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Hit the streets! Social Media in 2017 Russian protest actions

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Abstract

Social media have been instrumental in organizing and coordinating mass protests in different parts of the world and there is evidence of their impact in Russia. As the sole accessible source of communication for the non-systemic opposition and an important instrument for content domination for the Kremlin, they play a rather unique role in the domestic political process. Russian online political community is split in several consistent, homophilous and quite segregated groups, among which the 'non-systemic opposition' and the pro-Kremlin ones are the most antagonistic and the most actively responding to the political events and issues. While quite a large number of political transformation occurred between 2011-12 and 2017 protests, none led to active political demonstrations. Yet the release of the investigative video alleging corruption by Dmitry Medvedev, caused profound grievances for large groups of the population. On the basis of March 26 and June 12, 2017 protests in Russia this paper seeks to explain why only highly resonant political events increase the political significance of Twitter. Based on our previous research, we hypothesize that "echo chambers" substantially accentuate opinion leaders' posts to publicly viral issues, creating fertile soil for mobilization.

1 Introduction, internet as a politically contested area in Russia

In 2017 Russia faced a new wave of street protests, targeted particularly against the current ruling elite. On March 26 - the anniversary of Putin's first victory in the 2000 elections - thousands of people crowded the streets of almost hundred cities in Russia. In at least eleven of them the number of participants exceeded 2000, with Moscow and St. Petersburg topping the list with around 25,000 and 10,000 protesters respectively. The total number of participants varied between forty and ninety thousand. The protest actions were repeated on June 12 - the Russia (independence) Day - with almost a hundred thousand participants in more than hundred and fifty cities protested against corruption in the upper echelons of the Russian state. Both protests ended in mass detentions (more than 1500 protesters).

These were the first significant acts of public discontent after the 2011/12 mass protests. Despite similarities between the 2011/12 and 2017 events, they differ substantially from one another. First of all, the earlier events were much more populous and their magnitude reshaped the political landscape and the disposition of forces in the opposition camp. Secondly, they were substantially different in terms of their causes: if the early protests were inspired by unconcealed facts of electoral fraud and reasonable doubts about the fairness of the final results, the 2017 protests were aimed against corruption. Whereas the former were inspired by the events that occur in real life, the motive for the latter was purely virtual. On March 2, 2017 the Russian Anti-Corruption Foundation released an investigation video of Alexey Navalny titled "He is not Dimon for you", in which he provided evidence of corruption of by Prime-Minister Dmitry Medvedev. The rather predictable response of government officials prompted Navalny to call for the public protest.

Taking all this into account, the 2017 protests can be regarded as purely social media driven events. The protests were inspired by social media information, as Navalny's investigation was published on the most popular video hosting site, Youtube. The call for protest was also conveyed through social media as well as further organization and coordination of participants' activities. The comparatively lower magnitude and impact of the 2017 events in comparison to the earlier protests can be explained by both: the nature of the event (corruption is a rather commonplace issue to urgently radicalise public opinion) as well as the overall different domestic and foreign political situation in Russia, as the current leader boasts broad political support of the people even in times of economic crisis. Therefore, the 2017 protests require close attention and detailed study as more refined cases of purely social media / internet driven political events.

Social media have been instrumental in orchestrating protest in many different countries, having formed a whole new line of research in political science and sociology. The culmination of attention to their role in the political process began with the Arab Spring (2010-2012), following by the Occupy Movement (2011-2012) and protests in Russia (2011-2012) and Ukraine (2013-2014). During these events, protesters utilized social media platforms to disseminate information about the event (Tufekci & Wilson, 2012; Nikiporets-Takigawa, 2013; Tremayne, 2014; Theocharis, Lowe, Van Deth, & García-Albacete, 2015), as well as to promptly coordinate the actions of protesters (Steinert-Threlkeld, Mocanu, Vespignani, & Fowler, 2015: Onuch. 2015a). In all the above mentioned cases social media were an important and independent variable, significantly guiding the scenarios of further development of the situation. Their importance should supposedly increase in the context of authoritarian regimes and hybrid democracies. Early normative approaches have gone as far as to assume the imperative role of new social media in the democratization and undermining of authoritarianism (Shirky, 2011; Tufekci & Wilson, 2012). These views were confronted by sceptics, who questioned the capacity of social media to substantially challenge the status quo and referred to the capacity of the authoritarian elites to 'learn on the go' and efficiently quash the negative effects of social media (Morozov, 2012; Gunitsky, 2015; Tufekci, 2017). At the same time, scholars also reflected a complex role of social media in authoritarian political process, revealing mixed, situational and limited impact, which depends on the specificities of platforms (Reuter & Szakonvi, 2015).

Although, scholars' opinions are split in their reviews of social media impact on politics, they nevertheless acknowledge that various platforms have changed the ways the communication is performed. Often, the impact is perceived negatively, as social media have been studied and, in the aftermath, actively used in disruptive tactics and ways to misinform and bias on-line audiences (Tucker, 2018). At the same time, social media provide immediate access to a vast array of raw data that allows researchers to overcome biases associated with traditional methods of qualitative and quantitative analysis. Among the plethora of methods and approaches this research focuses on the advantages of Social Network Analysis techniques.

