Approval Voting, Evaluation Voting

An Experiment during the 2012 French Presidential Election

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FULL-TEXT

INTRODUCTION

On April 22, 2012, the day of the first round of the French presidential elections, voters were invited to test two different plurinominal methods of voting. One was approval voting (AV), and the other, score voting, or "evaluation voting" (EV). These two voting methods were tested in one round. Being

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plurinominal, voters could express an opinion about each and every candidate, rather than having to choose a single candidate as in official, uninominal voting. With AV, voters could either approve or not approve each candidate, and the winner was the one who obtained the greatest number of approvals. With EV, voters were asked to assign a score to each of the 10 candidates. Scoring followed three predefined ranking scales, one in each of the three cities in which the experiment was conducted. In Saint-Étienne (Rhône-Alpes), the EV scale was (0, 1, 2); in Louvigny (Basse-Normandie), it was (–1, 0, +1); and in Strasbourg (Alsace), it was (0, ..., 20). The winner was the candidate with the highest total score.

The experiment was conducted at two polling stations in Louvigny, at the Terrasse polling station in Saint-Étienne, and at the two polling stations at the Salle de la Bourse in Strasbourg. This was made possible by the backing of prefectures, the consent of the elected officials, the cooperation of the municipalities, and the assistance of many volunteers.[1] As voters exited the polling stations, their anonymous and voluntary participation was solicited. Two experiment ballots, voting booths, and a ballot box were made available so that voters could vote under conditions matching the official procedure. A questionnaire attached to the ballots invited voters to express their opinion about the experiment, indicate how they had voted on the official ballot, and provide some personal information.

[1]
The authors extend a warm and hearty thanks to them...

A field experiment of this type was not new in France. In the first round of the 2002 presidential election, the AV method was tested on a large-scale (Balinski, Laslier, and Van der Straeten 2002 and 2003; Laslier and Van der Straeten 2004 and 2008). The 2007 election was an opportunity for testing other voting methods, including majority judgment (Balinski and Laraki 2011); alternative vote (Farvaque, Jayet, and Ragot 2009 and 2011); and AV and EV (0, 1, 2) (Baujard and Igersheim 2009 and 2010); Baujard, Igersheim, and Senné 2011). Moreover,

France is the only country where experiments were conducted during official voting. Similar experiments were conducted in Germany (Alós-Ferrer and Granic 2010) and more recently in Bénin (Kabre, Laslier, and Van der Straeten 2012). Other similar, Internet experiments have been conducted in Canada, France, and Iceland (Van der Straeten, Laslier, and Blais 2013).

As in the preceding cases, this experiment aimed at gaining a better understanding of how democratic institutions operate, and at studying collective decision-making procedures in addition to voter behavior using the experimental voting methods.[2] This paper presents our first conclusions drawn from data derived from the experimental ballots. It is organized into three parts. In the first part, we describe the inception of the experiment. In the second part, we examine the way in which the voters adopted the AV and EV methods to express their opinions about the various candidates. In the third part, we present the results, after correcting for participation and representation biases, and compare them to the official results before reaching a conclusion.

How the Experiment and Tested Voting Rules Were Received

From this experiment, we were able to confirm that it is possible to test new voting rules on a large scale; further, that this is particularly so with populations who are uninformed about research on voting theory, and who are relatively more representative of French diversity than populations typically studied in experimental economics. Based on the responses to our questionnaire (by > 85 percent of test participants), we know that in each of the three cities 55 percent of the participants were women, an average 39 percent were under age 35, and 23 percent were over age 55. Two-thirds (67 percent) stated they had jobs. Since

[2]
For further details about the experiment and other...

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some of the test participants did not respond to every question, these statistics are indicative of a trend but they do not accurately reflect the participants sociologically. We will see that the political profile of the test participants was strongly leftist.

Voluntary participation was a first indicator of a favorable reception of the experiment and tested voting methods. Out of 5,371 registered voters in the five test polling stations, 4,319 voted officially, a participation rate of 80.41 percent, which is very close to the national participation rate of 79.48 percent. Of these 4,319 voters, 2,340 agreed to participate in the experiment, for a total participation rate of 54.18 percent, which is a satisfactory number.

In addition to the participation rates, the expressed voting rates[3] for the methods tested likewise accounted for the way in which voters perceived our approach. The AV rate is high, at 96.03 percent. The same applies for the EV scoring methods, ranging from 93.45 percent for EV (0, ..., 20), to 98.82 percent for EV (?1, 0, +1). At first glance, the relatively low number of invalid ballots led us to think that the rules being tested were correctly understood. Other elements, as based on Table 1 in particular, supported this hypothesis. The EV (0, ..., 20) rule was in fact the only rule that had less support from participants than the AV method. Some voters stated, either orally or on the questionnaires, that this rule was complicated.

