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VOTING AND EXPRESSING DISSATISFACTION: AN EXPERIMENT DURING THE 2017 FRENCH PRESIDENTIAL ELECTION

by

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Voting and expressing dissatisfaction: an experiment during the 2017 French Presidential election*

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Abstract

This paper reports an experiment realised with 850 electors during the 2017 French presidential election. It tested a ballot different from the official one. Instead of voting for a unique candidate, participants were asked to cast one vote on each candidate. The vote could be "in favor", "neutral" or "against". The theoretical advantages of such a ballot are discussed and tested empirically.

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1 Introduction

Distrust of political parties is spreading across countries (Dalton and Weldon, 2005) and has continued to grow during the recent crisis (Armingeon and Guthmann, 2014). In general this dissatisfaction cannot be explicitely voiced in elections. One exception is the "none of the above" possibility. It is offered in the State of Nevada (Damore et al., 2012); Russia during the period 1993-2006 (McAllister and White, 2008); and India since 2013 (Diwakar, 2015). Another exception consists in allowing electors to cross off the names of those against whom they wish to vote. This possibility was offered in the former Soviet Union (Hahn, 1988) or in some Chinese villages (Zhong and Chen, 2002). It also exists in French municipal elections, but only in villages of fewer than 1,000 inhabitants. When dissatisfaction cannot be explicitely voiced it is indirectly expressed, through abstentions (exit option), invalid votes, votes for populist or extreme parties (voice option) or vote for a mainstream party (loyalty option). The main disadvantage of these options is that they do not send a clear signal: for instance abstention may be due to desinterest or dissatisfaction; the votes received by a candidate may be in his or her favor or against the competitor.

Clear messages of dissatisfaction can be found in elections. Consider the two-round French presidential elections. Voters are allowed to vote for a unique candidate at each round. The second round takes place two weeks after the first one and opposes the two candidates with the largest numbers of votes. The number of invalid votes are always more numerous at the second round than at the first one. The additional invalid votes can be interpreted as voices of dissatisfaction with the second round competitors. The 2002 election provides a well-known example of dissatisfied electors choosing the loyalty option. In that election, sixteen candidates were present at the first round. Too many left-wing electors took for granted that the socialist candidate would anyway be selected for the second round and voted for other candidates. As a result all left-wing candidates were eliminated. More than three fifths of the total electorate voted for the conservative candidate at the second round. Many of these votes were cast against his opponent (whose party is considered as extreme). Dissatisfaction can also be found in the 2017 election. The second round exhibits the largest percentage of invalid votes on record and the second largest percentage of abstention (the largest was obtained in 1969). On the 7th of May 2017, four millions of French citizens bore the cost of electoral participation to cast a null or blank vote.

Social choice theory advocates for alternative electoral systems that increase the voters' capacities to express their preferences. Some of them were experimented during the 2002, 2007 and 2012 French presidential elections. All tested ballots differ from the official one. One experimental ballot asks voters to rank all candidates (Favarque, Jayet and Ragot, 2011); while all others ask voters to assign each candidate a grade chosen within a given set. Balinski et al. (2003) tested approval ballots, i.e. the grade is chosen within set {approval, non approval}. Baujard and Igersheim (2011) repeated the experiment with approval ballots and tested ballots with a set of numerical grades, {0,1,2}. Those ballots and two new ballots, respectively with sets {-1,0,1} and {0,1,...,20} were tested in Baujard et al. (2014). Balinski and Laraki (2011) tested ballots with a set of qualitative grades, {excellent, very good, good, acceptable, poor, to reject}. Experiments have also been realised in other countries: Germany (Alós-Ferrer and Granić, 2012); Benin (Kabre, Laslier, Van der Straeten, and Wantchekon, 2013); Romania (Roescu, 2014) and Austria (Darmann, Grundner and Klamler, 2017).

