What colours are the yellow vests? An ideological scaling of Facebook groups

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Abstract : The Yellow Vests' motto is "neither right wing nor left wing". Rather than "taking sides", they have chosen to dismiss entrenched political parties altogether, setting them back to back. Yet, when they emerged in France the public space was already informed by pre-existing structures and rife with tensions. Their actions are therefore necessarily situated, embedded in this space and imbued with some of its properties. This calls for an examination of the movement's role and the position of its digital expression on Facebook. How do online citation practices reveal not so much the movement's political colour, but the political space that informs it and which it in turn informs ? This article answers this question by introducing an original methodological framework that makes it possible to extend ideological embeddedness of Twitter users to posts published on Facebook. We first use a correspondence analysis to reduce the adjacency matrix that links French members of parliament to their Twitter followers. This first step allows us to identify two latent axes which are decisive in explaining the structure of the network. The first dimension distributes individuals according to their position on the left-to-right axis of the political space, and we interpret the second as a measure of distance to power. These two dimensions frame a space in which we then position hundreds of thousands of Twitter users along with URLs and media cited on the platform and, by extension, publications from almost 1,000 of the most active Facebook groups in the Yellow Vests movement. We finally quantify the evolution in these groups' publications within the latent ideological space, to provide both an interpretation and an answer to the question of the movement's political orientation. The dynamics observed support the interpretation of a movement that was initially fuelled by far right-wing resources but then quickly shifted to the left while maintaining an attitude of dissent. This portrait sketched through the lens of the Yellow Vests' use of media on Facebook perfectly illustrates the idea of a multifaceted populism.

Keywords : ideology scaling, social media, social movements, political ideology, polarization, populism.

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Introduction

On 17 November 2018, hundreds of thousands of demonstrators donned yellow high-visibility jackets and took to the streets for a full day of widespread road blockades across all of France. This first of many "acts" in the mobilization stemmed from anger that was largely stoked by a series of increases in fuel prices. The first signs of this movement that would evolve and grow with every new Act, Saturday after Saturday for over a year, are often said to be the petition published by Priscillia Ludosky on `change.org` and Jacline Mouraud's video to "Monsieur Macron". After having occupied motorway tolls, blocked access to fuel depots and held roundabouts throughout the country, the Gilets Jaunes' actions converged on places of power : prefectures, the National Assembly, and right up to the highly symbolic Arc de Triomphe.

The scope of their demands simultaneously broadened until they were no longer calling just for lower taxes, but also for better local social services, an ambitious constitutional reform (the Citizens' Initiative Referendum) and an increase in purchasing power. Through various consultation mechanisms, such as the Vrai débat ("True debate" – by opposition to the Grand débat initiated by the government) or the Assemblée des assemblées ("Assembly of Assemblies"), they set out to define a list of demands resembling a political programme (Suignard, Escoffier, Charaudeau, & Brugidou, 2020). The Yellow Vests thus appear to be a large-scale social and political movement. Yet can we really assign it a political colour and determine its position on the ideological scale that is traditionally used to interpret social movements of such magnitude ?

This type of question warrants cautious examination, as Gilets jaunes movement has consistently paid very careful attention to its independence and has resisted all efforts to categorize its ideologies. It was moreover organized independently of any political party or trade union, and has refused to take on an organizational form of its own by refusing any delegation mechanism. Various leaders of political groups or trade unions announced their support for the movement, and some of them cautiously showed themselves publicly with prominent individuals of the movement in order to seduce their sympathisers. But in the streets and on Facebook alike, activists were careful not to display their affiliations – and those who did were rebuked by their peers. Quite marginally, two "Yellow Vest" candidacies emerged in the European elections of May 2019, but they were overwhelmingly as accused of contradicting the spirit of the movement, and drew very few votes. Research on the Yellow Vests movement shows that the slogan "neither right wing nor left wing" was one of its most essential features and an indispensable factor in unifying the mobilization (Bendali et al., 2019). The Yellow Vests have constantly sought emancipation from any interpretations seeking to pin them down to a position on the traditional political and ideological spectrum. Thus, questionnaire surveys conducted among participants in the mobilizations (André et al., 2019 ; Tristan Guerra, 2019) show that 35% of the respondents refused to position themselves on the left/right axis, and that 52% claimed not to be close to any political party (André et al., 2019).

Even though the Yellow Vests claimed to embody an original political form, many analysts have tirelessly sought to interpret and define the movement's political and ideological nature. At first, many observers tried to position it on the right/left axis, stressing, particularly in its early days, that it had ties with the far right. Others then began to see it as a left-wing movement and, later, as a manifestation of the ultra-left – primarily due to the presence of violent groups during demonstrations. However, these unsatisfactory definitions also gave rise to other types of characterization, as editorialists focused on episodes of the mobilization in to give it an overall colour. For instance, fake news shared in their groups led to the view that the Yellow Vests were "conspiracy theorists" ; insults levelled at the political commentator Alain Finkielkraut were used to portray them as "antisemitic" ; the presence of journalists from Russia Today's French branch alongside demonstrators made them "pro-Russian", and so on. Intellectuals, too, have proposed many reflections linking it to historical movements, to depict it as a new "sans-culotte" uprising (Sophie Wahnich in (Confavreux, 2019)), a "popular social revolt" (Noiriel, 2019) or "citizenism" (Samuel Hayat in (Confavreux, 2019)).

As is often the case, however, most of the debate revolved around the use of the controversial term "populism", without any consensus being reached. The combination of demands, diverse tactics and strong anti-government positions led some commentators to describe the Yellow Vests as a populist

movement. Tarragoni et Gaudillière (2019) see them as the French version of other manifestations of populism that occurred when the Great Recession hit Europe in the late 2000s and contributed to the electoral successes of Podemos in Spain and M5S in Italy (Della Porta, Fernández, Kouki, & Mosca, 2017). Others, however, have challenged this characterization; Etienne Balibar, for instance, saw it rather as "counter-populism" (in (Confavreux, 2019)). It seems that the Yellow Vests are characteristically hard to characterize. Much of the research on the movement's social composition has shown its heterogeneity, particularly the diversity in its members' backgrounds, occupations, and territorial situations. These studies have often emphasized how difficult it is to delineate the categories of committed activists, casual supporters, and distant sympathizers, and how fluid the dynamics of participation in the movement were, as its sociological composition continuously changed throughout the mobilization. Yet this indeterminate aspect of the movement should not dissuade us from endeavouring to outline the ideological space within which it unfolded.

One of our intentions with this article is to show that digital methods can offer an original way to situate the Yellow Vests in an ideological space, without a priori imposing a scale of political positioning derived from the traditional right/left dichotomy. The objective here is not to renew the categories of ideological analysis so much as to identify them through an approach that is free from preconceptions – that is to say, through an inductive approach.

We posit that there are two ways of ideologically positioning social actors. The first consists in asking them to position themselves explicitly on a left-right axis, or to infer their position on this axis from their votes and past commitments (Algan, Beasley, Cohen, Foucault, & Péron, 2019). This method has the advantage of affording a comprehensive understanding the actors' attachments to the left-right axis, as expressed by them – assuming that the coordinates of this axis are common knowledge allowing each actor to position themself in relation to the others on a scale. With the second strategy, the actors are not asked for their opinions; instead there is an attempt to rank them, based on an analysis of the salient issues in their programmes and demands (Volkens, Bara, & Budge, 2009), their leaders' discourse, or the ideas to which they refer. In comparative work on the analysis of discourse and ideologies, panels of experts are sometimes called upon to thus qualify social processes within a framework of ideological positioning (Hooghe et al., 2010 ; Rooduijn et al., 2019).

In this article we have opted for a methodology that offers a third strategy. We show that it is possible to inductively construct a latent ideological space based on digital traces, and to infer actors' ideological positions by placing them in that space. The method we describe here does not afford verstehen , insofar as it is detached from actors' reflexively produced identifications. It is not hermeneutic either, as it would be if it relied on established intellectual constructions drawn from the history of ideas. Its main characteristic is that it generates an instrument – which we call a latent ideological space – based neither on actors' statements nor on experts' interpretations. Instead, it is derived from a considerable volume of digital behaviours initially produced by thousands of Internet users following political figures on Twitter and then sharing hypertext links on social media. The structure of this multidimensional space emerges from the automatic calculation of a very large volume of digital traces, the perimeter of which was traced based on the accounts of MPs and senators. This plots out a kind of architecture, a geometry, within which it becomes possible, by extension, to position very different sets of entities. We will provide a step-by-step description of the different stages in the construction of this space, and then its gradual shift towards the Yellow Vests groups on Facebook. As an introduction it must nevertheless be stressed that, while such an approach is obviously neither neutral nor completely immanent, it does require us to identify the strengths and limits, for the social sciences, of an inductive and behaviouralist approach based on massive data. As we will see, the outcomes it yields are consistent with those obtained with more traditional methods of political science, and yet it also offers new tools for exploration and analysis.

1 The National Assembly, the Yellow Vests, and the media

1.1 A brief overview of methods of ideological inference

The literature on the inference of ideological positions typically cites a widely diverse set of political science methods (Imai, Lo, & Olmsted, 2016) that draws on parliamentary election voting data. These methods are entirely inductive and generally do not require previous knowledge of individuals' political affiliations. Representatives' latent ideological positioning is taken from a dimensionality reduction operation wherein individuals are assigned positions based exclusively on their past voting decisions, and specifically on differences between their voting decisions. The pioneering work of Poole et Rosenthal (1991) has thus made it possible to measure the degree of polarization in the US Senate (Bonica, 2014) and in Europe (Hix, Noury, & Roland, 2006), or to follow the ideological movements of certain lawmakers. Several methods of inference have been developed along similar principles (Clinton, Jackman, & Rivers, 2004 ; Poole, Lewis, Lo, & Carroll, 2008) ; the best known among them is called NOMINATE (Nominal Three-Step Estimation).

These methods, however, serve only to position lawmakers. If the shape of the political space is not specified from the start and does not necessarily fit in a single dimension, such a calculation may apply only to members of an elected assembly. More recently, methods have been developed that make it possible, based on a speech or a question to parliament, to predict which party the speaker belongs to (often between Republicans and Democrats) (Gentzkow, Shapiro, & Taddy, 2019 ; Jensen et al., 2012). As these text-based methods rely on another form of signal than parliamentary votes, they can expand the realm of entities that may be immersed in an associated latent ideological space. However, the learning sample on which they are based is so specialized that it restricts this expansion. Rheault et Cochrane (2020), for instance, have implemented word embedding formalism to infer the ideological positions of parliamentary texts. Similarly – but once again in a relatively limited field of application – GrosecloseGroseclose et Milyo (2005) have measured media outlets' ideological bias according to their propensity to quote certain think tanks.

The advent of social media platforms has enabled inference methods to move out of parliaments and account for the relative positions of a wide variety of actors in the digital public space (Ecormier-Nocca & Sauger, 2020). Bond et Messing (2015) were among the first to massively apply these methods to analyse the dynamics of Internet users' political positions. In their study, more than 6 million Facebook users following at least two of the 1,200 "official" political pages hosted by Facebook at the time were placed on a right/left axis. Naturally, this data serves only Facebook researchers, which is why most recent efforts to infer political ideology from social networks have focused on Twitter, whose API allows for easy collection of large amounts of data and, in particular, of the online social relationships that link users of the platform to their followers. Pablo Barberà has popularized the use of Twitter data to infer ideological space (Barberá, 2015 ; Barberá, Jost, Nagler, Tucker, & Bonneau, 2015). His method is largely inspired by the one Bond et Messing (2015) used on Facebook, but draws from an analysis of the list of followers of all of a country's elected representatives (MPs and senators). The idea is simple : Barberà and his colleagues hypothesize that two individuals with similar political beliefs will tend to follow the same political accounts on Twitter. This classical homophily hypothesis allows them to assess accounts' political position based solely on the political accounts they follow. Individuals are thus attributed a score on a one-dimensional axis that is meant to reflect their ideological position. This political position is then inferred using a Bayesian model which assumes that each individual is defined by a latent ideology score whose value inflects the likelihood that they will follow such or such a senator, member of parliament or media outlet.

