Lying About Lying on Social Media: A Case Study of the 2019 Canadian Elections

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Abstract. This paper analyzes a new social media phenomenon in which users are lying about not being bots or about real news being fake news. Twitter data were collected throughout the 2019 Canadian federal election cycle, and we investigated the use of the #FakeNews and #NotABot hashtags. Twitter users connected the #FakeNews hashtag more often to mainstream news sources and reporters rather than actual fake news sites, often as a way to discredit certain reporters or viewpoints. We also found that users of the #NotABot hashtag were no more likely to be human than other users participating in political discourse in our data set. Bots that attempt to pass as human have been reportedly used to amplify misinformation campaigns in the past. This new type of online defensive strategy shows how these campaigns continue to evolve and illustrates how they may be run in the future.

Keywords: Social Cybersecurity · Social Media Analytics · Canada.

1 Introduction

Since the 2016 U.S. presidential election, there has been a great deal of international concern that Russia and other countries are trying to increase political division and spread disinformation in Western democratic nations [2]. Several studies over the last few years have characterized these misinformation campaigns and analyzed their potential effects on political discourse [2, 9]. Many others have focused on improved detection of bots on social media platforms [3] or improved automatic detection of potentially false or misleading news [8, 11]. As detection has improved, we have seen these campaigns continue to evolve. Over the last few years, we have witnessed a new type of phenomenon emerge: lying about lying as a way to provide cover for these campaigns. In this paper, we will characterize the users and targets of the #FakeNews and #NotABot hashtags as they were used during the 2019 Canadian election.

Over the course of the Canadian election cycle, journalists reported on various misinformation campaigns they discovered. In particular, the *National Observer* described the response to the #TrudeauMustGo hashtag with the amplifying #NotABot hashtag. The #NotABot wave was used to boost the #TrudeauMustGo message and produced a large spike in both hashtags in July 2019. This event raised concerns over a new wave of disinformation, as the journalists

feared that the #NotABot hashtag was potentially being used in an inauthentic manner and itself was a form of disinformation [12]. Additionally, as the term "fake news" has caught on in recent years as a way to expose potentially false or misleading news stories, both malicious actors and regular people have started co-opting the term as a way to discredit true news stories and political opponents [14]. Users that are falsely claiming that they are #NotABot or that a real news story is #FakeNews are using these claims as a type of defense, which illustrates a potential playbook for future misinformation campaigns.

2 Related Work

Social cybersecurity is an emerging interdisciplinary field that focuses on how information and network maneuvers on social media can change human behavior and opinions. This field will affect the national security and democratic foundations of our own country as well as of other open societies [4, 6, 7]. Adversaries use various maneuvers to manipulate social network structure by connecting or breaking up groups. In addition, they manipulate the information on networks by spreading falsehoods and polarizing information or by promoting certain groups and individuals. Bots are used to increase the effectiveness of campaigns' messages in the hope of reaching a larger or more connected audience [7].

Previous research has been conducted in the wake of foreign interference in the 2016 U.S. presidential election to characterize these campaigns and attempt to measure their impacts [4, 2, 9]. Other studies have focused on improved detection of bots on social media platforms [3] or improved automatic detection of potentially false or misleading news [8, 11]. While anecdotally polarization in the US has increased, it is difficult to quantify the precise impact of Russian disinformation campaigns on the 2016 election. Bail et al. found that those most likely to interact with the Russian Internet Research Agency's bot accounts were already highly engaged and polarized users and that it did not significantly change their levels of polarization [2]. Grinberg et al. found that older and more conservative users were more likely to be engaged with fake news but that the overall engagement level is low and highly concentrated [9]. However, it is still unclear how these campaigns impacted voting and other offline behaviors, which is the largest concern for democratic nations.

Consequently, Canada spent the three years since 2016 planning on how to safeguard their 2019 elections [13]. Wang et al. developed a method to identify "polluting groups" in the Canadian election Twitter space, finding that those users they flagged were four times more likely to be suspended over the course of the election cycle [15]. In addition, we have started to see an online reaction to misinformation with users calling out stories or URLs as "fake news". Ribeiro et al., however, found that users were more likely to slap the "fake news" label onto something they disagreed with politically rather than actually calling out false content [14]. Some users during the Canadian election cycle also started falsely claiming that they are #NotABot when amplifying potential misinformation

campaigns as a way to provide cover for those campaigns [12]. In this paper, we investigate these new defenses of misinformation.

