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Fragmentation and Dynamics of Echo Chambers of Turkish Political Youth Groups on Twitter

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Abstract

Aiming to contribute to the debate whether the Internet and in particular social networks are leading to echo chambers of fragmented groups or to public sphere, this article investigates the dynamics of echo chambers of followers of Turkish political youth groups on Twitter. It focuses on two classes: Official youth organizations of ruling party and main opposition party, and one independent group. Retrieving over 40 million tweets of 30 thousand followers of these groups, 5.5 million interactions between 2016 and 2018 were analyzed. Strong echo chambers are found, and no weakening observed with a small-scale exception through cross-ideology exposure by individuals following two groups. The results are discussed along with the political lines and the independence level of the groups.

1. Introduction

The emergence of the Internet and in particular social media has unprecedentedly enabled the interactions of individuals among the world. It gave rise to a fundamental debate whether it is leading to favoring the democracy by ensuring individuals easy access and even exposure to widespread viewpoints, or hindering the improvement of democracy. In the former case, the communication media have a potential to evolve to a public sphere through exposure to different or even opposite ideologies with a significant and effective volume of interactions. However in the latter case, the interactions between different minded groups are limited and significantly less effective than the interactions within each group, forming and reinforcing the so-called “echo chambers”, potentially leading to group polarization (see Sunstein (2001); Sunstein (2002)). Studying online political conversations on a single- or multi-country basis, an intense effort has been devoted to contributing to this debate.

Online political discussions in Turkey are held mostly on Twitter. Along this line, focusing on the dynamics of the interactions between the followers of Twitter accounts of three largest political youth groups of Turkey in a period of three years, this study analyses whether the echo chambers of these fragmented groups are reinforced or weakened over time on Twitter. It also analyses the role of deliberative cross-ideological exposure in the weakening of the echo chambers. In order to establish a concrete basis for this study, the relevant previous works are introduced below.

1.1 Literature Review

Early studies of online communication favored the first side of this debate. For example, Gentzkow and Shapiro (2010) found that the level of online fragmentation is much lower than the fragmentation in the face-to-face human interactions, and also claimed that they found no evidence for the increase of fragmentation on the Internet. Lee et al. (2014) found that online political discussions can moderate the political polarization. In a more recent work, Boxell et al. (2017) found that the political polarization is on the rise in the US mostly among individuals who less likely use the Internet and social networking sites.

However, some of the recent literature favors the other side of the debate. That is, this emergence also expedites people to gather around the same ideological lines on online platforms and interact mostly to those having similar or even same perspectives towards group polarization (see Sunstein (2002)), raising a threat to democracy. Studies on online fragmentation, echo chambers and polarization cover a wide range. Analyzing 30 thousand tweets on abortion (after the shooting of an abortion doctor on May 31, 2009), Yardi and Boyd (2010) studied the dynamics of group polarization over time. They found that although similar minded people strengthen group polarization, interactions between different minded people lead to weaken the polarization over time via exposure to broader perspectives. Focusing on two distinct types of Facebook groups, i.e. one on conspiracy theories and the other on scientific information, Quattrociocchi et al. (2016) found quantitative evidence of echo chambers on social media.

On the other hand, online political fragmentation and its consequences have become

core issues in the field (see Papacharissi (2002); Dahlberg (2007)). In order to provide a large-scale multi-country analysis on extremism due to online political fragmentation, Bright (2018) studied the discussion activities of 115 political groups among 26 countries and found that the more people get ideologically extreme, the less they tend to interact with the other extremes in different ideologies. Very recently, analyzing the political commenting of around 700 thousand people, Bond and Sweitzer (2018) found that the increase in the engagement in politics lead to an increased communication between ideologically dissimilar people and decreased homophily. Barbera (2014) showed that the online fragmentation is in accordance with the offline measures. Analyzing Facebook interactions of liberal and conservative partisan news organization pages, echo chambers are observed, and political orientation segregates partisan political discussions on social media (Jacobson et al (2015)).

