The Territory of the gilets jaunes

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Where did the "gilets jaunes" protest movement come from? From its first Saturday of action in November 2018, the movement was distinctive for both its local character and its national coverage. Relying on novel Facebook data, we show that there is a strong correlation between *online* mobilisation (on Facebook) and *offline* mobilisation (blockading of roundabouts), and offer a fine-grained and contrasted mapping of the data, at the scale of *départements* and commuting zones. By simultaneously controlling for the different political, economic and geographical factors likely to explain the movement's genesis, we reveal the significant role played by mobility issues, particularly the speed limit reduction to 80 km/h on secondary roads and commuting distances.

- We seek to identify the determinants of the mobilisation of the "gilets jaunes".
- Using data collected on Facebook and the locations of the blockaded roundabouts, we can map the "gilets jaunes" mobilisation online and offline.
- The 2017 presidential election results, the local share of diesel vehicles and poverty rates among retired people are not strongly correlated with the demonstration.
- Mobility, however, measured in terms of the exposure to the speed limit reduction to 80 km/h on secondary roads and commuting distances, appears to be an important factor for explaining the movement's origins.

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Introduction

On the 10th of October 2018, a call was put out on Facebook for a "national blockade against fuel price rises" to take place on November 17th. This call was the starting point of the "gilets jaunes" movement, which quickly turned into a widespread protest against government policy. Unlike traditional demonstrations, this movement was distinctive for both its local character and its national coverage. Its members were invited to blockade traffic in their local area; from that first Saturday, there was an unprecedented number of blockades all over France. The world had already seen massive demonstrations organised on social media,[1] but a mobilisation of this scale was a first in France.

Although the tax increase on petroleum products triggered the movement, it appears not to be the only explanation. Numerous protest movements—on wealth tax reform, the *contribution sociale généralisée* (CSG) increase, and the speed limit reduction to 80 km/h on secondary roads—took place at the start of Emmanuel Macron's presidency, but without managing to coalesce. In light of this, what factors brought about the "gilets jaunes" movement?

To answer this question, we have taken a territorial approach. We first establish indicators for *offline* mobilisation (roundabout blockades) and *online* mobilisation (on Facebook), and we analyse the territorial coverage of the movement. We go on to discuss the factors likely to explain why the movement took hold, grouping them into four main categories: political preferences, government decisions, socioeconomic factors, and geographical constraints affecting different areas. As these dimensions are all correlated with one another, we include them all simultaneously in a statistical analysis, which aims to identify the most salient factors.

Measuring the movement's intensity

As part of the demonstrations, a website was set up that provided an interactive map of the gatherings updated in real time (www.blocage17novembre.fr). In this report, we use the map of the gatherings planned for 17th of November (saved in the evening on November 16). This shows 788 gatherings that can be associated with a municipality in metropolitan France. These are declarations of intent to demonstrate issued by the "gilets jaunes" themselves the night before the events: to our knowledge there is no exhaustive list of the gatherings that actually took place.

However, as the purpose of this map was to coordinate the gatherings, there was little incentive to make false declarations of intent. In addition, because the movement was mainly organised on Facebook, we collected data on groups linked to the "gilets jaunes" between the 12th and the 15th of December. This enables us to gather information about preparations for the movement launched in October, and about the first month of its existence. We carried out searches on Facebook with a panel of keywords related to the movement, sometimes combined with geographical indicators.[2] For each group identified in this way, we obtained the following information: the group name, the number of members and the number of messages published. Ignoring groups with fewer than 100 members,[3] we identified 1,548 different groups using this method.

These different groups were then associated with an identifiable geographical level: national, regional, departmental or sub-departmental (i.e. city or county), based on explicit references in the group name (e.g. "Les gilets jaunes de Savoie", "Gilet Jaune 74" or "Mobilisation gilets jaunes senlis"). More than half of the groups analysed (834) are associated with a town, a small group of towns or a pays (a particular area); only slightly over 25 % of the groups covered an area larger than a département. Nearly half of all messages were published on the pages of local groups (730,295 out of 1,473,616). These findings bear witness to the local, decentralised nature of the movement.