3 Methods

3.1 Data

We analyzed a Twitter data set collected between 20 July 2019 and 6 November 2019 composed of 16,784,400 tweets written by 1,303,761 accounts using 137,419 hashtags. The data were collected by streaming tweets matching a set of search terms that were supplemented as the political environment developed. The final list of terms is shown in Table 1. This data set is not necessarily representative of all Twitter activity surrounding the 2019 Canadian election.

2019 Canadian Election Twitter Search Terms
#TrudeauMustGo, TeamTrudeau, trudeau, #Election2019, #elxn43, #chooseforward, #onpoli, #ItsOurVote, #lpc, #ndp, #cpc, #gpc, #NotAbot, #cdnpoli, #ButtsMustGo, #LavScam, #LiberalsMustGo, BlocQuebecois, #blocqc, cccr2019, #NoTMX, #TMX, #TransMountain, scheer, dougford, fordcutshurt, fordisfailing

Table 1: The list of search terms used to gather the Twitter data set on the 2019 Canadian election.

Two groups of hashtags were identified for further study. The first group consists of hashtags used to call out supposed misinformation. This group contains all hashtags that included both the words “fake” and “news”. The second group consists of hashtags used to allege that an account is not run by a bot. For this group, any hashtag containing both the words “not” and “bot” were considered. Table 2 lists the most popular hashtags in these two groups.

Fake-News Hashtags		Not-A-Bot Hashtags	
Hashtag	Number of Tweets	Hashtag	Number of Tweets
#fakenews	9,741	#notabot	45,605
#fakenewsmedia	3,287	#iamnotabot	921
#fakenewscbc	70	#imnotabot	142
#fakenewsandy	62	#teamnotabot	62
#cbcisfakenews	59	#stillnotabot	53

Table 2: The most used hashtags included in the fake-news and not-a-bot groups.

3.2 Bot Identification

We augmented our Twitter data with additional information on the type of account and on the probability that an account was run by a bot. We made use of the bot probability scores computed on our data by the tier-one BotHunter algorithm developed by Beskow and Carley [3]. This system was created by training a random forest regressor on labeled data. The BotHunter algorithm takes into

consideration both account and tweet information to determine the probability that a user is a bot. Attributes that the algorithm considers include user attributes (like screen name length and number of tweets), network attributes (including number of friends and followers), the content of a tweet, and general timing of tweets (including account age and the average number of tweets per day). The output of the algorithm is a probability value, not a classification. We used various probability thresholds throughout our work, ranging from 0.6 to 0.8. A lower threshold would include more accounts, but it might also have included some accounts that actually belong to humans. Higher thresholds would have been more conservative but may not have captured all the bots in the network.

Many of the accounts predicted by the BotHunter algorithm as likely being bots may be accounts associated with various legitimate organizational accounts, such as those of news sources and government agencies. These accounts often exhibit behavior similar to that of bots, such as sending a high volume of tweets. Therefore, we used Huang and Carley's classification system to remove these kinds of accounts. This algorithm is a hierarchical self-attention neural network for Twitter user role classification, and it outperforms many standard baselines. The algorithm classifies each user into one of seven classes: news media, news reporter, government official, celebrity, company, sports, and normal. [10]. Throughout this study, when seeking to detect bots at different BotHunter thresholds, we subsequently disregarded any detected bots that were not also deemed as normal accounts by Huang and Carley's algorithm.

