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The origins of the *gilets jaunes* movement

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This paper presents the results of a geographical study on the areas where the gilets jaunes (yellow vests) movement first emerged. This grassroots movement was organized at a local level but developed throughout France as soon as the protests began in November 2018. Using new Facebook data related to the movement, we show a strong geographical correlation between online mobilization (on Facebook) and offline mobilization (blockades of roundabouts). We precisely map the protests in France. Then, using data on roads where speed limits were lowered during the summer of 2018, and on the average commuting distance in French cities, we show that the issue of mobility is an important explanatory factor for the initial growth of the movement.

LES DÉTERMINANTS DE LA MOBILISATION DES GILETS JAUNES

Cet article présente les résultats d'une étude sur les territoires dont sont originaires les « Gilets jaunes », au début de la mobilisation. Dès le premier samedi de mobilisation, le 17 novembre 2018, ce mouvement se démarque par son caractère local et sa couverture nationale. À partir de données inédites de la mobilisation sur Facebook, nous montrons une forte corrélation entre mobilisation online (sur Facebook) et mobilisation offline (blocages des ronds-points). Nous réalisons alors une cartographie fine et contrastée de la contestation. L'étude économétrique met en évidence le rôle de la mobilité pour expliquer les origines du mouvement, au

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travers notamment du passage des routes à 80 km/h et des distances domicile-travail.

Keywords : yellow vests, protests, urban economics, online mobilization

Mots clés : gilets jaunes, manifestation, économie urbaine, mobilisation réseaux sociaux

JEL codes: F15, J40, J60, J80, C83.

INTRODUCTION

At the end of 2018, France was shaken by a large-scale protest movement: the “*gilets jaunes*” (yellow vests). The movement initially brought together motorists angry about rising fuel prices. But it quickly turned into a general protest against government policy. This movement stood out due to its local character and its nationwide coverage. Its members were encouraged to block traffic as close as possible to their homes, resulting in an unprecedented number of blockades on the very first Saturday of protests. Facebook seems to have played an important role in the success of this decentralized mobilization.

Although the increase in the tax on energy products was the trigger for the movement, it does not seem to be the only explanation. Indeed, various protest movements took place at the beginning of Emmanuel Macron’s presidential term without coalescing in this way. Besides dissatisfaction with the political choices made by the government, there were also fundamental questions about public policies that had been in place for several decades, in a context of declining public spending and increasing inequality, with significant territorial repercussions. Finally, the mobilization took place in the context of an apparent questioning of liberalism and social democracy in many modern democratic societies.

The *gilets jaunes* belong to a long history of social movements in France (Neveu 1996). In some respects, they reproduced familiar historical patterns. Indeed, fiscal policies are often evoked to explain the origins of popular uprisings (Ponticelli and Voth 2017). In France, from medieval peasant uprisings to the price of gas at the pump, fiscal revolts have appeared frequently throughout the history of taxation (Delalande 2011; 2014). However, the *gilets jaunes* also differed from traditional protests in several ways. First, the movement was distinguished by its use of numerous decentralized gathering points, often at roundabouts, symbols of French car culture. On the very first Saturday of protests, there were 788 blockades. Second, the demonstrations seem to have been organized largely without the intervention of traditional intermediary bodies such as political parties or unions: the latter were slow to join the protest movement. Finally, social networks seem to have played a decisive role in the organization and media coverage of the movement. By mid-December, there were 1,548 Facebook groups with more

than 100 members associated with the *gilets jaunes* movement. Although massive demonstrations had previously been launched and catalyzed by social networks around the world,¹ this was the first time that a mobilization of this magnitude had been sparked by social media in France.

Recent theoretical work has highlighted the potential importance of social networks in the emergence of large-scale protest movements (Edmond 2013; Little 2016; Barberà and Jackson 2020). It has long been known that coordination is key for effective collective action, but that it is limited by information asymmetries and communication channels (Sandler 1992; Russell 1982; Ostrom 2015). From this point of view, social networks are potentially game-changing for citizens and governments alike. They have the potential to facilitate access to other, sometimes more reliable sources of information, especially in autocratic regimes, and allow for better coordination of strategies among protesters. Some empirical studies seem to support predictions based on these models. In the context of the Arab Spring, for example, Twitter activity was a strong predictor of actual protests (Steinert-Threlkeld et al. 2015; Acemoglu, Hassan, and Tahoun 2017). Similar results have been found in Chinese (Qin, Strömberg, and Wu 2017), American (Caren and Gaby 2011; Vasi and Suh 2013; Bastos, Mercea, and Charpentier 2015), and Russian (Enikolopov, Makarin, and Petrova 2019) contexts.

The media coverage received by the *gilets jaunes* was extensive. On television, radio, and in newspapers, numerous interpretations were put forward to explain the emergence of the movement.² In the academic context, Sebbah et al. (2018) have analyzed the *gilets jaunes* movement through the prism of traditional media (newspapers) and social networks using textual analysis techniques (Facebook, Twitter, petitions on change.org). Their analysis highlights the importance of the themes of mobility and fiscal policy, as well as the discontent of the protesters. Using the CEVIPOF Political Trust Barometer, Algan et al. (2019) have studied the sociodemographic characteristics of *gilets jaunes* supporters. Their analysis shows that these supporters are mostly far-left and far-right voters, or nonvoters. It should be noted that the survey focuses on the political positioning of these supporters, but it did not question the protesters themselves. Finally, Bennani, Gandré, and Monnery (2020) have examined the local factors involved in digital participation in the “*grand débat national*” (great national debate). They show that median standard of living and level of education are the main determinants at the departmental level of overall participation in the “*grand débat en ligne*” (great online debate). To our knowledge, no study has examined the connections between physical blockades (at roundabouts) and online activity (Facebook).

1. The Arab Spring and Occupy Wall Street in 2011, La Manif pour tous in 2012, Nuit debout in 2016, etc.

2. A keyword search for “*gilets jaunes*” gives 181,563 journalistic articles published between October 1, 2018, and July 1, 2019 (*Source*: Factiva).

In this article, we approach the *gilets jaunes* movement through the prism of geography. We aim to answer the following question: What are the characteristics of the geographical areas with a high level of mobilization at the beginning of the movement? In this, our study differs from the two works mentioned above in several ways. First, we are interested in the mobilization itself (and not its support in the wider population), on Facebook and in the physical territory (blockades). We document the Facebook groups associated with the *gilets jaunes* that we were able to locate. We thus highlight a strong correlation between online and offline activity, before mapping the mobilization in these two dimensions. Second, we built a geolocated database that combines administrative sources (jobs, income, voting history) with offline (blockades of roundabouts) and online (Facebook groups) mobilization indicators. Our econometric study highlights the strong link between mobilization and variables related to mobility: commuting distance and the reduction of the speed limit on secondary roads from 90 km/h to 80 km/h.

The rest of this article is divided into six parts. First, we briefly review the history of social movements in France and the major events during Emmanuel Macron's presidency that led to the emergence of the *gilets jaunes*. Second, we describe in detail the collection of our data and we map the movement. Next, we discuss the factors that could explain mobilization, which we group into four categories: political preferences, government decisions, socioeconomic factors, and geographical constraints associated with the territories. We then present the results of the econometric analysis. Finally, we conclude by discussing prospects for future studies.

AN ATYPICAL SOCIAL MOVEMENT

By disrupting the established political order, protest movements have the potential to bring about major economic and political changes.³ For social scientists, it is important to understand the origins and consequences of these movements. However, their erratic nature and their mutation over time make them a challenge for research.

By adopting the definition provided by Neveu (1996, 11) we conceive a social movement (or mobilization) as “an intentional acting-together, marked by the protagonists’ explicit plan for concerted mobilization. This acting-together is centered around a demand, the defense of an interest, or

3. Numerous case studies have highlighted that protests structure voters’ political preferences. In the nineteenth century in the United Kingdom, the widespread uprising of agricultural workers influenced the propensity of voters to vote for reform of the British electoral system (Aidt and Franck 2015). More recently, the 2009 Tea Party protests in the United States significantly contributed to the increase in the vote for the Republican Party (Madestam et al. 2013). Furthermore, the threat of protests can impact a government’s public policies. Typically, in the case of fiscal policies, governments may move away from a system of optimal taxation in order to avoid tax revolts (Passarelli and Tabellini 2017).

a ‘cause.’’⁴ In this article, we focus on the different modes of coordination implemented in order to organize collective action, in particular the link between online (Facebook) and offline (blockades of roundabouts) means, by mapping these two dimensions of the movement and by highlighting the links between the territory and these forms of mobilization.