Because online political fragmentation cannot be independent from the unique cultural aspects, it was also investigated on the basis of countries. Analyzing the interactions of 10.1 million US Facebook users with news shared on social media, Bakshy et al. (2015) found ideological homophily in friend networks, and in their work, Colleoni et al. (2014) also measured homophily in Twitter. Conover et al. (2011) focused on the political alignment of Twitter users, and Colleoni et al. (2014) focused on the structural differences of homophily of Democrats and Republicans in the US. Performing content analysis on the network of selected political topics regarding 2010 midterm elections, Himelboim et al. (2013) found that because the clusters of Twitter users in the US are usually politically homogeneous,

they are rarely exposed to cross-ideological content. Analyzing Twitter data during 2011 national elections, Aragon et al. (2013) found evidence of balkanization of the Spanish online political conversation. As Switzerland is a unique country with a fragmented party system and strong federalism, Rauchfleisch and Metag (2015) studied the political communication of Swiss politicians on Twitter. Analyzing the online interactions towards 2011 federal elections, Garcia et al. (2015) found a strong polarization in the online political network. Analyzing around six thousand tweets during 2011 federal elections in Canada, Grudz and Roy (2014) found evidences for both political polarization, and potential for cross-ideological interactions. Supporting the analysis of around 700 thousand South Korean Twitter users' activities with survey data, Hahn et al. (2015) showed how news following on Twitter is sharply polarized due to selective exposure. On the other hand, studying Facebook data of the UK and Italy regarding the consumption of political information, Casteltrione (2014) argued how social networking could reduce political fragmentation and polarization via reducing the level of selective exposure.

According to Dahlberg (2007), both sides of this debate -whether the Internet is leading to echo chambers of fragmented groups or to an expanded public sphere- make their observations on very 'small pool' of data and also the data are usually used selectively. Research based on surveys or content analyses usually concentrate on a small set of 'significant issues'. What is more, although more research is needed, the underlying assumptions should not contain flaws, which usually arise from to Habermasian theory.

1.2 Research Gap and Research Questions

In this subsection, we describe the research gap we address and the research questions we rise in this work. As stated above, political fragmentation, echo chambers and polarization in a country are inseparable from the unique socio-cultural aspects from it. Furthermore, countries with a dense political agenda provide a fruitful environment for research.

Focusing on Turkey, which has been facing harsh political experiences and the polarization of the society is argued to increase sharply during the last decade, this article aims to contribute to the debate in the light of the arguments of Dahlberg (2007) within a dynamical perspective covering a three-years period. To name just a few, the rise of political Islam through AKP (Justice and Development Party) and Gulen movement during the last decades, Syrian war and immigration issues, Gezi Park Protests in 2013, the conflict appeared between AKP and Gulen movement which resulted in a failed coup attempt in 2016, and the regime change from parliamentary to a so-called 'Turkish-style presidential' in 2018 make this country an interesting cradle for research in this field. Gezi Park Protests has been the first big case in Turkey that social media played a key role, leading up to studies such as Hacıyakupoglu and Weiyu (2015), Ogan and Varol (2017), Varol et al. (2014), and Budak and Duncan (2015).

However, to the best of our knowledge, a comprehensive study on online political fragmentation and echo chambers in Turkey is missing. As the youth is in the center of most of these political experiences such as Gezi Park Protests, such a study focusing on Turkish youth becomes even more prominent. Hence, we ask our main research questions (RQs) as follows.

RQ1: Are there strong echo chambers between fragmented groups, namely the followers of the political youth organizations?

RQ2: If there are, do these echo chambers reinforce or weaken over time?

RQ3: Do the strength of echo chambers depend on the type of the youth group, i.e. whether it is a political party's official organization, or an independent political organization?

On the other hand, despite the efforts to detect 'who tweets' using Twitter data (see Sloan et al. (2015)), it is generally not known directly who is young, making it difficult to study youth participation in politics on social media. Hence, this study chooses a different direction. Rather than attempting to detect young people on Twitter, the study focuses on the political youth groups. Instead of 'young people' directly, this article claims to study on the followers of the Twitter accounts of political youth groups. This way, the first step in the fragmentation research which is generally to detect the individuals forming fragmented groups is already achieved in the present work.