All those experiments yield the following conclusions concerning the choice of ballots. Ranking all candidates appears to be difficult (see Favarque et al., 2009; Popov et al., 2014;[1] and Darmann et al., 2017). By contrast participants enjoy the possibility of choosing a grade for each candidate. Ballots with three grades are preferred to ballots with two grades but choosing among twenty-one grades is too complicated (Baujard et al., 2013). Participants attach meaning to numerical grades and do not consider that the sets {-1,0,1} and {0,1,2} are equivalent (Igersheim et al., 2016). Balinski and Laraki (2014) give further arguments in favor of qualitative grades.

This paper reports an experiment realised during the 2017 French presidential election with a ballot with three qualitative grades. Voters are asked to cast one vote on each candidate. The vote can be "in favor", "neutral" or "against". This ballot, referred to as approval and disapproval ballot, has several advantages compared with the official one. Two advantages are common to all ballots where each candidate receives a grade. First, more flexible options are offered: a voter can still vote in favor of a unique candidate but other possibilities also exist. Second, supporters of marginal candidates do not face the traditional dilemma of the first round: either to express support

[1] Regenwetter, Kim, Kantor and Ho (2007) and Popov, Popova and Regenwetter (2014) study the presidential election of the American Psychological Association where voters rank all candidates.

for the most preferred marginal candidate or to cast a useful vote for a less preferred candidate. The elimination of the socialist candidate in the 2002 election demonstrated that this choice could have important consequences. Compared with the ballots tested in the previous elections, the approval and disapproval ballot offers an explicit means to express dissatisfaction with the vote "against". The three qualitative grades have a common interpretation. The grade "in favor" corresponds to a positive opinion; the grade "against" corresponds to a negative opinion; and the grade "neutral" permits to express indifference and draws the frontier between positive and negative evaluations. Reducing the number of grades to three avoids the differences of interpretation that arise whenever several positive or negative grades are proposed. For instance what a voter requires for the grade "excellent" may be what another voter requires for the grade "very good".

This experiment was realised on April 23 (first round of the 2017 election) in the city of Allevard-les-Bains. It was both a scientific project and a citizen initiative. Electors were invited to the experimental voting station once they had cast their official vote. Three different voting rules using the disapproval and disapproval ballot were tested: the Dis&approval rule (Alcantud and Laruelle, 2014) and two of its variants. Each participant tested one at random.

Participants were satisfied with the ballot. The official ballot forced many left-wing voters to choose between the socialist candidate and another left-wing candidate ahead in polls. This generated a dilemma as polls were also suggesting that both candidates could be eliminated at the first round. In the experiment voting in favor of both was possible. As a result the socialist candidate received many votes "in favor" in the experiment while he scored very poorly at the official election. That is, his official score reflects a strategic choice rather than a lack of support. Participants were also very happy with the possibility of voting against candidates and used it intensively. In particular, two of the main candidates, the conservative one and the second round loser, received many votes "against".

Concerning the outcome, the finding of the experiment is that the three rules tested yield the same winner. Additionally, the ranking of the five main candidates is identical under the three rules. Remarkingly enough, the ranking of the five main candidates is not modified either when other rules using ballots with three qualitative grades are applied to the data. An identical ranking is obtained with the Approval-Condorcet-Elimination procedure (Yılmaz, 1999), the threshold rule (Aleskerov, Yakuba and Yuzbashev, 2007)

or the majority judgement with three grades (Balinski and Laraki, 2007). This robust finding permits to formulate a conjecture that would disantangle opposite conclusions drawn from different experiments. On the one hand Regenwetter et al. (2006) argue that different outcomes due to different electoral rules hardly occur in real-world situations. This is illustrated in the analysis of the presidential election of the American Psychological Association (Regenwetter et al., 2007, and Popov et al., 2014). On the other hand the above mentioned French and German experiments conclude that different rules using different ballots lead to different outcomes. The conjecture is that what really matters is the ballot which amounts for the information collected. It can then be expected that in real-world situations rules using different ballots, i.e. collecting different amounts of information, may easily yield to different outcomes. By contrast rules using different ballots will rarely[2] yield different outcomes.

