The Public's Perception of Political Parties During the 2014 Québec Election on Twitter

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ABSTRACT

Background *This article investigates how to extract signals from social media (Twitter) concerning political parties during an election.*

Analysis *670,000 messages were collected during the 2014 Québec election regarding each political party using a framing strategy. After associating each message to one of the four main topics of the campaign, two logistic models were developed to describe the election. While having been set by the incumbent party, the topic of "Independence" was not the most important topic of the campaign ("Economy" and "Society" were). When dominating in terms of mentions, each party was associated to a topic, and such association changed during the campaign.*

Conclusion and implications *From a practical standpoint, the findings of this article could be used to implement a framework to understand political campaigns dynamics through social media.*

Keywords *Conversation analysis; Political communication; Social media; Electoral campaign; Social Data Science*

RÉSUMÉ

Contexte *Cette recherche est axée sur la manière de structurer les signaux issus des médias sociaux (Twitter) en contexte politique.*

Analyse *Nous avons collecté 670 000 messages concernant l'élection québécoise de 2014 en utilisant une stratégie de cadrage. Chaque message fut associé à une thématique de campagne, puis deux modèles logistiques furent utilisés pour décrire les élections. Ainsi, alors que le thème de l'indépendance fut mis à l'avant par le parti sortant, ce sont les messages reliés à l'économie et à la société qui furent les plus importants. Chaque parti fut*

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associé préférentiellement à une thématique lorsqu'il domina en termes de mentions, et nous observons une évolution de cette association au cours de la campagne électorale.

Conclusions et implications *Les résultats de cette recherche peuvent servir de cadre analytique pour structurer l'utilisation de données massives en contexte électoral.*

Mots clés *Analyse de conversations; Communication politique; Média sociaux; Campagne électorale; Science de données en sciences humaines*

Introduction and the context of the 2014 Québec election

March 5, 2014, marked the start of a new general election in Québec. After 18 months in power with a minority government, the leader of Parti Québécois, Pauline Marois, sought to be elected with a majority government. A month later on April 7, the leader of the Québec Liberal Party (QLP), Philippe Couillard, won the race with a majority of the votes, allowing him to form a solid government for the next four years. It is interesting to note that Pauline Marois did not have to trigger a general election; there was no particular pressure to do so. Therefore, if she decided to run a campaign, it was because the polls were favourable to her political party. Moreover, as the incumbent, Pauline Marois thought, rightfully, that she would have an advantage over the other parties in terms of setting up the campaign agenda. Indeed, the incumbent is the only party that knows with certainty if and when citizens will be called to vote and when the campaign will start. It provides at least two competitive advantages: on the one hand, the incumbent can put forward some political or societal topics even before the other parties know that there will be an election in the near future, and on the other hand, the incumbent can consider its own stance in the polls and decide the best moment for its own re-election.

In short, based on these two competitive advantages, Pauline Marois was not considered as taking too big a risk, and rationally thought that the outcome would be one of only two options: 1) she would win with a majority government, or 2) she would win, but stay as a minority party leading the government. The latter option corresponds obviously to the worst-case scenario. Therefore, the only risk she was taking was to stay in the same situation or to improve it. In this context, the decision was easy to make: Québec would have a general election in April, 2014, after a short month of campaigning.

However, the results did not turn out as expected for Pauline Marois. Indeed, Philippe Couillard's party not only won the election and was put in the position of forming a government, but more importantly it was a majority government. The question is thus: what are the reasons that led to such a tremendous and unexpected reversal of fate? Political scientists will study this election with particular interest. The aim of this article is to see whether social media can be used to study elections in the Québec context. The goal is not to predict the results of an election, but to try to extract the trends from the conversations on social networks and have a better explanation of what happens during a campaign. This article focuses only on Twitter. The reasons are essentially twofold: 1) the data are more easily available compared to other platforms, and 2) it is possible to compare this 2014 election to the 2012 election.

Therefore, the research question is: can the conversations that took place on Twitter during the electoral campaign help understand the unexpected reversal of fate for Pauline Marois' party?

This research question could be a subset in several sub-questions to analyze the conduct of the electoral campaign:

- In this day and age of social networks in which the pace of conversations is dramatically increased, 1) does it matter for a party to have a program in order to try to set the campaign agenda, or 2) is it better to be prepared with the buzzwords that will emanate from the conversations on online platforms?
- Is there a moment or a period during a campaign that matters more?
- If the incumbent has a competitive advantage when starting the campaign, how long does it keep it?
- Is there an optimal number of debates to have during a one-month campaign?
- Do debates help change the pace and/or the themes of a campaign?

It is already interesting to note that to answer these questions in a traditional manner, e.g., through polls, would be in fact very expensive. By using social networks—and Twitter in particular—it should be possible to address these questions in a very inexpensive way: indeed, the platform allows any user to connect to its Application Programming Interface (API) in order to access tweets publicly published, which helps build databases dedicated to answer those questions.