In order to contribute to the efforts on youth participation in politics as well from a structural viewpoint, this article studies the youth groups in two classes. First one is the official youth organizations of political parties. In this class, the youth organizations of the two biggest political parties of Turkey, i.e. ruling party and the main opposition party are studied. The second class is the independent political youth group, and the largest group in this class is studied. Hence, spanning a 3-year period, the dynamics of echo chambers of the followers of fragmented political youth groups is analyzed. The method of this study follows the critics of Dahlberg (2007). That is, in order to avoid from being selective and from

sticking to a small set of 'significant issues', rather than a topic or hashtag basis or a content analysis, the whole space of interactions on Twitter between the groups are studied. To make observations on a 'big pool', over 40 million tweets of around carefully selected 30 thousand individuals were analyzed.

This article is organized as follows. In the next section, political youth groups in Turkey under consideration and their ideological lines are introduced. Next, the method for retrieving and analyzing the data are presented. The results are discussed in a theoretical perspective, which is followed by the conclusion.

2. Political Youth Groups in Turkey

In order to provide a through insight to this study, a brief introduction to the political groups in consideration is given in this section. The official youth organizations of political parties in Turkey consist of the official members of the parties below a certain age. Rather than focusing on youth issues, these youth organizations directly follow the general politics of the party. On the other hand, following their ideological lines, independent political youth groups create their own policies. This study focuses on the official youth organization of the ruling party, AKP (Justice and Development Party) and main opposition party, CHP (Republican People's Party), and the largest independent political youth group TGB (Youth Union of Turkey).

2.1 AKP

The party AKP was founded in 2001 and has been the ruling party since 2002 elections. AKP claims to be a 'conservative democratic party', and Islam has been the core value of the party.

Locating in the central right, the supporters of AKP do not follow strict ideological line, but rather span a wide spectrum. The main issues creating fragmentation among Turkish people are secularism, headscarf rights, Kemalism, human rights, youth politics and economy. AKP has been in the center of these issues, usually receiving serious criticism for polarizing the people ideologically.

2.2 CHP

Established in 1923 and though experienced several transformations during the last century, CHP is the founder party of the modern Turkish Republic, claiming to follow the six basic principles of Kemal Ataturk: Republicanism, Populism, Secularism, Reformism, Nationalism and Statism. However, in the last decade, CHP is criticized to be moving away from these principles, in particular for the candidates and political alliances during the elections. Being a central left party, CHP covers a very wide range of ideologies, mainly social democrats and also including a spectrum from radical leftists to people who define themselves as not even leftists but only republicans.

2.3 TGB

Established in 2006 through the union of 65 student clubs (most of them being Ataturk's Thought Clubs) at 40 universities, TGB (Youth Union of Turkey) is the largest independent political youth organization, currently organized in 65 universities and hundreds of high schools in 70 cities. Claiming to be Kemalist, patriotic, secular and anti-imperialist, TGB follows a strict ideological line.

At the first glance, the ideological line of TGB may look similar and even overlapping to the

(claimed) line of CHP up to some point, and strictly against to the line of AKP. However, in the daily politics, some serious conflicts emerge between TGB and CHP, and reconciliations take place between TGB and AKP. Due to such conflicts and reconciliations over time, a variable volume of face-to-face and online interactions can be expected between these fragmented groups.

3. Methodology

An unbiased analysis spanning a long period for detecting the strength and the dynamics of echo chambers among fragmented groups require to make no assumptions based on the daily political issues. Hence, analyzing the pure volume of interactions within the groups and between the groups over time can also shed light onto question whether temporal conflicts and reconciliations have a significant effect on the dynamics of echo chambers.

In order to analyze the dynamics of the interactions between the carefully selected subsets of the followers of the Twitter accounts of the political youth groups in concern, the data of this study covering the range from January 1, 2016 to December 31, 2018 were retrieved from Twitter during January 2019, using Tweepy library for Python programming language (Tweepy, 2010). Finding the volume of intra- and inter-group interactions, the obtained numbers reveal the strength of echo chambers of each political youth organization for each year. Observation in the 3-years period shows whether the echo chamber of each group is weakened or reinforced with respect to time, indicating the disposition to group polarization (Sunstein (2002)). In details, the basic steps of the method are as follows:

I. The followers of the official Twitter accounts of the three groups in concern were detected, namely

- (i) *@AKGenclikGM*: Official youth organization of AKP,
- (ii) *@chpgenclikgm*: Official youth organization of CHP,
- (iii) *@genclikbirligi*: TGB, the independent political youth organization.