From these two sources of compiled data, reflecting both online mobilisation (on Facebook) and offline mobilisation (roundabout blockades), we establish three indicators:

- *Number of gatherings* planned in each geographical area;
- *Number of members* of Facebook groups associated with each geographical area;
- *Number of posts* published on Facebook groups for each geographical area.

There is a positive correlation of 30 % to 50 % between the online and offline mobilisation indicators at the local level.[4]

Unlike other analyses of the gilets jaunes, in this study we take a territorial approach. Instead of aggregating infor-

[1] In particular, the Arab Spring and Occupy Wall Street abroad, and 'Nuit Debout' and 'La Manif pour tous' in France.

[2] The keywords used include, for example: "gilets jaunes rennes", "blocage", "blocage ain", "colère", "17 novembre", "17 novembre hauts de france", "hausse carburant", etc.

[3] They represent 1.1 % of the total membership of the Facebook groups identified, or 2.5 % if Facebook groups intended for a national audience are not taken into account.

[4] Based on the geographical divisions discussed below, we observe a correlation of 85 % at departmental level between the number of members and publications on Facebook group pages, and 32 % between the number of members and blockades. For commuting zones, the correlation between the number of members and blockades is 47 % , and it is 60 % between the number of members and posts on Facebook groups.

mation at the level of individuals (opinion polls, surveys, etc.), we take territories as the object of study.[5]

This approach enables us to aggregate a larger panel of data[6] and to take into account potential spillover effects such as informal interactions or the identification of individuals with place names.

Mapping

The mobilisation of the "gilets jaunes" involves different territorial levels, from the very local (road block, roundabout) to the national (government decisions). We chose two scales of study: the *département* and the commuting zone. The *département* is valuable when it comes to studying Facebook groups because they often identify strongly with this administrative and historical nomenclature (as evidenced by the large number of Facebook groups with a *département* name or number in their title). The fact that most départements are relatively similar in size (except for Paris, its inner ring and the Territoire de Belfort) and spatial composition (central town or city, the chef-lieu préfecture, and other smaller and less attractive towns) makes them a suitable unit of study for spatial comparisons. Out of the 96 départements in metropolitan France, we only use those of comparable size for the empirical study, which gives us 89 usable observations.[7] This nomenclature is particularly good for studying the online movement, because in many cases it is the smallest scale at which identification is possible.

The commuting zone is a geographical area defined by INSEE based on the analysis of commuter journeys: most of the individuals within a single commuting zone live and work in that geographical area. It therefore seemed appropriate to use this scale for studying the blockades linked to the "gilets jaunes" movement. There are 296 commuting zones in metropolitan France. It is worth noting that départements and commuting zones form two completely different divisions of space. For example, the Alençon commuting zone covers parts of three départements (Orne, Mayenne and Sarthe), whereas Orne covers five commuting zones. We describe this decision to use a double nomenclature in more detail in l'Box 1.

We observed an average of 13 blockades per *département*.[8] In the commuting zones, the average was 2.3 blockades per zone. Some commuting zones had an unusually high intensity of blockades.[9] In the case of the Facebook groups, we observed an average of 19,300 members per *département* and 3,347 members per commuting zone.[10] The maximum values, which are very high, reveal large differences in levels of online mobilisation between commuting zones.

We present various maps of the spatial coverage of the mobilisation. The first series of maps (Figure 1) shows the number of members of Facebook groups by département, in absolute values (left-hand map) and per inhabitant, in deviation from the average density value (right-hand map). These maps show a high intensity of online mobilisation in peripheral areas: there are high levels along the whole Atlantic coast, along the Mediterranean coast, and in the North and Alsace. The areas associated with the 'diagonale du vide' (an area of low population density from the north-east to the south-west of France referred to as an empty diagonal) are among those with low levels of Facebook activity. However, there were high levels of mobilisation in some départements with low population densities if the figure for mobilisation is compared to the total population, e.g. Lot, Charente and Hautes-Alpes.

A second series of maps (Figure 2) shows the intensity of the number of blockades, based on the locations of statements of intent, at the commuting zone level: in absolute values (left-hand map) and per inhabitant, in deviation from the average density value (right-hand map). This set of maps differs from the previous one.