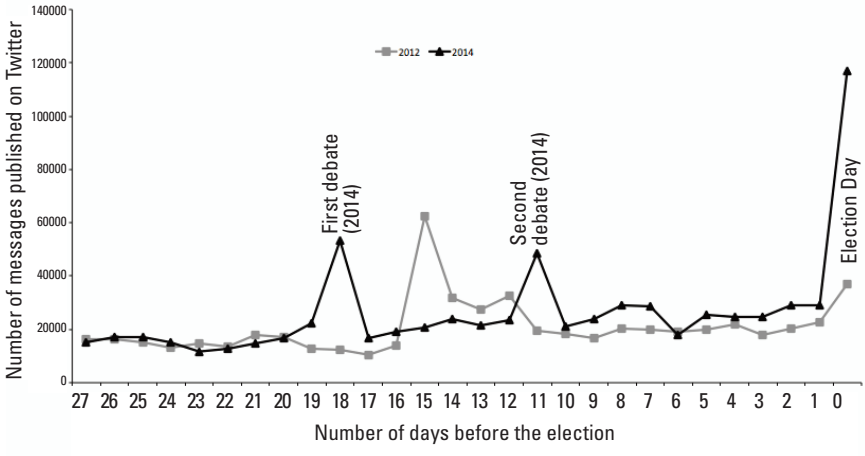
Many events occurred during the Québec electoral campaign. Some were expected and some differed from the previous campaign in 2012. Among the expected circumstances, there were four main opposing parties in action: the Parti Québécois (PQ, leader: Pauline Marois), the Québec Liberal Party (QLP—PLQ in French and in the rest of the article, leader: Philippe Couillard), the Coalition Avenir Québec (CAQ, leader: François Legault) and Québec Solidaire (QS, leaders: Françoise David and Andrés Fontecilla).

Among the new events were two debates on March 18, 2014, and March 27, 2014. Those debates confronted each leader on different topics, such as Québec's independence, ethical behaviours in the government, economics, and society. The two-debates approach was a major difference from the previous campaign held in 2012, which had only one debate. Another important difference is the adoption of Twitter by the population as a tool for commenting and sharing information or personal thoughts online and in real time. Finally, former CEO and President of Quebecor Pierre Karl Péladeau announced his candidacy in Saint-Jérôme's electoral district for the Parti Québécois 29 days before the election day. Known for his favourable opinion on Québec's independence, this unexpected announcement from Pauline Marois set the table for discussions on this topic at the beginning of the electoral campaign.

To start, this article compares both campaigns (2012 and 2014) in order to illustrate the changes in the use of Twitter. Between both electoral campaigns, the number of messages published on Québec politics increased, and peaked at the time of television

debates. Figure 1 illustrates the number of messages sent on a daily basis for both electoral campaigns. In 2012, the hashtags considered were #assnat, #polqc, and #qc2012, and in 2014 they were #assnat, #polqc, and #qc2014.

Figure 1: Number of messages published on Twitter



Electoral campaigns are monitored by polls published during this particular period of time. However, polls are only available a few days apart from each other and with some significant delays, which is not the case with a social network media such as Twitter. Indeed, social media allow access to their data through different APIs, offering the opportunity to analyze in near real time the reactions of the population. More precisely, a poll realized by the polling institute CROP from March 12 to March 16 and released in the press on March 18, predicted that the Québec Liberal Party was suddenly running ahead in terms of vote intentions compared to the Parti Québécois. This change in lead was observed three days ahead, on March 15. In fact, by observing the volume of tweets mentioning both party leaders, Philippe Couillard was outperforming Pauline Marois. This advantage in terms of presence on Twitter persisted until the end of the electoral campaign. This last case is an example of how to assess a finer level of information through unstructured data (tweets) in a faster pace than traditional polls.

Figure 2 plots the share of messages mentioning political party's leaders in 2012. Françoise David and Amir Khadir (co-leaders of QS) have a very low representation on Twitter in 2012. Comparing Figure 2 with Figure 3, it is apparent that Françoise David improved her presence in 2014. In 2012, Jean Charest started high and then his share dropped dramatically. On the contrary, Pauline Marois and François Legault saw an increase in their share in the last period of the electoral campaign.

During the 2014 electoral campaign (see Figure 3), Philippe Couillard and Pauline Marois started high in terms of presence on Twitter. It is also interesting to note that François Legault stayed at a low level for a very long time. For him, the change happened after the second debate when the economy started to resonate more with the electorate on Twitter compared to the previous period.

Figure 2: Proportion of messages by political leader, 2012

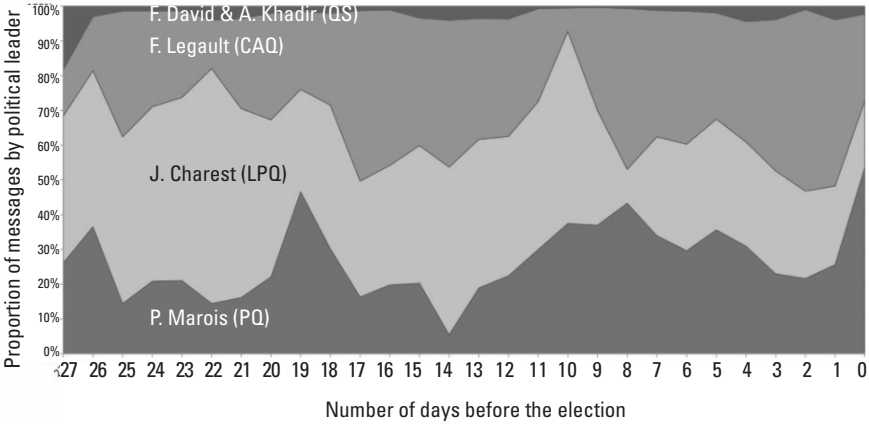
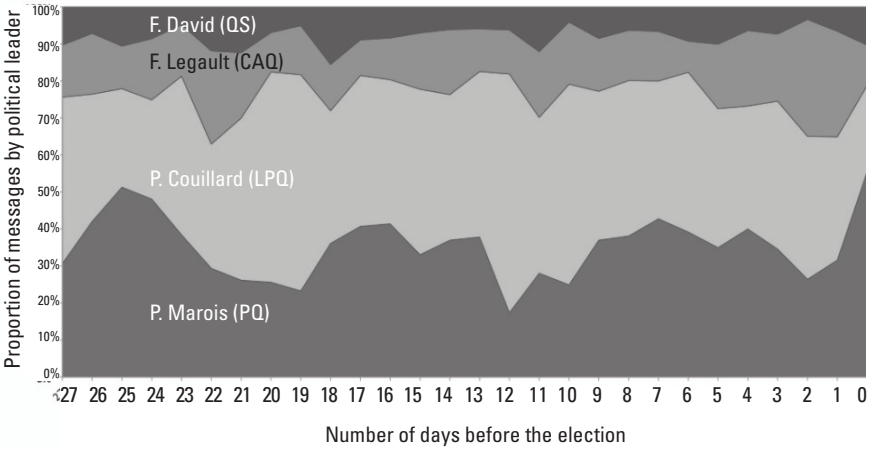