II. In order to eliminate the accounts which cannot be considered as reflecting the nature of the political youth groups, filters were applied to each set of followers according to the criteria below:

- (i) Verified accounts (with blue tick). These accounts usually belong to politicians, journalists, celebrities etc.
- (ii) Accounts with screen names consisting of eight consecutive digits. These accounts are usually maintained automatically.
- (iii) Accounts with screen names including the abbreviations AKP, CHP, TGB, etc. These accounts usually belong to party or group professionals, not natural followers.

III. The common followers of the groups were detected and labeled as listed in Table 1.

IV. Due to the rate limits of Twitter, because it would be infeasible to retrieve all the tweets of all the users in sets A, C and T (making more than half million), commensurate subsets A^S , C^S and T^S were picked as follows. There are users with too many or too few tweets that potentially unbiased the results. Hence, rather than a random sampling, we sorted the users in each set, i.e. A, C and T by their total number of tweets. We compared these sorted sets with respect to total number of tweets of the users. We found that taking 5% of each set with an upper bound of 30.000 tweets leads to subsets A^S , C^S and T^S with

comparable numbers of tweets, excluding the users with too many and too few tweets.

V. The tweets of the users in the subsets A^S , C^S and T^S were retrieved. Note that, the tweets of the users following more than one group (such as the sets AC or AT) were not retrieved because it is not possible to determine exactly which user actually belongs to one group, and also following the other group. The intersecting sets and the subsets are illustrated in Figure 1.

VI. Each retrieved tweet was checked if it is a *Retweet*, *Retweet with Comment*, or *Reply*, constituting an interaction with a target user (whose tweet was retweeted or received a reply). If so, the target user was searched among the seven sets listed in Table 1. If found, the relevant counter was incremented.

Please note that the sets of the follower accounts are fixed (according to Steps I-IV), and then their tweets are retrieved at once for the three-years period (according to Step V). Hence, the results are not affected from the change of the followers during that three-years period.

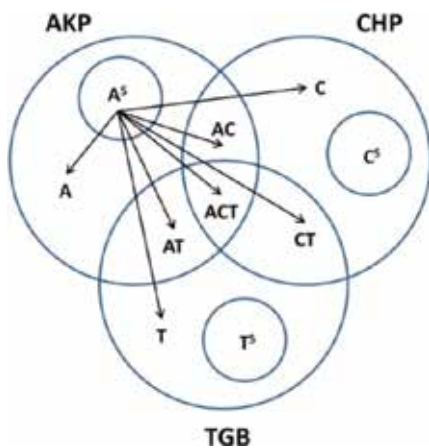


Figure 1. Sets of the followers of Twitter accounts of considered official youth organizations.

Table 1. The sets of considered Twitter users

Set	Explanation	Number of Followers
A	Following only AKP (@AKGenclikGM)	335.345
C	Following only CHP (@chpgenclikgm)	50.766
T	Following only TGB (@genclikbirligi)	191.750
AC	Following AKP and CHP	1.432
AT	Following AKP and TGB	2.227
CT	Following CHP and TGB	4.017
ACT	Following AKP, CHP and TGB	148

4. Results

The goal of this study is to analyze the strength and the dynamics of echo chambers of fragmented Turkish political youth groups to reveal the inclination to group polarization and extremism. The groups are studied in two classes: Official youth organizations of (ruling and opposition) parties, and an independent group.

At the time of the study, AKP (@AKGenclikGM) had 391.662, CHP (@chpgenclikgm) had 60.505 and TGB (@genclikbirligi) had 205.552 followers. After the filtering, these numbers reduced to 339.155, 56.366 and 198.145, respectively, and the result of the classification of distinct and common followers of accounts are given in Table 1. Subsets A^S (of size 16767), C^S (of size 2538) and T^S (of size 9587) were obtained. Up to last 3.200 tweets (between January 1, 2016 and December 31, 2018) of each user in subsets A^S , C^S and T^S were retrieved, -as this is the maximum allowed number by Twitter. The numbers of tweets retrieved are 24.361.415 for A^S , 3.812.329 for C^S ,

and 12.193.410 for T^S, exceeding 40 million tweets in total. Next, for each subset, the tweets were analyzed according to item VI of the Method section, and among them, the numbers of detected interactions (Retweet, Retweet with Comments or Reply) are found to be 3.756.220 for A^S, 383.025 for C^S and 1.353.917 for T^S during the 3-years period.

