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The household effect on electoral participation. A contextual analysis of voter signatures from a French polling station (1982–2007)

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ABSTRACT

We use electoral participation data coded from signature lists to show that patterns of voter turnout, be they related to average participation, versatility or precise moments of voting, are strongly related to what we call “electorate households”, i.e. groups of voters registered in the same polling station and living together. Each household tends to be homogeneous, at levels much higher than chance would explain, so that modelling individual participation without taking this household effect into account ignores much of what actually happens. The status in the household also plays an important role among individual factors of voter participation. Not only do people who live together often participate together, but the precise shape of their relationships influences their behaviour.

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1. Introduction

This paper uses a statistical analysis of electoral participation data coded from voter signatures to describe patterns of voter turnout that prove to be heavily influenced by the organization of individual voters in households. Turnout patterns are indeed characterized both by a strong homogeneity within “electorate households,” and by a correlation between the status of each individual in the household and his or her turnout.

We define “electorate households” as a group of persons registered in the same polling station and living under the same roof. We take into account several different dimensions of voter turnout: we are interested in the precise moments of abstention as well as in changes in behaviour (from abstention to participation and vice versa) and of course in the mean tendency of

each individual to take part or not to take part in each ballot. These definitions allow us to demonstrate, first, that people who live together have a strong tendency to present the same participation patterns, and second, that the specific status of the voter within the household influences his or her degree of electoral participation. Our study is thus part of a trend of research that highlights the social and environmental determinants of voting. We however shed light on an often overlooked context: the household.

The paper first explains why data collected from electoral rolls are particularly apt at allowing this sort of contextual analysis of patterns in electoral participation (2). It then presents the case study, situated in one polling station of the Parisian suburbs (3), and the variables that were built from the raw data (4). Finally, it presents our main results on the homogeneity within electorate households (5) and the effect of status in the household on voter turnout (6). The final discussion emphasizes the potential of data extracted from voter signatures for complementary analyses of electoral behaviour (7).

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2. Signature lists: sources for a contextual analysis of electoral participation

Since *Tableau de la France de l'Ouest* (Siegfried, 1913) and *The People's Choice* (Lazarsfeld et al., 1944), electoral studies have discussed the social dimension of voting behaviour, whether it be turnout or abstention in elections, preferences expressed in the ballots, or the competence displayed during this act. As electoral studies developed, an opposition emerged between two types of research. Some researchers saw the voter as an individual actor empowered by some sort of rationality, admittedly limited, but effective in that it allowed the actor to express a choice through his or her participation and his or her precise vote. Others, stressing the importance of social and local contexts, challenged the assumption that actors necessarily considered voting as a conscious choice, or even that they always cared. This article continues the second tradition of analysis, sometimes referred to as “contextual,” considering the voter not as much as an individual that makes a “choice” than as an actor inserted in a social and local context that strongly influences his or her voting behaviour.

Such an assumption led us to favour the use of data on voter participation that do not rely on voter statements, but are the direct product of an effective voter behaviour. Our data thus were collected in signature lists. In France, voters must be registered on the electoral rolls. When they participate in an election, they have to sign (e.g., initial) their polling station's particular signature list before placing the envelope that contains their ballot in the ballot box. At the close of the station, voter turnout is doubly measured by comparing the total number of envelopes collected from the ballot box with the number of signatures on the list. The voters' signature is thus lasting proof of their turnout in the election (in the case of proxy voting, the voter authorizes another to vote and sign in his or her place); all citizens have access to the rolls during the week following the election. In some places, the lists are then destroyed, but others preserve them in offices or in municipal archives. Our study is based on the analysis of turnout patterns of registered voters in one polling station between 1982 and 2008; we only have considered data for elections with available signature lists.¹

This kind of data has obvious limitations for a study of political behaviour. They only include French citizens,² and only those among them who are actually registered: estimates of unregistered potential voters range between 3.5% and 11.5% (Braconnier and Dormagen, 2007b).³ More

importantly, what we measure is not directly the behaviour of people actually living in a given area: as controls are very limited, it is possible to continue to vote in a place where one once lived.

The primary advantage of our data is their high degree of realism. We are not working on statements about acts, but on the acts themselves. Even if there is fraud, such as fake voters' signatures or actual voters' signatures appended by unauthorized parties, the actual act of voting or not voting is very closely recorded. We have taken into account 29,756 traces of acts of turnout or abstention, over three decades. These data offer several benefits.

First, it is well established that non-registration and abstention are highly underreported in opinion polls (Kenny, 1993), and that abstentionists refuse more than voters to respond to pollsters' questions (in proportions twice as high, according to Michelat and Simon, 1982). Studies comparing interviews and signatures on electoral rolls even showed that voters could be very prolix about a vote that they had not even cast, according to the lists (Braconnier and Dormagen, 2007). This has led some analysts to give up on including voter turnout in patterns of political participation for the sake of realism—although turnout remains considered as the very foundation of modern citizenship (Mac Clurg, 2003; Cramer Walsh et al., 2004).

A second advantage of data extracted from signature lists is their relevance to test the role of contexts in participation behaviour. Analyses combining survey and ecological data have long documented the effect of local contexts in shaping voter turnout. For example, the social composition of British constituencies influences working- and middle-class votes (Butler and Stokes, 1969; Andersen and Hearth, 2000). In such cases, the word “local” applies to a relatively large spatial unit, but the notion of neighbourhood plays a role. Other authors have emphasized the influence of primary groups as highlighted by the Columbia tradition: they have shown that people who talk together tend to vote together (Miller, 1977), and documented the influence of households and families on individual political orientation (Huckfeldt, 1986; Johnston et al., 2001; Johnston et al., 2005b). Households themselves are admittedly not independent from a broader local context, but many studies suggest that close relationships, especially those between spouses and between parents and children, shape the production of political opinions (Gamson, 1992; Burns et al., 2001; Pattie and Johnston, 1999; Verba et al., 2005). The mere fact of not living alone, but with a partner, especially with one or two children, has been shown to enhance participation in a study on the 2002 elections in France, that were characterized by particularly contrasted abstention patterns (Clanché, 2003). Most of these studies however only take into account something wider (the place) or more restricted (the couple) than the household. One exception is a paper by Johnston et al. (2005b) based on data from the British Household Panel Study: they too conclude that people who live together vote together. They find very high levels of within household agreement on voting behaviour and on changes in voting behaviour between elections. These high levels not only refer to the political preferences expressed, but also to the voter turnout itself, in three-person as well as two-person households.

¹ The signature lists of seven ballots were not available. They were however unnecessary for three ballots, as the 1986 regional elections took place on the same day as the general elections and the two ballots of the 2008 cantonal elections took place the same days as the municipal elections; from other similar situations, we can safely infer that almost all voters in one election also vote in other elections taking place on the same day.

² Since the Maastricht Treaty, the citizens of the European Union have the right to vote in municipal and European elections only; they are separately registered.

³ In our case study (described below), among 693 registered voters living at 396 different postal addresses, only 492 (71%) were listed in telephone directories while 162 addresses had no registered voter.