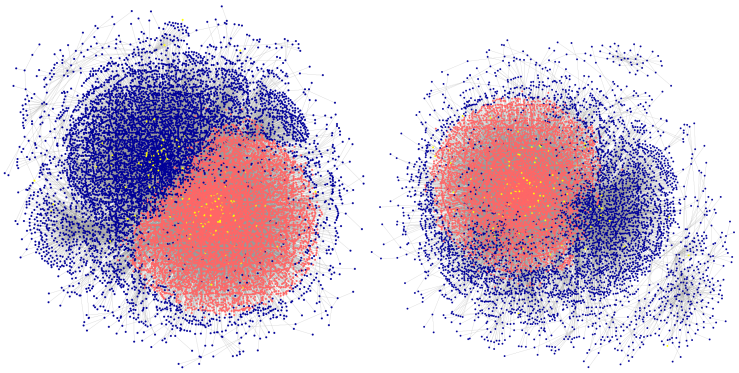
3.3 Detecting Targets of #FakeNews Accusations

Each tweet using a fake-news hashtag needed to be assigned a likely target to evaluate who was being called out as spreading misinformation. For each tweet, the set of targets was assigned as the union of (a) the users mentioned in the tweet who are potential targets, (b) the author of the original tweet if the given tweet is a reply to a tweet made by a potential target, (c) the Web sites linked to in the tweet if the sites belonged to a potential target, and (d) the specific targets of fake-news hashtags used in the tweet (if any). Links in tweets were associated with targets by un-shortening URLs and manually tying their domains to potential targets. Similarly, some hashtags were associated with potential targets (e.g., the hashtag "#fakenewscbc" was noted as targeting the Canadian Broadcasting Corporation). For this process, a potential target was defined as including political organizations, entities purporting to be news agencies, politicians, and individuals claiming to be reporters.

This method for detecting the likely targets of a tweet using a fake-news hashtag is limited. For example, there are cases in which a Twitter user may reply to a user of the same political inclination and use a fake-news hashtag to call out something that is not mentioned in the conversation [14]. Our method is not designed to detect such cases.

4 Results and Analysis

4.1 Network Structure



(a) Users of fake-news hashtags. (b) Users of not-a-bot hashtags.

Fig. 1: The reciprocal communication networks for the users of fake-news hashtags and the users of not-a-bot hashtags. Each has been divided into two groups colored in red and blue using CONCOR. Accounts with a bot score higher than 0.7 that were not filtered out by Huang's algorithm have been colored yellow.

We analyzed the structure of the reciprocal communication networks for each of the two groups of hashtags we examined. The reciprocal communication network is formed by tying two users together if they both have a communication tie to the other (such as user A mentioning user B and user B retweeting user A). Upon visual inspection, both of the reciprocal communication networks appeared to contain two large groups of users. Figure 1a shows the reciprocal communication network for the users of fake-news hashtags, and Figure 1b shows the equivalent network for the users of not-a-bot hashtags.

To evaluate the difference between these clusters, we isolated the groups using CONCOR [5], calculated the number of times every hashtag was used in each group, and normalized the count by the total number of hashtag uses in the group. Of particular interest were the usage frequencies for hashtags that demonstrate clear partisan stances, such as "#trudeaumustgo" and "#scheerlies". Table 3 shows the usage frequencies for five liberal-leaning and five conservative-leaning hashtags across the two groups in each of the two networks studied. For each of the hashtags, it is clear that one group uses conservative-leaning hashtags more frequently than the other and that the other group uses liberal-leaning hashtags more frequently than the first group. It therefore seems that both the reciprocal communication networks for fake-news hashtag users and not-a-bot hashtag users are split on a partisan basis.

		Usage by #FakeNews Users		Usage by #NotABot Users	
		Red (%)	Blue (%)	Red (%)	Blue (%)
Conservative	#trudeaumustgo	20.93	0.81	21.67	1.52
	#scheer4pm	1.86	0.03	1.93	0.05
	#trudeauworstpm	1.34	0.05	1.34	0.08
	#liberalsmustgo	1.19	0.02	1.25	0.03
	#trudeaumustresign	1.17	0.03	1.19	0.07
Liberal	#istandwithtrudeau	0.08	0.64	0.11	0.65
	#teamtrudeau	0.27	0.61	0.29	0.66
	#scheerlies	0.02	0.45	0.02	0.48
	#scheerdisaster	0.02	0.42	0.02	0.45
	#neverscheer	0.02	0.40	0.03	0.35

Table 3: The frequency of use for popular liberal-leaning and conservative-leaning hashtags in the CONCOR groups for the reciprocal communication networks of fake-news hashtag users and not-a-bot hashtag users. Usage frequency was calculated as the number of tweets using a hashtag divided by the total number of hashtag uses in that CONCOR group.