Now, let us analyze the results for each group, starting with AKP.

4.1 AKP

The obvious result for A^S (the sample subset of the official youth organization of the ruling party, AKP) as shown in Figure 2 (and the data presented in Table 2) is that almost all of the interactions are made within the fragmented group, clearly indicating an echo chamber. *Retweets with Comment* and *Replies* can be against or for the original tweet while a *Retweet* usually supports the original tweet and also contributes to its spreading. Hence, this result is the most obvious for *Retweets*, in the sense that the interactions with the like-minded individuals (following A) have the highest percentage. On the other hand, no significant change is observed over years 2016, 2017 and 2018 (depicted with red, green and blue in the figure, respectively, in

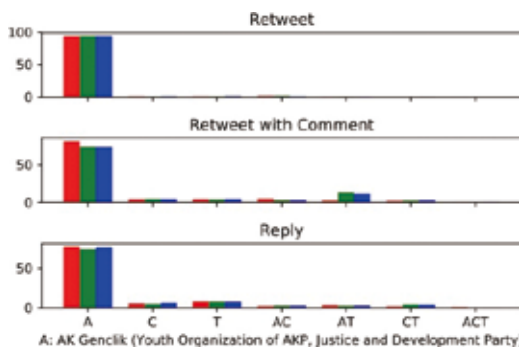


Figure 2. Percentage of interactions from A^S

Table 2. The number of interactions from A^S

		A ^S		
		2016	2017	2018
A	Retweet	611846	869731	1643179
	RT wComment	7512	12929	26539
	Reply	59919	89043	141418
C	Retweet	8628	8798	23577
	RT wComment	397	596	1612
	Reply	4259	5526	11053
T	Retweet	8652	11090	27279
	RT wComment	400	697	1625
	Reply	6166	9030	14112
AC	Retweet	12826	16929	22141
	RT wComment	479	471	957
	Reply	1922	3391	5353
AT	Retweet	4392	8376	11827
	RT wComment	197	2298	4042
	Reply	2661	3169	5521
CT	Retweet	1325	3144	9934
	RT wComment	168	370	910
	Reply	1548	4779	7089
ACT	Retweet	2980	2134	5885
	RT wComment	49	102	291
	Reply	988	732	1227

the figures). The only noticeable change suggesting a weakening of the echo chamber over time is in the *Retweets with Comment* to the users following both AKP and TGB (AT).

4.2 CHP

Looking at the numbers of the interactions only, the weakest echo chamber is found for C^S (the sample subset of the official youth organization of the main opposition party, CHP) in all types of interactions (see Figure 3, and the data is presented in Table 3). Although the highest percentage of interactions is done with C, there is a significant amount of interactions with the other two groups, T being the maximum; and especially with the intersections, CT being the maximum. What is more, from 2016 to 2018, the interactions to T and especially to CT exhibit an increase, as interactions to C tend to decrease.

4.3 TGB

In the case of T^S (the sample subset of the independent political youth group TGB), again looking at the numbers of the interactions only (see Figure 4 and the data is presented in Table 4), though not as high as AKP, the echo chamber is found to be stronger than CHP. Similar to the case of CHP, the interactions with the CT intersection exhibit an increase over time, again suggesting a weakening of the echo chamber. Although the like-mindedness in TGB is considered to be the highest, TGB forms a much weaker echo chamber than AKP.