[3] An experimental voting ballot is considered to be 'null' if it...

Table 1 : *Responses to the Question about the Preferred Rule of Tested Voting*

	Number of participants who preferred				
Responses to the questionnaire	Both rules	Approval Voting	Evaluation Voting	Neither of the two
Respondents at 5 polling stations					
Number	1,958	539	577	643	198
Percentage	100 %	27.53 %	29.47 %	32.84 %	10.11 %
Strasbourg, Salle de la Bourse: EV(0,…, 20)					
Number	802	207	283	228	84
Percentage	100 %	25.81 %	35.29 %	28.43 %	10.47 %
Louvigny: EV(−1, 0, +1)					
Number	852	255	216	300	81
Percentage	100 %	29.93 %	25.35 %	35.21 %	9.51 %
Saint-Etienne, La Terrasse : EV (0, 1, 2)					
Number	304	77	78	115	33
Percentage	100 %	25.33 %	25.66 %	37.83 %	10.86 %

Finally, the response rate to the questionnaire attests to the positive reception of the experiment. As noted above, the response rate was 85.85 percent for the experimental ballots, and reached 95 percent at Louvigny.

Besides the three rates noted in Table 1, which provide evidence of voter interest in this initiative, voters were also able to give their explicit opinion about the voting methods we tested, by responding to the first two questions on the questionnaire. The first question related to which voting method they preferred, AV or EV. The detailed responses are shown in Table 1. Almost one-third of experiment participants opted for both rules tested, nearly one-third for AV, nearly one-third for EV, and only one-tenth preferred neither of the two.[4]

Overall, and as in 2007 (Baujard and Igersheim 2009), EV seemed to be preferred, but with slight differences between cities, depending on the scoring scale used. In

[4] Of course, the last figure is a lower limit, in that it can…

particular, this relative EV preference was the opposite in Strasbourg, where people overwhelmingly preferred AV to EV, due to the evaluation difficulties produced by such a wide-ranging scale there of (0, ..., 20). On the other hand, the voters of Louvigny, who were able to vote according to EV (–1, 0, +1) were clearly more likely to lean toward EV. Undoubtedly, the voters had an interest in seeing a negative score that would enable them to express their rejection of certain candidates.

The Capacity for Expression

Overall AV and EV statistics show that those participating in the experiment did indeed use their capacity to express themselves as provided for by the voting rules that were tested. ¹¹

Thus with AV, each participant approved an average of 2.75 candidates out of 10. In 2007, this figure was slightly lower – 2.33 candidates on average (with 12 candidates as opposed to the 10 in 2012). Table 2 shows the number of ballots in relation to the number of candidates approved. For example, 616 participants, or 27.4 percent of the votes cast, approved three candidates; 320 participants, or 14.2 percent of the votes cast, approved four candidates, etc. There is a double-peaked distribution here, for two approved candidates and three approved candidates. Furthermore, the proportion of test participants who gave only one approval is approximately 20 percent, namely only one-fifth of the voters. These observations confirm trends from the previous experiments; that is that less than one-quarter of the voters give only one approval; the mode and mean number of approvals is between 2 and 3. [12]

Table 2 : NUMBER OF VOTES CAST IN RELATION TO THE NUMBER OF CANDIDATES APPROVED

	Number of approvals	1	2	3	4	5	6	7	8	9	10	Total
Total	Number of votes cast	465	619	616	320	154	38	18	6	3	8	2,247
	Percent	20.7	27.6	27.4	14.2	6.9	1.7	0.8	0.3	0.1	0.4	100

In the same way, voters made wide use of the options offered by EV by more clearly expressing their electoral preferences, as shown in Table 3. This table can be read as follows: in Strasbourg, the scores between 0 and 6 (inclusive) were assigned 5,355 times out of a total of 9,650 scores provided by the 956 experimental votes cast; scores between 7 and 13 were registered 2,443 times; in Louvigny, the score of –1 was given 3,462 times out of 919 experimental votes cast, etc.

Such being the case, an EV strategic vote (regardless of the scale used) would consist in assigning the maximum score to the candidate or candidates that one wished to elect, and the minimum score to the others (Núñez and Laslier 2014). However, in light of Table 3, it is obvious that intermediate scores are often used. The majority of voters thus opted for an "expressive vote" rather than a strategic vote. However, nothing allows us to say that their behavior would be the same if this method of voting was officially adopted for appointing the president of the Republic, because the political parties would probably seek to steer their sympathizers to a strategic vote likely to ensure election of their candidate.