The rest of the paper is organized as follows. Section 2 describes the outcomes of the official election. Section 3 presents the experiment and the participants. Section 4 analyses the experimental voting behavior. Section 5 gives the outcomes of the experiment and discusses their robustness. Section 6 concludes.

2 Official election at Allevard-les-Bains

The presidential election in France is a two-round run-off, with a unique district. Eleven candidates competed in the 2017 presidential election. Following the official order of presentation, these were: Nicolas Dupont-Aignan (Debout la France), Marine Le Pen (Front National), Emmanuel Macron (En Marche), Benoit Hamon (Parti Socialiste), Nathalie Arthaud (Lutte Ouvrière), Philippe Poutou (Nouveau Parti Anticapitaliste), Jacques Cheminade (Solidarité et Progrès), Jean Lassalle (Résistons), Jean-Luc Mélenchon (La France Insoumise), François Asselineau (Union Populaire Républicaine) et François Fillon (Les Républicains).

It can be said that there were five main competitors: M. Le Pen (MLP), E. Macron (EM), B. Hamon (BH), J.L. Mélenchon (JLM) and F. Fillon (FF). Their respective possibilities were described as follows by J. Rothwell and

[2] An example is the experiment realised on single transferable vote (Favarque et al., 2011), where the Hare and the Coomb methods lead to different outcome.

H. Samuel in the Telegraph [3]: "French elections are usually a two-horse race between the conservative Les Republicains (formerly the UMP) and the Left-wing Socialist Party. But for this year's election, the goalposts have moved. François Hollande's Socialist Party is in tatters after a disastrous term that has made him one of the least popular presidents in the country's history. And with Les Republicain's François Fillon smarting from the scandal over claims he paid his wife thousands of euros to do a fictitious job, his victory is no longer a foregone conclusion. Much ink has also been spilled over the possibility that Marine Le Pen could ride to the Élysée Palace on a wave of populism. Only one Front National (FN) presidential candidate has made it to the second round – Jean-Marie Le Pen in 2002. His daughter Marine is virtually assured of doing so, current polls suggest, but her chances of winning the run-off remain highly unlikely. Mr Macron has emerged in recent weeks as the clear favourite to win the second round runoff, but nothing is set in stone. (...) The surprise fourth man of the presidential campaign, Communist-backed radical Jean-Luc Mélenchon is polling to beat Socialist candidate Benoît Hamon as the top choice of the Left."

In the first round E. Macron obtained 8,657,326 votes; M. Le Pen 7,679,493 votes, F. Fillon 7,213,797 votes, J.L. Mélenchon 7,060,885 votes and B. Hamon 2,291,565 votes. The candidate ranked at the sixth position was N. Dupont-Aignan with 1,695,186 votes. The other candidates obtained fewer than 500, 000 votes. E. Macron was opposed to M. Le Pen at the second round and was elected.

Allevard-les-Bains is a city located in the Department of Isère, in the region of Auvergne-Rhône-Alpes with 2969 registered voters for the 2017 presidential election. At the first round 2308 electors showed up at the voting station. Table 1 gives the result of their first round vote. Candidates are denoted by their initials; "bn" stands for a blank or a null vote.

	NDA	MLP	EM	BH	NA	PP	JC	JL	JLM	FA	FF	bn
	132	442	507	146	10	27	2	27	575	31	351	58
(%)	6	19	22	6	1	1	0	1	25	1	15	3

Table 1: First round results at Allevard-les-Bains

[3] Consulted December 13, 2017
http://www.telegraph.co.uk/news/0/french-presidential-election-2017-does-work-candidates/

As can be seen from Table 1, the results are not representative of those of France. The ranking of three of the main competitors is different: here J.L. Mélenchon arrives first, E. Macron arrives second, and M. Le Pen is third. As in France F. Fillon is fourth and B. Hamon fifth.

3 Description of the experiment

The experiment realised in Allevard-les-Bains was a citizen initiative supervised by researchers. It involved around twenty volunteers from the city. Its procedure follows the protocol of the previous experiments realised during the French presidential elections. An official letter was sent to every registered voter at home. It informed that a scientific vote experiment would take place on the election day. The experimental ballot and the rules tested were described. Citizens were also invited to a public conference on the experiment. On the election day volunteers encouraged electors to participate to the experiment at the exit of the official voting station and explained, if necessary, how to fill the ballot. The official and experimental voting stations offered identical voting conditions (same opening hours, cabin booths, list of electors, checking the identity, urns).