In the original article, the method was applied to 6 different countries (the United States, Spain, Italy, Germany and the Netherlands), and validated by numerous measures exogenous to Twitter (Barberá & Rivero, 2015). This method had already been tested in France by Briatte et Gallic (2015) who measured the ideology scores of a thousand of the most central accounts in the French political landscape. In this article, we adopt the same principle but exploit the ideological positions of hundreds of thousands of accounts in the outlined space, for the purpose of characterizing the latent ideological space in which

Yellow Vest Facebook groups evolve. Our strategy is set out in detail in the following section.

1.2 Une méthode en trois étapes

1.3 A three-step method

Our study is based on the way Yellow Vests express themselves on Facebook. While the movement extends beyond it, this platform is one of its preferred forums (Boyer, Delemotte, Gauthier, Rollet, & Schmutz, 2020). As our data is not intended to be an exhaustive representation of the ideology expressed by the Yellow Vests, we "probe" and map their ideological space, based on traces of their digital interactions. Our method consists of three steps, as represented in Figure 1. First, a latent ideological space is constructed from the network of Twitter users who follow French MPs and senators. These scores are then extrapolated to the URLs shared by the Twitter accounts positioned in that space. Finally, individual Facebook posts are given the "political colour" of the links they contain. The ideological space occupied by a Facebook group is described by the cloud of ideological positions of each of the URLs shared on it (and therefore, strictly speaking, by the ideological distribution of the accounts sharing them). The same operation can be carried out on the scale of an online media. An online daily or a YouTube channel form a distribution in the ideological space corresponding to the set of scores of the Twitter accounts that have shared URLs from this outlet.
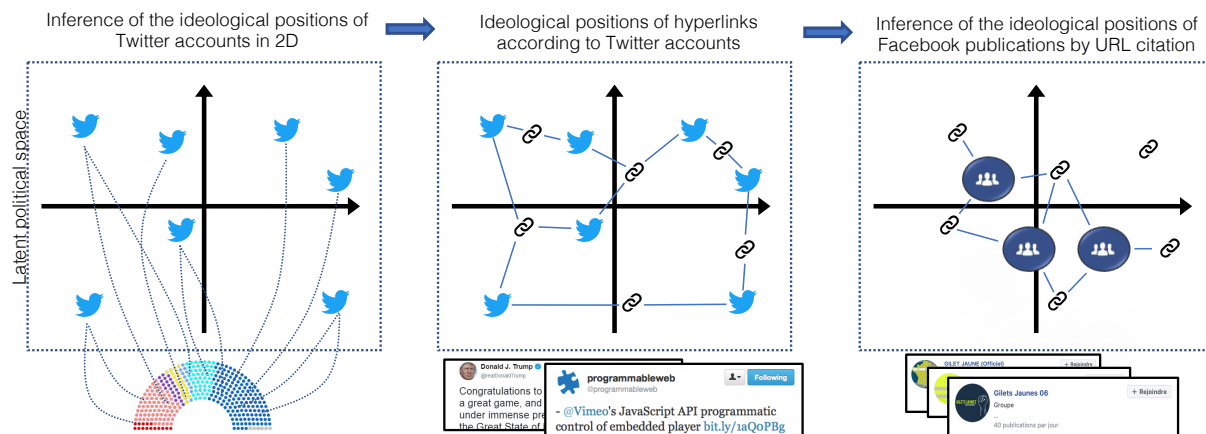

FIGURE 1 – Breakdown of our methodology into three stages. From left to right : inference of an ideological space from Twitter accounts (based on their links to MPs and senators), calculation of the scores of URLs as the average position of the accounts having shared them, and propagation of these scores to the posts and then to the Facebook groups in which these links are shared.

This analysis based on hypertext links sheds light on the manifold drawn by the Yellow Vests movement (Part 4.2). As the movement has undergone considerable change, reading its movements on different scales allows us to reconstruct a new understanding of it. The ideological space induced from Twitter is, in the true sense of the word, virtual – meaning potential. It presents both as an atmosphere, since it is external to the actors, who are positioned "virtually", and as a structure serving to establish relative positions in several dimensions, which can be moved to other types of data. This mobility is precisely what allows us to extend elected officials' latent ideological space into the Yellow Vests' Facebook posts, by propagating political labels via hyperlinks.

The three steps illustrated in Figure 1 will also serve as a guide for the next three parts. In the first part, we present our application of a method for inferring ideologies from data collected on Twitter to assign several hundred thousand users a position in a political space. In the second part, we describe and validate this space. In the third part, we use these individual positions to characterize a set of URLs shared by our tagged users, which often link back to media outlets. Finally, in the last part, we put this

positioning of press articles, videos, and other online resources to use, to project the posts produced by Yellow Vests Facebook groups in this virtual space (part 4.1).

2   Inferring the latent political space from Twitter

Before projecting the Yellow Vests' Facebook interactions into the political space, we begin by constructing this latent political space from Twitter. We first introduced the literature on inference of ideological scores (Section 1.1. We now turn to present the datasets on which we drew (Section 2.2), before describing the space thus constructed (Section 2.3) and empirically assessing it (Section 2.4).

2.1   Collecte de données relationnelles sur Twitter

2.2   Relational data collection on Twitter

The first step in this methodology aims to infer the political positions of a set of Twitter accounts that follow MPs. In his original paper, Barberá (2015) looks at a set of actors from the world of politics : elected representatives at national level and the Twitter accounts of political parties and of the country's main political news media. The relations that anonymous Twitter accounts do or do not establish with these highly politically discriminating accounts make it possible to measure their latent position in the form of a simple scalar whose value is inferred by a Monte-Carlo method using Markov chains. We have simplified the protocol and considered only members of parliament during their term of office in the National Assembly or the Senate in 2019.

First, using the data collected and maintained daily by the association Regards Citoyens [1], we compiled the list of 883 Twitter accounts held by French MPs (545) and senators (338).

We thus had an exhaustive list of followers of Twitter-using lawmakers in May 2019. In total, 856 of these accounts (the list of which is appended in section A) had an active account, from which we extracted all follower data on 22 May 2019 [2]. We thus identified 4 487 430 separate accounts that followed at least one of these accounts. This bipartite network was then reduced to a network of 979 606 accounts following at least 3 of the 856 elected officials. Finally, we removed the Twitter accounts whose profile was duplicated [3] from the initial data, to end up with a sample of only 368 831 accounts.

2.3   Inferring the ideological positions of Twitter users

From these data, we extracted an adjacency matrix A composed of 368 831 users who follow at least 3 of the 856 political figures selected. If i is one of the 368 831 users, and j one of the 856 selected politicians' accounts, the final adjacency matrix is a binary matrix defined as :

$$A(i,j) = \left\{ \begin{array}{ll} 1 & \text{if } i \text{ follows } j, \\ 0 & \text{if } i \text{ does not follow } j \end{array} \right.$$

Our correspondence analysis [4] shows two main axes which explain respectively 1.07% and 0.97% of the total inertia. The distribution of the positions of the 856 accounts immersed in this latent space is represented in Figure 2. Clearly, our initial population of accounts is distributed in a very particular way. To interpret the axes thus constructed, it is necessary to represent certain accounts whose political label is known. The obvious choice is to represent the MPs and senators who are present both in rows and in

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1. https://github.com/regardscitoyens/twitter-parlementaires/blob/master/data/deputes.csv, https://github.com/regardscitoyens/twitter-parlementaires/blob/master/data/senateurs.csv

2. We wish to thank Justin Clark for leading this collection effort, and for his extensive guidance in implementing the Barbera inference method.

3. Hundreds of thousands of accounts followed exclusively the 3 accounts MLP officiel', 'jlmelenchon', 'manuelvalls'; tens of thousands followed exclusively (among all deputies and senators) the 5 accounts 'official MLP', 'BrunoLeMaire', 'jlmelenchon', 'JVPlace', 'jclagarde', 'manuelvalls'. These accounts' renown tends to distort the constructed space because of the very large population of accounts that occupy the same position.

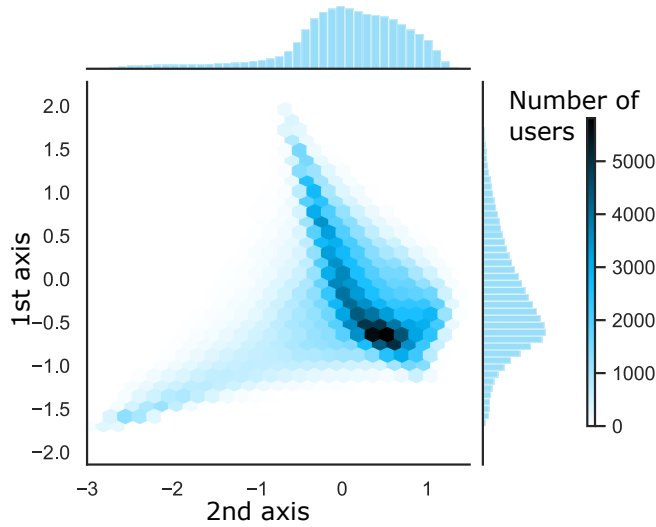4. Which was carried out with the help of the Prince library

FIGURE 2 – Distribution of the 368 831 Twitter accounts positioned in the two-dimensional ideological space.

columns of the starting adjacency matrix (their accounts are also likely to match those of their colleagues' in both chambers).

In Figure 3, we first identified the distribution of the ideological positions of the "column profiles" of all the MPs and senators on the two axes. From the order that emerges we can propose a first interpretation of our axes, which appear to oppose majority and opposition for the first, and right wing and left wing for the second. These qualifications seem obvious even though the automatic inference method also produces some variations with regard to the results an experienced political scientist would expect. First, the distribution of deputies and senators is laid out on the first axis according to their relation to power and institutions. Deputies and senators from the government majority (LREM and Modem) draw this distribution out by opposing those from La France insoumise, the PCF, and the Rassemblement national. Proximity to or distance from the government and institutions thus clearly marks the degree of integration with those in power by separating members of parties with regular government experience from the others. The second axis clearly distributes lawmakers on the right and left wings. It does, however, reveal an anomaly in the positions of LREM deputies and senators, who are located slightly more to the left than socialist MPs. Although there are certainly multiple valid explanations for this phenomenon, it is reasonable to assume that, as they were newcomers to politics, LREM deputies and senators were not politically identified by Twitter users at the time of our data collection (a year after the election) and that the distribution of their subscribers was therefore less stable. This interpretation is supported by the fact that, when one looks at individual MPs, the positions of the few experienced members of LREM (who had already been in office as members of the PS or the Republicans) on the right/left axis is much more in line with what could be expected.