The use of signature lists allows us to further this line of studies by taking into account a large number of ballots and by assessing the precise composition of households. As the lists include the voters' date and place of birth and address and the married wives' maiden and married names, they allowed us to recognize married couples and generations within households and to infer relationships with in-laws, uncles and aunts, etc. We could also mobilize the ethnographic knowledge of the environment provided by one of us in order to characterise each neighbourhood in the polling station. This has only partly compensated for one of the drawbacks of signature lists: they do not provide any socio-demographic data other than gender, age, and marital status: the voter's occupation, level of education, of income, status of homeowner or tenant, etc. remain unknown (though the occupation was recorded in some places in the past: Dupeux, 1952; Peneff, 1981), which forbids us both to take these factors into account at an individual level and to construct aggregate descriptions of the social characteristics of neighbourhoods.

Finally, it is worth noticing that there has already been a French tradition of sociological analysis of signature lists; although it was not concerned with influences within households and did not always use longitudinal data, it has produced interesting results. A pioneering work by Dupeux (1952) found a positive correlation between proximity to the voting station and voter turnout during the 1871 elections in one region of rural central France. Grawitz (1965) used cross tabulation on data from Lyons to show that women participated less than men, and married women less than single women. Lancelot's wide study of abstention (1968) also mobilized signature lists to describe patterns of participation over several elections. He emphasized "mobile abstention" (following the hypothesis previously presented by Bodin and Touchard, 1957): most electors were neither "consistent voters" nor "consistent abstentionists," but rather "intermittent abstentionists". He also stated that abstentionism generally depended on the voter's social integration. Lancelot's most important successors were Subileau and Toinet (1993), whose meta-analysis of a series of French empirical studies based on voter behaviours in several elections demonstrated the virtual inexistence of consistent abstentionism. They also discussed political abstentionism, defined as different from "social abstentionism" (based on social integration, or lack of it) in that it depends on individual political commitment and appraisal of the political situation. Meanwhile, other case studies had used participation data derived from signature lists (Brusset and Thomas, 1971; Toinet, 1968, 1978; Sineau and Mossuz-Lavau, 1978; Restier-Melleray, 1982; Subileau and Toinet, 1986), generally describing abstention patterns from series of 4–8 elections. Finally, sociologist Peneff (1981) benefited from sources including a mention of occupation in his analysis of the 1977–78 elections in the town of Nantes. He highlighted the overrepresentation of abstention in working-class stations and of high turnout in middle- and upper-class environments and was the first to systematically use cross tabulation for more than two variables. Most of these studies however only tested monivariate, mono-level explanations on a limited number of ballots.

This situation has changed with a recent revival in the analysis of signature lists—even if French electoral analysis is dominated by studies relying on data from opinion surveys. INSEE "Electoral Participation" surveys have matched data from signature lists for national elections with the Permanent Demographic Sample established in 1988.⁴ Based on an unparalleled sample of 39,000 registered French voters, results from this study (Morin, 1990; Héran and Rouault, 1995; Héran, 1997, 2004; Clanché, 2003; Désesquelles, 2004; Jugnot, 2007) describe patterns of abstention and correlate them with variables such as gender, age, level of education, employment status, etc. However, it is impossible to follow individual behaviours for sequences of more than two elections or four ballots. The other revival of lists studies tries to solve this problem by focussing on local cases. Braconnier and Dormagen (2007) examined signature lists from a polling station in the Parisian suburb over more than 30 years (1974–2005), mixing various methods (exit poll questionnaires, neighbourhood surveys, interviews, and ethnographic observation) to contextualize their analysis of voting behaviour. They highlighted the extremely high rate of conformity in participation behaviours among married couples. We expand on this research by studying voting behaviours over three decades, and not only within married couples, but within all households in the same polling station.

3. The case study: a polling station in the Paris region

Our data come from a polling station located in the Northern part of an old village that has been merged into a "new town" (*ville nouvelle* in French) of the Paris region in the 1970s. "New towns" were four big districts in the periphery of the Paris region, chosen by the government, whose development in terms of economic activities, transports, etc. was planned in order to achieve a new demographic balance in the region.

The part of the town that includes our polling station has been relatively protected from urbanization; it is called "the (old) village" by its inhabitants and is almost exclusively made of detached houses. Most of them are renovated vegetable farms or adjacent village houses of various sizes built before 1939 and often before 1914, with a minority of manors and recent detached houses. Most are primary residences. The village, where the oldest farmers' families still live, is currently much sought-after by the local property market; it is also the residence of many municipal officers, including the mayor. The station is overwhelmingly residential, mostly because many small businesses have collapsed due to malls opening in the "new town". What is important for us is that collective housing scarcely exists, with the exception of a retirement home, a social housing centre, and a small rooming house. In

⁴ INSEE is the National Institute of Statistics and Economic Studies. The survey is presented on the following webpage: <http://www.insee.fr/fr/methodes/default.asp?page=sources/ope-enq-participation-electorale.htm>. The Permanent Demographic Sample (EDP) is the first socio-demographic large-scale panel (100th of the population) established in France.

almost all cases, it is thus possible and easy to identify electorate households.

According to an exit poll conducted at the station during the 2007 presidential elections, the population is older and more educated in the village than in French society and it has a larger upper class. Even if only 55% of registered citizens and 65% of actual voters responded, which tended to over-represent highly educated groups and under-represent retirees, it is worth noticing that retailers and business owners (6.3%, compared to 3.2% in France), middle-class occupations (21.8% vs. 12%) and especially the upper-class (32.9% vs. 7.8%) were overrepresented at the expense of retirees (14.5% vs. 30.2%) and employees (2.1% vs. 16.1%). Three-fourths of those questioned declared themselves to be homeowners. Half worked in the public sector and one-fifth as independent professionals. 65% had an education level higher or equal to an associates degree (*bac* + 2), 50% had a bachelor's degree (*bac* + 3) and 30% had a master's degree (*bac* + 5). Half of those questioned were registered at the station since 1997 or before.

The number of people registered on the *commune's* electoral rolls increased during the period studied, at the same rate as the French total number of registered voters. The village polling station thus had to be divided in three. We in fact studied only one of the three stations: in the oldest lists, we ignored addresses not currently included at the station. The observed polling station had 767 registered voters in 2008, while there were only 549 registered voters in the area in 1982. This increase in registrations (+38% over the period) was achieved in successive stages during years preceding high-stake elections: the 1993 general elections and the presidential elections in 1995, 2002, and 2007.

Finally, the observed polling station has high turnout rates. Since 1988, its total turnout rate has exceeded that of the *commune's* from 2 to 7 points in all general and presidential elections. As compared to the rest of France, it also shows more participation in these national elections, but less in the local and European elections. It is also politically peculiar at the local scale: while the Socialist Party has ran the *commune* since 1989, our polling station, where previous leaders still live, leans to the right and has the highest far-right voting rates in the *commune*. Results for right-wing candidates in the second round of presidential elections exemplify this result: Giscard won 51% in the station in 1981 (versus 42% in the *commune*), Chirac 54% in 1988 (versus 41%) and 66% in 1995 (versus 49%) and Sarkozy 56% in 2007 (versus 40%).