This research utilizes the opportunity to explore the phenomenon of a purely Internet-orchestrated protest in Russia. It was incentivized by on-line information, then fully organized and conducted via the Internet and, particularly, social media. The overall magnitude of people's reaction to the release of the investigative video against Dmitry Medvedev on Youtube appeared to be quite unpredictable for politicians and commentators, sparking harsh criticism from the ruling elite. Particularly, this can be illustrated by the fact that the proportion of arrested and detained protesters to the total number of those who hit the streets in March and June was higher that in 2011-2012. The events also implicitly demonstrated that the Russian state had not enjoyed the overall control over the Russian cyber-space, allowing the protests to occur, despite the absence of permission from the authorities to conduct these events, as well as no coverage in traditional media. Therefore, it seems like an Internet-mediated political process does indeed take place in Russia, allowing the relatively open and free existence of the alternative and opposition discourses. Analyzing users' interactions on Twitter, this research paper attempts to contribute to the analysis of how on-line political discussions were converted into off-line political actions (protests) (Steinert-Threlkeld et al., 2015).

It shall also be stated that political discussions on Russian Twitter, fail to dominate mainstream conversations. At the same time they are marked by a solid and stable core of participants, who are



Figure 1: Overall activity in Russian Twitter, daily total of number of tweets and retweets

consistently and vividly responding to current socio-political events and issues. As Figure 1 demonstrates, among politically relevant events, reflected in Twitter blogs, only the protests resulted in significant spikes of on-line discussions. At the same time even such high-profile events failed to make bursts that substantially exceed one standard deviation from the average rate of daily discussions. The majority of spikes on the figure were instead driven by non-political events. This factor determines that high nominal politicization of Russian Twitter (i.e. the prevalence of political Twitter accounts among the top most followed handles in the Russian segment of the platform, which are much higher than in other countries), which we discussed elsewhere (Zherebtsov & Goussev, 2017b), does not contribute to the actual politicization of discussions.

These considerations posit an interesting paradox: even the most politically significant events, like nation-wide protest actions only moderately influence discussions on political platforms. At the same time, their influence is sufficient to inspire, organize and coordinate off-line protest. Therefore, focusing on this paradox, we attempt to answer the research question of **what are the specific features of on-line political discussions on Twitter that they are able to encourage people to protest**. In this discussion we acknowledge the natural limitations of the project, related to the insufficient data as well as robust methodology to detect and depict the 'tipping point' when a 'the critical mass' of on-line conversations and vocality of mainstream arguments motivate people to express their discordance in the real world.

At the same time this research is based on the findings from our previous research projects on the politics of social media in Russia. These studies determine the conceptual boundaries and methodology that helps answer the posited research question. *Firstly*, we established elsewhere that two prominent antagonistic communities - the opposition and the pro-Kremlin - dominate political conversation in Russia. These communities appear to be quite stable over time and over a variety of political topics and issues. They are distinguished by a rather original structure and a system of intra-group relations that differ from internationally recognized trends. Political communities in Russian Twitter are not only stable, but also quite segregated from each other. Most connections between users occur with members of their own group. Secondly, a relatively high level of segregation, depicted by the modularity index means that most communication occurs within the communities. This establishes a high potential for the "echo chamber" effect to enforce certain messages that are consonant with the mainstream ideology of the community. Thirdly, traditional public opinion leaders, such as politicians and pundits are more influential and play a greater role in the diffusion of information, whereas, it is commonly accepted that mid-level influencers are the key drivers of information in the communities (Bakshy, Karrer, & Adamic, 2009). Leaders interconnect both groups, effectively becoming mainstream channels of inter-group communication. In the Russian case, on-line political communication is more structurally and hierarchically organized, thus, securing the efficiency of traditional media-management techniques. At the same time, top-level politicians and public officials are less influential than in the majority of democratic countries. Their official accounts are being developed and maintain as additional channels of official information dissemination without efforts to engage with the public. Yet, some politicians and most pundits from both, the opposition and the pro-government communities utilize their social media accounts pro-actively in order to enhance ties with and influence their audiences. Finally, our studies also concluded that internet, in general, and Russian social media, in particular, are a contested area, where the Kremlin attempts to ensure its domination similar to off-line space, but has been destined to use more agile methods. Given the highly decentralized nature of interpersonal ties in digital social networks, traditional mechanisms of control cannot be used. Therefore, the Kremlin has to resort to competitive strategies, attempting to outperform opposition forces. We depicted active intervention by the Kremlin (or the state) in on-line discussions with three dominating objectives: (a) to mobilize supporters; (b) to dominate the content of those discussions in a competitive on-line environment, by producing and promoting its own and alternative narrative and political agenda; and (c) to disrupt on-going unfavourable and potentially detrimental political conversations by means of targeting influencers from the opposition and flooding the discussions, thus diffusing the narrative and complicating the search and navigation for information for common users.

The given considerations split the research question into four parts, which are being discussed in this paper. We focus on:

- establishing peculiarities of conversations in the opposition and the pro-Kremlin groups, as the specificities of the content as well as its dissemination pattern contribute to better understanding of users' motives to protest;
- reviewing and depicting the role of opinion leaders in both communities and during all stages from motivation and mobilization to coordination of protests;
- analyzing the "echo chamber" effect and its impact on mobilizing the protest;
- determining factors that made inefficient the disruptive tactics of the pro-Kremlin community, not allowing them to prevent the organization of protest actions.