In this space it is also possible to project the "line profiles" of any of the accounts following at least 3 senators and deputies from our base, and many political figures – including the MPs themselves – are naturally part of this set. We have thus included in Figure 4 all the French MPs, to whom we have added a certain number of political figures (former ministers, heads of lists at the last European elections) that we could assign to one of the following thirteen parties : La France Insoumise (LFI - 39 members), the French Communist Party (PCF - 43), Europe-Écologie Les Verts (EELV -31), Génération.s (16), the Socialist Party (PS - 236), the Radical Left Party (PRG - 16), La République en Marche (LREM - 365), the MoDem (49), the centrists (UDI, AGIR... - 107), Les Républicains (LR - 293), Debout la France (DLF - 16), the Patriotes (10) and the Rassemblement National (RN - 22).
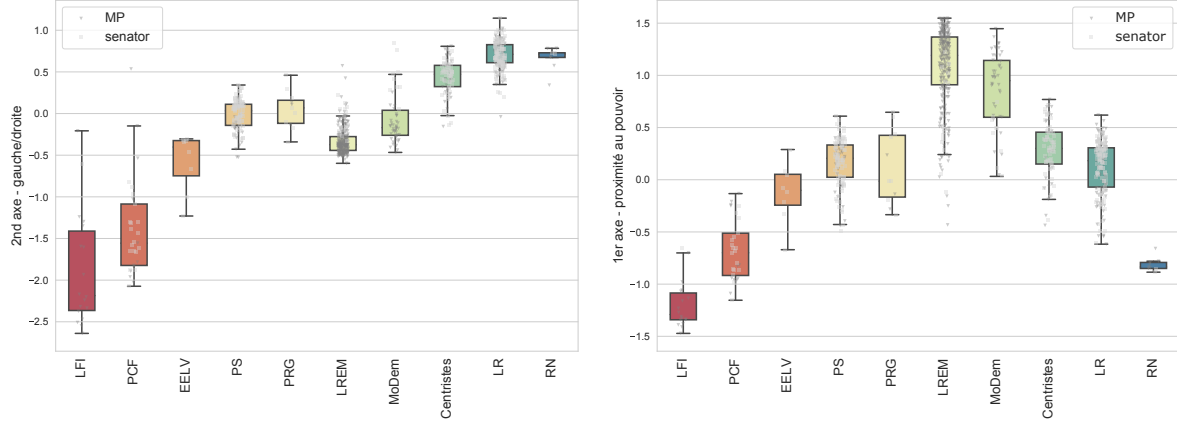
FIGURE 3 – Box-and-whiskers diagram showing the distribution of the main parties present in our sample on the two main axes of the latent political space. While the second axis clearly orders the parties according to their ideological orientation, from the most left-wing to the most right-wing, the first axis distributes the parties according to their proximity to institutions.
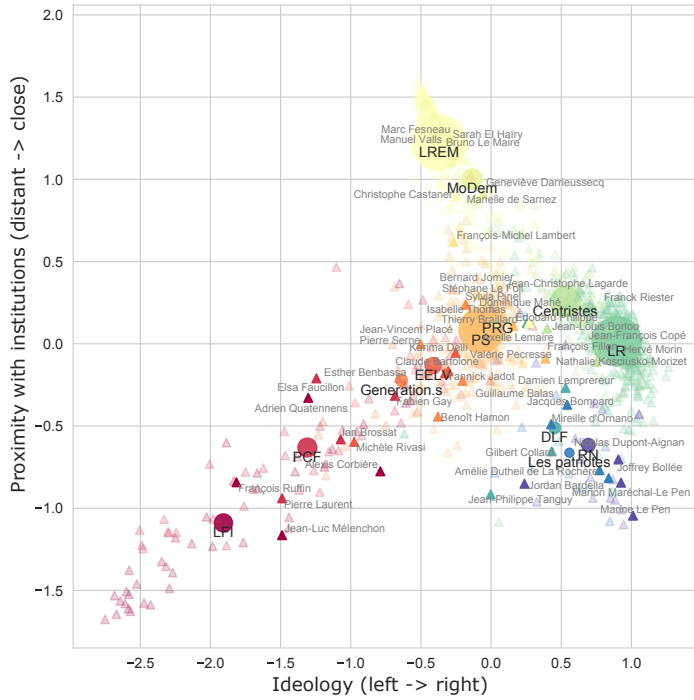

FIGURE 4 – Positions of almost a thousand political accounts (deputies, senators, candidates in the last European elections, ministers or former ministers) in the latent space induced by the correspondence analysis. A few individual accounts are labelled. The accounts of each personality are coloured according to their party, whose average position is represented by a circle and whose size is proportional to its number of elected representatives. The 4 most followed accounts of each party are labelled with their full name.

2.4   Validation using comparison with scores inferred from votes

One way of validating our method based on social media analysis is to compare our distribution of deputies and senators to the scores obtained through the usual method of ordering members of a chamber according to their votes. To carry out this verification, we correlated the ideological positions of the accounts of MPs obtained on Twitter with those that can be inferred from their votes in the Senate and the National Assembly. Classically, roll call data analysis serves to order deputies or Senators

according to similarities in their voting choices (Clinton et al., 2004 ; Poole & Rosenthal, 1984). For the National Assembly, we produced an individual score per MP using voting data collected over the first year of the 15th legislature : 995 votes held between 4 July 2017 and 26 June 2018[5]. As for the Senate, we considered all the votes of the 2017-2018 parliamentary session to which we had access at the time : 139 votes, held between 18 October 2017 and 19 June 2018[6].

575 MPs and 349 senators are included in this dataset, whose position we have inferred using a one-dimensional "spatial vote" model[7]. We were thus able to associate a score with 484 deputies and 224 senators for whom we had also inferred a position on Twitter. We then tested the correlation (Spearman's) between the positions of the representatives on the two axes produced by the Twitter analysis with the score obtained from their votes in the two chambers. The associated correlation tables are shown in Figure 10. Each dimension of our correspondence analysis is strongly correlated with the order that emerged from representatives' votes in both chambers. The first axis (which we have interpreted as distance to power) is thus strongly related to the logics behind deputies' votes ($R = .79$). The second axis (right/left valency) is strongly correlated to the order produced by senators' votes ($R = .75$). While the values of the correlation coefficients are not as strong as those that Barberá (2015) had measured on a single dimension, they are significant enough on both axes to indicate that the latent space constructed does indeed capture an order emanating from parliamentary activity.

3 Media space

Once this latent ideological space was constituted, our method in this research consisted in propagating it towards new entities in order to position them in the two-dimensional space we were able to create using lawmakers. The architecture of the space remains the same, but we modify its population. In order to propagate these labels towards Yellow Vests Facebook users, the second step in our methodology consists in positioning the URLs shared on Twitter in the same latent ideological space. By aggregating URLs linking to the same domain[8], it is possible to describe the position occupied by a media outlet, an association or a YouTube channel, by simply defining it as the sum of the political orientations of the Internet users who share their contents.

3.1 URL sharing data on Twitter

We first selected a random sample of 40 000 Twitter accounts from among those politically engaged accounts of which we could infer the ideological position (*i.e* : accounts that follow at least 3 senators and/or deputies). We then captured their most recent tweets (up to 3 200 for the most active ones) using Twitter's API. Finally, we extracted all shared hyperlinks from this body of tweets (39 392 tweets shared at least one link). In total, we counted 23 534 803 links, citing 13 279 718 distinct URLs. After normalizing domain names, we identified 419 256 different domains in the data. We could then carry out a range of operations on these domains, which often belonged to media outlets.

3.2 One media outlet, varied audiences

The first operation we undertook consisted simply in representing the projection in the ideological space of a set of articles published on the same media site. The left side of Figure 6 thus illustrates how articles published on the same outlet can generate an echo on Twitter among ideologically diverse audiences. The articles on *Russia Today in France*, a channel that constantly plays on the ambivalence

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5. These data (as well as the senators') have been compiled by the association Regards Citoyens and are hosted in an aggregated form at this address : `https://git.regardscitoyens.org/regardscitoyens/sprint-scrutins/-/tree/master`.
6. See the Senate's website for details on the votes :`https://www.senat.fr/scrutin-public/scr2017.html`
7. The "pscl" (Jackman et al., 2017) was used to analyse these data (via MCMC). We thank Jason Kaiser for his advice on its use.
8. The domain name is the first entity of a web address, for instance, http ://www.insee.fr.
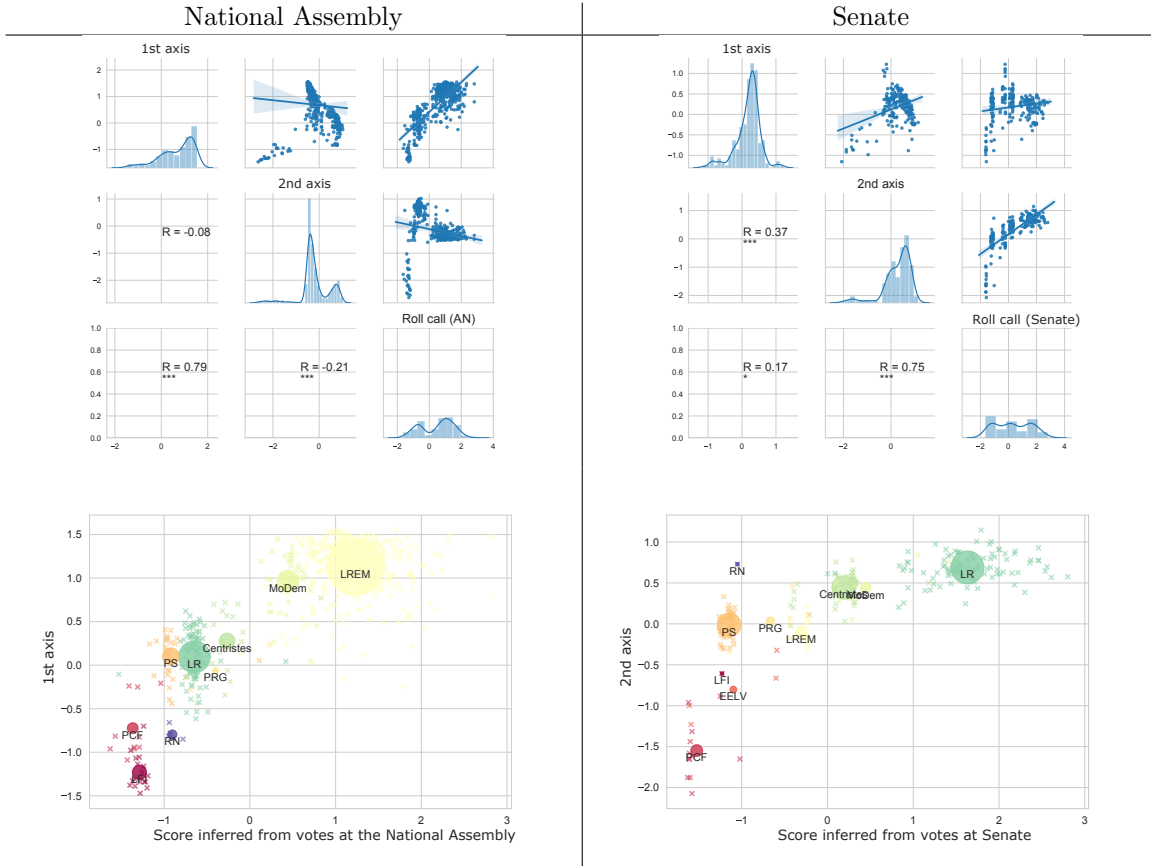
FIGURE 5 – Top : Correlations between the two axes of our correspondence analysis (scores are in the columns) and the scores attributed to senators and deputies according to their votes in Parliament. Votes in the Senate correlate very well with the second axis, votes in the Assembly with the first axis. Bottom : Detail of correlations by political families in the National Assembly (left) and the Senate (right)

of its position, are a perfect illustration of this : some are shared by Twitter accounts positioned on the left, while others are shared by accounts positioned on the far right.