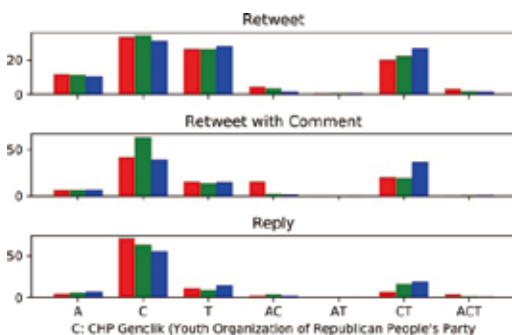


Figure 3. Percentage of interactions from C^S

Table 3. The number of interactions from C^S

		C ^S		
		2016	2017	2018
A	Retweet	3583	6327	16933
	RT wComment	127	294	917
	Reply	830	1461	4711
C	Retweet	10322	19210	50957
	RT wComment	861	2804	5422
	Reply	12037	17851	36530
T	Retweet	8201	14812	45807
	RT wComment	311	672	2047
	Reply	1852	2459	9962
AC	Retweet	1409	2073	2394
	RT wComment	313	108	230
	Reply	459	1153	1547
AT	Retweet	142	312	884
	RT wComment	8	13	79
	Reply	73	136	414
CT	Retweet	6283	12510	43980
	RT wComment	420	965	5089
	Reply	1173	4644	12589
ACT	Retweet	1044	962	2381
	RT wComment	10	42	127
	Reply	708	444	607

4.4 Analyzing the Results of Three Groups Together

Because one can retrieve only around the last 3200 tweets of a user, the more a user tweets (more than around 1.000 times a year), the more

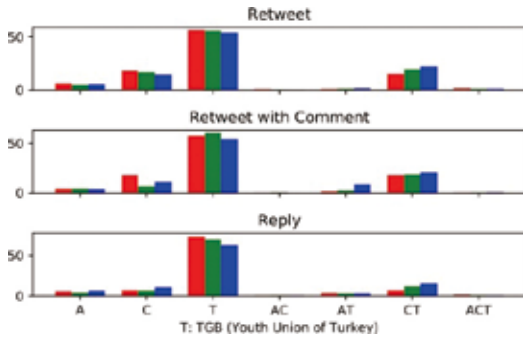


Figure 4. Percentage of interactions from T^S

retrieved tweets will belong to the most recent years. Therefore, in order to reveal the dynamics over the years, instead of the exact numbers, the percentages of the interactions are analyzed and presented in Table 5. Take A^S in 2016, for example, i.e. analyzing the interactions from the users in subset A^S to all the users in each distinct set, the following results are found:

Retweets: 94.04% to A; 1.33% to C; 1.33% to T...

RT wComment: 81.63% to A; 4.31% to C; 4.35% to T..

Reply: 77.35% to A; 5.50% to C; 7.96% to T..

Echo chambers at various levels were observed for each fragmented group. The strongest echo chamber is found in the youth organization of AKP, where the like-minded individuals in this group reinforce the group positions and tend to be in more insulated ‘deliberative enclaves’ (see Sunstein (2001); Dahlberg (2007)). In the case of CHP, though being very limited, the weakening of the echo chamber is achieved mostly through the individuals on the boundaries, contributing to the expansion of public sphere towards a stronger democracy (see Habermas (1989)). This result suggests an accordance with the policy of CHP in the last decades to cover diverse ideologies. The

Table 4. The number of interactions from T^S

		T^S		
		2016	2017	2018
A	Retweet	8707	10526	33363
	RT wComment	302	584	1725
	Reply	3514	5966	13265
C	Retweet	24420	37137	85903
	RT wComment	1271	1760	4911
	Reply	4149	5968	20987
T	Retweet	76122	124093	317200
	RT wComment	4119	8063	24704
	Reply	42945	60817	123914
AC	Retweet	1345	1293	2322
	RT wComment	41	102	195
	Reply	398	719	1404
AT	Retweet	1478	2986	10291
	RT wComment	112	322	3865
	Reply	2142	2451	5879
CT	Retweet	20507	43750	130233
	RT wComment	1271	2478	9465
	Reply	4135	10657	31477
ACT	Retweet	2492	2788	7231
	RT wComment	45	95	365
	Reply	897	782	1469

results of TGB suggests that being an independent political group, TGB tends to a more rational deliberation between ‘unlike-minded’ groups. Sunstein (2001) discussed that such a rational deliberation paves the way for avoiding group polarization and extremism which lead to social