In particular, we can see that physical mobilisation is much lower in Brittany than online mobilisation, and the same is true in Alsace. An axis between Paris and Clermont-Ferrand, with no online mobilisation, cuts across the 'diagonale du vide'. The commuting zones nomenclature reveals large differences within départements, e.g. in Cher and Marne.

The four dimensions of mobilisation

The factors determining the mobilisation of the "gilets jaunes" intersect with many issues. Four dimensions appear essential to identify the factors underpinning the

[5] See: Algan, Y., Beasley, E., Cohen, D., Foucault, M., and M. Péron (2019). *Qui sont les "gilets jaunes" et leurs soutiens ?*, CEPREMAP and CEVIPOF Well-Being Observatory, 2019 - 03 and Sebbah, B., Souillard, N., Thiong-Kay, L., and N. Smyrnaios (2018). *Les Gilets Jaunes, des cadrages médiatiques aux paroles citoyennes*, Preliminary Research Report by the Laboratoire d'Études et de Recherches Appliquées en Sciences Sociales (Université de Toulouse).

[6] To combine different data sources at geographical level, the data simply need to use the same system of spatial identification (name of commune, geographical coordinates, etc.). This is often easier to achieve than identifying individuals, which is necessary to match survey data with census data or employee databases.

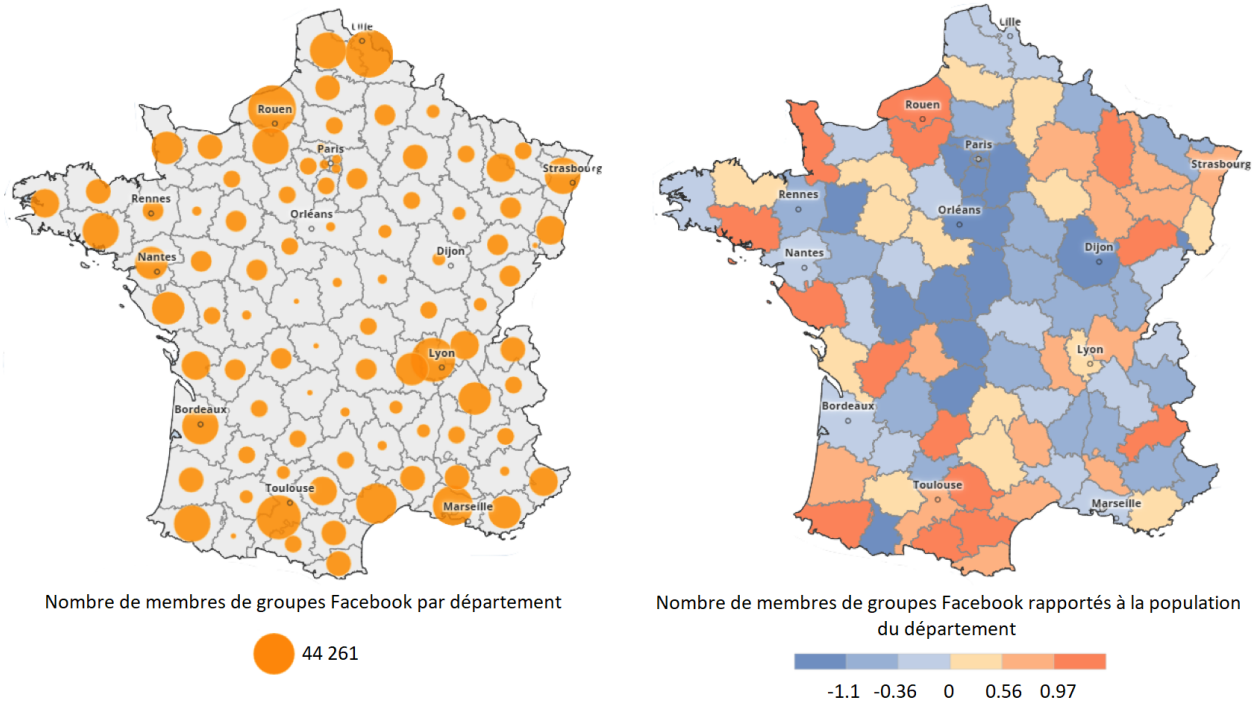
[7] We did not include the overseas départements and regions, demonstrations organised abroad, or the two Corsican *départements*, because we wanted to analyse a continuous geographical entity.