However, when aggregating all the shared content from a given media or domain, the associated two-dimensional distribution is almost always unimodal. The distribution of articles shared from *Le Monde*, *Reporterre* and *Valeurs actuelles* in Figure 6 very clearly show how distinct these publications' positions are in the latent ideological space. We systematically tested the most shared domains, those that totalled more than 5,000 shares (there were about 400 of them), and for each of them, the Phi-Means statistic used (Siffer, Fouque, Termier, & Largouët, 2018) detected a unimodal distribution in 97% of cases [9]. Most of the domains that do not show a unimodal distribution are sites that could be thought to project themselves isotropically into the ideological space, because they correspond either to web services or to online commerce platforms (*unfollow.fr*, *shrd.com*, *clubic.com*, *etsy.com*, *cdiscount.com*, *hugedomains.com*, *fno.fr* [10]). Moreover, only very few sites have truly bimodal distribution. This is notably the case of La France Insoumise (LFI) or the site *melenchon.fr*, whose distributions are represented in Figure 7.

9. This statistic was calculated with a 95% confidence level.
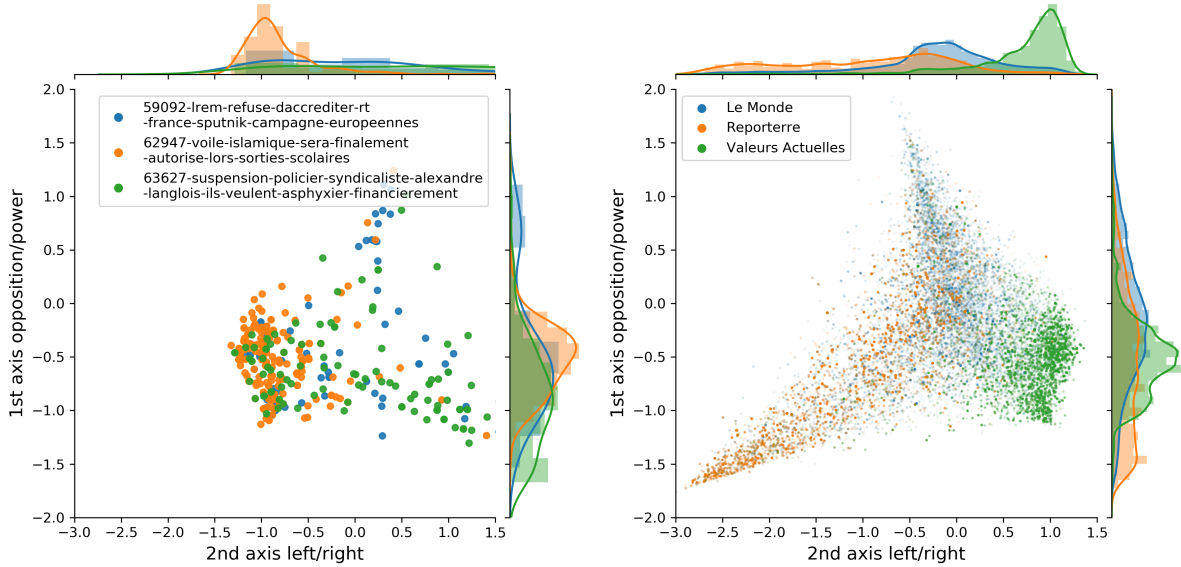10. *fno.fr* is the national foundation of speech therapists' website

FIGURE 6 – Ideological profile of three URLs shared on Russia Today. The article on the authorization of the Islamic veil during school outings was largely taken up by a left-leaning audience. On the other hand, the articles on the refusal to accredit RT and Sputnik to cover the European elections, and on the suspension of policeman and trade unionist Alexandre Langlois were mostly shared by a rather right-wing audience (and, for the former, some people closer to power). [right] Ideological distribution of a random sample of 20,000 shared URLs from Le Monde, Reporterre and Valeurs Actuelles. The political orientation of these media outlets' audiences is clearly visible in their joint distribution on the two axes

3.3 Political distribution of the media

The example of Jean-Luc Mélenchon's blog is nevertheless "the exception that proves the rule". It therefore seems reasonable to start off by summarizing a web domain's ideological position as the average position of the accounts that have shared its URLs. This principle led us to map Figure 8 , which represents the spatial distribution of the 20 000 media most shared on Twitter in our sample. The projection of media in the latent ideological space shows that, based on the same kind of principles of organization as in the two-dimensional space of deputies and senators, tensions on the distance to power axis and left-wing/right-wing axis provide a relevant framework for interpretation. However, the new entities that we have projected in this space require us to review the definition of the axis of distance to power and institutions. Here, it pits peripheral, highly politicized and small audience media against central, professional and very broad audience media. Top and centre of the map are major publications in the daily and regional press, *L'Equipe*, or the main radio and television stations such as *franceinfo.tv*. The place of the economic news press such as *Les Echos*, *La Tribune* or *Challenges* also reflects the effect of the first axis (proximity to power). Going a little further down the map, the effect of the second dimension (right-left axis) comes into play and slightly separates professional, central, major newspapers or magazines between those that lean rather to the centre-left (*Le Monde*, *France Culture*, *Libération*, *Télérama*, *The Guardian*) and those that are more centre-right oriented (*Le Figaro*, *L'opinion*, *Paris-Match*, *Atlantico*). At the bottom of the map, political polarization on the right-left axis introduces a rift between two distinct camps, with two types of media which are both in a position of much stronger opposition to power and institutions. They also have a much smaller audience than the mainstream media. The constellation formed in the left part of the map shows, after media that are more integrated into the institutional pole, such as Alternatives économiques, Médiapart or Reporterre, more politicized media such as *L'Humanité*, *Révolution permanente* or *Lundi.am*. On the other oppositional fringe, right-wing
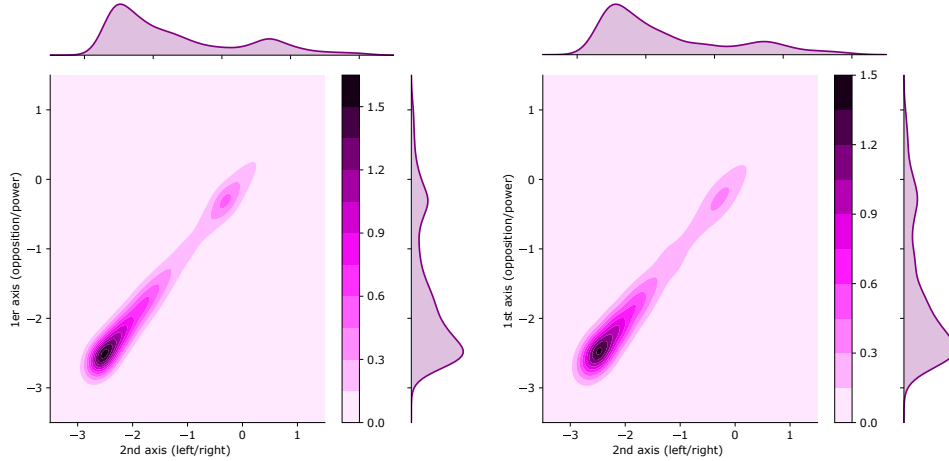
11

FIGURE 7 – Ideological distribution corresponding to the 13 112 times content from the France insoumise website and 6 571 times content from Jean-Luc Mélenchon's blog was shared. Naturally, the profiles are similar, yet they are surprisingly bimodal (with a set of points focused on the radical left first and then on a space corresponding to a more "institutional" left).

media (*Causeur*, *Valeurs actuelles*) unfold in the intermediate zone, up to the identitarian far-right's sites (*Français de souche*) and national-revolutionary outlets. Thus immersed into our latent ideological space, the positions of media appears to be surprisingly consistent with the results obtained in another study (Cardon, Cointet, Ooghe, & Plique, 2019), which used different principles of grouping as it looked at hypertext links exchanged between media sites.

Furthermore, Figure 8 also shows the dispersion of media URL sharing on the right/left axis (represented in colour). This measure of ideological diversity should be interpreted with caution, as the ideological space is characterized by diversity. However, the results of such a measure are nevertheless interesting. The media with the least distributed shared articles are those from the dominant central pole, closer to power, on the one hand and, on the other hand, right-wing and far-right media. Articles from these outlets are shared on Twitter by accounts with relatively consistent ideological identities, while articles from the centre-left mainstream media and, more surprisingly, from more left-wing media that stand further away from power, are shared by accounts that are ideologically more dispersed. These results give a fairly accurate representation of the ideological form of the French media space and, in particular, of sharing on Twitter, whose barycentre is located centre-left (Boyadjian, 2014 ; Charon, 2006).

4   Yellow Vests Facebook groups

At the tail end of this long walk to shift the latent ideological space towards the Yellow Vests, the last phase of our method consists in extending the ideological positions of the URLs extracted from Twitter accounts in the previous step to the posts that quote these URLs on Facebook, and especially within Yellow Vests groups.

4.1   Group data collection on Facebook

To collect publications from Yellow Vest groups on Facebook, we used Facebook's Crowdtangle API. In a first exploratory step, we identified all Facebook groups that used one of the variants of the phrase "Yellow Vests" (singular, plural, attached, detached, preceded by a hashtag or not) : a total of 21 047 groups. We then set aside the 1,000 most active groups and proceeded to examine them manually in order to exclude those that were not Yellow Vest militant groups (some groups which commented on political
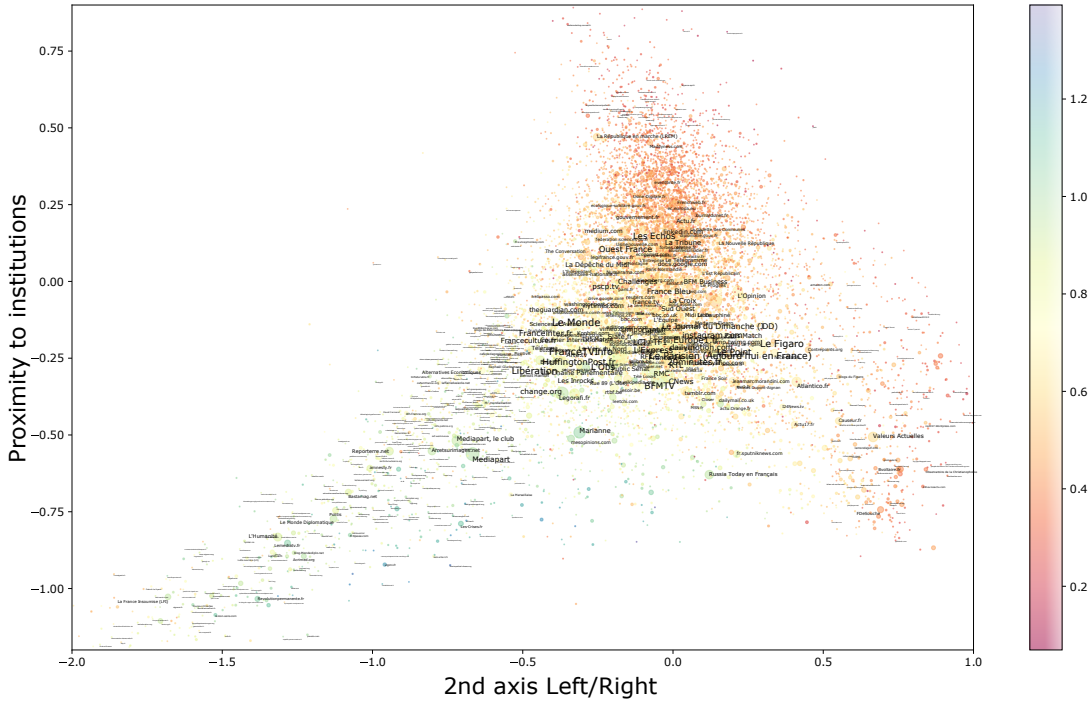
FIGURE 8 – Distribution of the 20 000 domains cited by the largest number of accounts on Twitter. The 100 most cited sites are labelled, as is a random selection of sites on the periphery of the political space. The size of domains is proportional to the number of times they were cited on Twitter. The colour of the domains corresponds to the standard deviation of sites' ideological position on the right/left axis.

news but did not sympathise with the Yellow Vests were thus excluded). Our sample thus covers the 892 most active Yellow Vests Facebook groups, which totalled 2,667,810 members [11] as of 7 October 2019, the collection deadline.