4. Variables extracted from registration lists

Our data covers 44 ballots, corresponding to 27 different national, European, and local elections over the period 1982–2008. We know the behaviour of all 1799 registered voters, each one being registered in the polling station for 1 to 44 elections, so that we observe a little less than 30,000 acts of participation or abstention. One-third of voters (30.5%) were already registered in 1982, so that we do not know exactly when their first registration took place. They form the initial cohort. 160 voters have been registered during the entire period; they represent 8.9% of the population, but 29.1% of registered voters in 1982, and 20.7% of

registered voters in 2008, and have carried out over 7000 acts of turnout or abstention. In contrast, 189 voters (10.5% of the population over the period) have been registered at the station for only one year, representing one or several ballots.⁵ One of the first lessons in our study is thus that we should not underestimate the extent of changes in the lists of potential voters: “the electorate” must be thought of as a stock constantly subject to inflows and outflows. That it to say that the main issue for the study of electoral volatility isn't political orientation (from one political party to another between two ballots) but registration and electoral participation (from participation to abstention, and conversely) (Lehingue, 2003, 2009).

Signature lists apparently contain few useful data, but we managed to extract information that was not directly available at first glance. We know the first and last names of voters, their date and place of birth (that we coded in discrete generations and origins⁶), their address, the marital status of women—and we know if they did or did not vote. We could also infer gender (51.3% of women), age at each election, age at the first or last registration (in our polling station), distance between the address and the polling station (19% were coded as close, or less than 500 m, 38% as far, or more than 1 km, and 43% as medium distance) and additional information on the marital status (e.g for widows). We also coded addresses in seven districts defined by the ethnographic study in order to appear as socially homogeneous as possible in terms of both class and date of arrival in the village, in order to partly obviate our lack of occupational data.

Our main task was however to create two sets of indicators: one describing households and the place of individuals within them, the other describing different dimensions of the participation behaviour.

The peculiarities of the polling station and our ethnographic inquiry allowed us to identify “electorate households” grouping individual voters that lived at the same address and had family links among themselves (generally married couples or parents and children). When two households shared an address, we separated them on the basis of these family ties. Of course, “electorate households” do not necessarily coincide with actual households, which often include unregistered adults and minors. In other words, a two-person electorate household can very well correspond to an actual household of four or more people. However, our premise is that the electorate household corresponds to all or part of an actual household. The “electorate household” is thus not an analytic fiction, even if it does not fully represent the environment that produces voter turnout.

We were able to define 938 electoral households living at 396 different addresses. Half of them had only one registered voter (49.8%), one quarter had two (27.6%), one

⁵ There are many elections and ballots in certain years, the maximum being 1988 with four elections and seven ballots (presidential, general, municipal, and a national referendum).

⁶ 21% were born in the “new town” and coded as local; 37% were born in the Paris region, 34% somewhere else in France and 8% in other countries.

tenth had three (9.4%) or four (8.8%) and others up to seven. For the sake of clarity, we retained a static definition of households, valid for the entire period. For example, a household with two married registered voters, whose child registered only in 2000, is considered to be a three-person electorate household. In the future, we plan to investigate such dynamics more closely, especially in order to compare the parents' behaviour before and after their children's registration.

After having defined households, we were able to characterize the status of voters within them, based on their connections with other voters in the same household: it is not an absolute characterization of an individual's marital or parental status. We have first distinguished 14 different types of status in an electorate household, which we then arranged into 5 broader groups.⁷ "Couples" are those who conjugally live with another registered voter and without any children registered as potential voters (27% of voters were labeled as parts of couples, including 22% married and 5% involved in another form of partnership⁸). "Children" (21% of voters) have at least one "parent" (22% of voters, generally also living with a spouse) present in their electorate households, and vice versa. This category has nothing to do with the voter's age (some "children" are 50 years old; all voters are over 18). 80% of "children" are also brothers or sisters of registered voters in the household—an information that we will use in future studies. "Others" (4%) are people living with at least one other registered voter, but who did not fall in the previous categories. Finally, 26% of the total population was coded as "isolated," which means that they were the only voter in their electorate household. It must be noticed that "isolated" voters could in fact live with a partner and children, if they were not registered on the electoral rolls of the observed station.

Finally, the signature lists informed us about voter turnout itself, with very detailed longitudinal data. We thus were able to create many different indicators (e.g. differentiating the tendency to participate in national and/or in local elections); only three will be used here. Two of them are individual indicators of the tendency to participate and the tendency to have a changing participation behaviour; the third one is not an individual indicator, but a metric that allows to assess the similarity in the exact moments of participation and abstention between any possible couple of voters. These three indicators should of course be considered together. If one accepts to define electoral volatility not only as an issue of partisan loyalty (are voters faithful to a party?) but also as an issue for participation (how many times and when do people go to the polls?), the three indicators allow us not only to analyze individual volatility by measuring each individual participation rate

(Participation Index) in relation with individual propensity to change one's behaviour (Change of Behavior Index), but also to focus on the collective dimension of volatility by comparing participation trajectories (Similarity Index).

A signature list only gives two possible results for each ballot: A (abstention) and P (participation), but there is an implicit third possibility: N, non-registration in the observed polling station. The first and simplest indicator of participation behaviour is the mean individual turnout rate $nP/(nA + nP)$ or Participation Index (PI). We excluded from its calculation the voters who were only registered for one or two ballots ($n = 134$, while 1665 voters are included). With a median at 69, a mean at 63, and quartiles at 42 and 89, the PI confirms that the people in our polling station have a tendency to vote often. Its dispersion confirms Lancelot, Subileau, and Toinet's theses. Intermittent participation seems to be the most widespread behaviour, with 78% of registered voters (77.6%). Only 262 voters (16% of those registered for at least 3 elections) are consistent participationists (PI = 100), while 111 (7%) are consistent abstentionists (PI = 0). In addition, 27% of those consistent abstentionists have been registered for less than 4 ballots, and 58% for less than 8 ballots: long-term consistent abstentionism is extremely rare.

Our second individual indicator measures the average propensity of a voter to switch behaviour at each election, either from participation to abstention or from abstention to participation. This Change of Behaviour Index (CBI) is calculated as follows:

$$CBI = \text{number of changes} / (\text{number of registrations} - 1) * 100$$

For example, in the participation sequence PPAP, there are four ballots, 3 opportunities to change behaviour, and 2 actual changes of behaviour (from P to A, then from A to P), hence a CBI of 67. The mean CBI for all 1665 voters taken into account is 23, the median is 21, and the quartiles are 6 and 33. By definition, the CBI partly varies according to the PI: the voters who have a very low or high PI (quasi-consistent abstentionists or participationists) have a very low CBI. On the other hand, most voters have an average PI and differentiate according to their CBI. For example, voters whose PI is 50 will have a very high CBI if their voting behaviours regularly alternated, but a very low CBI if they consistently participated for a long period and then consistently did not vote for a long period: two types of behaviour that are likely to rely on very different mechanisms.

Finally, we introduce a third measure that is not an individual behaviour index, but a measure of the exact temporal similarity between individual sequences of participation (Similarity Index, or SI). It can be used to define a degree of similarity between any couple of participation sequences among our 1799 voters. This measure is based on the "optimal matching analysis" method, also often called "sequence analysis" (Abbott, 1995; Brzinsky-Fay and Kohler, 2010; Lesnard, 2010).⁹ The

⁷ The more refined coding will be used in subsequent publications, especially in order to differentiate mothers from fathers in the transmission of participation behaviours.

⁸ Five cases of couples living with a brother or sister have been added to this category. "Partners" are two voters at the same address that we assumed were living together; the category is presumably underestimated, because we assumed partnership on the basis of compatible ages and registration dates and different sexes and/or personal knowledge of the persons involved.