[8] The highest numbers were in the Bouches-du-Rhône, Nord and Rhône départements, linked to their high population densities. It is worth noting that the density of blockades in the inner ring of départements around Paris was low.

[9] The commuting zones with very high numbers of blockades were Troyes, Roubaix-Tourcoing, Lens-Hénin and, to a lesser degree, Istres-Martigues and La Rochelle.

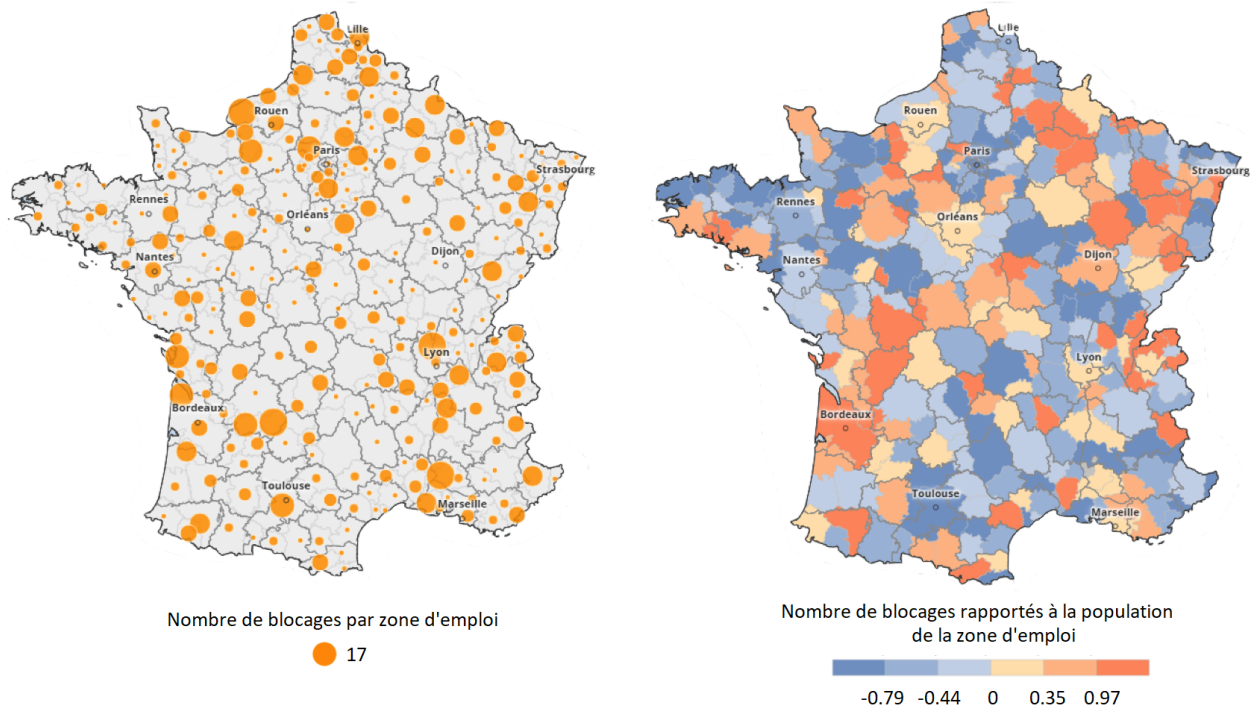
[10] The highest values are observed for the Saintes - Saint-Jean d'Angely, Istres - Martigues, Neufchâteau, Troyes, Lens-Hénin, Douai, Argentan, Lorient, and Cherbourg en Cotentin commuting zones.

Figure 1: The online mobilisation by *département*



Key: These two maps show the number of "gilets jaunes" Facebook group members by département, in absolute values (left) and compared to the total population (right). The cold colours (blues) correspond to a lower intensity than the national average. The differences are expressed as standard deviations in the key. **Sources:** Data on "gilets jaunes" Facebook groups collected manually between 12 and 15 December 2018. Map projection produced using the online tool: 'INSEE, Statistiques locales'.