Historical dynamics of social movements

The second half of the twentieth century was a period of major change in social movements, linked to social and economic transformations (deindustrialization of Western economies, end of the Cold War, and globalization).⁵ Thus, the workers’ movement, characterized by its acts of opposition within factories (pitting workers and unions against the owners of the means of production), declined from the 1960s onward, with the end of “working-class consciousness” and the rise of the service economy. 1968 marked a turning point with the appearance of “new social movements” (Touraine 1968; Parkin 1968; Crouch and Pizzorno 1978), which saw the emergence of new figures of collective action such as students, regionalists, feminists, and the LGBTQ community. These groups made cultural demands, in what were now transversal struggles (Foucault 1982) that were not limited to one country in particular and that addressed the effects of power as such.⁶ These new social movements were accompanied by the affirmation of the subject and of the global dimension of struggles,⁷ which led, from the 1980s onward, to the emergence of *global* movements (Della Porta 2015) structured around non-governmental organizations (such as the alter-globalization movement) and based on the combination of very local actions and a global structuring.

When we look at social movements from this historical perspective, it is clear that what makes the events of late 2018 stand out is the *gilets jaunes*’ use of new tools (social networks) and the actors involved in the action (motorists). In particular, this mobilization did not relate to means of production, either in its modes of action or in its demands; nor did it, like the new social movements, involve minority figures⁸; nor did it possess the

4. **Translator’s note:** Unless otherwise stated, all translations of cited foreign-language material in this article are our own.

5. A more detailed general overview of these historical and social dynamics can be found in Wieviorka (2008).

6. This last point involves the disappearance from protestors’ demands of an identified opponent. New social movements questioned the forms of domination and power in society, in both the public sphere (politics, work) and the private sphere (violence against children, women’s place in the home, etc.).

7. The individual became the driving force of action, in their very choice to *join* the collective action, thereby giving rise to ethical considerations and a new perception of the total individual as a “rights-bearing subject” (Touraine 2013).

8. It is also interesting to note that the movement involved the (re)emergence of a majority actor, claiming to represent “the people.” This characteristic connects the *gilets jaunes* to the contemporary populist dynamic and can probably help to explain the (initial) rejection of the movement by progressive forces.

supranational structuring characteristic of global movements. Nevertheless, we can associate with it certain characteristics of recent movements, which together seem to form a turning point, with the use of social networks for the organization, structuring, and mediatization of collective action. A unique aspect of the *gilets jaunes* movement seems to lie in the connection between local gatherings and an effective national coordination.

The context of the *gilets jaunes*

Various mobilizations have taken place in France since the 2000s, often taking the government and the president as their adversary.⁹ One action that echoes the demands of the *gilets jaunes* is the opposition to the ecotax in Brittany against the backdrop of layoffs in the agri-food industry, which gave rise to the “*bonnets rouges*” (red caps) movement in 2013. Since Emmanuel Macron took power, various mobilizations have hit the headlines: against the easing of the wealth tax, against the increase in the generalized social contribution, against labor law reform in 2017, and then, in the spring of 2018, against the opening up of railways to competition¹⁰ and against the reform of the system for admission to higher education (Parcoursup). None of these mobilizations, which involved up to several hundred thousand demonstrators, resulted in changes to government policies.

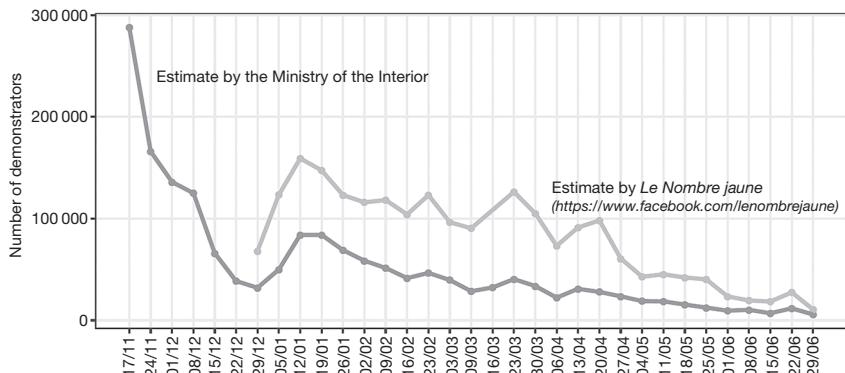
In the study of collective action, motorists and motorcyclists are atypical populations. These groups often organize for recreational purposes, but they also monitor changes in road regulations and sporadically mobilize to influence government policies (the use of speed cameras, reduction of speed limits, fuel taxes). Demonstrations took place in January 2018 to oppose Prime Minister Édouard Philippe’s plan to lower the speed limit on secondary roads from 90 km/h to 80 km/h, which brought together several thousand demonstrators in different cities.¹¹ On May 29, 2018, a motorist, Priscillia Ludosky, launched a petition on change.org, “For a decrease in fuel prices at the pump!,” against the backdrop of a continuous increase since 2016.

9. These include, in chronological order: the so-called “banlieue riots” in 2005, which began in Clichy-sous-Bois following the death of two teenagers, Zyed Benna and Bouna Traoré; opposition to the “contrat première embauche” (CPE) (first employment contract) in 2006; and opposition to pension reforms in 2010. Opposition to the “El Khomri” labor law in 2016 lasted from March to September and gave rise to various innovations in collective action, with Nuit debout using a variant of the “city square movement” in the Place de la République, and the presence of “black blocs” in the leading group. These different mobilizations had major effects on public policies, including the amendment or withdrawal of the policies in question, and even the implementation of a state of emergency in the case of the 2005 riots.

10. This reform was decided on before Emmanuel Macron came to power, but it took effect during his term of office.

11. R. Bx with AFP, “Vitesse limitée à 80 km/h: des milliers de motards en colère contre ‘la Sécurité rentière,’” *Le Parisien*, January 27, 2018. It is interesting to note that the article mentions that, “in addition to the 80 km/h limit, the demonstrators were also protesting against the high cost of living and the increase in the CSG [generalized social contribution], while singing *La Marseillaise*.”

Figure 1 – Estimation of the number of protesters per act in the gilets jaunes movement, November 17, 2018–June 20, 2019



On July 1, 2018, the 80 km/h speed limit came into effect. Various rallies took place at the time, scattered across the country, to oppose the reduction of the speed limit on secondary roads and the increase in fuel prices. On October 10, a call for a “national blockade against rising fuel prices” was launched on Facebook by Éric Drouet and Bruno Lefevre. On October 18, Jacline Mouraud posted a video on YouTube against the rise in fuel prices, tolls, and the use of speed cameras. From this date on, we observe a high rate of creation of Facebook groups (see Figure 3). On October 24, the “*gilet jaune*” (a yellow high-visibility vest) was proposed as the rallying sign of the movement. Motorists were urged to display their opposition to the government by placing a yellow vest on their dashboard. On November 16, there were more than 700 action points throughout the country, which would lead to act 1 of the movement the following day.

During act 1, the mobilization brought together about 300,000 people according to the Ministry of the Interior.¹² This was the peak of the mobilization. Figure 1 (all figures are available in color in the online appendix, DOI: 10.3917/reco.711.0109) shows the change in the level of participation over time.¹³ Saturdays were set as the day for action, although blockades were sometimes maintained during the week. The violence and the resulting police repression reached their peak on Saturday December 1 at the roundabout surrounding the Arc de Triomphe in Paris. On December 10, Emmanuel Macron announced a “10 billion euro” plan to try to appease the protesters. Politicians and trade unions gradually lent their support to the movement. The protests resumed after the New Year celebrations, before gradually slowing down at the end of spring.

12. The association France Police – Policiers en colère counted more than a million protesters.

13. Note the discrepancy between the two estimates, which is a constant feature of social movements, and which provides another justification for our Facebook-based counting method.

DESCRIPTION AND MEASUREMENT OF THE MOBILIZATION

To quantify offline mobilization, we used a map of the blockades planned for November 17, 2018. We also identified more than 1,500 Facebook groups created before December 13, 2018, whose activity we measured in order to quantify the size of the online mobilization. From this information, we were able to build a database of *gilets jaunes* mobilization.

Offline mobilization

After the call for a national blockade on October 10, and owing to the increasing number of rallies planned throughout the country, a website was set up to list the different actions planned and to facilitate coordination of the November 17 mobilization.¹⁴ This website offered an interactive map of the rallies, updated in real time. In this article, we use the map of rallies planned for November 17 (which was recorded on the evening of November 16). This map refers to 788 rallies announced in mainland France, which are geocoded and can each be associated with a particular *commune* (municipality). These are declarations of an *intention to demonstrate*, made by the *gilets jaunes* themselves on the eve of the mobilizations. To our knowledge, there is no exhaustive inventory of the rallies that took place. However, as this map was primarily intended to coordinate the rallies, there was little incentive to declare false intentions.