⁹ All our calculations and figures involving variants of sequence analysis have been made thanks to the R-package TraMineR (Gabadinho et al., 2008).

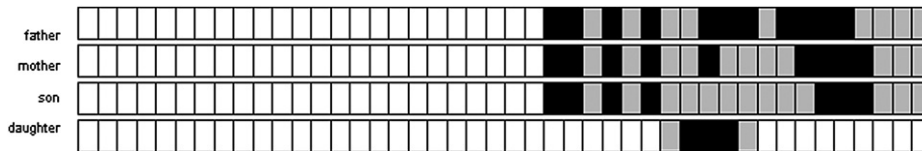


Fig. 1. The Pascal household.

“optimal matching distance” provides a measure of similarity between any pair of possible sequences. The sequences considered here are individual series of behaviours, which can be represented as a series of letters representing each ballot, for example:

NNPPPPPPPPPPAPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPA.

The distance between two sequences—and reciprocally the similarity between them—depends on the number of operations needed to transform a series of letters into another, by either adding or subtracting letters or transforming an N into a P, a P into an N, etc. The researcher has to choose some of the parameters in this metrics. Here, we fixed lower substitution costs between non-registration and participation or abstention (0.51) than between vote and abstention (1), so that two sequences presenting opposite behaviours (participation on the one hand, abstention on the other hand) at the same ballot are considered very different, while two sequences presenting a non-registration on the one hand, and a vote or an abstention on the other hand would be considered less different.¹⁰ Furthermore, we chose very high “insertion and deletion costs,” or “indel costs,” (5) as compared to substitution costs. This allows to consider sequences with similar patterns occurring at different dates as different, as what we want to assess here is the similarity of behaviour in the same ballots. If three persons vote one time, then do not vote at seven ballots, then are not registered anymore, their sequences are considered identical. If one of them had voted one time and then not voted seven times, but at the end of our period, he or she would be considered as very different from the others in our metrics.

In our figures, each rectangle represents one ballot and ballots are arranged in chronological order, from 1982 to 2008. The horizontal axis is thus a time axis, but distances on this axis are related to the number of polls, not to calendar time. Black represents participation, grey abstention and white non-registration. Each individual is labeled according to his or her gender and relationships with other

¹⁰ If the only possible states had been participation and abstention, we could more simply have used the number of differences between two sequences as our indicator. The use of an optimal matching distance allowed us to include patterns of non-registration while giving them less substantial weight than patterns of participation and abstention. This is allowed by the choice of a lower substitution cost (0.51, as compared to 1). We actually set it at the lowest possible level allowed by the algorithm. A substitution cost of 0.5 or lower would lead the algorithm to decide that the distance between vote and abstention is shorter if we first go from vote to non-registration, and then from non-registration to abstention, which is not what we want to achieve (see Abbott and Hrycak, 1990 for pictures showing how the algorithm uses substitution costs to define the shortest possible distance between two sequences).

members of the “electorate household”. For example, the Pascal household (Fig. 1) has four voters: the parents and their two children. The parents and the eldest son registered at the same time, whereas the daughter registered later for a period of five ballots and then left the polling station. From visual inspection of the figure, it can be assumed that the PI for the mother and the father are close, very low, but higher than the son’s; likewise, the PI for the father is without doubt higher than the mother’s, yet the daughter holds the highest PI. The calculated PI values are indeed 55 (father), 45 (mother), 35 (son), 60 (daughter). On the other hand, the parents’ CBI are the same (47), close to the daughter’s (50), and higher than the son’s (37), as he had a longer period of consistent abstention. Finally, the household as a whole is homogeneous, according to our three criteria, with a rather low PI average (49), a rather high CBI average (45), not much dispersion on these two indicators and rather similar voting patterns at each ballot. The internal mean similarity of the household (calculated from our SI between each couple of members) is 2.6, versus 7 for the mean SI of the whole population. To sum up, this household is not only quite abstentionist and versatile, but also homogeneous for each of our indicators. The parents and the son especially only diverged between their 9th and 14th ballots; even the daughter behaved like her father in three of her five ballots.

5. The homogeneity of electorate households

The first statistical result of our study is that what is true for the Pascals is true for our population as a whole: belonging to an “electorate household” structures voter turnout. In other words, the electorate households are homogenizing participation behaviours within them. And this is true if we consider the precise moment of voting (Similarity Index) as well as the Participation Index or the Change of Behaviour Index.

We reconstructed the “electorate households” in order to test the hypothesis that they acted as primary groups shaping individual voting behaviours. We thus have to prove that the members of each household tend to resemble each other more than if they were randomly assigned to households of the same size. We will do it here in an univariate way, using ANOVA and similar techniques suited to our Similarity Index; we will then confirm this finding by including an household effect in the multivariate, multilevel model presented in Part 6. Three clarifications must be made before presenting our results.

First, the tests presented here were carried out on the subset of 1179 voters who were members of an electorate household including at least two voters, and for whom we were able to calculate the PI and the CBI. Household

Table 1
Participation index in two-voter (+) households.

	Df	Sum Sq	Mean Sq	F value	Pr (>F)	
Household	418	658414	1575	3.76	0.000	***
Residuals	760	318044	418			
Address	281	455785	1622	2.79	0.000	***
Residuals	897	520673	580			

*** denotes significance at the 0.001 level.

Table 2
Participation index in three-voter (+) households.

	Df	Sum Sq	Mean Sq	F value	Pr (>F)	
Household	180	307296	1707	3.5	0.000	***
Residuals	522	254796	488			
Address	159	272932	1717	3.22	0.000	***
Residuals	543	289159	533			

*** denotes significance at the 0.001 level.

homogeneity may still be suspected to be overestimated due to the large number of two-person electorate households, often corresponding to couples (it might be argued that similarity among couples relies on specific mechanisms). In order to take this limitation into account, we separately analyzed the subset of 703 voters who were members of households including at least three voters registered for at least three ballots.

Second, in the univariate calculations presented here, other factors than the mere fact of living together, such as similar dates of birth (in couples) or of initial registration, might induce homogeneity in behaviours. ANOVA is only used to provide an initial measurement of within-household homogeneity.

Third, we introduced another control by performing ANOVA calculations based on the fact of living at the same address, but not necessarily in the same household. If, as we believe, the homogenizing effect of the household on behaviour is due to internal social factors, like the existence of frequent interactions and marital or kin relationships between members, the homogeneity of within household behaviours should be far more important than that of within-address behaviours. Living in the same place obviously increases the chance of being socially similar and even of interacting,¹¹ but we try to test the additional cohesion caused by actually living together.

According to Tables 1–4, the behaviour variations are much larger between households than within households; for most of the indexes, our tests also indicate that electoral households have much stronger homogenizing effects than addresses, even if the latter prove significant.

The fact that voters from the same household have more similar behaviours than voters randomly grouped together

¹¹ The reality is in fact more complicated due to the longitudinal nature of our data. 23% of voters over the period belong to households that succeed (or precede) another household at the same address. In this instance, there are fewer reasons to believe that households sharing an address would behave in similar ways. Half of the voters live in a household cohabiting with at least one other household at the same address at the same time, while 27% of voters live at an address with only one household.