Table 3 : DISTRIBUTION OF SCORES

Strasbourg EV(0, …, 20)	Score	0-6	7-13	14-20	Number of votes
	Number of scores	5,355	2,443	1,762	956
Louvigny EV(−1, 0, +1)	Score	−1	0	1	Number of votes
	Number of scores	3,462	3,650	2 078	919
St Etienne EV(0, 1, 2)	Score	0	1	2	Number of votes
	Number of scores	2,227	910	603	374

Contrasting Results Between Official and Experimental Votes

Before commenting on our experimental results and comparing them to the official results of the April 22 election round, the raw experimental data must be corrected for representation bias and participation bias. Indeed, the experiment was proposed to voters at five polling stations who were not representative of all French voters, as is clearly seen by comparing the two first rows of Table 4. Additionally, not all voters using these polling stations participated in the experiment and/or indicated their official vote by completing our questionnaire, as indicated by the difference between rows 2 and 3 of Table 4.

Table 4 : *Comparison with the Official Results*

(In percent)	Hollande	Sarkozy	Le Pen	Mélenchon	Bayrou	Joly	Dupont-Aignan	Poutou	Arthaud	Cheminade
Official national results	28.63	27.06	18.03	11.14	9.10	2.31	1.79	1.15	0.56	0.25
Official results from the 5 test polling stations	33.16	22.31	12.57	13.54	11.60	3.61	1.56	0.97	0.57	0.12
Official vote as declared by the test participants	41.11	14.37	5.87	16.62	13.37	5.95	1.16	1.00	0.15	0.39
Associated weighting for correcting the AV	0.70	1.89	3.05	0.67	0.68	0.39	1.55	1.14	3.65	0.65

Note 1: In Table 4 and those following, the candidates are listed according to the official national classification scheme.
Note 2: The weightings assigned in Table 4 allow the AV results to be corrected.

In concrete terms, the bias was corrected as follows: out of 2,340 experimental ballots, 1,294 had a response to the question, "In the official vote, I voted for [. . .]," and those ballots could therefore be used to compare the official national vote (row 1 of Table 4) to the official vote declared by the test participants (row 3 of Table 4). It is evident that voters for François Hollande or François Bayrou were overrepresented in these responses, while the voters for Marine Le Pen were underrepresented. Correcting for these biases must therefore result in lowering the weighting assigned to the voters for Hollande or Bayrou and increasing that of the voters for Le Pen. A weight p_x, which is equal to the ratio between the official national percentage for candidate x and its percentage in the national vote declared by the 1,294 test participants, is associated with the voters for this candidate. Thus, weightings < 1.0 are obtained for all of the overrepresented candidates in our data, and > 1.0 for those who are underrepresented. In other

words, the votes of the experiment participants have been weighted according to their declared official vote.

Of course, it must be pointed out that this corrected data does not allow calculation of the results that we would obtain with a voting system other than the two-round, uninominal system used in France. First of all, such a conclusion would presume that it is possible to generalize the behavior of the voters who came from these five national polling stations, which is a strong assumption. Then, the adoption of a different voting method would change the political landscape, and both the candidates and voters would make other choices. This corrected data reflects the current political situation and, as a precaution, only significant deviations in percentages can be interpreted.

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With these reservations, we are able to comment on our experimental results for France and compare them to the official first-round results for the country. Table 5 can be read as follows: as concerns the official vote, Hollande earned 28.63 percent of the vote for France as a whole on April 22. Sarkozy came in second in this first round. As concerns the AV, 27.43 percent of voters gave their approval to Le Pen. Note that if we add up the percentages per candidate in the column "percent of voters," a sum > 100 percent is reached since the voters approved more than one candidate. For the three EV scores, the "Avg." columns provide the overall average obtained by the various candidates. Thus, Mélenchon had an overall average of 8.22 for EV (0, …, 20), i.e., 8.22 is equal to the total scores of this candidate divided by the number of voters. For this particular EV method, he earned second place.

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It can immediately be seen that the candidates earning first, penultimate, and last place in the five rankings were the same (Hollande, Arthaud, and Cheminade,

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respectively). Beyond that, the rankings and results of the official and experimental votes differed significantly.