Further operationalization of research questions determines the following specific tasks, needed to be accomplished. (1) We identify and distinguish communities, actively involved in discussing protests from the samples of Twitter data, collected shortly before, during, and after the events. Particular measurements of their homophily and modularity will determine the general appropriateness of the main hypothesis that users' polarization leads to the segregation of content and is the key background factor mainly determining the potential for mobilization. (2) In the samples we identify key influencers, that led discussions and demonstrated the ability to set and control the agenda. We use re-tweeting patters as key markers of leaders' impact, as this indicator is overall consonant with our hypothesized expectation that only impactful information will be reused and further shared during highly resonant events. The particular goal is to identify the types of information that dominate discussions during the active phases of the protest, distinguishing between messages aimed at coordinating (thus, serving the trivial function of social media during protests) and mobilize supporters. The latter would mean that Twitter alongside other platform has

Sample	Date range	Sample size
The release of the investigative documentary film "He Is Not Dimon to You" about alleged corruption by Dmitry Medvedev, produced by Alexei Navalny's Anti-Corruption Foundation	Mar 1-4, 2017	19.4K tweets / 39.7K retweets / 21.4K users
Public protests in Russia against corruption, inspired by the "He Is Not Dimon to You" documentary	Mar 25-Apr 1, 2017	165K tweets / 374K retweets / 94.5K users
Public protests in Russia against corruption and their aftermath (massive arrests)	Jun 12-21, 2017	$\begin{array}{c} 170.7 \mathrm{K} \ \mathrm{tweets} \ / \\ 250.7 \mathrm{K} \ \mathrm{retweets} \ / \\ 88.4 \mathrm{K} \ \mathrm{users} \end{array}$
Overall sample of Russian language Twitter	March 21-August 4, 2017	4.11M tweets / 1.21M retweets / 821K users

a more stable and institutional role during such events. (3) Given the level of segregation of the overall network and the specific role of leaders in the Russian protest, we will test whether their messages are being 'naturally' reinforced in specific groups, thus creating the "echo chamber" effect, which has already been proven to contribute to opinion polarization and thus mobilization for active action. (4) Expanding from this, we will specifically focus on activities in the pro-government group, given that their established practice of disseminating disruptive information appeared ineffective in the case of protest.

2 Methodology, Research Design, & Data

Data on the public reaction of three specific events related to the 2017 summer protests are captured: the original release of the "He is Not Dimon to You" video on YouTube by Navalny; the March 26th; as well as the June 12th protests, each filtered to keywords pertinent to the event (Table 1). An unfiltered sample of all Russian language tweets is also collected for comparative evaluation of the impact of the events. The Twitter Streaming and REST (Search) Application Programming Interfaces (APIs) are used to collect these samples. The GET friends feature of the REST API is also utilized to collect the follower relationships in all captured samples. A total of 865K unique users and 6.3M unique tweets and retweets were captured.

To identify communities in the captured sample of users, the research focuses on the follower relationships present between them. Researchers have found, both around the world (Halberstam & Knight, 2016; Myers & Leskovec, 2014; Kwak, Lee, Park, & Moon, 2010; Colleoni, Rozza, & Arvidsson, 2014) and in Russia (Kelly et al., 2012; Zherebtsov & Goussev, 2017a), that Twitter users choose who to follow based on close alignment and political preference, related or similar personal interest, and general informativeness. While psychologically explained as users' choosing to follow, or listen, to others who share information that minimizes their cognitive dissonance (Festinger, 1954), this results in the self-segregation of users into communities of like-minded individuals, often sharing similar political ideology. While some contrasting opinions and information can seep in, such as from key influencers important to the whole network, overall a resultant network structure emerges of several segregated communities or "echo chambers" where users mostly encounter similar, and hence reinforcing, opinions.

Communities are detected with the *InfoMap* method (Rosvall, Axelsson, & Bergstrom, 2009), a well performing algorithm (Lancichinetti & Fortunato, 2009) that simulates dissemination of information through directional links, categorizing users as one community if information shows high tendency of staying within the group, conceptually analogous to the follow link on Twitter. To support analysis of the network and the identified communities, the force directed graph layout ForceAtlas2 (Jacomy, Venturini, Heymann, & Bastian, 2014) is utilized, which presents network relationships by visually clustering well connected users into groups and allows the study of resultant user clusters. Finally, to assess the polarization and segregation of the network into isolated communities, the modularity statistic is calculated, a commonly used indicator to provide insight on the strength of the division of a network into modules, ranging from lack of structure at -1/2 to perfect segregation at 1.

In part due to modularity as a metric by itself not being sufficient to prove polarization and the presence of "echo chambers" (Guerra, Meira Jr, Cardie, & Kleinberg, 2013), several qualitative and text analysis methods are utilized. As as retweets and hashtags have been regularly used as a means to spread information, coordinate, and mobilize during major protest actions around the world (Penney & Dadas, 2014), both are adopted to shed light on the scale of these activities during the Russian protests. The latter is particularly useful as an indicator of the ability of specific users to spread resonant information, during each event hence identifying who the key 'leaders' of the protest are. Both indicators together also reveal how the two main political communities reacted differently to each protest, identifying the scale of the "echo chambers" present, and its impact on how the events unfolded.