4.2 #FakeNews Analysis

For the fake-news hashtags, we were most interested in seeing which types of news agencies or people are targeted the most. We also wanted to find out which types of targets Twitter bots are most interested in calling out as misinformation. Figure 2 shows a bar plot of the number of tweets that were associated with an entity for the ten most-targeted entities. An added bar shows the number of times all other entities were targeted. Each bar also shows the portion of those tweets that came from bots detected using three different thresholds: 0.6, 0.7, and 0.8. Note that, as was mentioned previously, after using BotHunter to detect bots at a given threshold, we disregarded bots that were not deemed as normal by Huang's classification algorithm [10].

As can be seen in Figure 2, the most targeted entity was the Canadian Broadcasting Corporation (CBC). The second-most targeted entity was Amy McPherson, who *HuffPost* describes as a freelance journalist based in Ontario [1]. The plot shows the most commonly targeted entities to mainly be important Canadian news sources like the CBC, CTV News, the Toronto Star, and Global News as well as prominent Canadian politicians like Andrew Scheer, Justin Trudeau, Catherine McKenna, and Chrystia Freeland.

4.3 #NotABot Analysis

We sought to determine whether the proportion of bots using not-a-bot hashtags was different from the proportion of bots in the overall Canadian data. As shown in Figure 3, the difference in the percentage of bots is negligible between the population of not-a-bot hashtag users and the rest of the population when looking at just the BotHunter scores. We ran a two-sample proportion test of

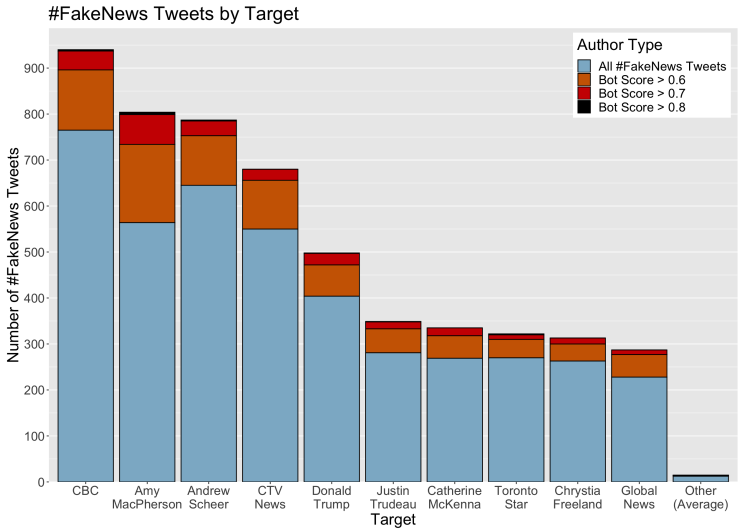


Fig. 2: A plot showing how many times an entity was targeted using a fake-news hashtag by normal users and bots detected with various BotHunter thresholds.

equality using bot probability thresholds of 0.6, 0.7, and 0.8 (shown in Table 4). None of the tests had statistically significant p-values, indicating that we would not reject the null hypothesis that these two proportions are equal. After removing "official" bots using Huang's algorithm [10], we found that the proportion of bots was higher in the #NotABot group than in the general Canadian user group. These differences were statistically significant with p-values near zero.

	All Bots			All Non-Official Bots		
Bot Threshold	#NotABot	Canada	P-Value	#NotABot	Canada	P-Value
≥ 0.60	16.21%	15.97%	0.545	14.38%	9.59%	2.2e-16
≥ 0.70	5.10%	5.25%	0.540	4.38%	3.00%	1.925e-14
≥ 0.80	1.47%	1.70%	0.104	1.22%	0.87%	0.00043

Table 4: The percentage of users in the #NotABot group and the rest of the Canadian users that are over the three different bot score thresholds. The p-value is associated with the 2-sample proportion test for equality.

We additionally ran a Mann-Whitney U test, which is a non-parametric test for the null hypothesis that the distribution of two populations is the same. The test resulted in a highly significant p-value, which indicates that the distribution of bot scores is statistically significantly different between users of not-a-bot hashtags and the rest of the Canadian data. Upon closer inspection, the difference appears small, as the difference in the mean bot score for the two groups is less than 2%. However, these results are in line with the higher percentage of non-

official bots found in the #NotABot group overall. Table 5 shows the summary statistics for the bot scores in the #NotABot group and the other data.