Table 3
Change of behaviour index in two-voter (+) households.

	Df	Sum Sq	Mean Sq	F value	Pr (>F)	
Household	418	236527	566	2.52	0.000	***
Residuals	760	170913	225			
Address	281	153609	547	1.93	0.000	***
Residuals	897	253830	283			

*** denotes significance at the 0.001 level.

Table 4
Change of behaviour index in three-voter (+) households.

	Df	Sum Sq	Mean Sq	F value	Pr (>F)	
Household	180	85316	474	1.89	0.000	***
Residuals	522	130688	250			
Address	159	76829	483	1.89	0.000	***
Residuals	543	139175	256			

*** denotes significance at the 0.001 level.

is proved by these tests, both in terms of average participation and of versatility. The similarity of the overall behaviours of participation is more impressive than that of the tendency to be versatile, but the latter certainly exists. Tests on households with at least three voters also confirm these results: homogeneity does not only exist within couples, but also within larger groups based on other types of relationships. Voters living at the same address are also characterized by homogeneous behaviours. When all households with at least two voters are included, the Fischer tests however show that homogeneity is much higher within households than within addresses. This is less true for households including at least three voters, but in this case, there are fewer examples of different households living at the same address. Our analysis thus firmly points in the direction of homogeneity between neighbours and even stronger homogeneity within households. Participation behaviours, both in terms of average level and versatility, are determined primarily inside the household, but also influenced by its closest environment.

ANOVA could however lead us to believe in a general homogeneity within households, while in reality, only some of them might be very homogeneous, while others could be extremely heterogeneous. To deal with this bias, we calculated internal variance indicators for each household: the results confirm a strong homogeneity for most households. While the standard deviation of the PI of the whole 1179 subpopulation is 29, one quarter of the observed households (103 out of 419) have a zero standard deviation (their voters all have the same PI), and 48% (203 out of 419) have a standard deviation higher than 0 but lower than 20.

We can finally measure the homogeneity of households in terms of precise timing of participation (our SI) thanks to “pseudo-ANOVA” calculations (Studer et al., 2011). Based on a very large number of data permutations, they allow to perform a procedure similar to ANOVA for an indicator that is not measured at the individual level, but consists in distances between pairs of individual sequences. What the test does is thus basically to assess whether within-household similarity is significantly higher than between-household similarity, or, put differently, whether there is

Table 5
Similarity index in two-voter (+) households.

	Df	Sum Sq	Mean Std error	Pseudo F value	Pr (>F)	Pseudo R2
Household	469	5700	12.15	2.87	0.000	0.61
Residuals	862	3654	4.24			
Address	302	3871	12.82	2.41	0	0.41
Residuals	1029	5484	5.32			

Table 6
Similarity index in three-voter (+) households.

	Df	Sum Sq	Mean Std error	Pseudo F value	Pr (>F)	Pseudo R2
Household	210	3087	14.7	2.81	0	0.49
Residuals	603	3156	5.23			
Address	183	2678	14.64	2.59	0	0.43
Residuals	630	3564	5.66			

more similarity between household members than if they were randomly assigned to households of the same size (see Tables 5 and 6).¹²

Again, households are significantly homogeneous in terms of precise moments of participation, and, particularly when two-voters households are included, they are much more homogeneous than addresses. Finally, an additional test performed only on the voters who were consistently registered during our whole period also confirms—even more than the others—that the similarities are stronger within households than between households (Pseudo $R^2 = 0.75$). This confirms that our SI is not too heavily influenced by patterns of non-registration and really captures similarities in the exact moments of participation.

In order to more concretely present what our results measure, we calculated SI variances within each household and added this measure of within-household homogeneity to our graphical representations of participation behaviours (Fig. 2). For the whole population, the SI variance is 7. Out of the 470 households with two or more voters, 97 have an internal variance of 0 (exactly the same behaviour at each ballot), 93 have a variance higher than 0 but lower or equal to 1 (including the Jasmins of Fig. 2), and only 64 have a variance equal to or higher than 5 (including the Merles of Fig. 2, with the highest variance for a four-person household). Of course, two- or three-person households are especially homogeneous. Even in large households, however, homogeneity is often present: among 123 households including four or more voters, 21 have a variance lower than 2, 77 have a variance lower than 5, and only 19 have a variance higher than 6. It is true for households with both high and low average participation levels.

Homogeneity on SI is therefore a very general phenomenon, even more than homogeneity on PI and CBI:

what households tend to shape is the precise moment of voting, even more than the general tendency to participate or the degree of versatility.

6. The status in the household as a participation factor

The second main result of our study is the fact that the precise status of the voter inside his or her “electorate household” shapes his or her participation behaviour, both in terms of average participation and versatility.

As we saw in Part 5, belonging to a given household shapes participation behaviours, that are generally quite homogeneous. However, perfectly homogeneous households are rare. What is interesting is that even this measure of heterogeneity appears to be partly related to the status within the “electorate household” (parent, child, etc.). This is thus another form of influence of households on electoral participation: what matter here is not the homogenization of behaviours within households, but the fact that some behaviours are correlated with a particular position held in any household. This result holds not only when this single variable is considered, but when it is confronted with other individual attributes (sex, place of birth, age, date of registration, etc.) that may explain participation behaviours and that we included in a multi-level model capturing the homogenizing effect of household: the status in the household always keeps a significant independent effect.

Let us however begin with an univariate analysis. A boxplot representing PI values according to the status in the household (Fig. 3) shows a remarkable gradation in the participation index level based on the status in the household. In particular, the boxes representing the parents and the isolated are quite distinct. The other categories overlap, but parents have a tendency to be more participationist than couples, who themselves participate a little more than children or other household members, and definitely more than the isolated. In fact, pairwise ANOVA testing shows that the mean PI is significantly different (at the 5% and generally at the 1% level) between each couple of categories, except, on the one hand, between children and “other” and, on the other hand, between isolated and “other” (“other” being a residual category that only includes 68 voters, while the rest of our categories group 380 to 500 of them). Participation is thus strongly related to the status in the household.

Integration, if not social bonding, promotes electoral participation. We are however not suggesting that the “isolated,” as defined here, are less endowed in general social ties than the “parents.” For example, fathers with young children and a foreign wife are classified as “isolated.” What we observe here is thus more subtle, as our definitions are centred on ties within the electorate household. First, to be isolated, e.g., not to live with any other registered voter, leads to less participation. Second, being both married to a voter and the parent of a registered voter (which is the case of most “parents”) leads to more participation than only having a registered partner (“couple”). Perhaps more surprisingly, the status in the household also has a significant effect (according to

¹² As the SI can be calculated even for voters who were registered for a short time, this calculation includes all voters belonging to households of the mentioned size. Given the large number of households and addresses, as well as the small size of each group, calculations were performed with 5000 permutations and the distribution of Pseudo F for all of these permutations has been observed: it confirms the significance of the results.