Network structure and Twitter metadata analysis is also supported by an evaluation of the natural text shared by users in the main political communities, as lexical contexts are expected to vary between polarized groups, especially during major coordinated protest events. To quantify the difference between the corpora of text shared in the pro-government and opposition communities, we adopt the tf-idf transformation method together with cosine similarity, two common Natural Language Processing methods widely utilized in Computational Linguistics and becoming increasingly adopted in Political Science research as well (Grimmer & Stewart, 2013; Stier, Bleier, Lietz, & Strohmaier, 2018). Tf-idf transforms a document, or in our case a collection of tweets, into a vector, with cosine similarity evaluating the cosine degree between two vectors, hence returning a standardized indicator of the similarity of two documents based on the words they use (ranging from 1 where the is 100% alignment and -1 where every attribute shared is different). To statistically evaluate the similarity of text shared between the two main communities, as well as evaluate whether the tweets and retweets shared by each community differ, we grouped all the content shared by each community by hourly chunks, pre-processed them to remove Twitter metadata and stop words,¹ and determined the cosine similarity over the timeline of the protest events. While this *Bag of Words* model looses the detail of word order and hence a large amount of meaning in the specific sub-topics and sentiment discussed, it provides an effective metric for the difference in the type and variety of words expressed between two groups. Finally, an ANOVA test was run on the observed time series of cosine similarity to evaluate whether the content shared by the political communities as tweets and retweets was statistically different to evaluate whether coordination of information differed from what is natively shared by users.

¹Pre-processing is done to convert a tweet full of Twitter particularities to be as close as possible to the quality of edited text, as common tweet metadata, such as 'RT @user', or hashtags, or urls, are not informative to actual discussions. As tf-idf is a bag-of-words model, stop words, or common linguistic features that have no meaning to the actual topic of discussion but act as glue for proper grammar and style in text, such as articles (*and, the, or,* etc), are similarly removed. Lemmatization, or the converting of words to their roots, was evaluated and found to not have any noticeable affect on the resulting patterns.

Community	Number	Number	Number	Av. num. of	Av. num. of
	of users	of tweets	of	tweets per	retweets per
			retweets	account	account
Pro-Government	34,613	70,298	124,575	2.03	3.60
	(36.6%)	(42.7%)	(33.3%)		
Opposition	$11,\!240$	$23,\!380$	$126,\!558$	2.08	11.26
	(11.9%)	(14.2%)	(33.8%)		
Youth	$3,\!971$	$2,\!317$	$6,\!625$	0.58	1.67
	(4.2%)	(1.4%)	(1.8%)		
All others	44,697	$68,\!596$	$116,\!263$	1.53	2.60
	(47.3%)	(41.7%)	(31.1%)		
Total	$94,\!521$	$164,\!591$	$374,\!021$	1.74	3.96

Table 2: Activity during March 26th Public protests, breakdown by community

Note, the number of users counts the users who tweet or retweet, hence the average tweets per user for the Youth community is below 1, indicating that a large quantity of users simply retweeted others' content but did not author their own tweets.

3 Findings & Discussion

3.1 "Echo chambers" and polarization

While off-line, the 2017 summer street protests were the first significant acts of public discontent since 2011/12, on-line evidence does not point towards high polarization or a schism inside society. Instead, it reveals a stable and moderate segregation of politically engaged on-line users into a set of communities both reacting differently to the protests, consistent with previous findings (Zherebtsov & Goussev, 2017a). In both the March 26th (Figure 5) and June 12th (Figure 6) protest networks, the largest and dominant political community (Tables 2 and 3) revealed pro-Government sentiment, however not consistently. Interestingly, a considerable proportion of users in this community positively viewed the protests and tweeted opinions negative of the scale of corruption in the country, while others dismissed allegations of corruption and the protests outright, revealing that the pro-government community is a collection of individuals partial to the current regime, but not ignorant of its weaknesses. At the same time, patterns of opposition were different between the two events. On March 26th, (Figure 5), one Opposition community is revealed, while on June 12th, (Figure 6), a more central (or Centrist) community participates in discussions, alongside with the traditional Opposition group. Users in the Centrist community do not participate every political discussion in a significant enough quantity to statistically reveal themselves as a separate community, similarly consistent with previous findings (Zherebtsov & Goussev, 2017a, 2017b). Both the Centrist and Opposition communities revealed strong support for the protests and opposition to corruption in the country. Finally, the quantity of young Russians physically participating in both protests was widely noticed by many observers, and is consistent with on-line behaviour, as the Youth community was persistently present in both Twitter discussions.

Polarization between the observed communities was present, however not extreme. Nominally, friendship networks of both protest events revealed moderate polarization, with homophily varying from 0.376 in the March 26th sample, and 0.443 in the June 12th sample. The content shared within each community presented a slightly different picture as users in the pro-Government, Opposition, and Centrist communities used differing language during both events. Specific language and topic markers such as hashtags used varied between the Opposition/Centrist and pro-Government communities (Figure 2). While the most popular hashtag overall (#ДимонОтветит or 'DimonWillAnswer')² was similarly popular in every political

²Many hashtags used a variation on Dimon, a nickname for the first name of Prime Minister Dmitry Medvedev popularized

Community	Number of users	Number of tweets	Number of	Av. num. of tweets per	Av. num. of retweets per
			retweets	account	account
Pro-Government	14,833	$45,\!655$	$79,\!158$	3.08	5.34
	(16.8%)	(26.8%)	(31.6%)		
Opposition	7,439	18,728	50,847	2.52	6.84
	(8.4%)	(11.0%)	(20.3%)		
Centrist	$10,\!440$	29,512	$53,\!471$	2.83	5.12
	(11.8%)	(17.3%)	(21.3%)		
Youth	2,719	2,171	4,361	0.8	1.60
	(3.1%)	(1.3%)	(1.7%)		
All others	52,979	74,262	62,916	1.40	1.19
	(59.9%)	(43.6%)	(25.1%)		
Total	88,410	170,328	250,753	1.93	2.84