We extracted all messages posted on the 892 most active groups between 1 November 2017 and 7 October 2019, which yielded a starting sample of 9 755 214 posts. Yellow Vests groups could retrospectively be found prior to 2018 because some groups changed their names during that year to integrate the phrase "Yellow Vests" when the movement emerged. We therefore decided to keep them, in order to integrate into our analysis the ideological space in which the Yellow Vests' claims began to spread (Figure 9). However, the number of posts collected before November 2018 is almost insignificant compared to the volume of data generated daily from the first act onwards.
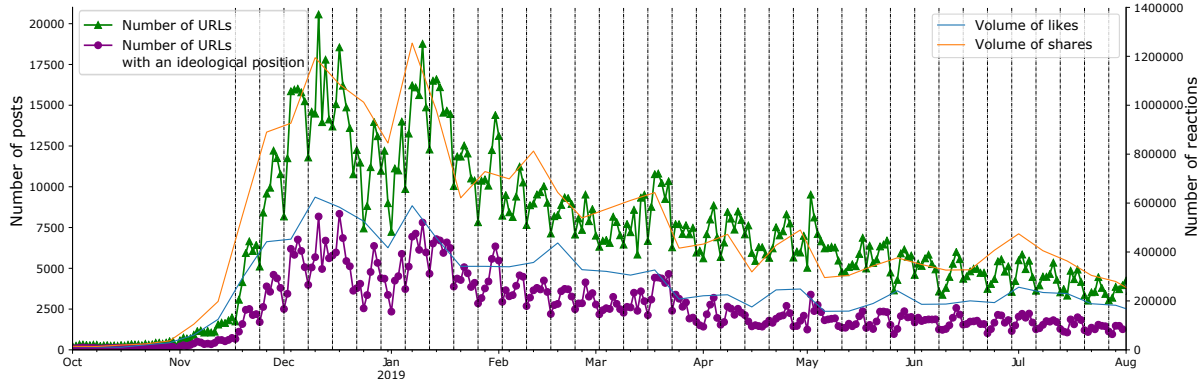

FIGURE 9 – Number of posts published among our groups, and number of likes and shares generated

4.2 The Yellow Vests in the political space

We subsequently focused on almost 2 million posts that quoted resources outside of Facebook or used them to illustrate their discourse (we counted precisely 1 875 462 posts citing 2 377 875 URLs, of which 456 435 appeared only once [12]). Interestingly, almost a quarter of those URLs linked to videos hosted on YouTube (576,277 posts, quoting 57,699 different URLs).

Given our data collection strategy (based on a sample of 40 000 Twitter users) and the fact that not all content shared on Facebook necessarily circulates on Twitter, we were able to associate an ideological position with only a small proportion of these URLs. Of the 1 371 794 URLs for which we were able to define a political label calculated as the average position of the users who shared them (provided there were at least 5 of them), only 85 742 were found in our Yellow Vests groups. Nevertheless, they were cited in our sample 788 104 times between 1 October 2018 and 1 August 2019, in almost a third of all posts featuring a URL (precisely 36.4% as of 1 September 2019). Figure 9 shows that the proportion of posts containing URLs labelled by our method is relatively stable throughout the movement. It is difficult to characterize the bias that may stem from this lack of coverage of posts. In all likelihood, as our results indicate that the URLs found on Facebook are characteristically distant from institutions, it is reasonable to assume that the statistical bias that URLs that do not circulate on Twitter may introduce would likely amplify the observed effect.
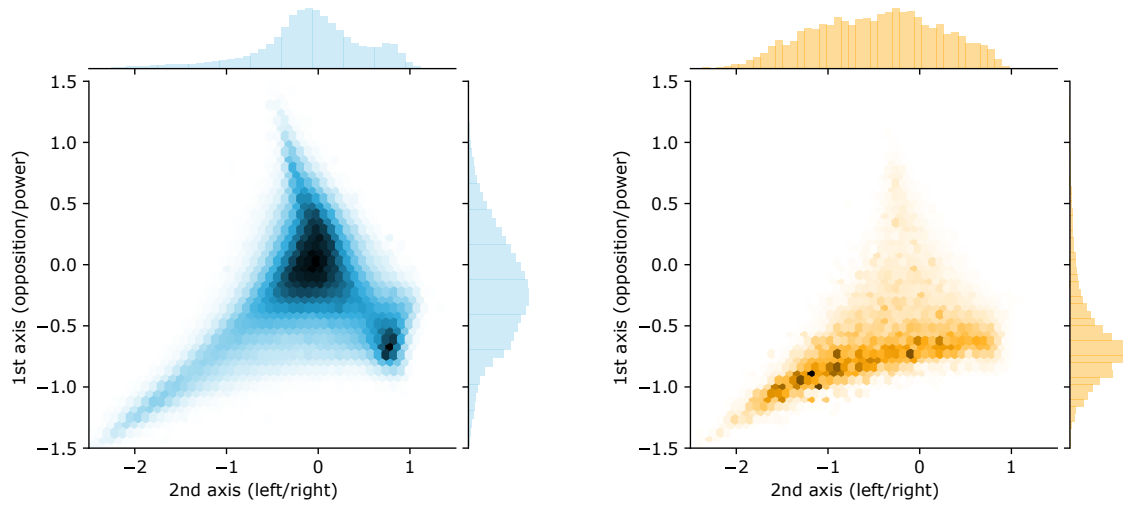
14

FIGURE 10 – Distribution of the ideological space occupied by URLs shared on Twitter (40 000 random accounts) [left], and URLs shared on Yellow Vests Facebook groups [right]

4.3 Static Analysis

To identify the Yellow Vests' ideological "colour", we position their publications in our latent ideological space. Figure 10 presents two layouts side-by-side, which both represent spatial distributions of shared URLs. In accordance with the calculation applied to media in the previous section, we define the position of a URL as the average of the inferred ideological positions of the Twitter accounts that shared it. Only URLs that were shared at least five times were kept. It hence becomes possible to put into perspective the ideological envelope composed of all the URLs cited by our random sample of 40 000 "politically engaged" accounts on Twitter since the summer of 2018 (left hand figure), and the distribution of URLs shared in Yellow Vests Facebook groups in our sample (right hand figure).

The contrast is striking. Contrary to the standard distribution of links on Twitter, the bulk of the distribution of Yellow Vests on Facebook is located on the most "oppositional" (distant from power) border of the latent ideological space. And, while it is very distant from the pole of institutional power, the Yellow Vests are also barely present on the right/left axis, which reveals the movement's widely heterogeneous political distribution. As far as the two dimensions deployed in this space are concerned, it is indeed the first dimension, distance to institutions, which constitutes the dominant and unifying characteristic of the Yellow Vests' posts, much more than the second dimension.

Transposed now onto the Yellow Vests movement, the first axis, which we had defined in the context of parliamentary space as proximity or distance to governmental power and institutions, appears to be a good approximation of what political science approaches mean by the term "populism". While scholars have long debated this the definition of this concept (Rooduijn, 2019), it has become consensual to use this label in a non-normative way to describe formations that share a worldview which opposes "the people", who is seen as "pure", to "corrupt elites" (Canovan, 1999 ; Hawkins & Rovira Kaltwasser, 2017 ; Laclau, 2005 ; Moffitt, 2020 ; Mudde & Kaltwasser, 2012 ; Müller, 2017 ; Rooduijn et al., 2019 ; Taggart, 2004 ; Van Kessel, 2014).

Over the last three decades, research on populism began by focusing on its right-wing variants (Albertazzi & McDonnell, 2007 ; Mudde, 2007). Only recently did left-wing formations draw direct attention to

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11. This figure does not correspond to the number of people following the Yellow Vest groups in our sample, as many of them were members of several groups.

12. The ural library enabled us to standardize and homogenize URLs as much as possible in order to get rid of variants of an address that all point to the same page

the relationship between populism and left-wing politics in Europe (March, 2007 ; Stavrakakis & Katsambekis, 2014). In this respect, the Yellow Vests, which bring together people with strong far-right or far-left convictions, fit with an understanding of "populism" that does not seek to define it on a right/left axis – on which the Yellow Vests refuse to define their own position. Instead, it sees it as constant opposition to the institutions and the power of elites and representatives – an oppositional distance that seems to stem from a moral construction pitting the people against the elites (Moffitt, 2020 ; Mudde & Kaltwasser, 2012). Yet this Manichean construction does not eclipse the variety of positions on the right/left axis. In spite of the Yellow Vests' central motivation being the opposition to power, the heterogeneity of their political references finds ground on both ends of the left-right axis, and therefore persists. Borrowing the term that Pirro (2018) coined for the Italian Five Star Movement, one might say that the Yellow Vests represent "versatile populism", which articulates political traits found at both ends of the political spectrum, without necessarily mixing them. Other works, based of opinion surveys, have stressed that the plurality of ways of sympathizing with the Yellow Vests movements, which are more readily expressed on the left and right fringes of the scales of opinion, neither erases the diversity of ideologies nor allows them to be brought together in a single homogeneous whole (Algan, Beasley, Cohen, & Foucault, 2019). This result also appears in the distribution of Yellow Vests Facebook groups in the latent ideological space inductively constructed through our method.

4.4   Dynamic Analysis

The political structuring shown in Figuree 10 is very clear, but could it be the result of an ex-post construction artefact in our sample, which tends to flatten a year of debate and mobilization into a single representation, albeit a two-dimensional one ? It seems clear that the Yellow Vests are located on Facebook in a political space at a distance from the Republic's institutions. However, it is theoretically possible that the movement mutated between 17 November 2018 and the spring of 2019, so that the strong dispersion we found actually resulted from the temporal aggregation of successive moments of mobilization, whose political centre of gravity would have shifted. The advantage of our method is precisely that it allows us to follow the distribution of the ideological space the Yellow Vests occupy by cutting out a variety of temporal groups.

To answer this question, we have delineated four periods (Figure 11), which we deemed likely to correspond to a partition of the Yellow Vests movement in four phases : first, the movement's preparation before the first Act ; then intensification of the mobilization in Paris and across France, culminating in the degradation of the Arc de Triomphe ; third, a phase in which the movement settled in through the winter until the strong revival of mobilization in Act VIII ; and, finally, a fourth phase which corresponds to its gradual exhaustion. While this temporal breakdown makes it possible to answer the initial question, the answer it provides is not unambiguous. In its first weeks, and particularly before the first Acts took place, the Yellow Vests movement mobilized many far-right resources on Facebook. During this first phase, the distribution is tightly concentrated on this part of our latent space. The next two phases (from Act I to Act VIII, which was marked by media coverage of former boxing champion Christophe Dettinger defying riot police bare-fisted on the Léopold-Sédar-Senghor footbridge) clearly show a progressive shift in the movement, towards the left of the political spectrum. However, the space occupied by the movement also tends slowly to flatten out on the right/left axis – a finding that the fourth period seems to confirm. Over the months, the very strong initial concentration (on the right of the ideological spectrum) was replaced by a much more scattered distribution, which quite aptly illustrates the notion of polyvalent populism.