Figure 3: Proportion of messages by political leader, 2014



The research question is: can the conversations that took place on Twitter during the electoral campaign help us understand the unexpected reversal of fate for Pauline Marois' party? In order to do so, the evolution of topics during the electoral campaign on Twitter is examined. The focus is on establishing which party is associated with which particular topic, and if that stays stable until the election day. More than 670,000 messages were collected during the last 28 days of the electoral campaign, and a text analysis was performed on the content of these messages. This article presents a review of the literature to develop a framework to analyze this research question. Methodology and results are then presented, particularly the explicit methodology used to extract messages and to build the dataset. The econometric approach developed in this article is explained and, finally, it comments on the use of Twitter as a monitoring and feedback tool for political purposes.

Literature review

The research question inscribes this article in a branch of the literature interested in how voters respond to information (Kendall, Nannicini, & Trebbi, 2015). This literature includes several relevant empirical contributions, among these are Stephen Ansolabehere, Shanto Iynengar, Adam Simon, and Nicholas Valentino (1994), Donald Green and Alan Gerber (2004), and David Nickerson (2008).

Launched in 2006, Twitter has since been the subject of prolific academic research. Scholars in political science have benefited from a constant new stream of information from citizens, political parties, and government. Since Twitter data is openly accessible through its API (Application Programming Interface), electoral campaigns can be understood in a different point of view compared to traditional polls. For a systematic literature review on a fragmented field, see Andreas Jungherr (2016).

The first election of President Obama in 2008 was coined as the first social media election due to the extensive usage of Facebook during the campaign. The United States acted as a "networked nation" (Cogbrun & Espinoza-Vasquez, 2011, p. 199), since millions of users were connected and expressed their opinions regarding policy issues. Such perspective resonates even at the local level, for example the 2010 municipal election in Calgary, Canada, from which Delia Dumitrica (2014) has characterized social media as "the new tools and spaces of an improved communicative relation between politicians and citizens" (p. 65). Vincent Raynauld and Josh Greenberg (2014) found that Twitter contributes to "permanent campaigning" (p. 413) strategies for political candidates. As mentioned by Gunn Enli and Anya Anaheim Naper (2016), the incumbent advantage on social media played in favour of Barack Obama's second election in 2012 against Mitt Romney, since the president leveraged his larger audience of followers to mobilize grassroots actors. In Québec, the National Assembly has adopted a strategy to use internet and social media to promote "an effective communication between the people and their government" (p. 31) (Grétas, de Nicolini, & Cimo-Matter, 2014) since 2009. In fact, online petitions that were introduced since 2009 have collected more signatures from citizens than their paper counterparts; a Facebook page and Twitter accounts were opened in 2012, whereas a YouTube channel was put in place in 2013.

Extracting information from tweets

Scholars have rapidly tested whether Twitter could be used as a reliable source to predict elections by computing the mean absolute error (MAE) of election forecasts. Results within the margins of error of traditional polls have been obtained (see Bermingham & Smeaton, 2011; Metaxas, Mustafaraj, & Gayo-Avello, 2011; and Tumasjan, 2010, with MAEs of 1.65 percent, 1.1 percent, and 5.85 percent respectively).

A tweet, although composed of 140 characters, contains more than 40 elements in its metadata: the name of the user that sent the message, its geolocation (if activated), the time the message was sent, the content of the message, and how many times the message has been liked (previously favourited), to name a few. In this regard, the number of followers a user has could be assessed to measure its reputation or how much attention s/he can generate online. Moreover, metrics such as the sentiment associated with a message or how many times it has been retweeted provide additional information. The later metric could help visualize the network of users concerning a certain topic.

Axel Bruns and Jean Burgess (2011) found that during the 2011 Australian federal election, 35 percent of the 415,000 messages in their #ausvotes dataset were retweets (a message sent by a user displayed on another user's feed), whereas 20 percent were messages directly addressed to other users (with the mention "@"). In South Korea, Min Song, Meen Chul Kim, and Yoo Kyung Jeong (2014) associated presidential candidates with specific topics by revealing their most frequently associated terms on Twitter.

Besides a textual analysis of messages on Twitter, several network analyses have been performed during elections (Burgess & Bruns, 2012). With this scope, Anders Olof Larsson and Hallvard Moe (2013) identified the most prolific Twitter users during the 2011 Danish election using the hashtag #fv11. They provided an answer to who communicated the most in the public sphere (citizens, experts, media, or politicians). The authors offered some interesting insights on citizens' involvement in the public debate. They used network analysis software (Gephi) to present how users are mentioning or retweeting themselves. Such an approach was used in financial conversations to differentiate accounts considered as influential, talkative, or followed regarding the S&P500 stocks (Nathalie de Marcellis-Warin, William Sanger, & Thierry Warin, 2016). During the 2010 U.S. midterm election, Michael Conover, Jacob Ratkiewicz, Matthew Francisco, Bruno Goncalves, Filippo Menczer, and Alessandro Flammini (2011) analyzed 250,000 tweets to study the polarization of users on the platform. They differentiated two kinds of networks: 1) the retweet network and 2) the mention network. While the first one was highly polarized, with users retweeting messages with whom they agree politically, the second one displayed links between different groups of political affiliation. During the 2011 Canadian election Anatoliy Gruzd and Jeffrey Roy (2014) analyzed 5,918 messages sent by 1,492 users on Twitter to understand the communication patterns between politically identified users. In fact, the research suggests the presence of "pockets of political polarization," (p. 28) as observed by the network analysis of the mentions within the dataset. However, cross-ideological connections are also noticed. More precisely, supporters of left-leaning parties (the Liberal Party of Canada, the New Democratic Party of Canada, and the Green Party of Canada) tend to communicate openly between each other, whereas communication toward supporters of the Conservative Party of Canada seems to be more sarcastic and confrontational. By sending tweets using the dedicated hashtag of the election (#elxn41), Anatoliy Gruzd and Jeffrey Roy (2014) suggests that "supporters of different parties are aware of each other's presence on Twitter, and that the Twitter communication platform is conducive to exposing people with opposing points of views" (p. 39).