Table 3: Activity during June 12th Public protests, breakdown by community

community due to it acting as the main topic of both protest actions, subsequent hashtags were priorities differently by the two sides. The Opposition and Centrist group generally favoured protest and pro-Navalny hashtags (#требуемответов or 'WeDemandAnswers', #Навальный2018 or 'Navalny2018'-specifying the upcoming presidential election), while the Pro-Government group often favoured anti-protest hashtags (#5колонна of '5thColumn', #навальныйдолженсидеть or 'NavalnyMustBeInJail'). Overall patterns of language used also varied between communities, resulting in *cosine similarity* scores almost exclusively below 0.5 (Table 5). During the March 26 protests, average similarity was 0.608 and 0.4901 for tweets and retweets shared between the Opposition and Pro-Government communities, respectfully. During June 12, cosine similarity was even lower, averaging 0.396 and 0.333 between Pro-government and Centrist, and 0.331 and 0.3052 between Pro-Government and Opposition. The quite low indicators, predominantly so for retweets, illustrate the presence of relatively separate discussions occurring between the pro and anti-government communities during both protests events.

This evidences that the "echo chamber" theory applies to Russian Twitter during the two protest, however nuanced to the specificities of Russian politics. Users in either the pro or anti-Kremlin communities have a somewhat interrelated follow relationships and thus have access to content shared within the opposing community. However, users on either side do not demonstrate a preference for cross-community communication, instead pursuing different discussions in their own groups. The two anti-Kremlin communities, the Opposition and Centrist groups, show relatively high similarity in the content the two retweet, demonstrating some congruence in political preferences.

3.2 Leaders influencing the protests

Particular attention was given to the role of leaders in organizing and coordinating the protests. As we found out in Zherebtsov and Goussev (2017a), traditional 'off-line' opinion leaders generally exercise significant impact on the discussions and their content is usually the most circulated in their groups. We also established that in the context of regular on-line discussions, media and parody (entertainment) accounts tend to be more influential regardless of the community. Using the sampled data from both protests, we depicted a slightly different pattern.

by the title of the anti-corruption video released by Aleksey Navalny, "He is not Dimon to you", such as 'HeIsNotDimonToYou', or 'HeIsNotDimonToUs'

Figure 2: Top hashtags, heat-map of differences between the March 26th and June 12th protests between communities

March 26			June 12			
	User_Community			User community		
hashtag	Opposition	Pro-Government	hashtag	Centrist	Opposition	Pro-Government
димонответит	22,956	16,823	12июня	5,115	3,725	1,730
онвамнедимон	1,499	742	требуемответов	2,161	826	226
москва	882	364	димонответит	1,777	1,443	285
26марта	860	929	деньроссии	1,301	929	1,491
медведев	773	945	митинг	953	561	302
оннамнедимон	723	612	навальный	516	276	2,013
питер	632		навальный2018	513		
навальный	585	3,251	димон	384	238	
путин	566	254	онвамнедимон	355		
МИТИНГ	489	1,282	москва	250	588	644
димон	412	318	россия	246	438	688
коррупция	313	266	барнаул	228		
фбк	298		кактус	220		
путинвор	282		язанавального	211		
судпротивнавального	260		news			558
новости	253	961	yandex			249
россия	214	1,162	донбасс			252
navalny		320	лнр			278
news		314	МИНЬОНЫ			252
russia		480	митинги			240
навального		418	новости		352	1,312
навальныйдолженсидеть		243	общество			218
онижедети		202	питер		435	
политика		230	путин			225
полиция		229	сегодня			364
рф		446	тверская			355
хочучитатьвсех		602	украина			326

March 26

The hashtags represent various topics of discussion about the protests, the colours of the heat-map and numbers represent how often a specific hashtag was utilized in ether community. A filter of 150 hashtags was applied, with white blanks representing less than 150 hashtags used by the specific community.

We assumed that during highly resonant events, messages of the most influential user-accounts will also be the most actively re-shared within the communities. Figures 3a and 3b demonstrate top-20 user accounts, whose tweets were most re-tweeted during the protests. Rather unsurprisingly, the opposition community leaders outperformed their pro-Kremlin counterparts. It was expected that the need to lead the the protest would require a more active use of social networks, as the majority of actions were conducted without formal approval from the local authorities. The latter meant that traditional organizational formats as well as media coverage were not available for the protesters.

Messages from personal accounts were among the most re-tweeted during the protest. This pattern slightly differs from the normal leaders activities on Twitter. The overall prevalence of media and parody accounts during less resonant events provides insights on patterns of social media activity as predominantly 'infotainment' platforms. Users tend to share information that not only concords with their own views, but also contains opinionated statements often produced for entertainment purposes. Personal accounts of off-line public opinion leaders rarely produce such content and, therefore, appear to be less influential during volatile political events.