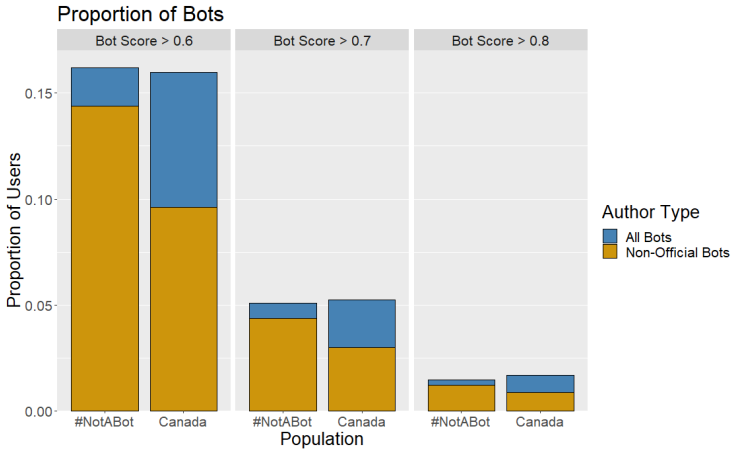


Fig. 3: A bar plot showing the percentage of users in the #NotABot dataset and the general Canadian dataset that were detected as bots at various thresholds.

	Minimum	First Quartile	Median	Mean	Third Quartile	Maximum
#NotABot Users	2.66%	29.20%	42.74%	42.56%	55.01%	99.80%
Canadian Users	1.01%	27.00%	40.99%	41.20%	54.49%	100.00%

Table 5: The summary statistics for the bot scores in the #NotABot group and the rest of the Canadian users.

5 Discussion

Overall, we found that large and established news agencies are the most associated with fake-news hashtags, indicating that they are frequently targeted with accusations of spreading misinformation. Additionally, we find that using not-a-bot hashtags is not a reliable signal for indicating that one is not, in fact, a bot. After accounting for official bots (government agencies, news reporters, politicians etc.), the proportion of bots is higher in the population using not-a-bot hashtags than in those that do not use those hashtags. Both the network of fake-news hashtag users and the network of not-a-bot hashtag users show a strong partisan divide in their members' usage of other hashtags. In both of these networks, many of these users are attempting to deceive others on what is actually false news and on whether or not they are a bot. It is also clear that accusations calling something fake news come from both liberal-leaning and conservative-leaning groups of users.

6 Conclusion & Future Work

Our work describes some new tactics being used by malicious actors hoping to influence an election. Mainstream news organizations are being labeled as "fake news" at higher rates than news sites that are either fake, satirical, or otherwise not held to high journalistic standards. Additionally, during the Canadian election, a Twitter user claiming not to be a bot was just as likely (if not more likely) to be a bot as anyone else on the platform discussing Canadian politics. Therefore, the #NotABot hashtag is not a good indicator for a user trying to prove that they are a human. These results show that users claiming that they are telling the truth on social media are just as likely to be lying as general users.

Future research will likely build on this initial set of hashtags to investigate how lying about lying on social media may evolve over time and may be used differently in other countries. Malicious actors may continue building on these techniques to discredit anyone who calls out their misinformation campaigns, or these hashtags may be replaced by other hashtags or techniques in the future. Discovering how these hashtags evolve is a challenging problem that itself requires more study.

Additionally, these hashtags have been recently used in a variety of non-political contexts, supposedly as a way to call out false news or to claim that the user themselves is not a bot. Examining how these hashtags are used differently in various contexts could be helpful for understanding these phenomena. Perhaps more importantly, a useful avenue for future research would be to investigate how much of an impact these hashtags are having on human behavior and opinions. It is not clear whether users on these platforms believe someone who makes a claim of not being a bot. While our research shows that people using these hashtags are often lying, the general public may not be aware of this.

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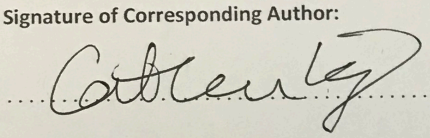

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