4.5   The geometry of discourses

The content of the Yellow Vests' discourses can also be positioned in the latent ideological space to shed light on a range of themes and categories of expression. We did so in two steps. In the first step, we divided the ideological space occupied by all our posts into 16 rectangles, each containing an identical number of posts [13]. We then isolated the 4 rectangles which corresponded to the most extreme posts

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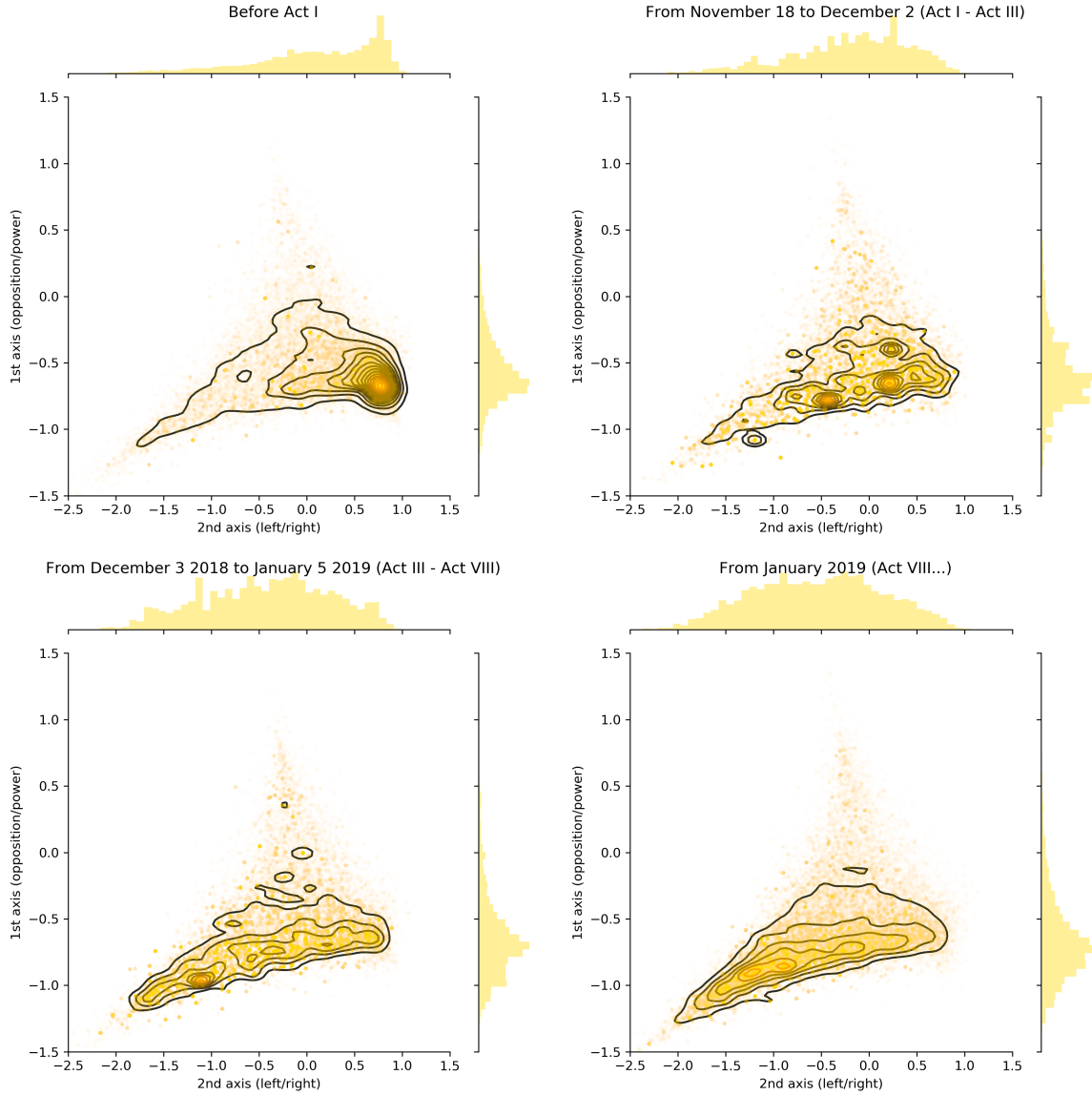13. We used a KD Tree decomposition to cut out the space

FIGURE 11 – Ideological distribution of Yellow Vest posts as a function of URLs cited in four successive periods. 28 000 random URLs were sampled for each period, so as to construct distributions that correspond to a constant number of entities in each period. The successive concentric contour lines also correspond to a constant density level from one period to the next, which reveals a gradual flattening of the distribution

in the two dimensions of our analysis. Each set thus brought together about 20,000 posts located in these rectangles, at the furthest point from the movement's centre of gravity. We thus distinguish the posts closest to power and the furthest to the left (Left-Power), the closest to power and the furthest to the right (Right-Power), the furthest from power and the furthest to the right (Right-Opposition), the furthest from power and the furthest to the left (Left-Opposition). We were then able to use terminological

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extraction[14] to identify the most frequent terms in each box[15].

For the final representation, we retained only those terms whose distribution in our 4 predefined sets was the most unbalanced, so as to show in a ring the terms most specifically associated with the different directions in the ideological space. Figure 12 thus shows, in each frame, specific demands and names of organizations or public figures (we have chosen to use a red font to differentiate these individuals).
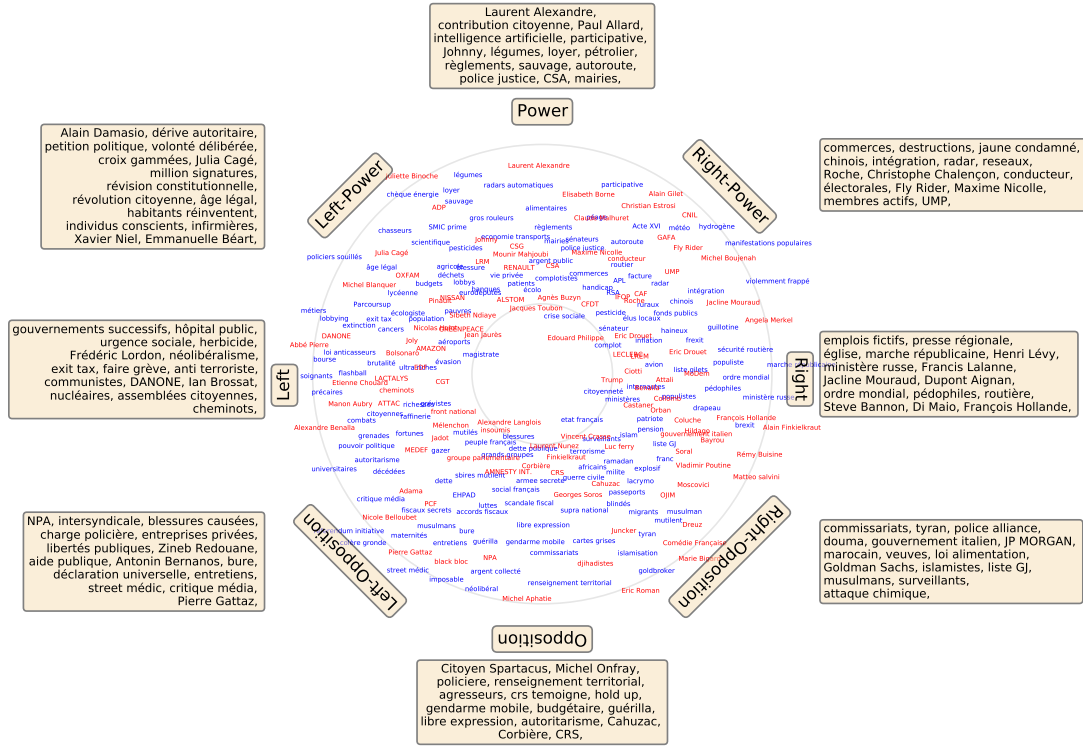

FIGURE 12 – The Yellow Vests' words. The terms (shown in red when they are actors' names) are positioned in a ring pulled into shape by the Left/Right and Opposition/Power dimensions according to their relative frequency of appearance in the ideological space. In the peripheral boxes, we have listed the terms most exclusive to each category

The closer one is to power and institutions (in the upper part of the graph), the more the themes discussed on both the right and left sides are related to the workings of institutions and democracy. Participatory and constitutional demands, such as the Citizens' Initiative Referendum (RIC) demanded by part of the Yellow Vest movement, appear in the pole that is most integrated into the central and institutional space. Terms linked to members of the government and public policies (taxpayers' money, public service, taxes, transportation, or RSA – the baseline solidarity income for the unemployed) are located in this upper part of the graph. On the other hand, the further one goes down the graph and away from institutions, the more the thematic demands differ between poles located further and further to the left and to the right. In the oppositional left wing, the demands focus on contesting economic power (economic aid, public hospital, social emergency) around the middle of the graph, but the theme of police violence almost completely saturates the most oppositional area on the figure's left hand side (injuries,

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14. We were inspired by Jason Kessler's Scattertext library to produce this visualization

15. After eliminating empty words and cleaning up the slag present in the posts (isolated characters, encoding problems), we identified almost 5,200 terms (including bigrams) whose frequency of appearance in the sub-corpus composed of our four rectangles is above an arbitrary threshold of 80. We finished by cleaning up manually to eliminate certain duplicates (singular/plural, spelled out acronyms).

police assault, public liberties, mutilation, [police brutality victim] Zineb Redouane, etc.), leaving only a small space for the actors who frame the Yellow Vests' demands on the far-left (NPA, Frédéric Lordon, Mélenchon, Ruffin, etc.). The police also feature in the oppositional right-wing part (bottom right of the map), but to defend it, this time. The terms migrants and Islamization also appear, as a reminder of the influence of far-right themes. Thus placed in the latent ideological space constructed for this research, the Yellow Vests' lexicon on Facebook also shows the extreme political heterogeneity of polyvalent populism.

Conclusion - propagating a latent ideological space

Starting from an analysis of the structure of the social network that links French MPs to their Twitter followers, we were able to position the ideology behind the Yellow Vests' information sharing practices on Facebook. In spite of their refusal to be boxed into a party or a political orientation, the inference method we employed allows us to position the Yellow Vests on Facebook along two dimensions that correspond to a traditional right-left axis and a second axis opposing Power and Counter-Power. Close to 2 million posts, published on almost a thousand public Facebook groups associated with the Yellow Vests movement, were thus positioned in this latent ideological space. These posts are not homogeneously distributed in the space ; they are mostly grouped together in a space opposed to power (lower part). Monitoring their position over the course of the acts that punctuated the movement's evolution shows that the movement was initially inspired by staunch right-wing resources before very quickly widening out to the left while remaining faithful to an attitude of dissent, which is typical of polyvalent populism. But how can a latent ideological space constructed from MPs' Twitter followers be a relevant tool to position millions of Yellow Vest Facebook posts ? The quality of the outcomes yielded by the propagation technique used in this research raises questions on the reasons for its effectiveness. Immersed in this latent ideological space, the Yellow Vests mobilization unfolds within coordinates that make it more intelligible : determining features of its dynamics emerge, the movement's heterogeneity becomes mappable, and it becomes possible to link the themes of their demands to political positions. Although it is still difficult to accurately assess these new methodologies' contributions and pitfalls, we would like to propose some reflections to initiate a conversation on the contributions of data-driven approaches to social science research.