Accounts of associates from Alexey Navalny's Anticorruption Fund-the main initiator of the protests-naturally appeared among the most influential ones. Messages of Navalny's personal accounts outperform all other accounts by a large margin. Alongside them were other leading bloggers as well as influential liberal media outlets. Interestingly enough that personal accounts also dominated among the most re-tweeted pro-Kremlin users. Yet, the messages that they conveyed, were re-shared almost exclusively within their own community, whereas messages of protest leaders demonstrated much wider dissemination patterns. This implicitly speaks in favour of the fact that the opposition community appears to be much more homophilous, increasing the potential impact its top influencers. As the same time, the pro-Kremlin community appeared to be much more diversified and included users whose membership networks allows to associate them with the pro-Kremlin ideology. Yet their attitudes towards the corruption in the higher echelons of power made them support the ideology of the given protests.

Table 4 indicates the impact of leaders on the basis of the degrees of separation metrics. It provides a statistically aggregated average indicator of the capacity of the leader's message to be seen beyond his/her immediate network. Obviously, this parameter can be compensated by the size of the immediate network. For example, in the case of top political bloggers and media accounts the number of followers, or those, immediately exposed to the original tweet may exceed the number of users in a given community. In this case, the degree indicator will be quite low. At the same time, in the case of accounts with small number of followers the indicator evidently demonstrates their impact on the communities. Interestingly enough, among the pro-Kremlin leader accounts, the vast majority of them either did not have statistically sufficient amount of data to validly estimate their degree metric, or their actual influence in the group was equal or near zero, meaning that their influence among the opposing community was literally non-detectable.

The larger presence of pro-Kremlin community among the most re-tweeted accounts during the June 12 protests (relative to the Marh 26 event) speaks for their greater awareness and preparedness, as they were able to organize a counter-information campaign, attempting to reduce the impact. Yet, the results of their activities were half-hearted. On the one hand, they were able to produce highly re-shared content, substantially increasing their presence among the most popular accounts and increasing their impact. Seven of the top-20 most retweeted accounts were from the pro-Kremlin community and four of them appearing the top-10. On the other hand, their impact outside their own community remained insignificant, similar to the March 26 protests, supporting the hypothesis of higher homophony and ideological consistency of the opposition community.

To advance the discussion we also analyzed the contents of most re-tweeted messages. For the purposed of our research, aimed at analysing factors that contribute to mobilization of off-line protest, we distinguished

Figure 3: Most retweeted users by community



(a) March 26th Protests

The most retweted users in the captured samples, and the users' communities that retweted them

5K

Number of Records

6K

7K

4К

Communities All_others

Centrist

Youth

8К

Opposition
Pro-Government

9К

10K

mediazzzona

SvobodaRadio

navalnylive

iremeslo

oldLentach

sashakots

OlegLurie

er_lenta

xoccts 4

alburov

ОК

tyrain

1,260

888

1,700

2К

ЗК

1,107

909

1,878

498

1.63

1.641

802 4

1К

\mathbf{User}	ideology	Average distance in the	Average distance in the
		opposition community	pro-Kremlin community
Navalny	opposition	1.1	1.123
MeduzaProject	opposition	1.22	1.176
Kira Yarmysh	opposition	1.425	1.616
adagamov	opposition	1.19	1.263
spacelordrock	pro-Kremlin	0	1.099
ars_ves	opposition	1.577	1.361
StalinGulag	opposition	*	0
$Sandy_mustache$	opposition	n/a	1.198
SvobodaRadio	opposition	*	1.093
A_Gasparyan	pro-Kremlin	*	1.099
gniloywest	opposition	1.302	1.435
$openrussia_org$	opposition	1.17	1.207
EvgenyFeldman	opposition	1.567	1.923
$rishikesh_news$	pro-Kremlin	*	1.307
SobolLubov	opposition	1.187	1.235
pravdarule	opposition	1.632	0
zapvv	pro-Kremlin	1.595	1.345
imerkouri	pro-Kremlin	n/a	1.437
MaksFuckUkrainu	pro-Kremlin	n/a	1.425
ANAKOYHER	opposition	1.143	1.329
LeonidVolkov	opposition	1.218	1.38
sashakots	pro-Kremlin	1.417	1.158
alburov	opposition	1.28	1.375
OlegLurie	pro-Kremlin	0	1.424

Table 4: Average degree of leaders

Average degree was determined by evaluating the distance between the leaders' accounts and the users who retweeted their content. A degree of 1 means a user follows the leader. n/a = not enough data to measure the distance

Communities compared	Average Cosine similarity for tweets	Average Cosine similarity for retweets	ANOVA F-score
March 26th Protests Pro-Government vs. Opposition	0.6079	0.4901	26.44***
June 12th Protests Pro-Government vs. Opposition Pro-Government vs. Centrist Centrist vs. Opposition	$0.3307 \\ 0.3960 \\ 0.4097$	$\begin{array}{c} 0.3052 \\ 0.3333 \\ 0.5932 \end{array}$	1.63 9.54^{**} 49.51^{***}

Table 5: Cosine Similarity statistics by Protest

Note: All content shared by each community was grouped by hourly basis, pre-processed to remove stop words and tweet specific particulars, and compared. Scores for similarity were calculated for the days of the protests and the 3 days following, with the above representing averages of the 96 hourly similarity statistics.

two categories of messages-coordinating and motivational. We suspected that coordinating messages would be of higher demand during the day of protest. The logic for this was quite straightforward, as it was expected that in the absence of traditional forms of protest organization, its leaders would resort to social media to coordinate protest activities. Such utilization of social media was particularly evident during the EuroMaidan protest in Ukraine (Onuch, 2015b). We expected that the same pattern would be repeated in Russia. However, quite surprisingly, the motivational type of messages prevailed among the most re-tweeted ones. This fact allowed us to assume that at least the role of Twitter as the tool for information dissemination that increases the "echo chamber" effect has not substantially changed during the protest. Alternatively, it can be stated that leaders themselves do not recognize (either intentionally or not) the diversified potential of this platform.