Political debates are considered as key moments in an electoral campaign. Assessing the reaction of television viewers is of great value for political parties since they have the ability to react and frame their messages. By its real-time nature, Twitter could be helpful in doing so. In 2008, the debate between Canadian party leaders was analyzed through comments on Twitter (Elmer, 2013). In Norway, the 2011 election presented two television debates. Scholars found that Twitter discussions reflected topics opposing candidates on television. However, the social media served as a channel for criticizing the debates, but also for supporting candidates (Kalsnes, Krumsvik, & Storsul, 2014).

The limits of Twitter as a predictive tool for elections

While the literature offers promising results, a lack of reproducible methods has been noticed. In fact, scholars found that Twitter's ability to predict the outcome of an election may be lower than Facebook's (Cameron, Barrett, & Stewardson, 2013). Concerning the 2011 Singaporean election, Murphy Choy, Michelle Cheong, Ma Nang Laik, and Koo Ping Shung (2011) obtained results as high as 6.06 percent in terms of MAE with only two candidates. In an article published in 2011, Daniel Gayo-Avello, Panagiotis Metaxas, and Eni Mustafaraj (2011) analyzed 234,000 messages during the 2010 U.S. Senate election and obtained an MAE of 17.1 percent using only the number of messages concerning candidates. Their MAE decreased to 7.6 percent when considering the sentiment associated to each message.

Gayo-Avello (2012) resumes concerns regarding the use of Twitter as a predictive tool for elections in "I Wanted to Predict Elections with Twitter and All I Got Was This Lousy Paper": A Balanced Survey on Election Prediction Using Twitter Data. More precisely, the author expresses concerns regarding the lack of a balanced literature in the field since most studies present positive correlations between Twitter predictions and electoral outcomes. In addition to this, rumors and propaganda are ignored while the demography on Twitter do not replicate the electoral demography.

In this regard, Tamara Small, Harold Jansen, Frédérick Bastien, Thierry Giasson, and Royce Koop (2014) studied the propensity of the Canadian population to participate in political debates on the internet. Even though most of the members of parliament are using Twitter (80%), only a fraction of the population is active on social media (3.9% of the overall population of the 2014 Canadian Online Citizenship Survey is following a political actor on Twitter; 3.1% of the overall population has written a political tweet. Such metrics suggest that Canadian online activity level is lower than the U.S.'s. In this regard, should this low participation number harm the potential of Twitter as a viable source of information regarding politics? Three elements suggest otherwise. First, the study from Small et al. (2014) was made outside of a political campaign cycle, when the interest of the population regarding politics is lower than during an electoral campaign. Indeed, during the electoral campaign, news channels and newspapers are offering content dedicated to the campaign, and campaign signs are spread across streets, which would drive discussions about politics. Second, Twitter, as well as other social media, is characterized by the fact that a small proportion of users are driving the discussions by being more vocal than other ones. On the other hand, most of the people are either not participating, or participating a little. This is replicating what would happen in public life with interactions between individuals, where politically engaged people are more vocal than other ones (Barberá & Rivero, 2015; Vaccari, Valeriani, Barberá, Bonneau, Jost, Nagler, & Tucker, 2013). Finally, even though people are not participating actively by publishing a political tweet, they can be exposed to political content through the accounts they follow. Christian Vaccari et al. (2013) describe this as the two levels of influence on Twitter during electoral campaigns. Indeed, the authors found that online and offline activities are not distinguished by Twitter users, and that discussions between people offline can be driven by online (Twitter) events.

Québec elections on Twitter

In Québec, a few studies have been published linking Twitter and politics. A comparative study of France and Québec was assessed in 2013 (Eyries & Poirier, 2013) and revealed a later adoption of the social media by Québec's political parties in 2012. In a book published in 2013, Éric Bélanger, Frédérick Bastien, and François Gélineau describe in detail the 2012 Québec election and in particular how political parties and citizens used Twitter. In his book chapter, Olivier Beauchesne (2013) sheds light on how that the platform offered a space for political communication unfiltered by traditional media or organizations. By performing a content analysis of almost 1.5 million tweets using a Latent Dirichlet Allocation (LDA) method, political topics emerged from discussions on Twitter. They also found that 54.5 percent of all messages where in fact retweets. In a subsequent chapter, Thierry Giasson, Gildas Le Bars, Frédérick Bastien, and Mélanie Verville (2013) analyzed how each of the six political parties used Twitter in their communication strategies. Two of the smaller ones (Québec Solidaire and Option Nationale) used social media in order to foster interactions with community members, whereas the more established parties (the Québec Liberal Party, the Parti Québécois, and Coalition Avenir Québec) used Twitter in order to broadcast information.

Finally, for a detailed analysis of how Twitter was used during the 2014 Québec election by politicians, see "La cyberdémocratie québécoise : Twitter bashing, #VoteCampus et selfies" (Katherine Sullivan & Pierre Bélanger, 2016), which studies 13,000 messages sent by 26 "super-users" (candidates from the main parties particularly active on Twitter) and shares the same results as Olivier Beauchesne (2013): members of traditional political parties use Twitter as a marketing tool, whereas Québec Solidaire's members promote the use of the social platform to engage with users.

