individuals, who are predominantly employed in higher or intermediate occupations. They are more active online (though not politically), less likely to abstain in the 2022 presidential elections, and not necessarily very interested in politics. This group emphasizes, as reasons for using internet voting, the advantages directly linked to its digital nature: the time saved and convenience of use compared with voting at a polling station, the speed of communication of the results, and their well-developed familiarity with digital technology and the associated skills.

A second group stands out, comprising 15% of individuals: the 'comfort' group. This group is less educated, older, primarily working in lower occupations, more interested in politics, less politically active online, and more right-leaning. The individuals in this group emphasize the benefits of internet voting in terms of voting comfort to justify their willingness to use it. Finally, a larger class, making up 61.5% of individuals, forms the 'median' class. Positioned in the median categories of main sociological variables, these respondents are less interested in politics but lean more towards the left and center, and are politically active online. They seem to correspond to the 'gladiators' social group identified in classic studies on political participation (Milbrath, 1965). They are relatively hesitant but generally favorable to the use of internet voting, although their arguments in its favor are not particularly well-structured

Our hypotheses H2a and H2b pertain to the motivations of individuals in favor of internet voting. H2a suggests that younger, more educated individuals are more likely to emphasize their familiarity with online processes and the convenience these offer as reasons for their support. This hypothesis is supported by our data. Indeed, the younger and more educated respondents, belonging to the 'connected' group, justify their preference for internet voting by emphasizing the time saved and the convenience it provides in comparison to traditional polling station voting. They also highlight their existing familiarity with digital technology and the associated skills. Furthermore, H2b posits that older, politically engaged individuals are more likely to stress the higher security of internet voting as a reason for their support. However, this assumption does not appear to be supported by our data. In reality, the 'comfort' group, which includes significantly older individuals, justifies their preference for using internet voting, if it were available, based on the comfort it offers, rather than its security advantages.

Figure 2. Results of the second LCA on individuals who would not use i-voting if it were implemented



Source: PEOPLE2022 online survey, $n=1214$ respondents, no weights applied. N. B. The coefficients of each class are slightly different from those cited in the paper because no weights were applied on the data used for generating the graph, but they were used in the LCA analysis mentioned in the text.

Explanation: the vertical bars represent the different reasons given by individuals in each class. The higher the bar, the more frequently the reason is mentioned by the individuals in that group. For example, individuals in the second group frequently cite the lack of security of internet voting ('safe') as a justification for their intention not to use Internet voting if it were implemented. They cite the discomfort of internet voting compared to going to a polling station ('confort') much less frequently.

Our second LCA also identifies three distinct classes of individuals who say they would not use internet voting, if it were available (Figure 2). The first group, comprising 29.9% of respondents, labeled the 'i-voting illiterate' group, is younger and predominantly female. This group gathers respondents with lower educational attainment, lower occupational status, lower electoral participation, and lower interest in politics, who often use social media, including for consuming political information, and who tend to refuse to position themselves on the traditional right-left political spectrum. In rejecting the use of internet voting, they cite their lack of familiarity with using digital technology for voting, as well as the loss in terms of voting comfort. They mirror the class of the 'connected' respondents outlined above. The second class, which emerges more clearly from the analysis, is the 'safety' class, accounting for 49.5% of respondents. Members of this class tend to be older, more educated, and work more in higher or intermediate occupations. They are more interested in politics, relatively politically active online, and lean towards the centre and the right of the political spectrum. In terms of age and political positioning, this group mirrors the 'comfort' group,

those in favor of internet voting. Finally, the last class, the 'inexperienced,' includes 20.7% of respondents. It is composed of less educated, less active online, and more left-leaning respondents, who cite their inexperience with digital technology and their fears regarding security as reasons to oppose internet voting. They mirror the above-mentioned 'median' class of respondents.

Our hypotheses H2c and H2d focus on the justifications of individuals who oppose internet voting. H2c suggests that older, less educated individuals are more likely to highlight their lack of digital skills and limited experience with online procedures as reasons for their opposition. This hypothesis is partially confirmed. On the one hand, individuals with the lowest level of education (referred to as the 'i-voting illiterate' and 'inexperienced' groups) indeed emphasize their lack of familiarity with digital technology when it comes to voting. On the other hand, the older group (referred to as the 'safety' class) appears to prioritize concerns about the security risks associated with internet voting over their lack of online experience.

H2d posits that the the most politically engaged individuals, especially those with extreme political ideologies, are more likely to emphasize the security risks associated with internet voting as reasons for their opposition. This hypothesis is partially supported by our data. In the 'safety' class, the most politically engaged group presents arguments focusing on the security issues of internet voting to oppose its use, if it were available.

5. Discussion

This paper sets out to reply to the following research questions. First, how do different groups of citizens, differentiated by socio-economic profile, political attitudes, and technological literacy, perceive internet voting? And second, what explains the patterns of acceptance or non-acceptance of internet voting across these groups?

Regarding our first research question, the literature has long established that 'usual suspects' who vote more regularly online and who fit the typical profile of the 'super activist' are more likely to adopt e-voting (Vassil et al., 2016). Our data shows that this holds true, at least for the effect of political interest, also for populations not yet largely experienced with the instrument, and in countries where i-voting is limited to specific groups such as expatriates.

In addition to testing our hypotheses, this article highlights several observations. Our regression analysis confirms that the rejection of internet voting stems more from political reasons – such as individuals' level of interest in politics and their ideological positioning – than from social ones, like educational attainment. A striking result when analyzing the variables influencing people's disagreement with the introduction of internet voting or their reluctance to use it, if it were introduced (left columns of Tables 1 and 2) is that only the ideological positioning is significant in the models. Neither sex, age, level of education nor interest in politics determines - other things being equal - whether people disapprove of internet voting or are unwilling to adopt it if introduced.