Figure 2: Offline mobilisation by commuting zone



Key: These two maps show the number of blockades per commuting zone (left) and the number of blockades compared to the total population (right). The cold colours (blues) correspond to a lower intensity than the national average. The differences are expressed as standard deviations in the key. **Sources:** Data collected on 16 November 2018 in the evening from www.blocage17novembre.fr. Map projection produced using the online tool: 'INSEE, Statistiques locales'.

movement: election results, political decisions, and the socioeconomic and geographical characteristics of the areas in question. Below we describe the variables used and in Table 1 we present their correlation with our mobilisation indicators. As all these variables are defined at territorial level, we also consider the mobilisation indicators in

Box 1: Territories and geographical division

Modifiable areal unit problem: Conducting studies using a spatial approach raises the issue of which is the most appropriate geographical unit to use. Spatial aggregation carries the risk of producing results skewed by the choice of nomenclature, such as scale or zoning effects. This is the modifiable areal unit problem. Highlighting the sensitivity of the study to the choice of spatial division is not really a problem, but reflects the multi-scale aspect of the subject of study.

Commune: The smallest administrative unit available is the commune (municipality). France has around 35,000 of them, but the area each one covers is too small for our analysis. Facebook groups and roundabouts were identified for larger spatial units such as the département ("Gilets Jaunes Gironde", "Union Gilets Jaunes 84") or the pays ("Gilets Jaunes du Pays d'Auray" or "Gilets Jaunes Dinan et environs").

Département: The first spatial unit used in our study is the administrative division of the département, established in 1789. The long-standing and discretionary nature of this division make it relatively neutral in the socioeconomic context discussed in this report. However, this disconnection from contemporary economic dynamics also has its disadvantages when it comes to more fine-grained studies of the impact of localised public policies or social movements. For example, a département contains a variety of housing types and activities, and potentially competing cities and towns, which can smooth out variations. Furthermore, people may work in one département and live in another.

Commuting zone (zone d'emploi): A good definition of a territory based on a particular economic reality is the one provided by INSEE: the commuting zone. It defines a geographical area within which most of the working population lives and works (at least 40 %) and where businesses can find most of the labour they need to fill the jobs available. Commuting zones are the territorial division usually used for studies of the labour market. Because they cover large areas where individuals work, live and shop, commuting zones are also relevant for local diagnostic studies. In particular, they were designed to guide territorial divisions for the implementation of territorial policies. Here we use the updated divisions from 2010. Note, however, that analyses based on this spatial unit can mask disparities within areas polarised between the centre, the suburbs and periurban areas. In addition, because they cover the whole country, commuting zones can sometimes appear rather artificial in geographical areas of low population density with no urban centres.

Constituency: A territorial division half way between the département and the commune that could appear relevant to our study is the constituency (current boundaries date from 2011). However, it is not always easy to obtain data on this scale, which is not linked to municipal boundaries. Communes are split between different constituencies, making it impossible to match up information. It is therefore impossible to link Facebook groups with a single constituency and thus create a satisfactory database.

relation to the size of each zone. The analysis is performed by considering, in a 'representative' square kilometre, the number of blockades, members and published messages counted.

1. **Vote in the first round of the 2017 presidential election:** we collected electoral data for the first round of the 2017 presidential election. This includes the share of abstainers and votes for the top five candidates: Emmanuel Macron, Marine Le Pen, François Fillon, Jean-Luc Mélenchon and Benoît Hamon. For both départements and commuting zones, there is a negative correlation between the mobilisation of the "gilets jaunes" and votes for Emmanuel Macron, François Fillon and Benoît Hamon, and the correlation is positive with votes for Marine Le Pen, Jean-Luc Mélenchon and abstentions. The correlation between abstention and mobilisation is around 20 % . These correlations are nevertheless moderate: this first step seems to suggest that the "gilets jaunes" movement does not amount to a third round of the 2017 presidential election. We took the abstention rate and votes for Emmanuel Macron to be the main variables explaining the mobilisation. The share of abstainers is interesting as a measure of engagement with politics and attachment to France's institutions. Where voters voted, the number of votes for Emmanuel Macron enables us to analyse the extent to which the movement developed as a way of expressing opposition to the current president.
2. **Political decisions by the government:** three policy decisions seem to be strongly linked to the protests: the decision to increase taxes on diesel, the increase in the CSG and the reduction of the speed limit from 90 to 80 km/h on secondary roads. The first two were in Macron's election manifesto,[11] whereas the third, which came into force in July 2018, was not. Administrative data tells us the share of vehicles registered in each commune that run on diesel. It is difficult to interpret the correlation of this variable with our mobilisation indicators: at departmental level,