3.3 The unfolding of protests

While the lead-up to the March 26 protests was noticeable on-line, the scale and virulence of the protesters was somewhat unexpected by the Russian state. The reaction, both off-line and on-line, demonstrate this fact. Off-line, this was manifested by the large proportion of protest participants arrested and detained, as well as the violence shown to protesters. On-line, there was a lack of control of the discussed agenda and few attempts to coordinate the dissemination of positive or distracting information, a traditional disruptive tactic adopted within this community (Zherebtsov & Goussev, 2017a). As such, there were two sets of opinions expressed by pro-Government users. On the one hand, a sizeable proportion expressed anti-corruption sentiment and support for the protests, even distributing videos and pictures of the event. Indeed, content shared during early stages of the protests starting with the 2pm local time start were mostly positive and supportive. On the other hand, anti-protest and anti-Navalny content was also shared, although mostly at later stages of the day and into the late-evening of the 26th. Common topics among this content included claims that Navalny was acting on behalf of a foreign power, calls for Navalny to be sent to jail (#HabaльныйДолженСидеть), or one particular fact highly retweeted within the community was that protesters beat up a police officer who died in transit to a hospital.

In contrast, the Opposition community demonstrated considerable coordination and greater technologically sophistication. In the lead up and during the event, participants and supporters of the protest shared motivating information—including pictures and videos (via the Periscope Social Media application) of how the protests were going on. This was meant to show via factual information what was occurring throughout the country and motivate others to come out and join the protests. Tweets were often accurately tagged

Community	Num used, day of March 26th	Num used, day of June 12th
Pro-Government	16,389	7,965
Opposition	20,985	7,270
Centrist	_	12,443

Table 6: Hashtag use statistics by community during the days of protest

with specific hashtags to give them meaning or context and support dissemination, such as the location of the city or the street where the protest was happening, or the #periscope hashtag to signify a live video. Interestingly, there was considerably high cosine similarity between the overall content tweeted by the Opposition and Pro-Government communities, validating the support for the protests within a sizeable proportion of the latter group. The similarity indicator, while still quite high, is statistically lower for retweeted content (Table 5), indicating that the two communities shared different opinions and outlooks on the protests.

The June 12th protests on-line unfolded in a similar fashion. The Opposition and Centrist communities together showed high similarity in the content they shared by widely disseminating pro-protest information, including hashtags identical or similar to the March 26th event, such as cities around Russia where protests were occurring or #periscope videos. The pro-Government community at this point showed much greater coordination of disseminating mostly pro-regime and anti-Navalny opinions, or celebrating June 12th as 'Russia's day of independence'. The #navalny hashtag was also used to coordinate negative attacks against the protests, including accusations of Navalny acting as a foreign agent. Interestingly, the pro-regime and pro-protest communities both adopted the #12june hashtag to tag their content, helping push it to be the top hashtag of the day. Furthermore, a small minority of users also distributed pro-protest information, and some discussed the merits of celebrating June 12th altogether, expressing nostalgia for the Soviet Union. Such a variety in the topics discussed, as well as mostly general pro-regime sentiment is reflected in the low cosine similarity of the discussions between the pro-Government community and the pro-protest communities. Furthermore, the relatively high cosine similarity between the content retweeted by the Centrist and Opposition communities validates the high affinity between the two groups.

For both protests, the users in the Opposition and Centrist communities prioritized the distribution of coordinating and motivating pro-protest content, embodying the main differences in the behaviour of this group versus their pro-Government counterparts. While the Opposition was a third the size, they used 30% more hashtags than the pro-Government community on during the first protests. On June 12th, the Opposition group almost matched the number hashtags used, while the Centrist community used hashtags 56% more than the pro-Government group (Table 6). The two pro-protest groups also used retweets to share each others' posts and distribute information about the protest throughout their communities. On March 26th, the Opposition averaged 11.26 versus the pro-Government's 3.6 retweets per user (Table 2), and 6.84 versus 5.34 during the second protests (Table 3). This Opposition community behaviour is also visible on an hourly basis, with the number of retweets per user on average peaking in the middle of the day during the March 26th protest, far outpacing the ability to widely distribute information compared to the pro-Government group (Table 4a). This behaviour was again repeated during the June 12th protests, as the Centrist and Opposition communities retweeted much more content per user than the pro-Government group. While the latter community did demonstrate quite larger retweet per user statistics on average (Tables 2 & 3), the hourly average was quite similar between the two events (Figure 3).

The low cosine similarity between the pro and anti-protest communities supports previous findings of the presence of the "echo chamber" theory to Russian Twitter and demonstrate how the disparate communities



Figure 4: Retweet rates, average number of retweets per user by each community

(a) March 26th protests

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pursued their own conversations. The pro-protest communities particularly utilized retweets and hashtags in order to coordinate the protests. Indeed, combined with the widespread use of geographic hashtags as indicators of ongoing protests around the country, coordination within these two communities can be interpreted as (a) a means of demonstrating the legitimacy of the event by visually establishing the high level of participation by many Russians, (b) a means of motivating other protesters to join the event, and (c) a means of coordinating the action, as the locations are well known city streets that others could join. The latter is particularly important in light of the nature of the event, as content shared on-line and on social media specifically, helped distribute the original YouTube video, coordinate protests throughout the country, and sustain them during their occurrence.