The first characteristic of this method is its inductive nature. This allowed us to avoid assigning actors to a political scale that they contest (self-positioning on the right-left axis, inferring from past votes, casting out non-respondents and respondents who refuse to take a position). This approach is original in the way it projects these positions as if they were emerging *alongside the actors*, by tracing the geometry of a virtual space in which their behaviour makes sense in relation to one another. Our choices of input data (from MPs), of means to extend them (the Twitter platform), and of a vehicle to propagate the space (URL sharing) is by no means neutral and plays a significant part in orienting the construction of this space, against the backdrop of the most legitimate definition of politics. But the fact remains that the dimensions produced by this space were defined neither by central political actors nor by researchers but, instead, by the behaviour of thousands of Twitter accounts. The particularity of such an approach is that it obviously lacks precision when positions are observed locally, at the scale of an individual URL that is not widely shared yet that is remarkably consistent overall.

The second characteristic of this propagation technique is the flexibility in the architecture of its *latent ideological space* : a research tool of a new kind, the potentialities and shortcomings of which are yet to be fully apprehended. The dimensions it reveals take on different colours according to the entities that are immersed in it, while nevertheless expressing the same kinds of properties. While this space's first axis is surely most accurately described as a spectrum of opposition between government parties and opposition parties at the time of its gestation in chambers of parliament, it takes on a different meaning when the media is immersed in this same space. The opposition between mainstream media with a large audience and the more radical and peripheral media thus constitutes another way of defining the same dimension of this latent ideological space. Finally, when applied to the Yellow Vests' behaviour, the distribution on the axis of the distance to power becomes an index of "populism" that is relevant enough to cast original

light on the movement. As a structure that is both stable and flexible, the latent ideological space thus constitutes an instrument of exploration that can be used to read and interpret a broad range of processes, so long as they leave traces in the digital space. This inductive method is therefore particularly suited to characterize spontaneous collective actors with no formal ties to parties or trade unions, like the Yellow Vests.

Finally, the last characteristic has to do with explanations for the "flexible stability" in this method. Two answers come to mind. The first is that the URLs shared on social media – which we refer to here as the "media space" for the sake of simplicity – constitute a structure that is sufficiently stable and frequently mobilized to propagate, over long distances and to entities that seem quite foreign to it, ideological positions arising from some Internet users following the Twitter accounts of deputies or senators. Because the positions of media websites in relation to one another draw a topography with a relatively stable structure, they constitute a relevant intermediary to migrate ideological positions towards all sorts of digital actors who share URLs from news sites. The second explanation is closely related to the first and has to do with the codified and organized aspect of Internet users' behaviour. This space's structure can be propagated thanks to a certain form of practical rationality in the attitudes of Internet users : in their choices of Twitter subscriptions and in their practices of sharing hypertext links from media they engage with, they assemble, bundle, and oppose information in a much more diverse and varied way than they would if they had to regulate their practices according to a set of fixed and binding ideological values. And yet, the compound effect of Internet users sharing very large amounts of information ends up yielding a legible and orderly behaviour. Approaches based on digital data can introduce an original contribution by making it possible to extract information from a considerable mass of digital micro-behavioural data, so as to bring out a sufficiently coherent overall order affording an interpretation framework that can be moved from one social space to another. This approach thus provides an abstract and distant framework for analysis that is spontaneously produced by the organized aspect of individual behaviours when they are measured on a large scale.

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A Liste des comptes de politiques

_DidierParis, _richardramos, 3807Limon, A_Ardisson, AANZIANI, AbadieCaroline, ac_loisier, ACanayer, ACazabonne, AChristine_Lang, adrienmorenas, AFBrunet_4403, AGenetet, agnesfirmin, ainakuric, AJoyandet, AKaram973, al_petel, Alain_Bruneel, AlainDavid_AN, AlainFouche, alainhoupert, alainneri, alainramadier, AlainTourret, AlainVasselle, AlbaneGaillot, ALCattelot, aldemontgolfier, alexIholroyd, alexiscorbiere, AliceThourot, AlineArchimbaud, AllizardPascal, AMBERTRAND, amelia_lkf, andre_reichardt, AndreChassaigne, AndreGattolin, Andretrillard, AngelePreville, Anissa_Khedher, AnnaigLeMeur_AN, anne_chain, AnneBlanc_12, AnneBrugnera, anneEmeryDumas, AnnickBillon, anniedavid38, AnnieGenevard, anthonycellier, antoineherth, AntoineLAON, Apourceau, AQuatennens, arnaud_bazinVO, arnaudviala, AubeyF, AudeAmadou, AudeBono, AudeLuquet2017, audreydufeu, AurelienPradie, Aurelientache, auroreberge, AVFreschi, AVilliers2017, avyelimas, b_abba, b_belhaddad, B_BessotBallot, b_perrut, B_Peyrol, baillydom, Bannier_G, barbarapompili, basphilippe, BBrocard, BCouillard33, BDeflesselles,

beatricepiron, BeaudouinSo, beauvais2017, BechtGroff2017, BenedictTaurine, BenjaminDirx, benoitpotterie, BenoitSimian, bernard_buis, bernardcazeau, bernarddelcros, BernardJomier, bernardreynes, BertrandBouyx, BertrandPancher, BertrandSorre, bessonjean, BGriveaux, BHammouche5708, BJoncour, bmicouleau, BNAzerot, BockelJeanMarie, bonnefoy_n, BonnivardE, BorisVallaud, BouchetGilbert, bourquinmartial, BoyerJ_M, BQuestel, bretonxavier, BrigBourguignon, Brigitte_Kuster, brigitte_liso, bru_vincent, bruno_fuchs, bruno_sido, BrunoBilde, BrunoBonnellOff, BrunoDuverge, brunogilles13, BrunoMillienne, brunoretailleau, brunostuder67, BuonTAN, C_deCourson, C_Frassa, C_MorinDesailly, c_naegelen, C_Troendle, CalvetFrancois, Capo_Canellas, CaroleBBonnard, carolinecayeux, CarolineFiat54, CarolineJanvier, Castellani_, catherine_dumas, CatherineTasca, CBE16, CBonfantiDossat, CConconne, cderoche_senat, Cdganay, CdLavergne, Cecile_Rilhac, CecileCukierman, ceciluntermaier, CedricRoussel06, celine_brulin, celinecalvez, cfabreAN, CGrandjean54, Ch_Hennion, Chalumeau_P, chantal_jouanno, chapelierannie, ChassaingPh, ChauvinMcm, ChCambon, chevenement, ChPrunaud, Chris_Bouillon, ChrisCloarec, christianfavier, ChristianHutin, christoblanchet, christophe_p, christophearend, ChristopheBechu, ChristopheEuzet, Cisaacsibille, cjerretie, CKamowski3805, clairepitollat, clapotmireille, claude_kern, ClaudeGoasguen, ClaudeMalhuret, claudinelepage, Clem_Autain, CMUSCHOTTI, CoDubost, colettemelot, ConstanceLeGrip, CORDIERPierre08, CorinneBouchoux, CorinneFeret, corinnevignon, CornanoJacques, COURTOIS_JP, cperrin90, cpiresbeaune, CProcaccia, CyrilPellevat, damienabad, damienadam76, DamienPichereau, damienregnard, DanielChasseing, DanielDubois80, Daniele_herin, DanielPercheron, danydegert, DanyWattebled, dassouline, DAUBRESSE_MP, david_lorion, david_rachline, DavidDhabib, DBagarry, dbaichere, dbrulebois, DDasilva_LREM, delaverpilliere, delphbataille, delphinebatho, DelponMichelEM, demoulinem, denis_Masseglia, DeniseSaintPe, DenisSommer, DeputeCabareP, DeputeCausse, Deputee_Obono, DeputeRatenon, desarnez, DFasquelle, DiardEric, Didier_Marie76, didier_rambaud, didierlegac, DidierMandelli, didierquentin, DimitriHoub17, DinoCinieri, DipompeoChrist, Djebbari_JB, dmartindijon, Domdelegge, dominiq_estrosi, DominiqueDavid_, DominiqueGillot, doorjean, DoStephanie_77, draoulsenateur, DuboisMarianne, DubyMuller, dumasfrederique, dupontaignan, E_Doineau, e_renaud_G, eanthoine26, ebareigts, ebothorel, ECiotti, EdouardCourtial, egold_senat, eguerelLREM, ejeansannetas, ElianeAssassi, ElianeGiraud, EliseFajgeles, elodiejala, elsafaucillon, EmilieCariou, EmilieCChalas, emmanuel_maquet, EmmanuelCapus, EPoulliat, ericalauzet, ericbocquet, ericcoquerel, EricKerrouche, EricPAUGET1, ericstraumann, ericwoerth, erwanbalanant, estherbenbassa, etoututpicard, eyonnetSenat, F_BACHELIER, F_Bonhomme, f_cartron, F_Charvier, F_Lardet, F_Menonville, f_patriat, f_personne, fabien_gay, Fabien_Rssl, fabiennecolboc, FabriceBrun, famatras, faureolivier, fchouat, FCommeinhes, FCornutGentille, fdescrozaille, fdumasdeputee, FEspagnac, FGouttefarde, fgranjus, fionalazaar, FJolivet36, florent_boudie, flprovendier, fm_lambert, FMARC_Senat, fmeunier19, FMsenateur59, fnb_officiel, FontainDomeizel, FournierSenat, fpetitan, fpupponi, FranceLorho, franckmarlin, FranckMontauge, Francois_Ruffin, FrancoisAndre35, francoisbaroin, FrancoiseGatel, Fred_Barbier, FVercamer, fzocchetto, g_gouffiercha, G_Peltier, G_ROUILLARD, g_vuilletet, GabrielServille, GaelLeBohec, GarciaLaxou, Gauvain_Raphael, GBessonMoreau, gchevrollier, Genestjacques1, genevievejean84, genevievelevy83, GeorgesPatient, gerard_larcher, GerardCherpion, gerardcollomb, gerardcornu, gerardlonguet55, GerbaudFrdriqu1, ggorce, GilbertCollard, gilbertroger_93, GillesCarrez, GillesLeGendre, gilleslurton, GirardinEric, GiseleBiemouret, GiseleJourda, GLabazee_senat, GLarrive, gonthier_maurin, GrazieMelchior, GrosdidierSenat, GuillaumeArnell, GuillaumeChiche, guillaumegarot, guillaumekasba, GuillaumGontard, GuyDoKENNEL, guyteissier, HConwayMouret, HdeRaincourt, HeleneZannier, HenrietPierre, HerveBerville, hervemarseille, HervePellois, HerviauxO, hleroymandelieu, HMaurey, hsaulignac, HSaury, hub_laferriere, hubertfalco, HuguesPortelli, huguesrenson, HuguetteBello, HuguetteLREM46, hvchristophe, iacovellixavier, IanBoucard, IDebre, iflorennes92, imbertcorinne17, imullerquoy, isabelle_rauch, isavalentin43, J_C_Boulard, J_M_Jacques, j_paulfournier, j_pVigier, jacky_deromedi, jacqlinedubois, Jacques_GILLOT, jacquesbigot, JacquesBompard, JacquesLeNay, JacquesSavatier, Jacquin_Olivier, JAviragnet, JBMagner, JC_Carle, JCattin2017, JCBOUCHET, JCColasRoy, jcgaudin, JCGrelier, JCLarsonneur, jctaugourdeau, jctissot42, Jdetemmerman, jean_bizet, Jean_LucFUGIT, JeanArthuis, JeanClaudeLUCHE, jeandesessard, jeanlassalle, jeanlouistouren, jeanluclagleize, JeanMarieFIEVET, JeanMarieJansse, JeanMichelMIS, JeanPierreGrand, JeanPierrePont, JeanSOL_, JeanTerlier, JeromeBascher, jeromebignon, Jeromedurain, jeromelambert16, jeromenury, JF_Acquaviva, jf_husson, jf_longeot, JFCesarini, JFEliaou, JFMBAYE, jfportarrieu, JGrosperrin, jimmypahun, JJ_Gaultier,