On the experimental ballots the names of the eleven candidates were printed, with three boxes per name: one "in favor", one "neutral" and one "against". Participants were asked to tick one box per candidate. It was stated that if one box was left empty, it would be counted as an "against" vote. It was also specified that ballots would be considered as invalid if more than one box per candidate was ticked. There was a small questionnaire on the back of the ballot: the questions were on their official vote and gender.

Each participant received at random a green, blue or yellow ballot. The colour of the ballot determined the rule experimented. Participants with a blue ballot tested the Dis&approval rule (Alcantud and Laruelle, 2014); those with a green or yellow ballot tested two variants of this rule. On all ballots it was precised that candidates would obtain one point for each "in favor" vote received and that a certain number of points would be withdrawn for each "against" vote. It was stated on the blue ballots that the number of point withdrawn would be one. This number was half on the green ballots and two on the yellow ballots. The candidate with the largest number of points was elected.

Volunteers reported that it was sometimes difficult to convince electors

to participate: 859 of 2308 electors came to the experimental voting station. By contrast it was easy to explain how to fill the ballot. Only 9 participants ticked more than one box per candidate. We have thus a set of 850 valid ballots: 247 green ballots, 280 blue ballots, 307 yellow ballots and 16 letters of information used as ballot (this possibility had been allowed). The huge majority of participants answered the questionnaire. This lead to the following information. More women participated: 433 of them answered the gender question while 366 men did. All candidates' electors are represented among the participants. Those of J.L. Mélenchon are the more numerous (256 of them) while one elector of J. Cheminade participated. Table 2 gives each candidate's number of electors for the 808 participants who reported their vote at the official election.

	NDA	MLP	EM	BH	NA	PP	JC	JL	JLM	FA	FF	bn
	55	79	201	79	4	10	1	5	256	19	94	8
(%)	7	10	25	10	0	1	0	0	32	2	12	1

TABLE 2: distribution of participants according to the official vote

Participants are not representative of the electorate of Allevard-les-Bains, as can be concluded from the comparison of the percentages of Table 1 and Table 2. The electors of N. Dupont-Aignan, B. Hamon, E. Macron and J.L. Mélenchon are proportionally more represented in the set of participants than in the electorate of Allevard-les-Bains. The opposite holds for the electors of M. Le Pen or F. Fillon. This lack of representation prevents us from making any comparison between the official vote and the experimental one.

4 Voting behavior

The official ballot represented a dilemma for many 2017 French electors. Voters have to choose a single candidate and the 2002 election taught them to be strategic. Participants enjoyed the new expressive possibilities offered by the experimental approval and disapproval ballot. Some comments were: "with this ballot we can at last vote with the heart" or "voting with this ballot is a relief". Participants generally decided to transmit more information than the one they are usually asked. Only 45 participants chose to cast a ballot that would be equivalent to the official one. That is, 45 participants voted in favor a single candidate and cast a vote against (or neutral vote) all other candidates.

It is also worth noting that most participants used the three possible votes. The neutral vote is used by 735 participants. That is, the ballots filled go beyond what would be an approval vote. This empirical evidence contradicts Felsenthal (1989)'s theoretical conclusion that no rational voter chooses a neutral vote because it is a dominated strategy.

Participants were especially satisfied of being offered the opportunity to vote against candidates. Most participants cast more "against" votes than "in favor" votes. Participants appreciated the possibility of voting in favor several candidates, although more than 30% of the participants (256 out of 850) cast a single "in favor" vote. Around 50% of the participants cast two or three "in favor" votes. The dispersion is larger for the number of votes "against" cast.

On average, the 11 votes cast by a participant are distributed as follows: 2.3 "in favor" votes; 5.7 "against" votes and 3 neutral votes. Table 3 gives the average distribution of the 11 votes for the whole sample of the 850 participants; for those who filled a green, blue, or yellow ballot; and for male or female participants.