Online mobilization

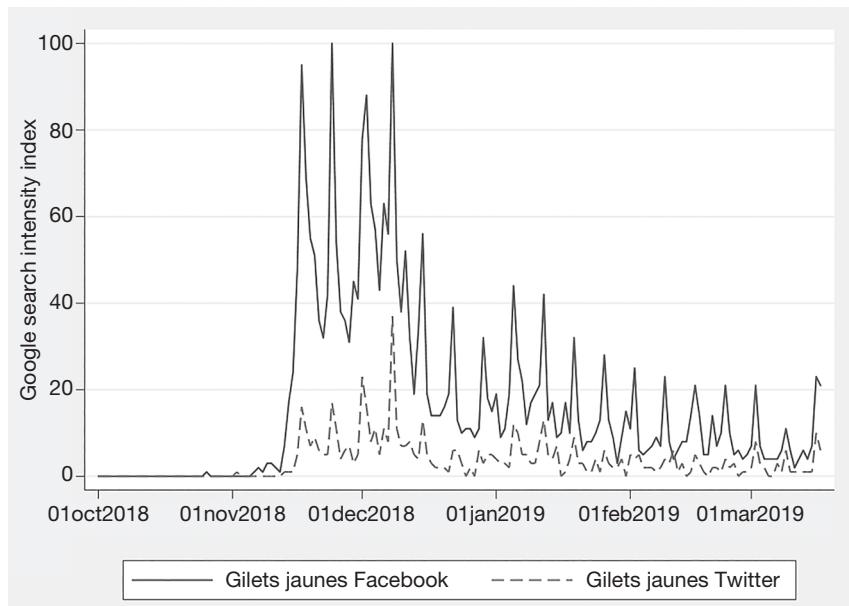
The online activity of the *gilets jaunes* seems to have been concentrated on the social network Facebook. It was on Facebook that certain famous figures of the movement, such as Éric Drouet or Maxime Nicolle, made their names, and the websites connected to the movement (first www.blocage17novembre.fr, then www.gilets-jaunes.com and www.giletsjaunes-coordination.fr) coordinated the rallies by listing local Facebook groups.¹⁵ The data provided by Google Trends, using the search terms “*gilets jaunes Facebook*” and “*gilets jaunes Twitter*,” also indicate that Facebook was the dominant means of coordination (see Figure 2).¹⁶ When studying the coordination websites mentioned above, it seemed to us that the movement was organized more within Facebook groups than within Facebook pages. This may be partly

14. The address was: www.blocage17novembre.fr.

15. We also note the unequal penetration of Twitter across the country compared to Facebook. Twitter is mainly used in Paris, but even there it has a low number of users. Facebook has stronger penetration in the population and is better distributed across the country.

16. Google Trends is a commonly used tool in many research fields. For a detailed discussion, see Stephens-Davidowitz (2014) and Stephens-Davidowitz and Varian (2014).

Figure 2 – Change in interest in the topics “gilets jaunes Facebook” (continuous curve) and “gilets jaunes Twitter” (discontinuous curve) (Google Trends data)



explained by changes made to Facebook’s algorithms in 2018, which then favored groups over pages.

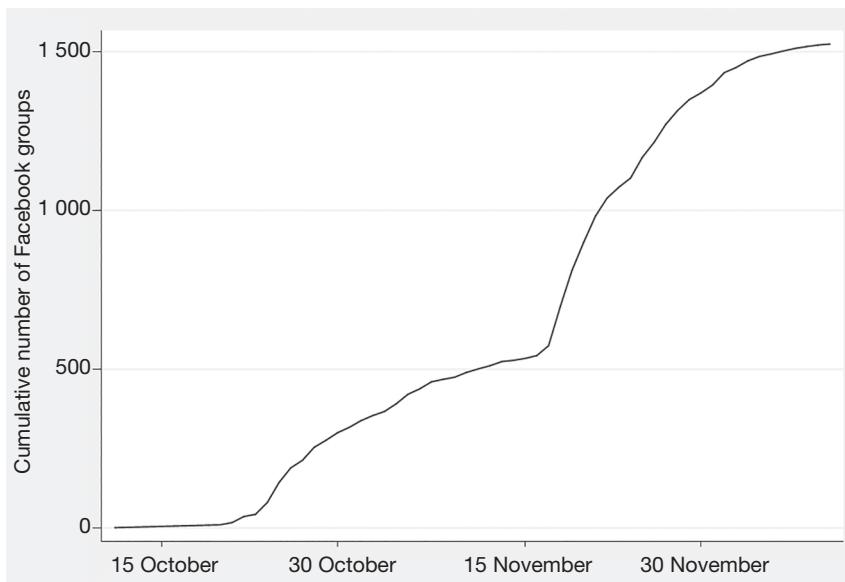
We therefore decided to measure the online activity of the *gilets jaunes* by listing the Facebook groups as exhaustively as possible. In the absence of an open API, we performed this work manually between December 12 and 15, 2018. This collection therefore gives us a snapshot of Facebook groups as of mid-December 2018. We used this list of groups to analyze the preparation of the movement when it was launched in October, as well as in its first month of existence.

To carry out this inventory of Facebook groups, following the methodology of Caren and Gaby (2011), we performed search queries on Facebook using a series of keywords related to the movement and associated, or not, with geographical indicators.¹⁷ For each group thus identified, we retrieved the name of the group, its creation date, the number of members, and the number of messages posted. While discounting groups with fewer than 100 members,¹⁸ this method allowed us to identify 1,548 different groups. In Figure 3, we show the change in the number of Facebook groups over time. The two intense phases of group creation correspond to the chronology mentioned above.

17. Some of the keywords used include “Gilets jaunes Rennes,” “blocage,” “blocage Ain,” “colère,” “17 novembre Hauts-de-France,” “hausse carburant,” etc.

18. This decision was made to allow us to identify only truly active groups. The excluded groups represent only 1.1% of the total number of members.

Figure 3 – Change in the number of Facebook groups over time



These different groups were then associated with an identifiable geographical level: national, regional, departmental, or infradepartmental (on the scale of a city or an urban area), depending on the explicit references present in the name of the group (for example, “Les Gilets jaunes de Savoie,” “Gilet Jaune 74,” “Mobilisation Gilets jaunes Senlis”). As detailed in Table 1, more than half of the groups analyzed were associated with a city, a small group of cities, or a “*pays*” (small region), and only a little more than 25% of the groups focused on a scale larger than that of the department.¹⁹ Moreover, almost half of the posts were made on local groups (infradepartmental scale), while just under 20% of total posts were on national groups. These observations reflect the local and decentralized nature of the movement. We used textual analysis methods (described in Appendix II) to associate each group with a geographical entity (region, department, commune, or group of communes).

Table 1 – Characteristics of the Facebook groups analyzed

Scale of the group	Number of groups	Number of members	Number of posts before December 14, 2018
National	287	2,454,585	281,365
Regional	113	254,068	138,739
Departmental	317	529,412	323,217
Local	834	1,025,628	730,295
Total	1,548	4,263,693	1,473,616

19. It is important to note that members were not identified and thus may belong to more than one group.

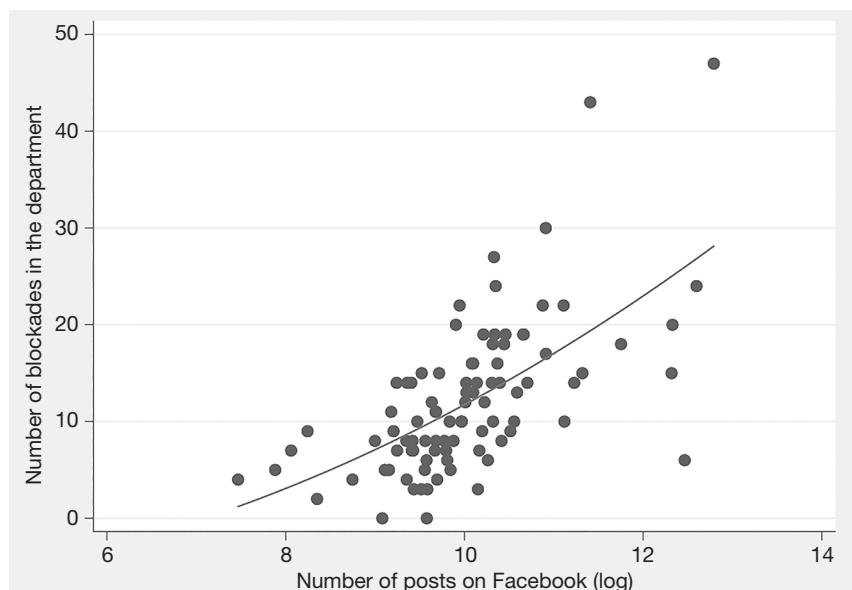
Despite the large number of searches carried out, we cannot guarantee the exhaustiveness of our database. Moreover, the use of data from social networks involves systematic selection biases. For example, in France, women, young people, people in lower socioprofessional categories, and voters of populist parties are overrepresented on Facebook. By contrast, members of intermediate professions, inhabitants of the Paris region, and voters of Emmanuel Macron (during the presidential election) are underrepresented.²⁰ Online mobilization also took place on other social networks (such as Twitter and WhatsApp), but the comparison of online behavior on different social networks during the movement is beyond the scope of this study.²¹

Mobilization indicators selected

With these two sources of compiled data, reflecting both online and offline mobilization, we constructed the following three indicators:

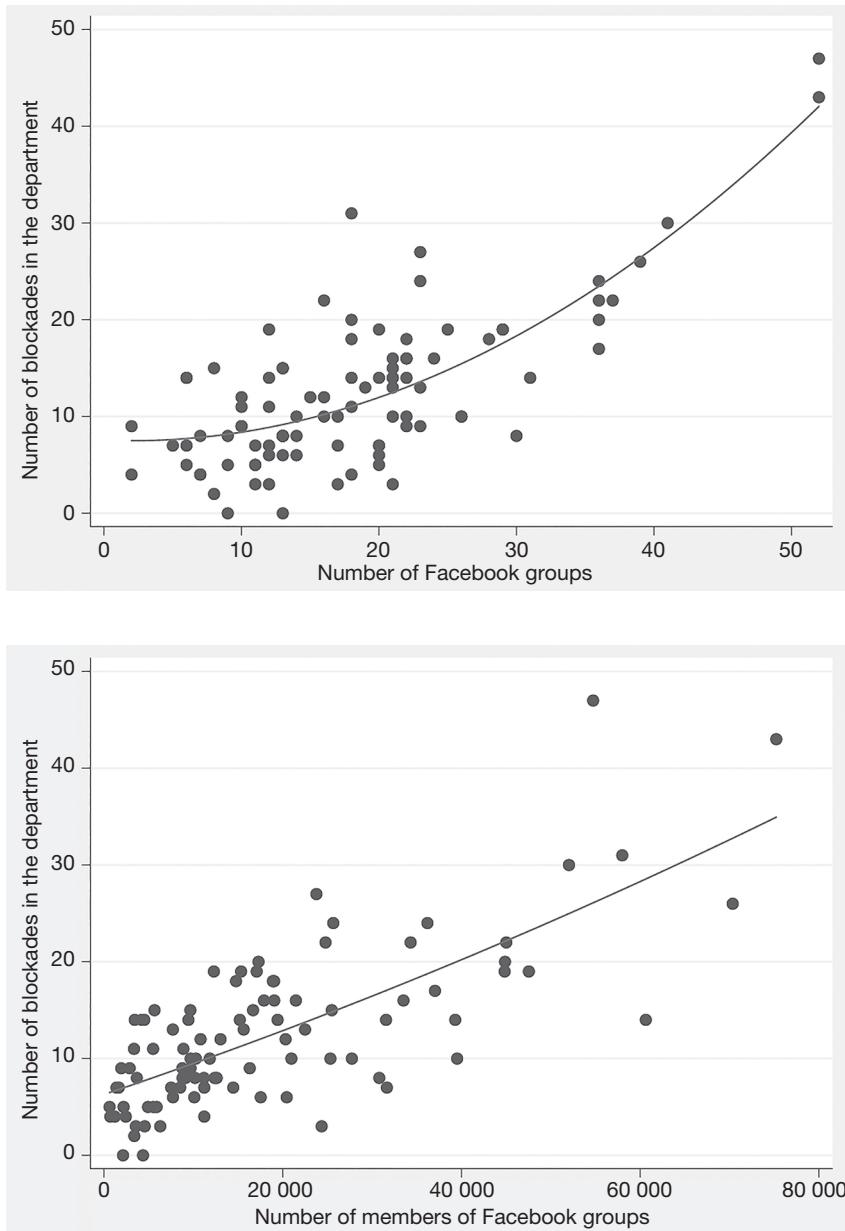
- *Number of rallies* planned by geographical area;
- *Number of members* of Facebook groups associated with each geographical area;
- *Number of posts* on Facebook groups associated with each geographical area.

Figure 4 – *Link between online and offline mobilization based on the location of these two modes of action*



20. Based on the IFOP survey *La confiance des Français dans les réseaux sociaux après l'affaire Cambridge Analytica* (FD/FK/JPD no. 115394) of March 2018.

21. This would require greater accessibility and interoperability of data from different platforms.



The online and offline mobilization indicators are positively correlated, as shown in Figure 4. It seems that the relationship between these two modes of mobilization is not necessarily linear. In particular, we observe a greater range in the number of posts when this number is high, and its predictive capacity for the number of blockades then seems to be low. This is partly a result of the right-censoring of the number of posts per group at 10,000 imposed

by Facebook. On the other hand, the predictive capacity of the number of groups, and even more so, the number of members, is high.

To further investigate the relationship between these mobilization indicators, Table 2 reports their level of correlation at the departmental level. There is a strong correlation between the number of members of Facebook groups and the number of blockades, at 71%. The relationship between the number of posts and the number of blockades is less strong, at 62%, which suggests the lower quality of this variable, due to the 10,000-post limit for groups. The correlation is, of course, strongest with the number of groups (74%), but we chose to focus on the number of members in the rest of our analysis, as it gives an idea of the scale of mobilization for each given event, which our blockade variable does not enable.

Table 2 – *Correlations between online and offline mobilization variables (departmental level)*

	Blockades	Groups	Members
Groups	0.74		
Members	0.71	0.86	
Log (Posts)	0.62	0.74	0.69

These very strong correlations testify to the close connection between the coordination of the movement via Facebook groups and physical action points. These results echo Enikolopov, Makarin, and Petrova's (2019) analysis of the links between the use of social networks and the structuring of political protests.

For the rest of the study, we focus, for the online aspect of the movement, on the number of members of Facebook groups. The offline variable, meanwhile, is measured by the number of declared blockades of roundabouts.

MAPPING THE MOBILIZATION

Methodology

The *gilets jaunes* mobilization involved different territorial layers, from local rallies (blockades, roundabout occupations) to protests against government decisions on the national scale. We focus on two geographical partitions of France: the *departments* and the *employment zones*. The scale of the department is useful for the study of Facebook groups, as many of these groups identify themselves with this administrative and historical nomenclature (as shown by the large number of Facebook groups with the name or number of a department in their title). The relative homogeneity of departments in terms of their size (excluding Paris, its inner ring, and the Territoire

de Belfort) and their spatial composition (a central hub—the prefecture or departmental capital—and various subhubs) makes them a relevant unit of study for spatial comparisons. Of the 96 departments in France, we retained only those of comparable size for the empirical study, which gave us 89 usable observations.²² This nomenclature is particularly useful for the study of the online movement, as it corresponds in a significant number of cases to the scale of identification used by the agents themselves.

The employment zone is a geographical space defined by the Institut national de la statistique et des études économiques (INSEE) (National Institute of Statistics and Economic Studies) based on the analysis of commuting patterns: most individuals grouped in the same employment zone work and reside within this geographical area. It therefore seemed appropriate to use this scale for the study of blockades connected to the *gilets jaunes* mobilization. There are 296 such zones in mainland France. It is interesting to note that departments and employment zones form two non-overlapping divisions of space.²³ We describe this choice of dual nomenclature in more detail in Appendix I.

We observe an average of 13 blockades per department.²⁴ At the level of employment zones, the average is 2.3 blockades per zone. Some employment zones have an unusually high intensity of blockades.²⁵ At the level of Facebook groups, we observe an average of 19,300 members per department and 3,347 members per employment zone.²⁶ The maximum values, which are very high, highlight the very strong heterogeneity of online mobilization at the level of employment zones.

Spatial analysis

We present different maps of the spatial reach of the mobilization.²⁷ A first series of maps (Figure 5) represents the number of members of Facebook groups per department, as an absolute value (left) and per capita (right). These maps show a high intensity of online mobilization in peripheral territories: the entire Atlantic coast shows high levels of mobilization, as do the Mediterranean arc, the north, and Alsace. The spaces associated with the

22. We did not take into account overseas departments and regions, mobilizations abroad, or the two departments in Corsica, in order to maintain a continuous geographical set.

23. For example, the Alençon employment zone covers three departments (Orne, Mayenne, and Sarthe), while the department of Orne covers five employment zones.

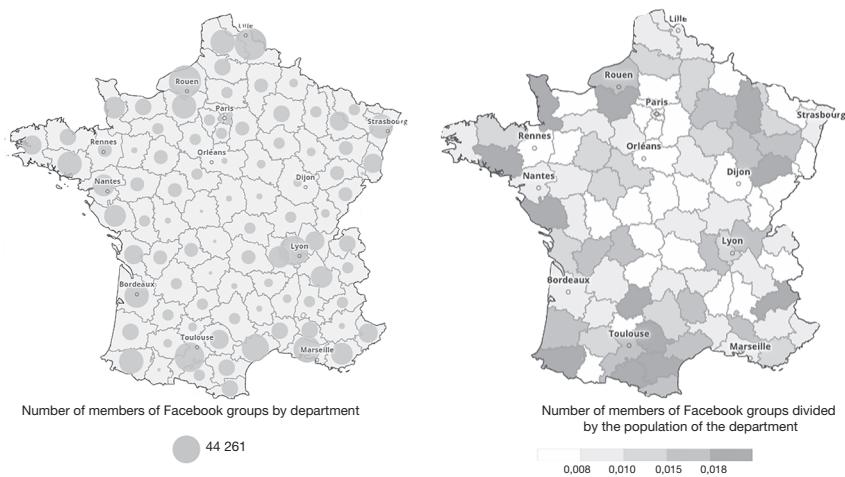
24. The highest values are located in the Bouches-du-Rhône, Nord, and Rhône departments, which all have high population densities. It should be noted that the departments in the inner ring of Paris had a low density of blockades.