[11] Objective 4 of France's ecological transition programme states: "To massively reduce pollution associated with fine particles, tax on diesel will be aligned with tax on petrol during the five-year period." (https://en-marche.fr/emmanuel-macron/le-programme/environnement-et-transition-ecologique). On the same website: "We will finance this with an increase in CSG, of around 1.7 points, which will not affect pensioners on low incomes (those exempt from CSG or subject to the lower rate of CSG, i.e. around 40 % of pensioners) or unemployment benefits, but will affect income from capital." (https://en-marche.fr/emmanuel-macron/le-programme/fiscalite-et-prelevements-obligatoires).

the correlations are negative, but at commuting zone level they are positive. This variable is correlated with inequalities, which we also measure.

Using OpenStreetMap, we calculated the number of kilometres of roads affected by the speed limit reduction to 80 km/h.[12] As part of our territorial study, we calculated the length of roads affected (km) in relation to the area of the zone studied (km2). A strong positive correlation is observed between this variable and the indicators for online and offline mobilisation. Using tax data, we take account of the share of retirement pensions and incomes in localised tax revenue. This variable enables us to assess the impact that the increase in CSG on pensions has in different areas. At first sight, this variable does not seem to be linked with the level of mobilisation.

3. **Socioeconomic factors:** mobilisation could also reflect economic disparities in France. To characterise this dimension, we consider the unemployment rate to be a measure of integration in the job market. Within each local labour market, we capture the level of pay inequality from the inter-decile difference for employees.[13] Whether we examine the unemployment rate or pay inequality, in both départements and commuting zones, there is a strong positive correlation between our variables and mobilisation, confirming the socioeconomic dimension of the movement.

   We also used a variable measuring the poverty rate within the population of households where the reference person is aged over 75 years, to take account of differences in the economic circumstances of pensioners all over the country. There is little correlation between this variable and our mobilisation variables.

4. **Geographical constraints:** to take account of travel constraints, we calculate distance as the crow flies, for each resident employee, between their place of work and home. The average of this variable appears to be a good approximation of the geographical constraints of different areas. It also reflects the impact of the fuel price rise on the different areas. One can see that this variable, which does not correlate with mobilisation at departmental level, correlates positively with online mobilisation, but correlates negatively with offline mobilisation at the commuting zone level. This difference possibly reflects the fact that offline mobilisation is partly dictated by ease of access to the blockades.

[12] We calculated that the total length of the affected roads was 390,000 km, which is similar to media estimates.

[13] This difference measures the ratio between the ninth and the first deciles of the local pay distribution.

Econometric analysis

Given there is often a high level of correlation between our explanatory variables, we carried out a statistical analysis in which the role of each could be isolated. Eleven variables were chosen: the variables described above, and two additional controls: population density, which neutralises the mechanical correlation between population density and the probability of observing an event in a particular geographical area, and average age, which is the simplest, most transparent variable, to check for local socio-demographic differences.

The results may vary according to geographical divisions and mobilisation figures, but the correlation measurements are always consistent (either the expected sign or very close to zero and not significant), which confirms our choice of variables. The variable for which the highest correlations are observed is the density of roads where the speed limit has been reduced to 80 km/h. For example, at departmental level, we found that one kilometre of roads where the speed limit has been reduced to 80 km/h per km2 is, on average associated with an increase of 10 extra Facebook group members per km2. This correlates positively with mobilisation on both scales. It demonstrates the importance of territorial constraints, particularly associated with residents' mobility, in the movement's genesis. Similarly, there is strong correlation between average commuting distance and online mobilisation: on average, a one standard deviation increase in the average commuting distance translates into an increase of 3,000 in the number of members of "gilets jaunes" Facebook groups in the département. However, it is not, in our specification, linked to blockade density. This result may relate to the fact that journey times do not prevent people from mobilising on Facebook, but they could act as an obstacle to physical mobilisation. In the case of the variables associated with the retired population, we see no correlation of the localised poverty rate among the elderly, but a positive correlation between online mobilisation and the contribution of retirement pensions to household income. However, there is no effect on the blockades. The effects of age are mixed: focusing on the working population, the highest proportion of young people (lowest average age) correlates significantly and positively with mobilisation. The variables of pay inequality and unemployment rate both correlate positively with mobilisation, but with only marginal significance. Conversely, the share of votes for Macron in the first round of the presidential election is negatively associated with mobilisation in the commuting zones, but not at *département* level, where political views may be less diverse.