	All 850	Green	Blue	Yellow	Women	Men
"in favor"	2.3	2.4	2.3	2.3	2.3	2.3
neutral	3	3	3	3	3	2.9
"against"	5.7	5.6	5.7	5.7	5.7	5.8

TABLE 3: Average numbers of votes cast according to the colour and gender

As can be seen from the table participants behave similarly whatever the colour of the ballot. This means that the rule has no impact on how a participant distribute the votes. We could have expected that the larger the number of point withdrawn in case of "against" vote, the smaller the number of "against" votes. This does not hold: the average number of "against" votes among yellow ballots is not smaller than among the green ballots. Participants had no incentive to vote strategically. It was also the first time that they were using these ballots, so no strategic learning may have taken place.[4] At the public meeting a question addressed by a participant was: Why should we vote differently according to the number of points assigned to a "against" vote? Women and men also behave similarly.

[4]By contrast strategic choices (popularly referred to as "useful vote") are common in the official elections, especially since 2002.

By contrast the averages differ according to the vote reported at the official election. Table 4 gives the average number of "in favor", neutral and "against" votes cast by the participants who are electors of the six main candidates.[5]

Votes	NDA's electors	MLP's electors	EM's electors	BH's electors	JLM's electors	FF's electors
"in favor"	2.1	2.1	2.1	2.3	2.6	2
neutral	3.7	2.5	3	3.1	2.9	2.5
"against"	5.2	6.3	5.9	5.6	5.5	6.5

TABLE 4: Average numbers of votes cast according to the official vote cast

Here the differences are more substantial: the average number of "in favor" votes varies between 2 and 2.6; the average number of "against" votes between 5.2 and 6.5; and the average number of neutral votes between 2.5 and 3.7. These differences are consistent with the political landscape: there were more left-wing candidates than right-wing candidates, and thus left-wing electors (that is, B. Hamon or J.L. Mélenchon's electors) cast more "in favor" votes than the other electors. It is worth noting that F. Fillon or M. Le Pen's electors cast more "against" votes than the other electors.

Among the electors of a candidate we can compute the percentage of them who vote in favor this candidate. We obtain a percentage of 0.98 for N. Dupont-Aignan; 0.92 for M. Le Pen; 0.95 for E. Macron; 1 for B. Hamon; 0.98 for J.L. Mélenchon; and 0.97 for F. Fillon. These very large proportions show that participants took the experiment seriously and voted consistently with their official vote. Moreover not voting in favor of the candidate for whom they voted at the official election is not necessarily an misunderstanding of the approval-disapproval ballot. Some participants warned us that the vote at the official election had been a strategic choice, while the answer to the experiment would be sincere.[6]

[5] The averages are done for the sets of ballots that represent at least 5% of the participants, i.e. if we had at least a sample of 43 ballots.

[6] This explains why these participants considered the experimental rule as a relief compared to the official rule.

5 Results of the experiment

Given that there is no substantial difference of voting behavior according to the rule tested, we consider the whole sample of valid ballots.[7] Table 5 gives the distribution of 850 votes received by the different candidates.

	NDA	MLP	EM	BH	NA	PP	JC	JL	JLM	FA	FF
"in favor"	191	131	303	322	133	169	31	77	401	59	146
neutral	227	78	215	247	309	277	297	325	177	273	83
"against"	432	641	332	281	408	404	522	448	272	518	621

TABLE 5: Numbers of votes received by the different candidates

Two candidates (J.L. Mélenchon and B. Hamon) receive more "in favor" votes than "against" votes; J.L. Mélenchon is even close to receiving 50% of "in favor" votes. This candidate dominates all others, in the sense that he has at the same time the largest number of "in favor" votes and the smallest number of "against" votes.

Two of the five main candidates, F. Fillon and M. Le Pen, receive very large numbers of "against" votes, much more than little known candidates do. It is also worth noting that little known candidates receive more "against" votes than neutral votes.