Methodology

The research question is whether the conversations that took place on Twitter can help us understand the unexpected reversal of the 2014 electoral campaign in Québec. On the one hand, the incumbent party has a tactical advantage by setting up the agenda of the electoral campaign. However, such advantage did not play out well for the Parti Québécois. On the other hand, there is a need to understand how political messages are perceived by the population through social media. At the end of the introduction, five sub-questions were laid out to focus the research question. Let us rephrase them into two working hypotheses to be tested:

> **H1.** On Twitter in Québec, certain topics increase the polarization of the public discussion, and their effects last for a longer period of time in comparison to other subjects.
>
> **H2.** On Twitter in Québec, the incumbent advantage plays at the beginning of the campaign, but can also become a curse toward the end.

Data

This article focuses on the resonance of election topics. In Québec, provincial elections were held from March to April 2014. Tweets regarding each party leader and the elec-

toral campaign were collected. More than 670,000 messages were analyzed in order to create the sample. Messages on Twitter were collected that presented at least one of the three used hashtags during the election period, namely #assnat (National Assembly), #polqc (Québec politics), and #qc2014 (Québec 2014). In total, this dataset was composed of 672,497 messages from the REST API of Twitter using Pablo Barberá's (2014) streamR package on R.

Each day, different indicators of importance on Twitter were computed. First, the volume of tweets corresponding to each party leader was calculated (Pauline Marois for the Parti Québécois, Philippe Couillard for the Quebec Liberal Party, François Legault for the Coalition Avenir Québec, and Françoise David for Québec Solidaire). Concerning Québec Solidaire, only Françoise David was considered since she was the most known political figure compared to the second spokesperson of the party, Andrés Fontecilla. Second, the presence of each party was assessed on a daily basis through their respective hashtags (#PQ, #PLQ, #CAQ, and #QS). Finally, the goal was to capture how the campaign topics would evolve and what would be the response from the population on Twitter.

To explore this, the four electoral programs as put forward by the four parties were consulted. 31 ideas or concepts that were going to be promoted during the campaign by the four leaders were isolated. Out of the 670,000 messages, a dataset of 157,916 tweets mentioning one or more of the 31 concepts was assembled. In total, this dataset is made of 868 observations per variable of interest (31 concepts x 28 days). Those 31 concepts were organized in four general categories regarding the independence of Québec, ethics, economics, and society. The volume of messages corresponding to each main category was obtained by assessing how many messages were written about their corresponding keywords. For the independence of Québec, messages containing words related to the Québec Charter of Values, national identity, secularism, referendum, and sovereignty were considered. Words related to the Charbonneau Commission, collusion, corruption, ethics, and integrity were searched for ethical behaviours. Finally, unemployment, debt, economy, employment, taxation, federal and provincial taxes, taxes, infrastructures, resources, and investments were used for assessing economic topics; education, students, environment, family, day care, youth, doctors, retirement, health, and university were considered social topics. Those keywords appeared in the electoral programs of the political parties and were also reflected in discussions in newspaper articles and television debates. In order to evaluate how political parties or political leaders were related to these four main categories, the number of messages associated to each keyword was computed (see Figure 4).

Finally, the electoral campaign was divided in three separate time periods. These three periods are delimited by the two televised debates in order to analyze how perceptions have changed during the electoral campaign. The first period finished the day before the first debate (March 17, 2014), the second period starts on the day of the first debate until the day before the second debate (March 18–26, 2014), and the third period goes from the second debate until the end of the electoral campaign (April 7, 2014) (see Figure 5).