More specifically, individuals positioned on the extreme left or right tend to disagree more with internet voting and its adoption. Political positioning also remains an important factor in explaining the refusal to use i-voting tools if available. These results echo those of Lust (2015: 314) who states that 'internet voting is a partisan project. Liberal, conservative, and social democratic parties support

internet voting as a way of modernizing the electoral system, while populist and agrarian parties oppose it as a tool for political manipulation'.

Furthermore, the lack of an opinion on the introduction of internet voting (right-hand columns of Table 1) or the indecision on whether to use it if introduced (right-hand columns of Table 2) seems to reflect the sociological and political differences usually found between individuals who participate in politics regularly and those who have a more distant relationship with politics, thus voting more sporadically or not at all. For example, those who do not position themselves along the left-right axis are less likely to express their opinion on internet voting. Yet, the indifference on the matter declines with increasing levels of education and political interest, similarly to what happens with political and electoral participation (Braconnier et al., 2017; Schlozman et al., 2012).

Nevertheless, the lack of opinion is more recurrent among older respondents (aged 65 or more), although they participate in elections significantly more than all other age groups (Braconnier et al., 2017; Tiberj, 2017; 2020). The weaker digital skills among older respondents (Best and Krueger, 2005) could explain their lack of opinion. On the other hand, if they participate more in elections, they are also less interested in politics and more attached to the traditional electoral (in-person) procedure (Tiberj, 2017; 2020).

Finally, the other main variable in our models is the general social media usage: individuals who use social media for non-political activities agree significantly more with the introduction of internet voting and are willing to use it. This difference reflects segmentation between individuals less connected or with lower digital skills and individuals regularly using Internet or having higher digital skills. In contrast, political participation (voting, offline activities, but also online activities) does not determine the support of or willingness to use internet voting. For online political activities, this could be explained by the more significant political use of social media by individuals positioned more at the far left or at the far right of the political spectrum (Neihouser et al., 2022b), and by individuals who are significantly less likely to agree and willing to use internet voting. For this reason, in this study, we also look at the reasons provided by respondents for (not) supporting the adoption of i-voting and for their (un)willingness to use it.

Concerning our second research question, which aims to explain the patterns of (non)acceptance of internet voting across different groups of citizens in terms of socio-economic profile, political attitudes and technological literacy, our study adds to the existing literature by researching citizens' rationales for (non)acceptance of internet voting. Once more, our findings align with the existing literature (Solvak and Vassil, 2018). Indeed, the two LCA models show strong differences between the subgroup of respondents who oppose the use of i-voting and the subgroup who accepts it in terms of their characteristics and the rationales for their choices.

On the one hand, the subgroup of respondents who accept the use of i-voting primarily consists of more 'connected' groups within society and citizens who are politically supportive of the project, yet not the most predisposed initially to embrace it (the 'comfort' group). However, this group also includes individuals whose arguments for supporting i-voting are poorly structured and, therefore, fragile. On the other hand, the subgroup of respondents who oppose the use of i-voting primarily consists of citizens for whom security is a significant concern. However, in understanding the rationales behind the choices of this 'opposing' subgroup, it is important not to overlook their lack of

skills and 'disconnection.' Additionally, the potential for changing their opinions through a gradual introduction of internet voting should also be considered. This may offer some preliminary suggestions for decision-makers aiming to identify the best practices for effectively introducing this technology in France while maintaining sufficiently high levels of trust in the electoral system.

Of course, these initial analyses are not without their limitations. For example, from a methodological point of view, they may be criticized for relying on statements from individuals who may have never previously considered the possibility of voting online. In such cases, the risk of imposing this possibility as a problem is significant (Bourdieu, 1984). To mitigate this risk, it would be beneficial to replicate this survey by establishing focus groups in the future, allowing respondents to articulate their reasons for their (non)use of internet voting. Furthermore, the next step would involve conducting similar studies in other countries to develop a European or international regulatory framework and establish best practices for adopting i-voting.

6. Conclusion

This study shows that people in France are broadly in favor of introducing internet voting. The rejection of such a voting system is primarily due to individual political attitudes and general social media usage. Indifference to the issue reflects the social divide traditionally observed in electoral and online political participation, is also determined by online political engagement and general social media usage. In terms of both acceptance and rejection of internet voting, different social and political groups stand out, depending on the arguments they use to justify their choice.

This study therefore complements existing studies. What emerges is the image of a process of normalization of internet voting. As citizens increasingly use digital technology with ease and frequency, they begin to recognize its advantages in terms of time and convenience. Consequently, the majority of citizens are prepared to digitize more public services, and democratic procedures as well, including presidential elections. This idea reflects the perception of internet voting as a habit, to which citizens are gradually becoming accustomed with each passing election, as already demonstrated in the case of Estonia.

The concept of 'normalization' might also signal a potential shift in French citizens' approach to voting. The de facto abandonment of republican symbolism – traveling to a designated place, setting up a polling booth to guarantee secrecy, and the symbolism of citizens shedding all social allegiances upon entering the polling booth – does not seem to concern respondents. Although none of the suggested answers directly tested this aspect, respondents who were opposed to internet voting could choose the 'other' response category in the items listing the reasons and justify their choice by filling in the designated blank space in the questionnaire. However, none chose to use this option.

This result is not surprising: it reflects a much broader change in people's relationship with politics, encompassing voting and other practices. This relationship is now characterized less by reverence, with participation increasingly viewed not just as a duty but as a right. Whether this signifies a shift towards viewing voters more as consumers – choosing the least costly way for themselves and the

state to participate in political decision-making—or further underscores a declining interest in voting, needs further investigation.

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