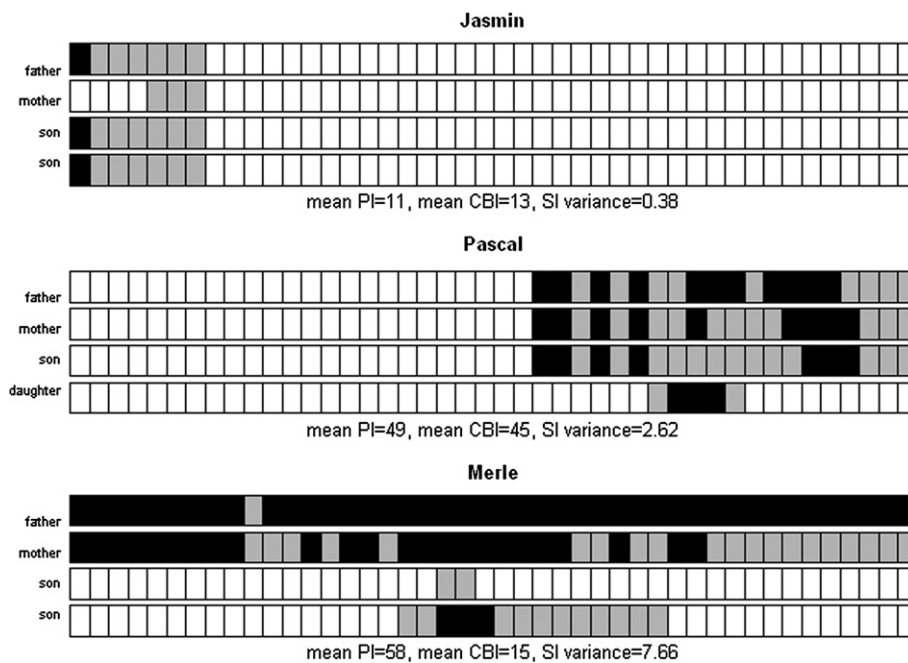


Fig. 2. Three household examples with a low, a medium and a high internal SI variance (pseudo-variance).

ANOVA) on the CBI, our versatility indicator. This effect is however more difficult to interpret and less distinct.

The status in the household is in any case not the only factor that influences the PI and CBI. In order to measure its independent effect, other determinants of participation must be considered, at least those that can be observed

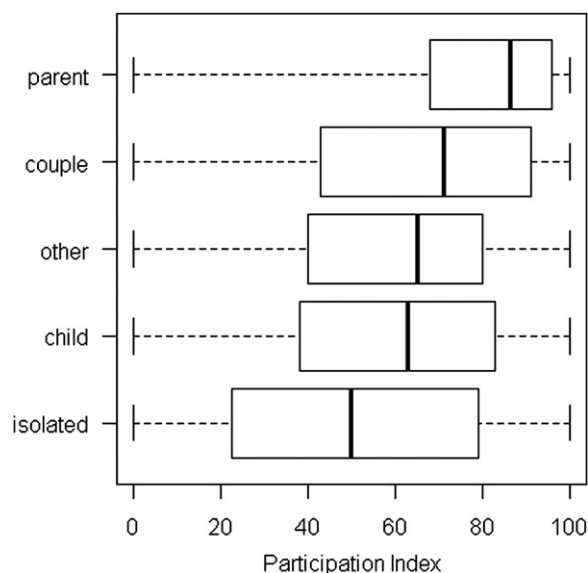


Fig. 3. Participation index boxplot according to the status in the household. Note: The vertical line represents the median for each category. The length of each box represents the interquartile range. The dashed lines connect the box to the maximum and minimum for each category.

from our source. We have thus analyzed data on the 1665 voters who participated in at least 3 ballots in a multivariate, multilevel regression modelling PI. Its parameters have been chosen thanks to preliminary univariate ANOVA tests that have also been performed for CBI.

When considered separately, most of our available variables seem to have a significant effect on PI (Table 7): it is the case for the status in the household as well as the date of birth and the date of registration (coded in cohorts constructed after an observation of PI variations between each year), the place of birth and, less distinctly, the district. However, sex or distance from the home to the polling station (divided into three classes) have no significant effect. It may be surprising that sex weighs so little here, since women are generally believed to participate less than men; but this is especially true when control for the education level is possible, which is not the case here (Désesquelles, 2004). In contrast, the status in the household and the date of registration appear to be the only significant indicators for the change in behaviour index (Table 8): we thus do not model it further, having sufficiently proved that it is shaped at the level of households.

Which of these effects significantly matter the most in a multivariate model remains to be measured. We first built an ordinary least squares regression: the best model is given in Table 9. No specification gave significant results either for sex or for district, confirming that these variables seem to have no clear effect in our polling station, even other things being equal. The overall additional explanatory power of the model, as measured by its R-squared, remains modest: different socio-economic variables are likely to influence participation. However, some effects are significant, of a high magnitude and substantially interesting.

Table 7
ANOVA on the participation index.

	Df	Sum Sq	Mean Sq	F value	Pr (>F)	
Sex	1	431	431	0.45	0.502	
Residuals	1663	1589900	956			
Place of birth	3	10880	3627	3.81	0.009	**
Residuals	1661	1579451	951			
Birth cohort	3	20365	6788	7.18	0.000	***
Residuals	1661	1569966	945			
Inscription cohort	2	32291	16146	17.22	0.000	***
Residuals	1662	1558040	937			
District	6	12865	2144	2.25	0.036	*
Residuals	1658	1577466	951			
Distance to the polling station	2	2916	1458	1.53	0.218	
Residuals	1662	1587415	955			
Status in the household	3	10880	3627	3.81	0.010	**
Residuals	1661	1579451	951			

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

In addition, the modest R-squared of the linear regression can at least partly be explained by the very household effect that we demonstrated in our previous part. If individual participation indexes tend to be very similar inside each household, regardless of obvious differences at least of sex and date of birth that should be present in each household, it follows that a model that only takes into account individual variables should poorly capture the determinants of voting behaviour. In order both to give an idea of the relative weight of household level and individual-level factors of participation and to assess which of the individual factors are still significant when the household effect is taken into account, we have used a multilevel model. Although the latter better represents our data than the ordinary least squares regression, we have chosen to report the results for both models in Table 9, in the interest of readers not accustomed to multilevel modelling. We also wanted to point out the fact that, however strong and interesting the household effect that

Table 8
ANOVA on the change of behaviour index.

	Df	Sum Sq	Mean Sq	F value	Pr (>F)	
Sex	1	229	229	0.64	0.423	
Residuals	1663	592116	356			
Place of birth	3	2769	923	2.6	0.051	+
Residuals	1661	589575	355			
Birth cohort	3	1722	574	1.61	0.184	
Residuals	1661	590623	356			
Inscription cohort	2	12306	6153	17.63	0.000	***
Residuals	1662	580039	349			
District	6	1933	322	0.9	0.490	
Residuals	1658	590411	356			
Distance to the polling station	2	1640	820	2.31	0.100	+
Residuals	1662	590705	355			
Status in the household	4	11659	2915	8.33	0.000	***
Residuals	1660	580686	350			

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

the multilevel model enables us to measure, other effects keep the same significance and magnitude as in the OLS regression: we do not intend to minimize them in our interpretation.

Multilevel modelling (Courgeau, 2007) has recently been used by Johnston et al. (2005a) in a research akin to ours in that it showed the important weight of household effects in voting behaviour; it however modelled a political choice (Conservative voting), not participation itself, thus offering a view complementary to ours. It also did not include the status in the household as a variable in multivariate models, whereas we find it to be one of the most influential ones. Orford et al., 2009 used multilevel modelling to study turnout, especially its connection to the local geography of voting stations, but could not include a discussion of the household level.