Figure 4: Proportion of messages by topic, 2014

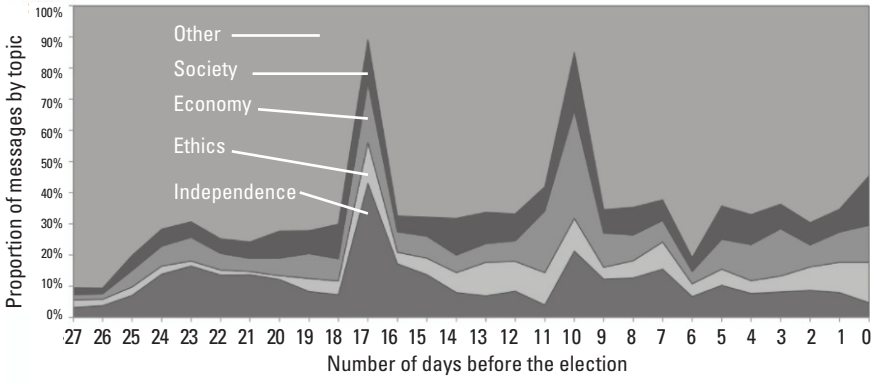


Figure 5: Proportion of messages by topic, 2014

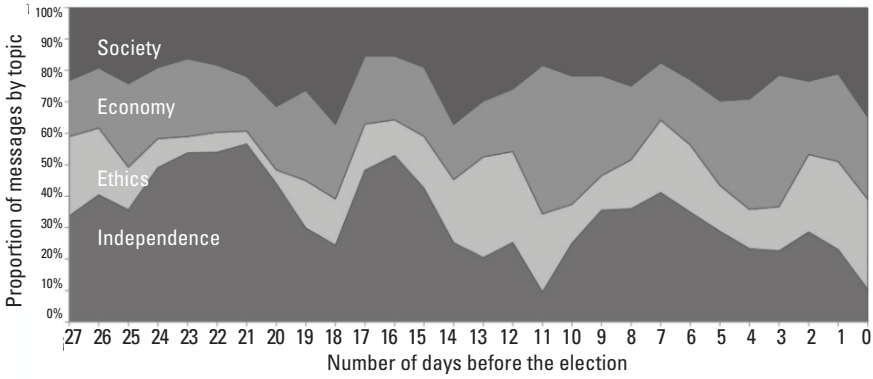


Table 1: Descriptive statistics about the dataset for each category studied

	Min.	Max.	Average	Median	Std. Dev.
Topic 1: Independence	491	7174	2576.11	2047	1465.99
Independence	76	507	206.36	181.5	107.46
National Identity	0	273	64.61	29	74.84
Québec Charter of Values	126	3573	1226.18	892	862.86
Referendum	78	2659	616.79	467.5	539.41
Secularism	16	315	121.39	94	82.19
Sovereignty	109	912	340.79	312.5	176.43
Topic 2: Ethics	147	2012	875.61	727.5	560.01
Charbonneau Commision	1	779	102.18	52.5	154.92
Collusion	0	61	25.68	24.5	16.71
Corruption	77	778	289.93	383	180.29
Ethics	8	558	117.46	77	119.36
Integrity	29	885	340.36	274.5	254.48

Table 1: (continued)

	Min.	Max.	Average	Median	Std. Dev.
Topic 3: Economy	265	5307	1388.5	1084	1015.29
Debt	6	491	153.86	117	120.57
Economy	108	973	377.46	367.5	178.48
Employment	48	1159	333.64	247.5	301.12
Federal and Provincial Taxes	8	781	143.54	86.5	170.8
Fiscal Policy	2	1674	153.36	31	360.6
Infrastructures	0	111	18.11	10.5	24.5
Investments	18	368	75	55.5	67.93
Resources	0	34	10.46	9	8.11
Taxes	9	461	96.29	76	86.04
Unemployment	2	217	26.79	15.5	42.8
Topic 4: Society	279	2833	1219.89	1136	581.1
Day Care	21	301	81.57	60	68.53
Doctors	5	363	81.04	51.5	78.15
Education	7	323	101.54	88.5	70.38
Environment	24	784	139.82	101.5	145.28
Family	13	457	131.04	110.5	99.27
Health	77	850	285.07	220.5	176.33
Retirement	1	122	25.39	16	31.41
Students	6	890	200	163.5	176.69
University	4	166	40.39	28.5	36.44
Youth	15	298	134.04	119.5	68.9

For the topic of Independence, the Québec Charter of Values was the keyword that generated the highest number of tweets. Discussions on ethical behaviours were dominated by messages about integrity. About the economy, both employment and the economy in general emerged as prominent subjects. Finally, health was the main concern of the messages written about society. Figure 6 presents how each of the four categories have generated discussions on Twitter.

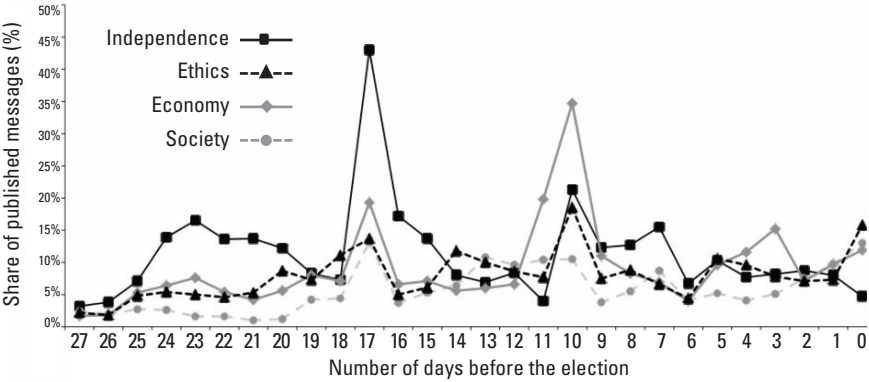
Model

The 157,916 tweets were put in a cross-section time-series format. The sections were structured around the 31 keywords and through the 28 days during which the tweets were collected.

Two models are used to measure 1) the importance of each topic during the campaign and 2) how likely a party was to be associated with such topics throughout the campaign.

For the first model, the dependent variable is a categorical variable capturing whether a message belongs to the first category (Independence, 1), the second category

Figure 6: Share of published messages (%)



(Ethics, 2), the third category (Economy, 3), or the fourth category (Society, 4). The presence of the political parties in the discussion about the keywords constituting each category is used as independent variables. The controlled variables are the three time periods identified. Finally, an ordered logistic model is used as follows:

$$pr(y_t) = x_1\alpha_t + x_2\beta_t + x_3\gamma_t + x_4\delta_t + x_5\tau_2 + x_6\tau_3 + c$$

Where $\{\alpha_t; \beta_t; \gamma_t; \delta_t\}$ equals the number of tweets per day referring to the (Parti Québécois; Quebec Liberal Party; Coalition Avenir Québec; Québec Solidaire) and τ_i the period of the campaign studied, with $i = \{2; 3\}$ for the second and third period (with the first period as reference).

For the second model, the party ahead in terms of mentions for each keyword was computed on a daily basis. If two parties were equally mentioned for a given day, the observation was duplicated in order to account for each party. In this model, a binary dependent variable was used concerning each topic, such as: $y_{t,\lambda} = \{1; 0\}$, with $y_{t,\lambda} = 1$ when observing for a topic $\lambda = \{1; 2; 3; 4\}$ and 0 otherwise.

As independent variables, two categorical variables were considered (the party leading in terms of mentions for a given day and the period of the campaign). A logistic model was considered as follows:

$$pr(y_{t,\lambda}) = x_7\pi_t + x_8\tau_t + c$$

With $\pi_t = \{1; 2; 3; 4\}$ for the leading party in terms of mentions for a given day, referring to the (Parti Québécois; Liberal Party of Québec; Coalition Avenir Québec; Québec Solidaire) and $\tau_t = \{1; 2; 3\}$ concerning each period of the campaign.