What this table does not show is that the participants who voted in favor of F. Fillon, M. Le Pen or E. Macron are generally participants who cast a few "in favor" votes. For instance 57% of the "in favor" votes received by F. Fillon were cast by participants casting one or two "in favor" votes. By contrast the participants who voted in favor of little known candidates (J. Cheminade, J. Lassalle, F. Asselineau, N. Arthaud, and P. Poutou) are rather participants who cast at least 4 "in favor" votes. N. Dupont-Aignan, B. Hamon and J.L. Mélenchon obtain the majority of their "in favor" votes from participants who cast 2 or 3 votes "in favor".

Another point worth mentioning is that participants who cast few votes "against" generally vote "against" F. Fillon and M. Le Pen. For instance, 22 participants out of the 26 participants who cast a single "against" vote, cast it "against" F. Fillon or M. Le Pen. Out of the 48 participants who cast two "against" votes, 40 vote "against" F. Fillon and 37 against M. Le Pen.

[7] Note that if we consider each subset of a given colour the results are not substantially different: the ranking of the five main candidates is basically identical. In particular the winner never changes.

We then compute the respective scores of the candidates for the three rules that were tested. A candidate's score with the Semi-Dis&approval (SD) rule is the difference between the number of votes "in favor" the candidate and half the number of votes "against" the candidate. It is the difference between the numbers of votes "in favor" and the votes "against" with the Dis&approval (D) rule; and it is the difference between the number of votes "in favor" and twice the number of votes "against" with the Double-Dis&approval (DD) rule. Candidates are then ranked according to their score. The results are given in Table 7.

We can compare these rankings with the rankings that would be obtained with other rules that deal with approval-disapprovals ballots. The Threshold (T) rule (Aleskerov, Yakuba and Yuzbashev, 2007) ranks candidates according to the number of votes "against": the smaller this number the better. In case of tie, the number of "in favor" votes are compared: the larger this number the better. What can be referred to as Lexicographical Approval (LA) ranks candidates according to the number of "in favor" votes (the larger this number, the better). In case of a tie, a candidate with a smaller number of "against" votes is considered as better. This is a lexicographical extension of the approval rule for approval-disapprovals ballots (Brams and Fishburn, 1978). The rankings for these two rules are given in Table 7.

The majority judgement (Balinski and Laraki, 2007) with three grades associates to each candidate her or his median evaluation (here, "in favor", neutral or "against"). The "candidate's majority gauge" (see Balinski and Laraki, 2011, p. 24 - 25) and a tie breaking rule permits to provide a complete ranking of all candidates. The results for the experiment is given in Table 7.

Yılmaz (1999) proposes the Approval-Condorcet-Elimination procedure. This rule is based on pair-wise comparisons of candidates. A voter is said to strictly prefer a candidate to another if the voter casts a vote "in favor" the first candidate but not "in favor" the second or if the voter casts a neutral vote for the first candidate and "against" the second. For each pair of candidates we count how many voters strictly prefer one to the other. The candidate with the largest number is globally preferred to the other one. The results for the experiment are given in Table 6, which reads as follows. The value 148 in row BH and column JLM gives us the number of participants who strictly prefer BH to JLM. We compare this value to, 216, the one in row JLM and column BH. We conclude that J.L. Mélenchon is globally preferred

to B. Hamon.

	NDA	MLP	EM	BH	NA	PP	JC	JL	JLM	FA	FF
NDA	0	299	208	222	265	261	277	258	198	261	289
MLP	88	0	140	159	164	168	165	162	131	152	134
EM	356	446	0	230	363	355	412	392	247	416	412
BH	397	504	262	0	334	322	438	400	148	432	492
NA	280	372	214	87	0	76	266	238	80	278	387
PP	289	388	219	102	111	0	286	254	74	294	394
JC	117	242	127	87	238	97	0	78	76	94	252
JL	178	304	171	136	159	157	180	0	122	181	297
JLM	425	502	328	216	395	353	487	446	0	468	495
FA	111	237	147	112	134	131	111	103	89	0	239
FF	113	158	120	176	198	199	193	179	166	184	0

Table 6 Matrix of preferences in the ACE-procedure

We observe in the table that J.L. Mélenchon is preferred to all other candidates. In turn the B. Hamon is preferred to all other candidates but J.L. Mélenchon. We obtain a complete[8] ranking of candidates which is given in Table 7.