Table 5 : *CORRECTED AV AND EV RESULTS FOR FRANCE*

	Official vote 1st round		AV		EV (0, … ,20)		EV (−1, 0, +1)		EV (0, 1, 2)	
	percent voters	Rank	percent voters	Rank	Avg.	Rank	Avg.	Rank	Avg.	Rank
Hollande	28.63	1	49.44	1	9.70	1	0.14	1	0.94	1
Sarkozy	27.18	2	40.47	2	7.74	4	-0.11	4	0.85	3
Le Pen	17.90	3	27.43	5	4.98	6	-0.35	8	0.68	5
Mélenchon	11.10	4	39.07	4	8.22	2	0.06	3	0.78	4
Bayrou	9.13	5	39.20	3	8.22	3	0.11	2	0.92	2
Joly	2.31	6	26.69	6	6.84	5	-0.17	5	0.46	6
Dupont-Aignan	1.79	7	10.69	8	3.69	8	-0.34	7	0.32	8
Poutou	1.15	8	13.28	7	4.28	7	-0.29	6	0.33	7
Arthaud	0.56	9	8.35	9	3.67	9	-0.40	9	0.26	9
Cheminade	0.25	10	3.32	10	2.35	10	-0.50	10	0.12	10

As a start, we will consider differences in ranking between the official, uninominal vote and the experimental, plurinominal voting systems. Only two inversions must be pointed out between the official and AV rankings: the first occurred between Le Pen (3rd in the official vote, 5th in AV) and Mélenchon (5th in the official vote and 3rd in AV); the second between two "small candidates," Poutou and Dupont-Aignan. As concerns the rest, these two rankings were otherwise similar in all respects.

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The EV rankings of Sarkozy and Le Pen were systematically lower than (or equal to) their AV rankings, which were themselves lower than (or equal to) their

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official rankings (candidates highlighted in dark gray in Table 5). The rankings of Bayrou and Mélenchon were systematically higher (or equal) when shifting from official rankings to AV ratings, and finally to EV ratings (candidates highlighted in light gray in Table 5).

Next, we will consider the differences in scores, by candidate, according to the respective voting systems. With plurinominal voting, the AV scores were all uniformly higher than the official results from the first round of voting. The differences between AV and official voting lie in the relative importance of the scores obtained by the candidates. Figure 1 shows this as it presents the percentages of voters for each of the voting methods. We will comment on these various differences.

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We will first discuss the winner, Hollande, the new president of France. Hollande achieved a much higher AV score than Sarkozy, whereas their official scores in the first round were close (28.3 and 27.18 percent respectively), and this was also true in the second round (52.65 and 48.36 percent respectively). Hollande received an AV rating of nearly 50 percent of the electorate, an absolute majority, whereas Sarkozy, the outgoing president, had an AV rating of only slightly more than 40 percent. The existence of a second official ballot round, setting just two candidates against each other, automatically produces a winner carrying the absolute majority of the votes. In other words, legitimacy of the winners in French elections is based less on the support of the electorate than on the existing electoral mechanism. In contrast, to obtain the absolute majority in a single-round ballot, as Hollande did with the AV vote, is far more remarkable. These AV results for the outgoing and incoming presidents, Sarkozy and Hollande, can be compared to those for Lionel Jospin (32.9 percent) and Jacques Chirac (36.7 percent) in 2002, or for Ségolène Royal (41.6 percent) and Sarkozy (35.9 percent) in 2007. Hollande's victory in 2012 seems to be the result of strong, concentrated

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support, which clearly sets him apart from Royal in 2007, who was challenged by a center candidate (Bayrou); and from Jospin in 2002, who was weakened by the candidacies of Jean-Pierre Chevènement and Christiane Taubira.

Figure 1
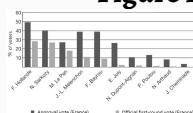
Later, comparable AV results were attained by Sarkozy (40.47 percent), Bayrou (39.20 percent), and Mélenchon (39.07 percent) – despite their very different official scores (27.18 percent, 9.13 percent, and 11.10 percent, respectively). It was with Bayrou that the difference in scoring reached its maximum (9.3 percent for the official vote and 39.20 percent for AV). Two factors need to be clarified here. On the one hand, according to Baujard and Igersheim (2010), the centrist candidate would have won in 2007 with an AV score of 42.8 percent, while the official ballot excluded him from the second-round duel. On the other hand, Bayrou was certainly the Condorcet winner in 2007 (Baujard and Igersheim 2007) and appears to have been the winner again in 2012 (Van der Straeten, Laslier, and Blais 2012). [5] However, it should be noted that in 2012 Bayrou would not have been elected by either the AV or EV system. Mélenchon also obtained an AV score that differed significantly from the official results – 39.07 percent – whereas only 11 percent actually voted for him in the official, uninominal ballot. Even if only the voices of the far Left actually voted for him in the official balloting, these figures attest to the fact that the themes developed by this candidate were of interest to a much broader sector of the electorate.