Results

Most important topic of the campaign

Throughout the whole period, the probability that the tweets mentioning the four parties are about "Independence," "Ethics," "Economy," or "Society" was 17.8 percent, 20.1 percent, 35.4 percent, and 26.6 percent respectively.

Therefore, the most prevalent topic during the whole electoral campaign in the dataset, when mentioning the different political parties, was the "Economy" and then "Society." It is interesting to note that the Parti Québécois thought that questions of

identity and independence were going to be important during this election. Apparently, they were not as important as assumed.

Table 2: Predicted probabilities for each category based on an ordered logit estimation

Pr(Independence)					
	Margin	Std. Err.	*P*-value	[95% Conf. Interval]	
constant	.1784479	.0142735	***	.1504724	.2064235
N = 868					
P-value: *** < .01; ** < .05; * < .1					
Pr(Ethics)					
	Margin	Std. Err.	P-value	[95% Conf. Interval]	
contant	.2008826	.0156595	***	.1701905	.2315748
N = 868					
P-value: *** < .01; ** < .05; * < .1					
Pr(Economy)					
	Margin	Std. Err.	*P*-value	[95% Conf. Interval]	
constant	.3544883	.017434	***	.3203183	.3886582
N = 868					
P-value: *** < .01; ** < .05; * < .1					
Pr(Society)					
	Margin	Std. Err.	*P*-value	[95% Conf. Interval]	
constant	.2661812	.158944	***	.2350286	.2973337
N = 868					
P-value: *** < .01; ** < .05; * < .1					

Note: Predicted probabilities for each category based on an ordered logit estimation.

Party association during the campaign

To go further in this analysis, a breakdown of estimations by party and time periods is needed. Tables 3 to 6 present the results of the predicted probability concerning each topic using the second model (equation 2).

Table 3: Predicted probabilities for the category "Independence"

Pr(Independence)					
Period – Pol. Party	Margin	Std. Err.	*P-value*	[95% Conf. Interval]	
1 – PQ	.2883107	.0356576	***	.2184232	.3581983
1 – PLQ	.0246657	.0106295	**	.0038322	.0454991
1 – QS	.0652011	.0453452		-.0236738	.154076
1 – CAQ	.0285819	.0201166		-.0108459	.0680098
2 – PQ	.3162395	.0358472	***	.2459803	.3864988
2 – PLQ	.0280621	.0116719	**	.0051855	.0509387
2 – QS	.073757	.0506823		-.0255785	.1730925
2 – CAQ	.0324996	.0230377		-.0126535	.0776528
3 – PQ	.2667128	.0281657	***	.211509	.3219165
3 – PLQ	.0222018	.0093918	**	.0037943	.0406093
3 – QS	.0589327	.0413546		-.0221207	.1399861
3 – CAQ	.0257372	.0183988		-.0103239	.0617982
N = 885, *P*-VALUE: *** <.01; ** <.05; * <.1					

Table 4: Predicted probabilities for the category "Ethics"

Pr(Ethics)					
Period – Pol. Party	Margin	Std. Err.	*P-value*	[95% Conf.	Interval]
1 – PQ	.1094821	.0204327	***	.0694348	.1495294
1 – PLQ	.3588622	.0492978	***	.2622403	.4554842
1 – CAQ	.0151309	.0150855		-.0144363	.044698
2 – PQ	.0959016	.0179669	***	.0606871	.1311162
2 – PLQ	.3256603	.0411761	***	.2449567	.4063639
2 – CAQ	.0130821	.0131888		-.0127676	.0389317
3 – PQ	.1063555	.0170065	***	.0730235	.1396876
3 – PLQ	.3514244	.0423167	***	.2684851	.4343636
3 – CAQ	.0146544	.0147334	***	-.0142225	.0435313
N = 885, *P*-VALUE: *** <.01; ** <.05; * <.1					

Table 5: Predicted probabilities for the category "Economy"

Pr(Economy)					
Period – Pol. Party	Margin	Std. Err.	*P-value*	[95% Conf.	Interval]
1 – PQ	.255428	.0292545	***	.1980902	.3127658
1 – PLQ	.3686906	.0424727	***	.2854456	.4519355
1 – QS	.5238003	.0949607	***	.3376808	.7099199
1 – CAQ	.5285858	.0632392	***	.4045805	.6525911
2 – PQ	.2577098	.0285069	***	.2018372	.3135823
2 – PLQ	.3714793	.0383998	***	.2962171	.4467416
2 – QS	.5267833	.0947099	***	.3411554	.7124113
2 – CAQ	.5315657	.067472	***	.399323	.6638083
3 – PQ	.2804084	.0257722	***	.2298958	.3309211
3 – PLQ	.3988148	.039319	***	.321751	.4758786
3 – QS	.5554475	.0944638	***	.3703017	.7405932
3 – CAQ	.560182	.0666578	***	.4295352	.6908288
N = 885, *P*-VALUE: *** <.01; ** <.05; * <.1					

Table 6: Predicted probabilities for the category "Society"

Pr(Society)					
Period – Pol. Party	Margin	Std. Err.	*P-value*	[95% Conf.	Interval]
1 – PQ	.3460254	.0331725	***	.2810085	.4110423
1 – PLQ	.2542577	.0364651	***	.1827874	.325728
1 – QS	.403192	.0929967	***	.2209218	.5854622
1 – CAQ	.4228356	.0624102	***	.300514	.5451573
2 – PQ	.3437164	.0322691	***	.2804701	.4069628
2 – PLQ	.2523248	.0333266	***	.1870058	.3176438
2 – QS	.4007353	.0926896	***	.2190671	.5824035
2 – CAQ	.4203436	.0663559	***	.2902883	.5503988
3 – PQ	.3379618	.0277283	***	.2836153	.3923083
3 – PLQ	.2475232	.0330615	***	.1827239	.3123226
3 – QS	.3946	.0928149	***	.2126863	.5765138
3 – CAQ	.4141155	.0659817	***	.2847939	.5434372
N = 885, *P*-VALUE: *** <.01; ** <.05; * <.1					