Multilevel models are routinely used in various areas of social science to investigate neighbourhood or regional effects, and especially in education research to investigate teacher, class or school effects (e.g. Goldstein, 1987; Bressoux, 2007). We used the R package nlme (Bliese, 2009) to estimate our multilevel models, considering individuals (level-1 units) as nested in households (level-2 units).

The first step of multilevel modelling is to estimate a so-called “null model” that, like the ANOVA test that we performed above, allows to assess that something happens at the non-individual level (here, the household level), that is that households are internally more homogeneous than would happen by chance. It is clearly the case here. According to our null model, the estimate of between-group variance (Intercept variance t_{00}) is 579 (with a standard deviation of 24), while the estimate of within-group variance (Residual variance s^2) is 433 (SD = 21), so that an estimated 57% of the whole participation index variance ($579/(579 + 432)$) can be explained by the household effect. This sheds doubts on any explanation of participation that does not take the electorate household level into account.

The results of our multilevel model that simultaneously takes into account individual variables and the household so-called “random effect” (reported in Table 9) however show that the latter does not capture or annihilate the effects of the former: both play an important role, and including the household effect does not change much of the significance or magnitude of the individual effects. It only adds to the explanatory power of the complete model.

In our final multilevel model, the between-group variance t_{00} is 506 (SD = 22) and the within-group variance s^2 is 362 (SD = 19), so that, as compared to the null model, 13% of the between-group variance ($1-506/579$) and 16% of the within-group variance ($1-362/432$) have been accounted for by our individual-level variables (mainly the status in the household and the dates of birth and registration). It means that only a minority of both what makes households homogeneous and what makes them heterogeneous can be accounted for by such individual factors, although adding them to a multilevel model still enhances its general accuracy. 58% of the variance that is not explained by the individual factors ($506/(506 + 362)$) is still related to the

Table 9

Multivariate linear regression and multilevel model of the participation index.

	OLS linear regression				Multilevel model with household "random effect"			
	Estimate	Std error	t value	Pr(> t)	Estimate	Std error	t value	Pr(> t)
Intercept	51	2.69	18.97	<2e-16 ***	54.07	2.91	18.59	<2e-16 ***
<i>Birth cohort</i>								
1893–1922	10.47	2.83	3.7	0.0002***	7.42	2.74	2.71	0.0068**
1923–1948	3.99	2.04	1.96	0.0503+	3.83	1.82	2.1	0.0358*
1948–1963	Reference				Reference			
1964–1990	–1.59	2.13	–0.75	0.4565	–2.88	2	–1.44	0.1518
<i>Inscription cohort</i>								
1982–1984	Reference				Reference			
1986–1995	3.46	2	1.73	0.0842+	2.87	1.98	1.45	0.1478
1997–2008	18.19	2.24	8.13	8.56e-16***	13.86	2.32	5.99	<2e-16***
<i>Status in the household</i>								
couple	Reference				Reference			
isolated	–16.56	1.99	–8.31	<2e-16***	–16.18	2.27	–7.13	<2e-16***
other	–7.22	3.94	–1.83	0.0670+	–1.92	3.85	–0.5	0.6177
child	–2.8	2.34	–1.2	0.2324	–3.37	2.71	–1.24	0.2146
parent	15.68	1.99	7.56	5.34e-14***	12.69	2.45	5.17	<2e-16***
<i>Distance to the polling station</i>								
far	Reference				Reference			
medium or close	3.99	1.46	2.73	0.0064**	3.52	1.94	1.82	0.0696+
<i>Place of birth</i>								
local	Reference				Reference			
region	2.41	1.96	1.23	0.2200	2.35	1.8	1.31	0.1921
France	4.51	2.06	2.19	0.0288*	4.11	1.92	2.15	0.0321*
other country	0.03	3.04	0.01	0.9921	2.59	2.96	0.88	0.3811
<i>Random part: Between-household variance</i>					362	19		

Notes : Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '+' 0.1 '.' 1.

Linear model: Residual standard error: 28.4 on 1651 degrees of freedom. Multiple R-squared: 0.1629, Adjusted R-squared: 0.1564 F-statistic: 24.72 on 13 and 1651 DF, p-value: <2.2e-16. Detection of multicollinearity: all Variance Inflation Factors are <3, which indicate that there are no multicollinearity problems (test performed using the R package car).

Multilevel model: Linear mixed-effects model fit by restricted maximum likelihood estimation (RMLE).

household effect, which remains highly significant in the multilevel model (as tested by a comparison with an identical model not including it).

Our models demonstrate that, even “other things being equal”—at least, of course, those that we actually were able to measure in our data—, the status in the household does play an important role in electoral participation: being the parent of a registered voter rather than just part of a couple of voters increases the Participation Index by more than 15 points in the linear model and 12 points in the multilevel model, while being isolated rather than married decreases it by 16 points in both models. However, children of voters and persons present in an electorate household with another status do not significantly differ from members of couples in their participation behaviour.

The distance to the polling station has a significant, but very small effect in the linear model (living close to or not too far from the station rather than far away increases the index by 4 points, other things being equal), and is not really significant in the multilevel model. Distance seems to play a role in enabling participation, but only a limited one. Our results thus confirm Dupeux's analysis in a 1952 paper about the 1871 elections in a rural department, as well as more recent conclusions by Braconnier and Dormagen (2007) about blue-collar voters—whereas our polling station is urban and over-represents white-collars—and Orford et al.'s (2009) results on low salience elections in the UK. Even when every voter is likely to have access to a car,

living far from the polling station is still a constraint on voter turnout.

Another present, but limited effect is that of the place of birth. Being born outside of the Paris region, but in France increases participation by 4 points in both models, in comparison to being a strict native (raised in the neighbourhood). We believe this effect to be in fact related to two more important factors in our models: the date of birth and the date of registration. They have effects that at first glance might seem contradictory. On the one hand, being older seems to increase the PI, at least for our oldest cohort: being born in 1893–1922 rather than in 1948–1963 increases the PI by 10 points in the linear model and more than 7 points in the multilevel model. On the other hand, the “freshness” of registration is significantly associated with a higher voter turnout: belonging to the most recently registered (in 1997–2008) rather than the oldest (registered before 1982 or in 1982–1984) increases the PI by 18 points in the linear model and more than 13 points in the multilevel model.

The coexistence of these two effects can be explained by the fact that it is possible to register in the polling station for the first time at an age much higher than the voting age, either after having been a non-registered voter or—which probably happened more often in our case— after changing residences. Our first result, having probably more to do with age than with generation *per se*, is in itself not surprising. Participation in France generally decreases from ages 18 to 30, steadily increases until age 70, then declines,

which is confirmed by our Fig. 4 (see Appendix) (INSEE, 2004). The second result is however more surprising, as abstention was generally higher in France after 2000 than before (with the exception of the 2007 presidential election). The most recently registered voters, those who, other things being equal, participated more according to our models were thus confronted with elections with a low general participation rate. At the national scale, it has been shown that voters who registered in 2006, although they had an overwhelming turnout in the 2007 presidential elections, had an equally overwhelming abstention in the legislative election that took place the following month (Jugnot, 2007).