jjbridey94260, jjferrarafb, JKrabal, JL_Reitzer, JLabbeSenat, jlbricout, jldupont14, JLeclabart, jlffichet, JLLagourgue, jlmelenchon, jlthieriot, JM_Todeschini, JMaireofficiel, JMaquetDeputee, JMarilossian, jm-clement86, JMGabouty, JMHoullegatte, jmsermier, jmzulesi, jnbarrot, jncardoux, jnguerini, Joaquim_PUEYO, JocelyneGuidez, joel_guerriau, Joelbigot49, JoelGiraud05, JolyPatrice, JosianeCostes, josypoueyto, jp_bansard, jp_caffet, JP_Dufregne, jp_mattei, JP_Prince_41, JP_Sueur, JPBosino, jpdecool, jpleleux, jpmasseret, JPPlancade, jpraffarin, jrcazeneuve, JRHugonet, juanico, JulienAubert84, JulienBargeton, JulienBorowczyk, juliendive, JVanlerenberghe, JVPlace, Kamardine_M, KarineClaireaux, Kerlogot22, KhattabiF, L_Harribey, L_Lafon, l_poniatowski, l_saintpaul, LabaronneDaniel, Laborde_Senat, lachaudb, LaetitiaAvia, LalandeBernard, LamureE, LanaTetuanui, laqhila, LaugierMichel, lauredlr, LaurenceCohen94, laurencegayte, LaurenceVanceu, lauriannerossi, laurossignol, LauStmartin, lauzzanamichel, LavardeC, LDarcos, LDumontDeputee, lecocqcharlotte, LeguilleBalloy, LeilaAichi, LenaickADAM, LeVigoureuxF, LevrierMartin, LilianeTanguyAN, lise_magnier, LMaillart, loicdombreval, loichervepublic, LoicKervran18, louis_aliot, LouisNegreCSM, luccarvounas, LudovicMDS, ludovicpajot, Lvichnievsky, m_blondin, m_bouvard, M_MeynierM, M_Orphelin, MainaSage, manuelvalls, MarcDelatte, marclefur, MarieAngeMagne, marie-lebec78, marietamarelle, marinebrenier, marion_lenne, MARSAUDSandra, MartadeCidrac, MartialSaddier, martine_filleul, MartineWonner, massonjeanlouis, mathdarnaud, mathildepanot, MaudPetit_AN94, MauriceANTISTE, MauriceLeroy, mauricevincent_, max_brisson, MaximeMinot, MaxMathiasin, mberthet2014, mcblandin, MDemessine, MDeprezAudebert, MdeVaucouleurs, menard2017, MESNIERThomas, meuniermichelle, Meyer_Habib, MezardJacques, mfperoldumont87, mguevenoux, mhdesesgaulx, michel_berson, Michel_Larive, michel_raison, michelamiel, michelcanevet, MichelDelebarre, michelecrouzet, MichelePeyron, michelfanget, michelforissier, michellegreaume, MichelMagras, michelsavin38, MichelVASPART, MichelVialay, MichelZumkeller, mickaelnogal, MIRALLESMP, MIZZONJeanMari1, MKaramanli72, MLP_officiel, mmerciersenat, mnlienemann, Moetai1, MonicaMichel_Of, MoniqueIborra, moreaujb23, MORELPIERRE, MorhetRichaud, Mouiller_P, mounir, MounirBelhamiti, mressiguier, MRobert_11, MTabarot, mustapha_laabid, n_delattre, N_Forissier, NadegeLefebvre_, nadiaessayan, NadiaHai78, NadiaRamassamy, Nadine_Grelet, NaimaMoutchou, NassimahDindar, NatachaBouchart, NathalieBassire, nbricq, nicole_sanquer, NicoleDubre17, NicoleDuranton, NicoleLePeih, NicoleTrisse, noel_sylviane, npouzyreff78, NRauscent89, ODassault, odelphine, OHenno, OlgaGivernet, OliveGaillard30, oliviagregoire, olivier_serva, OlivierCadic, olivierdam1, OlivierFalorni, oliviermarleix, olivierpaccaud, olivierveran, Ossoncatherine, OuzouliasP, p_a_raphan, p_abate, p_chaize, P_Kaltenbach, p_medevielle, PA_Anglade, pacolombani, PacomeRupin, PascalBoisLaREM, pascalbrindeau, pascaleBORIES, pascaleboyer05, PascaleGruny02, patrice_anato, PatriceVerchere, patrick_masclet, patrickhetzel, PatrickKanner, PatrickMignola, PatrickVignal, Pau_Langevin, paul_molac, PaulaForteza, PBertaGard, pdharreville, pereaalain, perrinegoulet, PGallerneau, Ph_Adnot, phbolo, PhDominati, phdumont, phgosselin, Philippe_Marini, philippedallier, philippefolliot, PhilippeGomesCE, PhilippeHuppe, PhilippeMichelK, PhilippePemezec, philmadrelle, pierr_person, pierre_jackie, pierrecharon, PierreCuypers77, pietraszewski_l, PJarlier, platombe, plaurent_pcf, poletti_b, potierdominique, PrudhommeLoic, PSavoldelli94, pybournazel, rachelmazuirse1, RachidTemal, RaconCathy, RaphaelGerard17, RAPINJF, RAYMOND_COUDERC, Raymond-Vall, RemiFeraud, remypointereau, renepaulsavary, RichardFerrand, RichardLioger, RixainMP, Rkaroutchi, RKokouendoJ, RobertHueOff, robinreda, rogermadec, Roland_Ries, RolandCourteau, rolandlescure, RomainGrau, Romeiro1L, ronan_legleut, RonanDantec, roserenxavier, rouxjy, RRebeyrotte, RSCactu, s_mazars, S_Trompille, S_Vermeillet, SabineRubinFI93, SabineThillaye, SachaHoulie, saidahamada, SamiaGhali, SandrineLeFeur, SandrineMorch, sarahelhairy, scazebonne, SCazenove, Schillinger2, sclaireaux, Sebastien_Nadot, SebastienHuyghe, sebastienjumel, sebchenu, SebLeclerc14, SegouinV, Sempastoushp, senateur61, senateurcabanel, SenateurDTheoph, senateurJGM, SenateurLozach, SenateurMilon, SenateurRYung, SenatriceADK, SenatriceJasmin, SenatriceThomas, sereineenmarche, SergeLetchimy, severine_gipson, SGoyChavent, sirasylla76, SKerbarh, SLeFoll, SmeurantL, solere92, Sonia_Krimi, SoniadlpCaen, sonjoachim, SoPanonacle, sophie_auconie, SophieErrante, SophieJOISSAINS, SophieMette1, sophieprimas, STaillePolian, StanGuerini, stelladupont, Stephane_Ravier, stephane1peu, StephaneArtano, StephaneBuchou, stephanie_rist, StephanieAtger, StephPiednoir, StephRiocreux37, StTRAVERT, sutour, Sy_robert, sylvainmaillard, SylvainWaserman, SylviaPinel, SylvieCharriere, SylvieTolmont, tgassilloud, thibault_bazin, ThierryBenoit35, ThierryMichels, ThillAgnes, trastour2017, trobert974, trudi-

goz, TuffnellLREM17, TurquoisNicolas, Typhanie_Degois, ugobernalicis, V_Delahaye, V_Faure_Muntian, V_Hammerer, V_Riotton, valerie_oppelt, Valerie_Rabault, valerieboyer13, valerieletard, ValeriePetit_EM, VALLINIAndre, vbazinmalgras, verdierjouclas, verienparent, VeroLouwagie, VGB83, VGUILLOTIN, VictorinLurel, Vidal7602, VigierPhilippe, VillaniCedric, VincentDescoeur, VincentEBLE, VincentLedoux59, VincentThiebaut, ViryStephane, VLacroute, VRolland73, Vthomas_63, warsmann, WatrinDominique, XavierBatut, XavierPalu2017, YaelBRAUNPIVET, ydaniel_depute, YDaudigny, ydecourson, yfavennec, YHaury44, YVaugrenard, yves_blein, YvesBouloux, YvesDetraigne, yvesjego, YvesPDB, yvesrome, zivkapark.

B Domaines les plus cités

TABLE 1 – Domaines les plus cités par les 892 groupes Facebook.

domaines	Nombre de mentions	Nombre de groupes	nombre d'URLs uniques
youtube video	474390	887	100533
FranceTVInfo	81518	861	13634
Russia Today en Français	53226	811	5020
Le Parisien (Aujourd'hui en France)	52203	831	10406
Le Monde	38889	808	4962
Le Figaro	37017	814	6309
20minutes.fr	35272	810	6452
BFMTV	30664	804	5423
Revolutionpermanente.fr	28797	780	2044
Libération	28010	769	3399
HuffingtonPost.fr	27553	770	5005
www.mesopinions.com	26768	809	2614
Mediapart, le club	26596	762	2331
Mediapart	26271	725	2378
fr.Sputniknews.com	24362	695	4748
France Bleu	24076	787	4946
Ouest France	23570	765	5293
L'Obs	21147	762	2773
www.change.org	17899	770	3371
Actu.fr	17065	707	4540
Marianne	16209	692	1431
LCI / TF1	15397	747	3380
L'Express	14897	686	2910
Europe1.fr	14335	704	2701
Le Point	14059	691	2717
RTL	13923	707	2517
Gj-Magazine.com	13281	595	2144
Sud Ouest	12369	634	2828
Planetes360.fr	11552	623	1803
Le Dauphiné	11013	624	2523
Capital	10906	656	1390
La Voix du Nord	10734	606	3242
www.leetchi.com	9952	679	2015
La Dépêche du Midi	9755	610	2339
Reporterre.net	9563	638	813
La Provence	8997	566	2829
actu.Orange.fr	8892	560	3183
MSN fr	8308	494	3482
FDeSouche	7145	261	4455
Midi Libre	6885	543	1622
Actu17.fr	6823	591	1138
Yetiblog.org	6803	592	479
L'Humanité	6632	539	1010
Bastamag.net	6611	550	536
chng.it	6396	572	2436
Union populaire républicaine (UPR)	6278	460	659
Franceinter.fr	5969	592	1103
vimeo.com	5969	592	720
www.dailymotion.com	5931	623	1404
www.article3.fr	5885	551	60
Resistance Républicaine	5596	444	1761
Le Progrès	5430	458	1595
Valeurs Actuelles	5352	500	1422
Public Sénat	5071	536	527
CNews	4869	539	1385
RMC	4792	582	1095
Le Journal du Dimanche (JDD)	4697	538	881
Bvoltaire.fr	4572	409	1713
Lundi.am	4262	508	301
Les Echos	4186	500	1126
Ripostelaique.com	4103	401	1259
Vincent Lapierre (LeMediaPourTous.fr)	4027	529	177
Lesmoutonsrebelles.com	4008	485	560
Franceculture.fr	3997	465	725
L'Est Républicain	3994	404	1279
Var-Matin	3983	390	910
Challenges	3959	478	884
France Soir	3899	523	383