The least prominent variables are the abstention rate in the first round of the presidential election, the share of diesel vehicles and the poverty rate among the elderly. In

Table 1: Correlations between mobilisation variables and explanatory variables

	Département			Commuting zone		
	Online		*Offline*	*Online*		*Offline*
	Members	Publications	Blockades	Members	Publications	Blockades
Share of diesel vehicles	-0.36*	-0.17	-0.43*	0.07	0.06	0.20*
Roads changed to 80 km/h	0.49*	0.11	0.35*	0.14*	0.15*	0.46*
Abstention rate in 2017 1st round	0.21*	0.07	0.36*	0.10	0.11*	0.30*
Votes Macron in 2017 1st round	-0.01	-0.06	-0.14	-0.12*	-0.17	-0.20
Average commuting distance	0.02	0.12	-0.01	0.14*	0.14*	-0.12*
Unemployment rate	0.21*	0.21*	0.39*	0.18*	0.24*	0.25*
Pay inequality	0.49*	0.28*	0.64*	0.12*	0.14	0.28
Poverty rate among over 75s	-0.23*	-0.01	-0.15	0.06	0.07	-0.08
Contribution of pensions to total income	-0.43*	-0.18	-0.44*	-0.01	-0.01	-0.29*
Average age of residents	-0.54	-0.24	-0.43	-0.09	-0.02	-0.33*
Population density	0.53	0.33	0.54	0.10	0.12*	0.59*
Vote Le Pen 1st round 2017	0.03	0.05	0.13	0.13*	0.18*	0.15*
Vote Mélenchon 1st round 2017	0.01	0.16	0.13	0.11	0.11	0.07
Vote Fillon 1st round 2017	0.02	-0.08	-0.05	-0.15*	-0.15*	-0.12*
Vote Hamon 1st round 2017	-0.01	-0.04	-0.13	-0.01	-0.05	-0.15*
N	89	89	89	296	296	296

For the variables indicated by a star, the hypothesis of non-correlation can be rejected with a 95 % confidence level.

theory, a positive correlation between abstention and the movement would reflect the replacement of traditional political engagement by engagement with the movement, whereas a negative correlation might reflect a low level of civil engagement. The fact that we cannot find any effect of abstention on mobilisation may be due to the fact that these two mechanisms cancel each other out. As to the share of diesel vehicles, which should measure the sensitivity of different areas to ecological taxation, our results appear to show that it played a minor role compared to other more profound socioeconomic and territorial determinants, such as the decision to reduce the speed limit on secondary roads.

Perspectives

By focusing on the start of the movement (blockade on the 17th of November 2018 and activity on Facebook from October to mid-December 2018), our study is interested in the triggers of the "gilets jaunes" mobilization. To this end, we propose an original approach adapted to the movement's spatial dimension. Our study reveals that the speed limit reduction to 80 km/h was an important factor in the launch of the movement, which could explain the lack of comprehension of the movement for a fraction of the population[14] and the political parties at the outset. However, this single theme became less important in the subsequent evolution of the movement. A dynamic study of the movement would seem to be of interest to explain the changes in the protest. The results presented in this report are only a first step in the analysis of the "gilets jaunes" movement. The "gilets jaunes" movement questions our relationship with physical and digital territories: the transformation of an online movement to an offline movement on this scale is a first in France. It is essential for research to be conducted with the assistance of digital platforms so that the new forms of political mobilisation can be understood.

[14] See for instance "#SansMoiLe17", https://www.youtube.com/watch?v=P1MuWx9FR_A.

Reference study

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