25. The employment zones with a very high density of blockades were Troyes, Roubaix-Tourcoing, Lens-Hénin, and, to a lesser extent, Istres-Martigues and La Rochelle.

26. The highest values were observed for the employment zones Saintes-Saint-Jean-d'Angély, Istres-Martigues, Neufchâteau, Troyes, Lens-Hénin, Douai, Argentan, Lorient, and Cherbourg-en-Cotentin.

27. Additional maps are presented in Appendix III.

Figure 5 – Online mobilization by department

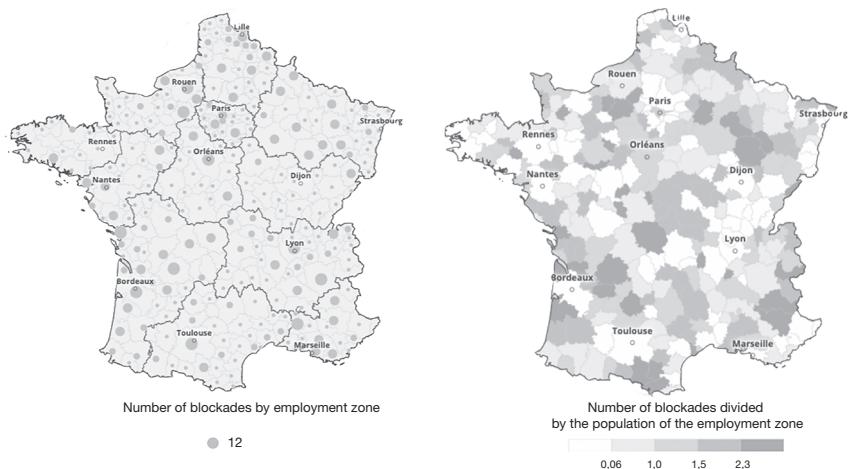


Notes: These two maps represent the number of members of *gilets jaunes* Facebook groups by department, among those we were able to identify. The values are given as absolute numbers (left) and per capita (right).

Orders of magnitude: On average, there are 18,593 members of Facebook groups associated with the *gilets jaunes* movement per department (left). Counting the number of members per capita, the average across departments is 263 members per 10,000 inhabitants (right).

Sources: Data collected on *gilets jaunes* Facebook groups, between December 12 and 15, 2018. Map projection made using the online tool: <https://statistiques-locales.insee.fr/>.

Figure 6 – Offline mobilization by employment zone



Notes: These two maps represent the number of blockades by employment zone (left) and the number of blockades relative to the population of the employment zone (right).

Orders of magnitude: On average, there are 2.63 blockades per employment zone (left). Counting the number of blockades per capita, the average across employment zones is 2.04 blockades per 100,000 inhabitants, with 21 employment zones having zero blockades (right).

Sources: Data collected on the evening of November 16, 2018, from www.blocage17novembre.fr. Map projection made using the online tool: <https://statistiques-locales.insee.fr/>.

“empty diagonal” area of France (an area of relatively sparse population running from the northeast to the southwest) are among those with low activity on Facebook. However, some low-density departments are in fact highly mobilized if we relate the measure to the number of inhabitants, such as the Lot, Charente, or Hautes-Alpes departments.

A second series of maps (Figure 6) represents the intensity of blockades, based on the location of intended points of assembly at the employment zone scale: in absolute terms (left) and per capita (right). This series of maps differs from the previous one. In particular, we observe a much lower physical mobilization in Brittany compared with its online mobilization—the same is also true for Alsace. A Paris–Clermont-Ferrand axis, which is absent from the online mobilization, cuts through the empty diagonal. The nomenclature of employment zones allows us to identify a strong intradepartmental heterogeneity, for example in the Cher and Marne departments.

FOUR DIMENSIONS OF MOBILIZATION

The determinants of mobilization are linked to many different issues. Four dimensions seem essential for highlighting the factors underlying the movement: electoral results, political decisions, the socioeconomic characteristics of populations, and the geographical characteristics of territories. We describe the variables selected below, and in Table 3 we present the correlations of the main variables selected with our mobilization indicators.

Table 3 – *Correlations between mobilization variables per km² and explanatory variables*

	Department			Employment zone		
	Online		Offline	Online		Offline
	Members	Posts	Blockades	Members	Posts	Blockades
Share of diesel vehicles	– 0.36*	– 0.18	– 0.31*	– 0.01	– 0.05	– 0.28*
Roads reduced to 80 km/h	0.49*	0.15	0.44*	0.15*	0.16*	0.50*
Abstention	0.21*	0.08	0.38*	0.11	0.12*	0.28*
Voted for Macron 1 st round	– 0.01	– 0.06	– 0.12	– 0.12*	– 0.18*	– 0.11*
Average commute	0.03	0.13	– 0.12	0.15*	0.15*	– 0.16*
Unemployment rate	0.22*	0.24*	0.27*	0.19*	0.25*	0.21*
Wage inequality	0.49*	0.30*	0.52*	0.12*	0.14*	0.31*
Average age	– 0.54*	– 0.27*	– 0.47*	– 0.04	– 0.02	– 0.32*
Population density	0.53*	0.34*	0.66*	0.11	0.12*	0.80*
N	89	89	89	296	296	296

Notes: 1) Members is the number of members, Posts is the number of posts, and Blockades is the number of blockades, N is the number of observations; 2) For variables marked with an asterisk, the hypothesis of non-correlation can be rejected with a 95% confidence level.

1. *Vote in the first round of the 2017 presidential election.* We collected electoral data on the first round of the 2017 presidential election, namely the abstention rate and the share of the vote obtained by each of the top five candidates: Emmanuel Macron, Marine Le Pen, François Fillon, Jean-Luc Mélenchon, and Benoît Hamon.

At both the department and employment zone scales, mobilization is negatively correlated with the vote for Emmanuel Macron, François Fillon, and Benoît Hamon, while it is positively correlated with the vote for Marine Le Pen and Jean-Luc Mélenchon, and to abstention. The correlation between abstention and mobilization is positive and quite significant. This is less the case for the voting variables, which are moderately correlated with our indicators: this first step seems to indicate that the movement does not amount to a notional third round of the 2017 presidential election, and that it has more to do with a rejection of the electoral process.

For the econometric analysis, we used the abstention rate and the vote for Emmanuel Macron as explanatory variables. These are the two variables most strongly correlated with our mobilization indicators. The abstention rate is interesting as a measure of level of engagement in political life and attachment to institutions (extensive margin). In cases where individuals did vote, the vote for Emmanuel Macron allowed us to analyze the extent to which the movement was constructed in opposition to the current government (intensive margin).

2. *The government's political decisions.* Beyond the increase in fuel prices, two political decisions seem to be strongly linked to the protest: the decision to increase taxes on diesel (carbon tax) and the reduction of the speed limit from 90 km/h to 80 km/h on secondary roads. The former policy was present in Macron's presidential manifesto,²⁸ while the latter, applied from July 2018, was not. The increase in fuel prices is difficult to measure at the local level, owing to spatial disparities in prices at the pump.

Based on administrative data, we were able to determine the share of registered diesel vehicles per commune. Surprisingly, this variable is negatively correlated with our mobilization indicators. However, this variable captures many other dimensions, such as social inequalities and mobility issues, which we also measured. In addition, it is worth noting that the increase in taxes on diesel, which was reaffirmed in September 2018, was scheduled for January 2019 (before being cancelled), and thus had not yet occurred at the start of the protest.

Using OpenStreetMap, we calculated the number of kilometers of roads affected by the introduction of the 80 km/h speed limit.²⁹ In the context

28. Objective 4 of his manifesto on ecological transition reads: "In order to massively reduce pollution linked to fine particulates, the taxation of diesel will be aligned with that of gasoline during the presidential term" (<https://en-marche.fr/emmanuel-macron/le-programme-environnement-et-transition-ecologique>).

29. We obtain a total length of affected roads of 390,000 km, similar to the estimates mentioned in the media (e.g., AFP, "Vitesse limitée à 80 km/h: ce qui va changer," *Le Point*.fr, June 27, 2018).

of our territorial study, we calculated the length of affected roads (km) in proportion to the surface area of the zone studied (km^2). This variable therefore indicates, for a representative square kilometer, the number of kilometers of roads affected by the reform.³⁰ There is a strong positive correlation between this variable and the mobilization indicators. Unlike the increase in diesel prices, this reform had just been implemented (July 1, 2018), and its effects were therefore beginning to be felt by commuters.³¹

3. *Socioeconomic factors.* Mobilization may also reflect economic disparities in France. To characterize this dimension, we used the unemployment rate as a measure of labor market integration (extensive margin). Within these local labor markets, we used the déclaration annuelle des données sociales (DADS) (annual declaration of social data) to calculate the 90/10 ratio in order to capture the level of wage equality (intensive margin).³² These variables allowed us to characterize the populations present in the mobilized territories. It is important to take these variables into account in order to control for variations associated with political variables (voting and government measures), since announced political changes do not have the same impact on the various segments of the population.