What we do observe thus has a more local explanation: something happened in our polling station that did not happen everywhere, but that definitely sheds light on more general participation mechanisms. Figs. 4 and 5 (see Appendix) and Table 10 give more precise indications about the correlations between date of birth, date of registration and our Participation Index. They show that what happened is not a specific correlation between date of birth and date of registration in terms of an influx of elderly people in the town: there are certainly some retirees among the recently registered voters, but they are a rather non-participationist minority. What we measure is probably more the specific social characteristics of the recently registered voters, who are likely to be participationist middle- and upper-class members.

Although the dispersion is high, as shown by Figs. 4 and 5, Table 10 shows very contrasting results between cohorts that are defined at the same time by the dates of birth and first registration (Figs. 4 and 5 having helped us to define those cohorts). It is especially remarkable that recently registered voters (after 1997) from ages 35 to 60 show the highest PI average (80), 17 points higher than the overall average of the polling station, whereas baby-boomers registered before 1986 are among the most abstentionists, with an average PI of 49. Although we do not have much additional information about the “recently registered baby-boomers” cohort, we know that their specific voting behaviour is not explained by a specific shape of households (e.g. while many of them are part of voter couples (37%) or “parents” of other voters (28%), some are also “isolated” (34%)).

We can therefore make two hypotheses that are specific to our field of investigation, but might shed light on wider issues. Our polling station is socially multipolar, which is reflected in voting behaviours differentiating, first, two groups among people who registered before the 1990s and,

second, newcomers from both of these groups. Among those who registered early in our period (or before the period that we actually observe), two groups can be distinguished. On the one hand, it includes older persons who generally vote, which makes sense considering their age, the fact that they have lived in what was a rural environment (in France, the rural areas generally vote more than the urban areas), and what we can guess about their socio-economic status and especially about its change over time. Members of this generation have indeed benefited from the creation of the “new town” by selling almost all of their land at attractive prices. On the other hand, we also find early registered baby-boomers who, contrary to what their age would predict, are not expressing any interest in voting. This might be related to a rejection of transformations of the new town, with less direct benefits for them and several controversial evolutions (urbanization, the arrival of a foreign population brought on by social housing facilities). Finally, the fact that newcomers of all age groups (registered in 1997–2008) are pretty much participationist can be interpreted as the product of the arrival of middle- and upper-class graduates in a place that has become more socially selective—because of higher prices of real estate. In addition, the temporary presence of students might have played a more marginal role. It is worth noticing that this presence translates into an effect of the date of registration, not of the place of birth, although both are obviously partly correlated. What is important here is the social context of arrival in the town and more generally of registration, more than the fact of being born precisely in the village, in the region or elsewhere in France.

7. Discussion

The study of nearly 30 years of voter signatures in a polling station of the Paris region has revealed two major results. First, electorate household membership is a structuring factor in electoral turnout: a remarkable homogeneity can be observed in the participation behaviour of members of the same households, be it in terms of the global participation rate, versatility or precise timing of voting. Second, the precise position of each voter in the household is an important determinant of the turnout level: members of households including more than one voter have a higher tendency to participate, and all the more when they are the parent of another voter.

Our research not only provides new results, but also raises new questions. An obvious limitation of our work lies in our lack of information on precise social characteristics of voters. We had planned to use the fact of living in one of seven different districts, broadly characterized as of different social levels, as a proxy, but this variable did not prove significant in any of our models, possibly because the area as a whole was anyway socially homogeneous, and we had no proxy at the individual scale. The general validity of our two main results (household homogeneity in voting patterns and the effect of status in the household on turnout) thus deserves to be tested in polling stations with different social characteristics and, if possible, with information on individual social level. What we have provided

Table 10

Participation index average by cohort.

	Date of first registration			All
	1982–1984	1986–1995	1997–2008	
Date of birth				
1893–1922	66	46	79	64
1923–1948	69	64	72	68
1949–1963	49	60	80	62
1964–1990	45	55	64	60
All	62	58	69	63

here is a replicable methodology allowing such comparative studies based on data that are actually produced by the act of voting, not by discourses about it.

Our data set will also allow further analyses. Three extensions are already underway. We are first examining the relationship between behaviours of parents and children, in order to prove or disprove the family reproduction of political behaviour (here, participation) and to finely distinguish its dimensions, e.g. with the specific, possibly non-symmetrical roles of mothers and fathers. Second, we want to consider the borders of households and the status in the household in a more dynamic way, in order to refine our analysis of electorate household homogeneity and to define the mechanisms that underly it. For example, we want to study the effect of a child's first registration—his or her admittance to electoral citizenship—on the parents' voting pattern. In our static analysis, being "parent" leads to voting more as being part of a "couple": is it still true if we take longitudinal, individual data into account? Finally, we want to add other indicators of participation to our general picture, particularly investigating whether households effects on voting behaviours differ for local and national elections, and for elections generally showing a very high or a very low turnout.

Acknowledgements

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Appendix

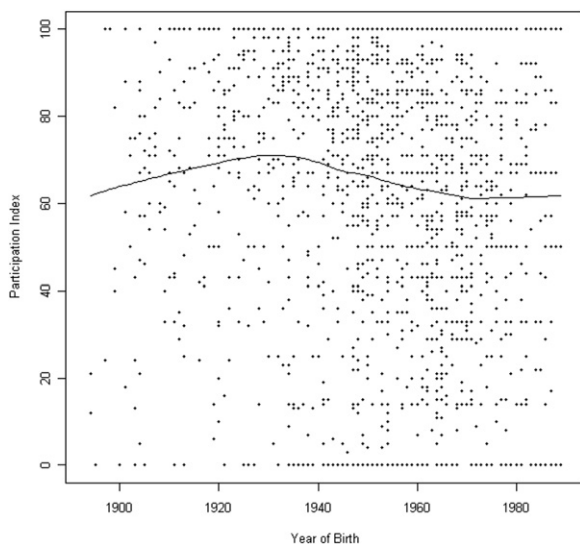


Fig. 4. Participation Index by year of birth. Note: The smoothing curve is built on a moving average of 50 points.

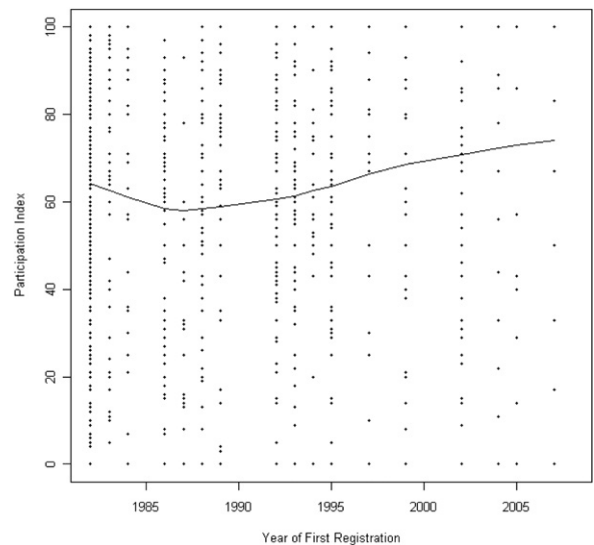


Fig. 5. Participation Index by year of first registration. Note: The smoothing curve is built on a moving average of 50 points. When the registration happened before 1982, it is considered here to have happened in 1982.

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