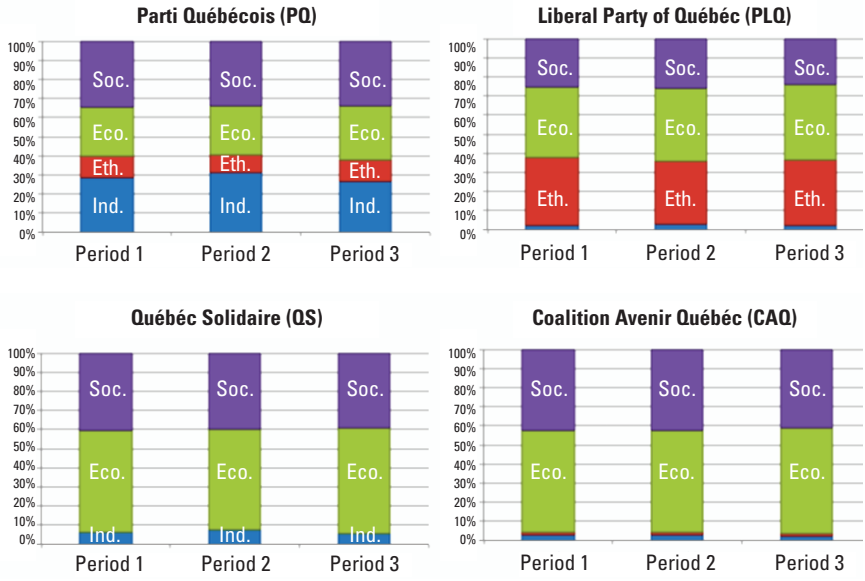
Two parties are more associated with the topic of "Independence" (a statistically significant relation) during the campaign. The PQ is the more prevalent one, since 28.8 percent of its campaign is associated with this topic. On the other hand, 2.5 percent of the PLQ campaign is associated with this topic when the party is leading in terms of mentions. There is a decline in the association between "Independence" and the PQ, especially at the end of the campaign (from 28.8% to 26.7%). This is particularly interesting when one considers that the PQ—the incumbent government—favoured this category when deciding to launch a new election.

The QS was never a prominent figure regarding "Ethics" compared to the other parties during the campaign. This time, the CAQ was associated to this second topic, but the relation is still not statistically significant. The PLQ, when leading in terms of mentions, was on average 34.5 percent of the time associated to the topic of "Ethics."

Concerning the "Economy," all parties have been leading the conversation during the campaign, but to a different extent. More precisely, most of the CAQ's and QS's campaigns were associated with this topic (more than 53% on average). It is interesting to note that the economic topics were the ones put forward by the CAQ. Although they did not resonate at the beginning of the campaign as much as the category, "Independence," when the economy became important for the users on Twitter, then the CAQ made a comeback (see Figure 3).

Finally, when leading in terms of mentions on Twitter concerning the "Society" topic, the order of the most associated parties goes as follow: CAQ, QS, PQ, and PLQ. In conclusion, CAQ and QS did a better job than the other parties to be more associated with this category and also to help change the initial agenda. The results are summarized in Figure 7.

Figure 7: Election results summarized



Notes: Soc. = Society; Eth. = Ethics; Eco. = Economy; Ind. = Independence

Conclusion

During the 2014 Québec Election, the gamble made by the PQ did not pay off well. While being in power before calling the election, the PQ lost to the PLQ, which won a majority government a month later. In this article, discussions held on Twitter regarding three hashtags used during the campaign (#assnat, #polqc, and #qc2014) were collected and analyzed. After scrapping 670,000 messages, the goal of the article was to understand how political parties were perceived during the electoral campaign by Twitter users.

While the incumbent government pushed forward the topic of "Independence" at the start of the campaign, it did not last too long and was surpassed by other events during the campaign, especially discussions about "Economy" and "Society," which were put forward by other parties. This evolution in association between four main topics (Independence, Economy, Society, Ethics) and the four main parties (PQ, PLQ, QS, CAQ) is the main contribution of this article. When leading in terms of mentions, each party was quantitatively associated with a different topic, and this association evolved during a campaign that has been paced by two televised debates.

A potential lesson is that the incumbent advantage plays at the beginning of the campaign, but can also become a curse toward the end. Parties need to anticipate what will be the main topic right before election day, and not so much at the beginning of the campaign. In terms of political strategy, opposition parties to the incumbent government should not fall into the trap of spending time on the incumbent agenda.

This article helped characterize which topic each party was associated with during the last month of the election. The results could be used to implement a framework to assess the perception of the political parties on social media. In the Québec context, this article provides information on a still-limited research area (social media in Québec politics) within a growing research field (politics and social media). Concerning political parties, such methodology may be useful to gauge their political propositions and how Twitter users are responding to it. For polling agencies, such a framework would provide additional information to traditional polling methods.

As mentioned in the literature review, limitations do exist such as the pitfall of using direct social media information as a substitute for voting intentions (hence having sample biases). Further works should take into account the dynamics of Twitter interactions (i.e., who are the most influential individuals concerning political discussions?) or topic differences between types of individuals (do age or gender influence the type of discussions or associations?). Finally, a growing literature on political bots (automated accounts) is emerging, and should be kept in mind for the next studies on elections, such as the one in 2018 in Québec.

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