3.4 Disruption factor and Comments

As well as a tool to support the propagation of public protests, the Russian regime has demonstrated its ability to use disruptive tactics on social media platforms, misinforming users, distributing pro-government information, and adding to online biases (Tucker, 2018; Zherebtsov & Goussev, 2017a). In the case of the protests however, such tactics did not prove successful. During the first protest action, little coordination was observed through qualitative evaluation of the content shared. On June 12th however, a more consistent use of coordination to distribute pro-regime, pro-Russia and anti-Navalny content were distributed, helping marginalize the few who expressed pro-protest sentiment.

The pro-regime and generally disruptive information that was disseminated proved to have no noticeable impact on the protests occurring off-line and the information distributed on-line in the pro-protest communities. We observe that there are three likely reasons for this. Firstly, the prevalence of "echo chambers" in both protest networks was considerable, as few users from one community followed users in other communities, challenging any attempts to distribute information that would cross community lines and disrupt on-line coordination activities. On June 12th, the #12 june hashtag was used by both the pro-Government and the two pro-protest communities, however content from the former was observed to be retweeted by the latter ones. This supports a second likely reason, that the two sides of the communities share different political ideologies and preferences. Cosine similarity between the pro-Government and the two pro-protest communities, especially for retweeted content, was low. This signifies that while modularity itself is moderate, users in either community do not prefer to share opposing content, a difference in preferences leading to two sets of conversations occurring in parallel at the same time. Thirdly, corruption and the root causes of the protests, seem to have affected a large portion of the on-line Russian population, as it was the pro-protest content that made it into the pro-Government community and not the other way around. The observation that many pro-protest and traditionally opposition Twitter accounts were re-tweeted by users in the pro-Government community, however accounts, popular in the latter group, were shunned by everyone else.

4 Conclusion and further research

This paper explored the peculiarities of the 2017 protest coverage in Russia in the inherently open network platform (i.e. Twitter), meaning that it is deliberately used for opinion expression. Particularly, it was aimed at identifying deviations from normal patterns of Twitter use by politically active users. The research confirmed the existence of quite stable antagonistic pro-Kremlin and opposition communities. At the same time, it depicted that the former one is much less homophilous and more ideologically eroded. This phenomenon has not been detected in our previous studies and will require additional in-depth investigation. At this stage we can suspect that the pro-Kremlin friendship-based community unites users that share patriotic and non-liberal ideology, yet are not necessarily aligned with the current ruling elite. This observation posits an important question of finding the exact attitudes of the pro-Kremlin community towards key political leaders, as well as refining their underlying ideological premises. As the research demonstrated, protests transformed the role of leaders during the events, shifting users' attention from parody and media to personal accounts. Although rather logical, the prevalence of the opposition community leaders during the March 26 protests spoke in favour of the fact that the pro-Kremlin community leaders were caught unawares and did not have a designated counter-measures strategy. We noticed that the situation changed during the June 12 protests, having more pro-Kremlin leaders making influential nd highly re-shared comments. At the same time, two consistencies were also depicted. Firstly, on both occasions the messages of the pro-Kremlin community were re-tweeted within their own community, signalling their potentially minimal impact outside their own cohort. Secondly, also in both cases, the motivational messages prevailed by a large margin over the coordinational, meaning that at least Twitter preserved its key function as an information dissemination platform even during the protests.

There are several limitations and suggestions to guide future research on the topic important to identify, however. Firstly, the sampling methodology used for collecting data from the Streaming and REST Twitter API possess an unknown bias (Morstatter, Pfeffer, Liu, & Carley, 2013) as Twitter does not reveal the methodology they use to prioritize and return tweets. While this is challenging to avoid for researchers, this potentially explains why the Centrist community do not consistently get returned in a statistically significant quantity, and the users of this group that do appear in specific samples, such as March 26th, get assigned to either the Pro-Government or Opposition groups by community detection algorithms. Secondly, while cosine similarity reveals overall differences in the discussions between different communities, other Natural Language Processing methods, including attribute extraction and sentiment modeling would provide more a detailed picture of the opinion sets of each community. This is one topic we are looking to explore, revealing for instance the proportion of the pro-Government community shared anti-regime and pro-protest sentiment, hence demonstrating when and how coordination and disruptive tactics started to take hold within the pro-Government community. Thirdly, a popular disruptive tactic used by the Kremlin both inside Russia and abroad is to disseminate pro-regime content through the use of bots, boosting content created by trolls or pundits. The current research focused on the discussions occurring strictly within the main communities, in part due to previous findings that identified many of the small surrounding communities as botnets and the main communities as proportionally groups of engaged Russians (Zherebtsov & Goussev, 2017a, 2017b). Expanding to evaluate the content shared by the plethora of smaller communities would add insight into the disruption tactics employed during both events.

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Figure 5: Network of users: Protests of March 26, 2017

Sample includes 94.5K users, 7.4M links (based on follower relationships); Modularity of the overall network is 0.37612



Figure 6: Network of users: Protests of June 12, 2017

Sample includes 88.4K users, 6.4M links (based on follower relationships); Modularity of the overall network is 0.4428