Table 5. The percentage of interactions from A^S, C^S and T^S

		A ^S			C ^S			T ^S		
		2016	2017	2018	2016	2017	2018	2016	2017	2018
A	Retweet	94.04	94.52	94.23	11.56	11.26	10.37	6.45	4.73	5.69
	RT with Comment	81.63	74.04	73.77	6.2	6.0	6.59	4.22	4.36	3.81
	Reply	77.35	76.98	76.12	4.84	5.19	7.1	6.04	6.83	6.69
C	Retweet	1.33	0.96	1.35	33.31	34.18	31.2	18.08	16.69	14.65
	RT with Comment	4.31	3.41	4.48	42.0	57.25	38.98	17.75	13.13	10.86
	Reply	5.5	4.78	5.95	70.26	63.42	55.05	7.13	6.83	10.58
T	Retweet	1.33	1.21	1.56	26.47	26.35	28.04	56.36	55.75	54.08
	RT with Comment	4.35	3.99	4.52	15.17	13.72	14.71	57.52	60.15	54.62
	Reply	7.96	7.81	7.6	10.81	8.74	15.01	73.81	69.62	62.46
AC	Retweet	1.97	1.84	1.27	4.55	3.69	1.47	1.0	0.58	0.4
	RT with Comment	5.21	2.7	2.66	15.27	2.2	1.65	0.57	0.76	0.43
	Reply	2.48	2.93	2.88	2.68	4.1	2.33	0.68	0.82	0.71
AT	Retweet	0.68	0.91	0.68	0.46	0.56	0.54	1.09	1.34	1.75
	RT with Comment	2.14	13.16	11.24	0.39	0.27	0.57	1.56	2.4	8.55
	Reply	3.44	2.74	2.97	0.43	0.48	0.62	3.68	2.81	2.96
CT	Retweet	0.2	0.34	0.57	20.28	22.26	26.93	15.18	19.66	22.2
	RT with Comment	1.83	2.12	2.53	20.49	19.7	36.58	17.75	18.49	20.93
	Reply	2.0	4.13	3.82	6.85	16.5	18.97	7.11	12.2	15.87
ACT	Retweet	0.46	0.23	0.34	3.37	1.71	1.46	1.84	1.25	1.23
	RT with Comment	0.53	0.58	0.81	0.49	0.86	0.91	0.63	0.71	0.81
	Reply	1.28	0.63	0.66	4.13	1.58	0.91	1.54	0.9	0.74

destabilization and supports social cohesion.

Despite the dense political agenda and arguably increasing social polarization of the country, no significant change in the strength of echo chamber of each group is observed in a 3-year interval between 2016 and 2018, with the

small exception through the individuals following two groups.

A more detailed analysis could take into account the number of followers of each group. Let us take C, T and CT for example with the number of followers approximately 51 thousand,

192 thousand and 4 thousand, respectively. At the first glance, the number of interactions from T^S to C and from T^S to CT (in Figure 4) looks comparable. However, taking into account the number of individuals in each set, it is revealed that these comparable number of interactions are actually made to groups of ≈ 51 thousand and ≈ 4 thousand people, respectively. Therefore, normalizing the number of interactions to each group with respect to the size of the target group provides a clear evidence that the interactions towards expanding the public sphere are made to the individuals who are following two groups, -in other words, the individuals who constitute a bridge between ideological fragmented groups through selective exposure. From the same point of view, as the size of TGB is almost four times of CHP, Figures 3 and 4 can be re-interpreted: Regarding the interactions from the subset C^S to T in Figure 3, the size of the target group T is four times of the size of C. However, regarding the interactions from the subset T^S to C in Figure 4, the size of the target group C is one fourth of the size of T.

In summary, taking into account the size of the target group in each interaction, these results suggest that although TGB has a narrower ideological line than CHP, the echo chamber of TGB may be considered as comparable to that of CHP, emphasizing a rational deliberative. This can be linked to the independent nature of TGB, rather than being the official extension of a political party.

5. Discussions

In this study, the interactions of the targeted followers were analyzed by retrieving up to last 3200 tweets of each follower in a 3-years period

(from January 1, 2016 to December 31, 2018). However, the more a follower tweets, the more retrieved tweets will belong to most recent years, potentially biasing the results. In order to overcome this potential bias, rather than the raw numbers, the percentages of the interactions for each year were analyzed.