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th
LA	JLM	BH	EM	NDA	PP	FF	NA	MLP	JL	FA	JC
SD	JLM	BH	EM	NDA	PP	NA	JL	FF	MLP	FA	JC
D	JLM	BH	EM	PP	NDA	NA	JL	FA	FF	JC	MLP
DD	JLM	BH	EM	PP	NDA	NA	JL	FA	JC	FF	MLP
T	JLM	BH	EM	PP	NA	NDA	JL	FA	JC	FF	MLP
MJ	JLM	BH	EM	PP	NA	NDA	JL	FA	JC	FF	MLP
ACE	JLM	BH	EM	PP	NA	NDA	JL	FA	JC	FF	MLP

Table 7: Ranking of the candidates with the different rules.

The rankings provided by the rules are rather consistent. The five main competitors appear in the same relative positions. This is an extremely robust results given that the other candidates were much less known. The first three candidates are always ordered as follows: J.L. Mélenchon first, B.

[8]The ranking obtained by the ACE-procedure is not necessarily complete as it is the case here.

Hamon second and E. Macron third. The other two main candidates come far behind. In most rules, M. Le Pen is last and F. Fillon is last but one. In fact M. Le Pen is not ranked last in the Lexicographical Approval (LA) or the Semi-Dis&Approval (SD), the two rules that give more importance to a vote "in favor" than to a vote "against". We can conclude that M. Le Pen and F. Fillon are much disapproved.

A detailed analysis of the data of the experiment suggests that some voters used the number of "in favor" votes or "against votes" in order to express some intensity of preferences. A rule that would take into account this information may deserve some theoretical study.[9] As a first step in this direction we made the following exercise. In the dis&approval rule a vote "in favor" a candidate is worth one point and a vote "against" is worth minus one point. Instead a "in favor" vote is weighted by the number of "in favor" votes cast by the participant (as long as this number is not zero). For instance if a participant casts a single "in favor" vote, this vote amounts for one, if a participants casts two "in favor" votes each of them will amount for half, etc. Similarly a vote "against" can be weighted by the number of "against" votes cast by the participant. We then sum the weighted votes and obtain a modified score for each candidate. J.L. Mélenchon's modified score remains the largest of all candidates. Among the five main competitors, the of M. Le Pen's modified score remains the smallest and F. Fillon's one is the smallest but one. By contrast the ranking of E. Macron and B. Hamon would be reversed.

6 Conclusion

Participants took the experiment seriously: ballots were filled consistently with the official vote reported. They enjoyed the option of voting in favor of several candidates and were especially satisfied of being offered the opportunity to vote against candidates. The three possible votes ("in favor", neutral and "against") per candidate were considered as very intuitive and sufficient to express their political opinion. In sum, this field experiment resulted in a democratic experience. Participants were happy to discuss electoral systems from a scientific perspective. Some of them learnt that alternative systems were possible and used in different countries. Even electors who cast a blank or null vote at the official election decided to participate and cast a valid

[9] This rule may have more strategic aspects than the others.

vote at the experiment. It can thus be inferred that the use of approval and disapproval ballots may boost electoral participation.

The political offer and more generally the political actors' behaviour would also be modified with alternative ballots. In order to win the election with the official ballot, a candidate has to convince electors to vote in her or his favor. With an approval and disapproval ballot candidates would also have to convince the rest of the electorate not to vote against them. Opposition to the adoption of these ballots may thus be expected. But some political interest nevertheless exists. In June 2017, in the wave of the experiment, the dis&approval rule was used in a popular referendum to choose the names of two new quarters. This referendum was organised by the city which initiated the citizen project of realising the voting experimen: Crolles (a neighbour city of Allevard-les-Bains).

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