In departments and employment zones, the variables of unemployment rate and inequality are strongly and positively correlated with mobilization, thus confirming the socioeconomic dimension of the movement. This indicates that the mobilized territories are those with higher-than-average unemployment rates and inequality levels, although this may be associated with other variables for which we control in the econometric study.

4. *Geographical constraints.* To account for mobility constraints, we calculated the average distance, as the crow flies, between employees' workplace and place of residence. This variable seems to us to be a good approximation of territorial constraints. It also indirectly reflects the impact of rising oil prices on territories.³³

ECONOMETRIC ANALYSIS

As the above variables are sometimes highly correlated with each other, we conducted an econometric analysis to isolate the role of each one. Table 4 describes the estimation results of an ordinary least squares regression of our

30. The variable that we constructed here may resemble a density, and thus capture the intensity of the reform across territories.

31. Commuters are defined as people making a daily journey to their place of work.

32. Formally, the 90/10 ratio is the ratio between the ninth and first decile of wage distribution.

33. According to the INSEE mobility survey (2008), excluding Paris, the share of public transport in commuting is very low. From 45% in Paris (which is excluded from our database), it falls to about 15% for Lyon, Lille, Grenoble, and Strasbourg, and is well below 15% for all other cities in the country. On average, three-quarters of all commutes, two-thirds of all journeys, and five-sixths of the total distance traveled are by private car. These figures have been relatively stable for several decades.

two main mobilization variables: the number of blockades on November 17 and the number of members of Facebook groups, both adjusted for the size of the area. We distinguish between an analysis at the departmental scale (columns 1 and 2) and at the employment zone scale (columns 3 and 4). There are nine explanatory variables, including two additional controls: resident population density and the average age of residents. Population density controls for the mechanical correlation effect between population density and the probability of observing an event in a geographical area, a correlation that is indeed very significant, as shown in Table 3.³⁴ As for average age, it is the simplest and most transparent variable for controlling for local socio-demographic differences. Older territories were less mobilized. All variables are centered and reduced in order to facilitate the interpretation of the estimated coefficients.

Table 4 – *Econometric results*

		Department		Employment zone	
		Members	Blockades	Members	Blockades
Vote	Macron	−0.0624 (0.121)	−0.0918 (0.119)	−0.225** (0.0934)	−0.307*** (0.0553)
	Abstention	−0.0569 (0.105)	0.103 (0.103)	0.105 (0.0878)	−0.00436 (0.0520)
Political decisions	Slowed roads	0.295*** (0.105)	0.117 (0.103)	0.240*** (0.0863)	0.134*** (0.0511)
	Diesel share	−0.0454 (0.110)	0.123 (0.108)	0.0587 (0.0886)	0.00766 (0.0525)
Economy and society	Inequality	0.256** (0.126)	0.125 (0.124)	0.175* (0.0894)	0.0772 (0.0530)
	Unemployment	0.122 (0.110)	0.134 (0.108)	−0.0683 (0.0918)	−0.0677 (0.0544)
Geography	Distance	0.248*** (0.0894)	0.0891 (0.0879)	0.127* (0.0671)	0.0234 (0.0398)
Additional controls	Age	−0.366*** (0.101)	−0.210** (0.0988)	−0.0114 (0.0763)	0.0117 (0.0452)
	Density	0.100 (0.123)	0.488*** (0.121)	0.0488 (0.0819)	0.781*** (0.0485)
Regional fixed effects		No	No	Yes	Yes
N		89	89	305	305
Adjusted R ²		0.513	0.529	0.104	0.687

Notes: 1) “Members” and “Blockades” refer, respectively, to the number of members of Facebook groups and the number of blockades planned for November 17, both per km;² N refers to the number of observations; 2) All variables are centered and reduced; 3) Standard deviations are given in parentheses; ***, **, and * denote the significance of results at 99.9%, 99%, and 95%, respectively.

34. We could also have run the regressions directly on our indicators of mobilization relative to the number of inhabitants of each area. However, given that our object of study is the territory, we consider that it is more direct to use a spatial intensity measure of mobilization and to use population density as a control, as this also has its own explanatory power, highlighting differences between rural areas and large cities, for example.

We chose to carry out this statistical work both by department and by employment zone. Indeed, although the measurement of online mobilization is, for the reasons detailed above, more precise at the departmental level, the small number of observations it provides forces us to be very cautious in the selection of explanatory variables. In particular, it is not possible to ensure that an unobserved local characteristic correlated with the different variables in the database does not bias the results obtained. It is likely that people in certain localities are more likely to protest, for historical reasons for example, and historical legacies may have an impact on political preferences or the current socioeconomic context. On the other hand, the breakdown by employment zone does not allow for such an exhaustive measurement of the intensity of the movement on Facebook, but the higher number of observations allows us to control for all the unobserved characteristics of the territory at a larger scale: as such, in the employment zone-level regressions, we included indicator variables corresponding to the 21 metropolitan regions that existed prior to the 2015 reform.³⁵ The results obtained through this fixed effects specification are interpreted with a view to their intraregional variation, which limits the risks of omitted variables. Table 4 thus presents our two preferred specifications: at the departmental level without regional controls, and at the employment zone level with regional controls.³⁶

Analysis of the explanatory power of our model shows that we manage to explain about half of the spatial dispersion of our department-level measures of mobilization intensity (columns 1 and 2). The inclusion of regional fixed effects increases the R^2 to 69% for blockade density by employment zone (column 4). In contrast, online mobilization at the employment zone level is poorly explained, reflecting the measurement problems with this dimension, as discussed above. It is interesting to note that controlling for population density is, paradoxically, significant only for understanding the number of blockades. This result suggests that population density, beyond its mechanical contribution to the intensity of mobilization per km^2 , reveals fundamental differences regarding the type of territory (rural) that was most extremely mobilized through blockades.

With respect to our variables of interest, we observe first of all that taking into account the correlation between the different explanatory variables removes, for certain variables, any significant correlation with mobilization: this is the case for the abstention rate, the share of diesel vehicles, and the unemployment rate. In particular, the coefficients associated with the

35. We preferred to control for regional rather than departmental fixed effects because, as explained earlier, the geography of departments and employment zones does not consistently overlap. Conversely, only nine employment zones straddle two regions: Mont-de-Marsan, Alençon, Cosne-Clamecy, Mâcon, Nogent-le-Rotrou, La vallée de la Bresle, Roissy, Brive, and Avignon. In our regressions, these areas are duplicated so that they can be associated with their two regions, which increases the number of observations from 296 to 305.

36. By way of comparison, Table A1 in Appendix IV complements these results by including the measure of the number of posts as a variable of interest (columns 1 and 2) and by including our two preferred variables of interest in an employment zone specification without regional fixed effects (columns 3 and 4).

share of diesel vehicles are now much lower, indicating that the strong negative correlation, which we observed previously, and which was difficult to explain, reflected the correlation of this variable with other controls.

Of the remaining variables, two are positively correlated with online mobilization, but not with offline mobilization: wage inequality and commuting distance. The measured effect is large, since one additional standard deviation of these variables from their mean level is associated with an increase in protest density of one-eighth to one-quarter standard deviation. The contrast with the zero correlation of the unemployment rate is interesting: it may mean that the movement, at least on Facebook, is determined less by inequalities in access to employment than by inequalities among workers. This finding corroborates the conclusions of sociological studies on the “intermediate” character of the *gilets jaunes*, who are more often poorly paid workers than people in situations of extreme exclusion.

The positive coefficients associated with commuting distance confirm the importance of the issue of mobility for online mobilization. On the other hand, in our specifications, commuting distance is not related to the density of blockades. This result may be due to the fact that commuting time does not prevent mobilization on Facebook, but it may act as an obstacle to physical mobilization. Even more notably, the presence of a large quantity of secondary roads whose speed limit was reduced to 80 km/h is very strongly correlated with mobilization, both on Facebook and in blockades. This is the most salient result of our study. This seems to indicate that the places most affected by this reform represented a *latent potential for mobilization*, which, thanks to the emergence of a protest movement against the rise in fuel prices, could then be *actualized*.

CONCLUSION

By focusing on the beginning of the *gilets jaunes* mobilization (the blockades of November 17 and Facebook activity from October to mid-December), this article examines the factors that triggered it. To this end, we propose an original approach, adapted to the spatial dimension of the movement. Our study shows that the reduction in the speed limit on secondary roads to 80 km/h played an important role in the emergence of the mobilization, which could explain why its motivation was poorly understood by a part of the population³⁷ and by political parties at the start.

The results presented in this article are interesting in that they suggest a link between *mobilization* and *mobility*. The *gilets jaunes* movement calls into question our relationship to physical and digital territories. These synergies between new phenomena of online mobilization and more traditional

37. See, for example, “#SansMoiLe17,” https://www.youtube.com/watch?v=P1MuWx9FR_A.

protests involving the occupation of public space constitute a new framework for interpreting social movements in France. Unlike other recent mobilizations in France, such as La Manif pour tous or Nuit debout, the spatial dispersion of the action points of the *gilets jaunes* movement was remarkable, which gave it an unprecedented nationwide coverage from the first day of mobilization.