[5]
The Condorcet winner is the candidate that would beat any other...

The official results showed Le Pen to be a particularly important candidate, ranking third with 17.90 percent of the vote, an undeniable challenger in the April 2012 election. However, the voting experiment showed that only 27.43 percent of French voters were prepared to show her their approval (AV score). If we compare the difference in her scoring to that of the other three candidates, Le Pen's importance is placed in greater relative perspective. She moves to fifth place, with a significantly lower AV score than Bayrou or Mélenchon, who ranked behind her

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in the official vote. Her AV score was just about equivalent to that of Eva Joly. AV does in fact enable voters to express their support for minor candidates, who are largely ignored in the official balloting, as already demonstrated in 2002 and 2007. This was precisely the case of Joly whose AV score was 26.69 percent of French voters, while she only earned 2.31 percent of the official vote. In the same way, while her official score placed her in the same category as the minor candidates, Joly's EV scores were significantly higher than those of all other candidates ranked in this category. If these experimental results had been taken seriously, it would have been difficult to continue to consider her to be a minor candidate.

Conversely, the status of the other minor candidates was confirmed. This was true for Cheminade, Arthaud, Poutou, as well as for Dupont-Aignan.

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Therefore, the experimental AV and EV results made it possible to observe significant differences in the scores and rankings of each candidate. Some benefited from the change in voting method, while others were placed at a disadvantage. Bayrou, Mélenchon, and, to a lesser extent, Joly appeared to be favored by the plurinominal voting systems, unlike Sarkozy and Le Pen.

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CONCLUSION

These experiments involving new voting methods, which were conducted during the first round of the 2012 French presidential election on April 22, confirmed that it is possible to conduct this type of research on a large-scale and in the field. The experiments were generally well received by the voters at the five polling stations surveyed, with an average participation rate of 54.18 percent. Furthermore, we observed that experiment participants fully utilized the finely

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shaded means of expressing themselves that were offered by the alternative voting methods. With AV (approval voting), those participating in the experiment approved some 2.72 candidates out of 10 rather than just one candidate. With EV (evaluation voting), the voters in Saint-Étienne, for example, granted the EV intermediate score of 1 (out of a possible 0, 1, or 2) in 24 percent of the cases; and the voters in Strasbourg granted scores of between 7 and 13 (out of a possible 0-20) in 26 percent of the cases.

The results also highlighted certain factors related to the relatively significant support enjoyed by the various candidates, and thus to the characteristics of the voting methods tested versus those of the official method:

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• There were significant contrasts between the results of the official, uninominal voting method and those of the experimental, plurinominal voting methods. However, it was also observed that, while some scoring scales reinforced the differences, the various plurinominal rules tested led to largely similar results.

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• Regardless of the voting method, Hollande remained the winner in this election. He even received the AV majority (nearly absolute), thereby outstripping Sarkozy.

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• Shifting away from the uninominal to the plurinominal seemed to benefit Bayrou and Mélenchon in particular, whereas it placed Sarkozy and Le Pen at a disadvantage.

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• Because the plurinominal systems tested allowed voters to express their opinions about a greater number of candidates, voters conveyed support for some candidates that were underestimated by the official voting system, such as in Joly's case. On the other hand, some candidates remained largely ignored by the voters and at the bottom of all the rankings, including Poutou, Dupont-Aignan, Arthaud, and Cheminade.

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Therefore, it follows from this study that whatever voting method is used it is never a neutral method for designating the winner, who would impose him/herself on the French people as the result of the indisputable proof of a mathematical calculation. On the contrary, the choice of a voting method shapes the democracy in which we live. The purpose of our research is to understand how.

NOTES

[1] The authors extend a warm and hearty thanks to them (http://www.gate.cnrs.fr/spip.php?article580#Merci).

[2] For further details about the experiment and other publications, see http://www.gate.cnrs.fr/spip.php?article580.

[3] An experimental voting ballot is considered to be 'null' if it contains annotations that do not comply with the rules. It is considered to be 'blank' if not filled in completely. Expressed ballots are ballots that are neither null nor blank.

[4] Of course, the last figure is a lower limit, in that it can reasonably be assumed that the voters who did not appreciate the proposed rules participated less than others in the experiment.

[5] The Condorcet winner is the candidate that would beat any other candidate in a duel, for instance the second-round duel.