The findings support the previous research that suggests strong echo chambers in the fragmented political groups, such as the very recent one demonstrating the inevitability of echo chambers (Sasahara (2019)).

One of the shortcomings of retrieving existing data from Twitter is that due to official requests by governments, Twitter may be deleting some of the tweets or suspending accounts, leading to imperfections in the analyses or even biasing the results. As a matter of fact, Turkish Government is one of the countries requesting removals from Twitter the most. However, one can expect that the deleted tweets are actually the sharpest political ones, contributing not only to the forming and reinforcing echo chambers but also to polarization and extremism. This could bias the results in the favor of weakening the echo chambers. Therefore, our interpretation is that having access to the deleted tweets could lead to more accurate results showing even stronger echo chambers. On the other hand, rather than the existing ones, retrieving tweets via live streaming could catch the tweets before they are deleted. This method has the drawback of technical and practical difficulties in the process, especially for the studies spanning several years.

A basic issue in analyzing data retrieved from social network sites such as Twitter especially in political conversations is the existence of automated accounts, due to their impact in manipulating the conversations (see Ferrara et

al. (2016); Shao et al. (2018); Vosoughi, Roy and Aral (2018)). In order to eliminate the impact of automated accounts, we applied a filtering as explained in the Method section.

The motivation behind the study on echo chambers is that more than reinforcing the ideologies, political discussions among like-minded individuals drive the fragmented groups to extreme ideologies (Sunstein (2001)). In order to grasp the strength of echo chambers not only at an arbitrary time, but actually the evolution of it in the long term, our method is to focus on a specific 3-year period in which Turkey had intense political experiences and it is widely believed that the political polarization among people has increased sharply.

6. Conclusions

The purpose of this article is to contribute to the debate on online political fragmentation and echo chambers, by investigating the dynamics of echo chambers among the followers of three largest political youth groups of Turkey between 2016 and 2018. In particular, these groups are studied in two classes. The first class consists of the official youth organizations of ruling party AKP (Justice and Development Party) and main opposition party CHP (Republican People's Party). The second class consists of the largest independent political group TGB (Youth Union of Turkey). Retrieving over 40 million tweets of a carefully selected 30 thousand followers of these groups, 5.5 million interactions (Retweets, Retweets with Comment, Replies) were analyzed.

Among these fragmented groups, strong echo chambers were found, by far the strongest in the ruling party AKP. This finding supports the previous research focusing in the US case in the

sense that the followers of AKP are more conservative than the followers of CHP or TGB, and more conservative individuals tend to form stronger political echo chambers in the US case (see Boutyline and Willer (2016)). What is more, followers of AKP are usually less educated (see Uncu (2018)). Less educated people are influenced easier than others by political discussions, which potentially increases the level of homophily, forms and reinforces echo chambers leading to group polarization (see Sasaki (2016)).

TGB is found to have a slightly stronger echo chamber than CHP. However, taking into account the size of the target set of interactions in a more detailed analysis, the strength of the echo chambers of TGB and CHP becomes comparable. On the contrary to the followers of AKP and CHP who have a wide spectrum of ideologies, the followers of TGB has a strictly narrow and well defined ideology. Therefore, despite its narrower political line, having a much weaker echo chamber than AKP and only a slightly stronger one than CHP can be interpreted as a consequence of being not an official party organization but an independent organization. This result emphasizes the role of independent political organizations towards a stronger democracy.

When it comes to the dynamics of echo chambers, in the period that Turkey had harsh political experiences including a failed coup attempt, and political polarization among the people is believed to become sharper, no significant change of echo chambers is found. The only small-scale exception is through the individuals following not one but two groups, experiencing a deliberative cross-ideological exposure.

This work focused on the fragmentation and

the dynamics of echo chambers of political youth groups in Turkey. To the best of our knowledge, this is the first work in the field to focus on political youth groups. Our results favor the side of the debate that online political discussions lead to strong echo chambers and polarization. In addition, previous research is supported that cross-ideological exposure lead to weakening echo chambers, contributing to the favoring of democracy. Because each country has specific cultural and political aspects, we believe that future works on other countries could contribute to provide a more insightful perspective for the debate whether the Internet is leading to echo chambers of fragmented groups or to an expanded public sphere.

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