Our work nevertheless has several limitations. First, the territorial approach masks, by definition, certain dimensions of individual heterogeneity within the geographical areas considered. Second, the statistical results we discuss are not all valid if we consider indicators of mobilization intensity *per capita*, rather than *per square kilometer*.³⁸ Finally, the subsequent evolution of the movement seems to have gone far beyond the issue of mobility alone. Only a dynamic study of the mobilization would make it possible to explain the mutations that the movement underwent.

38. We refer here to Table A2 in Appendix IV, which replicates Table 3 for mobilization variables related to the number of inhabitants in the area. Although we think that our approach in terms of territorial intensity is more relevant in this case, an intuition corroborated by the higher explanatory power of the associated regressions, tests on other mobilization variables will need to be conducted to determine whether these differences reflect a statistical artifact related to the small number of observations at our disposal. As shown in Figure 5, mobilization per capita is much less correlated with absolute mobilization than is mobilization per km².

APPENDIX

I – TERRITORIES AND GEOGRAPHICAL DIVISION

For a geographical approach. The aggregation of socioeconomic and political data at the geographical level has many advantages. It makes it possible to take into account interactions between agents that occur at the territorial level (local job market, exchange of information), the effects of localized public policies (local civil service, reduction in the speed limit from 90 km/h to 80 km/h), and certain modalities of action (blockades of roundabouts). Moreover, it makes it possible to merge information from different sources, for example to merge average income with voting behavior, which may not be possible at the individual level (unless a survey is conducted on a sample of the population).

The modifiable areal unit problem. Conducting studies with a spatial approach raises the question of the choice of the geographical unit studied. Indeed, aggregation at the spatial level carries the risk of producing results that are oriented by the choice of nomenclature, such as scale or zoning effects. This is the modifiable areal unit problem (MAUP), as documented by Openshaw and Taylor (1979). Highlighting the sensitivity of the study to the choice of spatial division is not strictly speaking a problem, but corresponds to the multi-scalar aspect of the object of study. The difference in results obtained from one nomenclature to another must therefore be seen as a contribution in itself to the knowledge of the phenomenon considered.

Commune. The smallest administrative unit available is the commune. There are about 35,000 communes in France, but the territories they cover are too small for our analysis. Indeed, the Facebook groups and roundabout blockades identified themselves with larger spatial units, such as the department (for example, “Gilets Jaunes Gironde,” “Union Gilets Jaunes 84”) or the “*pays*” (“Gilets Jaunes du Pays d’Auray,” “Gilets Jaunes Dinan et environs”).

Department. The first spatial unit chosen in our study corresponds to the administrative division of the department, established by a December 22 decree of the Constituent Assembly of 1789. Because of the age of this division and its discretionary nature, we consider this division to be “exogenous,” that is, we assume that its definition is *external to* the socioeconomic context discussed in this article. Moreover, the departments are fairly homogeneous and comparable in terms of size and organization. In general, they are composed of a central commune (the prefecture or departmental capital) and more or less populated departmental sub-hubs. This allows for a relatively consistent division of the territory. However, this disconnection of contemporary economic dynamics from the departmental division also presents disadvantages for a detailed study of the impact of localized public policies or social movements. For example, a department groups together heterogeneous types of housing and activities, and potentially competing hubs or sub-hubs, which obscures the variations.

Employment zone. A good “endogenous” definition of territory, based on an economic reality, is that provided by the employment zone, as defined by INSEE. It defines a geographical area within which most of the active population resides and works (at least 40%), and in which organizations can find most of the labor force needed to fill the jobs offered (Jayet 1985). The division of the territory into employment zones is common in labor market studies (Malgouyres 2017). Grouping together the broad living areas where individuals work, reside, and consume, the employment zone also defines relevant territories for local diagnoses. In particular, it aims to guide the delimitation of territories for the implementation of territorial policies. Here we use the updated 2010 division.

It should be noted, however, that an analysis based on this spatial unit can obscure the disparities that exist within zones that are polarized between the center and its periphery, the inner and outer suburbs. In addition, since they cover the entire country, employment zones are sometimes more artificial in sparsely populated geographical areas without urban centers (such as the employment zones of Morvan, Le Blanc, or L’Aigle).

Constituency. An intermediate territorial division between the department and the commune, which might seem relevant for our study, is that of the constituency or *circonscription* (the current division dates from 2011). However, it is often difficult to retrieve data at this scale, as it is disconnected from communal delimitations. Some communes are divided up by different constituencies, which makes it impossible to match data. It is therefore not possible for us to associate Facebook groups with a single constituency and thus build a satisfactory database.

In addition, most constituencies are constructed in such a way as to divide the territory in a homogeneous manner: starting from a portion of the central city, they extend into the peri-urban and rural areas of the department, without following any economic or administrative logic.

II – GEOLOCATION OF FACEBOOK GROUPS

We performed a task of character matching, starting from the contents of two lists: one containing the names of all French cities and another containing all the names of the Facebook groups studied. We proceeded in three stages:

1. *Cleaning the text*: we removed accents, punctuation, and single-letter words, and transformed the whole text into lower case. We replaced all occurrences of “ste” with “sainte” and “st” with “saint.”

Example 1: “*Les Gaulois de Calais ! MOBILISATION contre les taxes du gouv’t Macron*” became “*les gaulois de calais mobilisation contre les taxes du gouv’t macron*.”

2. *Matching*: for each Facebook group, we checked which cities appeared in the name.

Example 1: “*calais*” appears in the name of the Facebook group. No other cities appear.

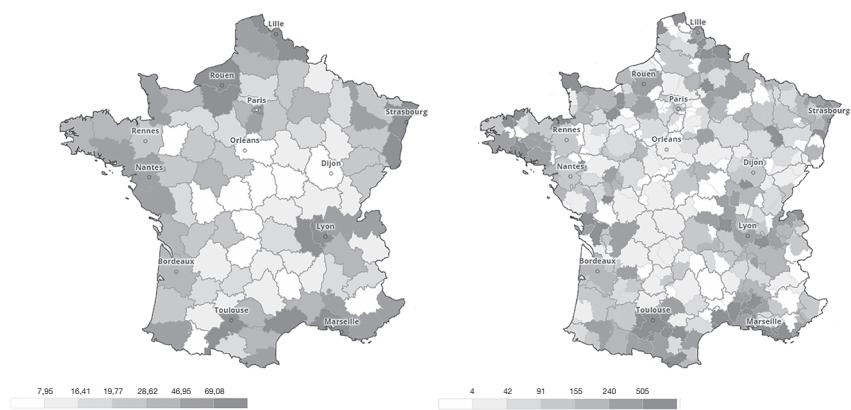
3. *Choosing the best candidate*: if several cities appear in the name of the Facebook group, we took the longest city name as the city with which the group is associated. This simple rule drastically reduced the number of false positives (cities associated with a group when the group does not correspond to that city).

Example 1: We associated the Facebook group with the city of Calais.

III – OTHER MOBILIZATION MAPS

Here we present four additional series of maps, representing online mobilization per km² (Figure A1) and per capita (Figure A2), as well as the equivalent maps for offline mobilization (Figures A3 and A4). The maps in Figures A1 and A3 represent the measures used in the empirical analysis. They closely resemble the population density maps, which justifies our use of this measure as a control in our regressions.

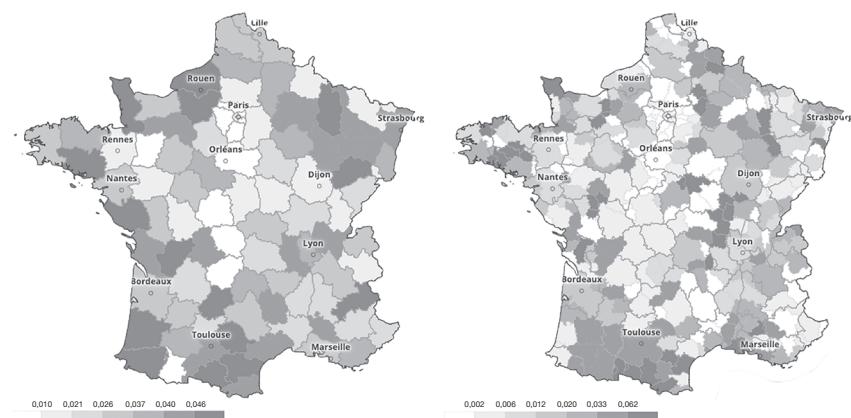
Figure A1 – Online mobilization (number of members of Facebook groups) per km²:
Departments and employment zones



Notes: These two maps represent the number of members of Facebook groups per km² localizable at the level of departments (left) and employment zones (right). The recording of this variable is more reliable at the departmental level and shows a strong correlation with population density. The employment zone level highlights small localities, where individuals identify more with their commune.

Sources: Data collected manually on *gilets jaunes* Facebook groups, between December 12 and 15, 2018. Map projection made using the online tool: <https://statistiques-locales.insee.fr/>.

Figure A2 – Online mobilization (number of members of Facebook groups)
per 10,000 inhabitants: Departments and employment zones

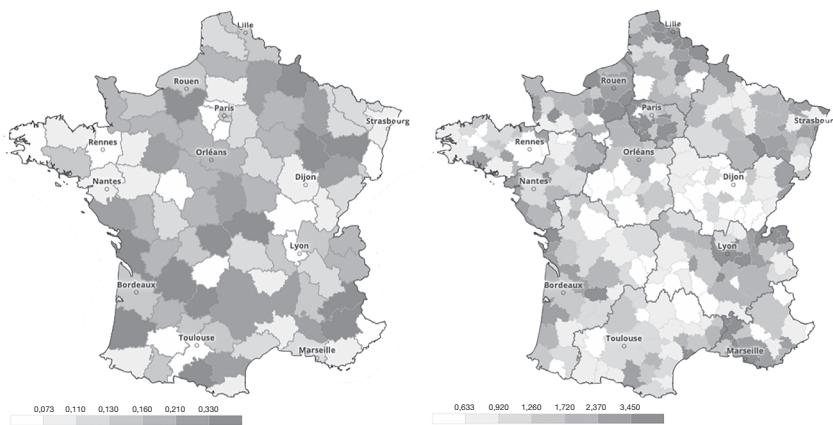


Notes: These two maps represent the number of members of Facebook groups per 10,000 inhabitants localizable at the level of departments (left) and employment zones (right). The recording of this variable is more reliable at the departmental level and shows a strong correlation with population density. The employment zone level highlights small localities, where individuals identify more with their commune.

Sources: Data collected manually on *gilets jaunes* Facebook groups, between December 12 and 15, 2018. Map projection made using the online tool: <https://statistiques-locales.insee.fr/>.

The origins of the gilets jaunes movement

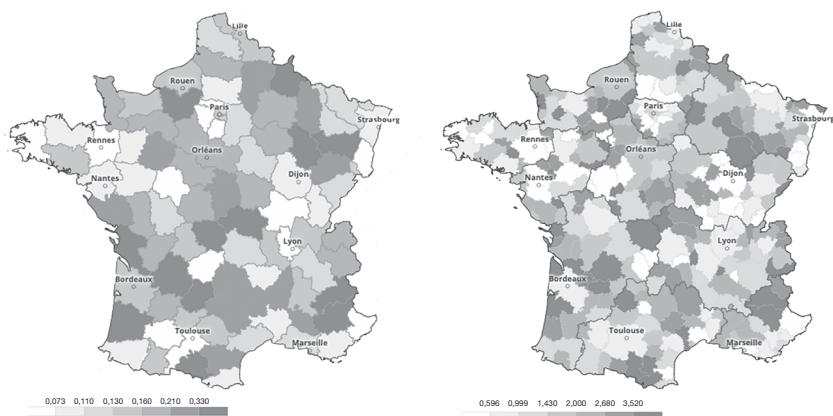
Figure A3 – Offline mobilization (number of roundabout blockades) per km²:
Departments and employment zones



Notes: These two maps represent the density of blockades per km² at the level of departments (left) and employment zones (right). We can see that there is a high degree of heterogeneity and that the comparison of these different types of division reveals heterogeneity within departments, thanks to the employment zone nomenclature.

Sources: Data collected on the evening of November 16 at www.blocage17novembre.fr. Map projection made using the online tool: <https://statistiques-locales.insee.fr/>.

Figure A4 – Offline mobilization (number of roundabout blockades)
per 10,000 inhabitants: Departments and employment zones



Notes: These two maps represent the density of blockades per 10,000 inhabitants at the level of departments (left) and employment zones (right). We can see that there is a high degree of heterogeneity and that the comparison of these different types of division reveals heterogeneity within departments, thanks to the employment zone nomenclature.

Sources: Data collected on the evening of November 16 at www.blocage17novembre.fr. Map projection made with the online tool: <https://statistiques-locales.insee.fr/>.

IV – ADDITIONAL RESULTS

Table A1 – *Additional econometric results, variables of interest per km²*

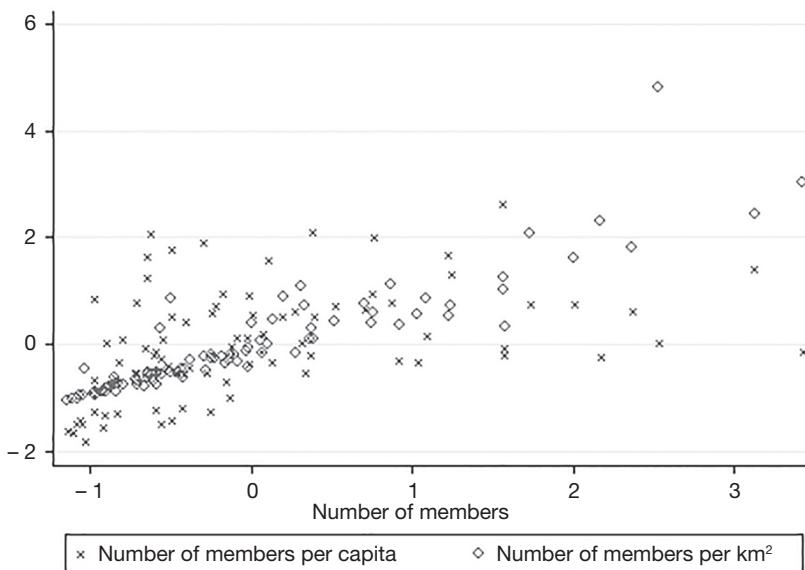
		Department		Employment zone	
		Members	Blockades	Members	Blockades
Vote	Macron	– 0.0196 (0.163)	– 0.316*** (0.0908)	– 0.0872 (0.0754)	– 0.209*** (0.0453)
	Abstention	– 0.0962 (0.141)	0.0998 (0.0854)	0.0295 (0.0754)	– 0.0369 (0.0444)
Political decisions	Speed limit reduction	– 0.0449 (0.147)	0.268*** (0.0839)	0.136* (0.0722)	0.127*** (0.0425)
	Share of diesel vehicles	0.0257 (0.149)	0.0263 (0.0861)	0.0859 (0.0827)	0.0509 (0.0487)
Economy and society	Inequality	0.0941 (0.171)	0.194** (0.0869)	0.112 (0.0819)	0.0289 (0.0482)
	Unemployment	0.196 (0.148)	– 0.0691 (0.0893)	0.0600 (0.0770)	– 0.00999 (0.0453)
Geography	Distance	0.194 (0.121)	0.108* (0.0652)	0.166** (0.0665)	0.0341 (0.0392)
Age and density		Yes	Yes	Yes	Yes
Regional fixed effects		No	Yes	No	No
N		89	305	296	296
Adjusted R ²		0.151	0.158	0.059	0.674

Notes: 1) “Members” and “Blockades” refer to the number of members of Facebook groups and the number of blockades planned for November 17, respectively, per km²; 2) All variables are centered and reduced; 3) Standard deviations are in parentheses; ***, **, and * denote the significance of results at 99.9%, 99%, and 95%, respectively.

Table A2 – Additional econometric results, variables of interest per capita

	Department		Employment zone	
	Members/capita	Blockades/ capita	Members/capita	Blockades/ capita
Macron	– 0.2838*	– 0.1436	– 0.1099	– 0.3638***
	(0.1612)	(0.1478)	(0.0977)	(0.0901)
Abstention	– 0.3024**	0.1018	– 0.0077	– 0.0860
	(0.1406)	(0.1288)	(0.0919)	(0.0847)
Speed limit reduction	0.1867	– 0.0717	0.0936	– 0.0872
	(0.1405)	(0.1288)	(0.0902)	(0.0832)
Share of diesel vehicles	0.1474	0.2374*	0.0665	0.1684**
	(0.1463)	(0.1341)	(0.0926)	(0.0854)
Inequality	0.1719	– 0.0478	0.0271	0.0370
	(0.1687)	(0.1546)	(0.0935)	(0.0862)
Unemployment	– 0.0192	0.0098	– 0.0714	– 0.1707*
	(0.1469)	(0.1347)	(0.0961)	(0.0886)
Distance	0.2018*	– 0.0878	0.1884***	– 0.0069
	(0.1194)	(0.1094)	(0.0702)	(0.0647)
Age	– 0.0321	0.3326***	0.1108	0.2742***
	(0.1342)	(0.1231)	(0.0798)	(0.0736)
Density	– 0.2019	– 0.0490	0.0204	0.0438
	(0.1648)	(0.1210)	(0.0856)	(0.0789)
Fixed effects	No	No	Yes	Yes
N	89	89	305	305
Adjusted R ²	0.130	0.269	0.015	0.173

Notes: 1) “Members” and “Blockades” refer to the number of members of Facebook groups and the number of blockades planned for November 17, respectively, relative to the number of inhabitants in the area; 2) All variables are centered and reduced; 3) Standard deviations are in parentheses; ***, **, and * denote the significance of results at 99.9%, 99%, and 95%, respectively.

Figure A5 – Mobilization on Facebook per capita and per km²

Notes: 1) Number of members of Facebook groups per km² and per capita, as a function of the total number of Facebook members; 2) Variables are centered and reduced.

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