The Hashtag Primary: Speaking Narrowly and Broadly in the 2016 Presidential Election

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Abstract: Does the polarization manifest in almost all aspects of American politics also show up on the campaign trail? Evidence from the social media accounts of all candidates in the 2016 U.S. Presidential race indicate that polarization may be more tactical than we previously imagined. Taking a network science approach to candidate and super PAC Twitter accounts, I quantify the polarization of over 6,000 hashtags used to guide Twitter users to content and found that candidates speak to more polarized channels only when they are rising in the polls. These results hold for both parties, though the effect is far more pronounced for Republicans than Democrats.

Introduction:

In the first decades of the republic, to campaign for office was considered, in the words of one prominent historian "completely gauche" (National Public Radio 2016). Men of esteem and prominence within a society where only landed white men could vote were expected to be immediately recognizable, with their qualifications for public office a foregone conclusion. Two hundred and twenty eight years later, the campaign landscape has shifted slightly, to say the least.

The modern political campaign is a communications factory. A myriad of messaging is plastered across an even more diverse array of channels. Besides the obvious choices of television and radio, political campaigns attempt to sway voters by moving increasingly towards the virtual spaces where Americans spend a growing portion of their waking hours. Indeed since the first election of President Barack Obama in 2008, digital communications and voter out-reach via social media and other internet based means has exploded both in use and focus from campaign professionals (Issenberg 2014)

While the technologies may change, the fact remains that the heavy-lifting of a modern political election comes from tailoring and targeting campaign messaging to the various sections of the electorate a candidate hopes to win over. One seeking to win or retain political office must not just develop a more persuasive message than one's opponent, but also ensure that their message resonates with more people than it repels. Whereas one statement can have great success among one courted demographic, that same statement could constitute a disastrous faux-pas with another (Popkin 1994; Vavreck 2001). Thus, a candidate seeking office must be strategic with their messaging such that a convincing statement for one group is not an offense to another.

Though the internet age has given political candidates the ability to broadcast their message across the nation almost instantly, doing so might not always be in their best interest. Some messaging is best tailored for a committed base, while other messaging may resonate with a broader spectrum of less committed potential voters. How then do candidates choose to moderate their speech, knowing when to whisper to allies and when to turn on the megaphone for the broader masses?

This project examines Twitter, arguably the most popular and influential internet-based communications platform of the modern campaign era. In the ten years preceding the 2016 elections, Twitter went from a relatively obscure micro-blogging service, (all Twitter messages are restricted to 140 characters), to "a new battlefield of the campaign" (Branstetter 2016). In fact, Election Night 2012 saw about 320,000 twitter messages sent each minute, at the time a record traffic for the site (Gaudin 2012).

Twitter offers a user a means to reach virtually the entire planet, while simultaneously side-stepping the gate-keepers of the traditional media. It's no surprise then that Twitter has been the communications medium of choice for a variety of social movements seeking to bypass official channels (see Barbera and Metzger 2013; BBC 2016; Buettner 2016). In the case of American elections, candidates can speak directly to voters without any mediation from journalists or other establishment media figures. Candidates can also channel their message better, rather than, for example, the generally crude geographic boundaries offered by a daily newspaper or rough demographics of a niche television show.

Much like television channels, twitter hashtags organize the flood of tweets by subject or interest (see Chang 2010; Sudhof 2011). With an estimated 320 million other Twitter users in the world[1], this filtering becomes essential to capture the attention of users who do not already subscribe to a sender's feed. Additionally, these hashtags sometimes achieve viral properties, which further drive the dissemination of content associated with them.

Studying the way in which candidates for political office utilize hashtags can tell us much about how aspiring politicians communicate to the public in a polarized era. With the low-cost but wide-reaching technologies of the internet age, are candidates searching for fellow partisans or attempting to straddle ideological divides to win over a wider swath of voters? In the era of omnipresent polarization, are political campaigns conducted at the edges of the ideological spectrum?

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[1] According to Twitter official statistics. See https://about.twitter.com/company.

Using a network science approach, I approximate the polarization of over 6,000 Twitter hashtags used thus far in the 2016 Presidential Election. I find that more ideologically extreme Republican politicians tend to tweet to more polarized hashtags than their centrist counterparts, but Democratic extremists generally target the center. I also find the universe of Democratic candidate hashtags is more polarized than that of the Republican candidates. Finally, a candidate's shift in the polls influences their tweeting strategy, with candidates tweeting to broader hashtags following gains in poll numbers both nationally and in individual early primary states. It would appear that notions of polarization are strongly modulated by which side of the ideological divide a candidate falls and how that candidate is faring in the polls. Polarization, in other words, fluctuates with practical concerns.

Looking to Twitter to study political communication also gives one insight into how candidates for office communicate with elites. Previous research (Barbera 2015; Dahlgren 2005) has shown that internet usage is higher among the more politically active. Germaine to my analysis, Twitter users are by-and-large richer and more educated than the general populace (Mitchell and Guskin 2013). As these elites tend to vote more reliably, volunteer to campaigns at a higher rate and are more disposed to donate money (Schlozman and Brady 2012), observing how candidates interact with this elite slice of the electorate gives us small insight into a world that was previously closed off to outsiders. Exploiting the granularity of the medium–that communications can be analyzed down to the very second they were published–allows a researcher to conduct a time-series analysis with a level of detail not previously available.

That politicians vary their communications style and strategy based on who happens to be on the receiving end is a long established truism of political science (Cain, Ferejohn, and Fiorina 1987; Fenno 1978; Lazarus 2009). Seekers of public office try and project the most sympathetic face to voters, such that the "electoral connection" becomes established between a voter's most salient policy positions and an aspiring politician's stated policy goals. Recent research has shown that this competitive race for positioning has resulted in incumbent lawmakers over-posturing, which in turn exacerbates political polarization (Grimmer 2013).

Our understanding, on the other hand, of how exactly politicians appeal to polarized audiences during a competitive election is less developed. A campaign built solely to appeal to extremists may function in a primary, but as recent scholarship shows, the effects during the subsequent general election may prove disastrous for not just the candidate, but for their party as well (Hall 2015). Thus, a candidate must not only "pivot" to a general election audience following a primary, but carefully balance their message to attract a winning-coalition of extremists and moderates in order to secure victory in both races.

That the polarization that exists in American legislative chambers can also be found in cyberspace is hardly a novel finding (Barbera 2015; Gentzkow and Shapiro 2010). However, the exact mechanism that political candidates turn this polarization into votes is an area still unexplored. Are extremist candidates riding a wave of polarized, but highly active voters into office, or is playing to the extremes simply part of the coalition building that defines any election? A look at Twitter in the 2016 U.S. Presidential Election can answer this question.

The 2016 Election in Tweets

As of February 04, 2016, a total of 1,565,992 tweets were sent by candidates vying for the presidency or their affiliate super PACs. The analysis considered only contenders for either the Republican or Democratic party, of which there were 23 contenders. Drilling down further, 41,540 tweets contained a hashtag–comprising 2.7 percent of the total tweets sent thus far during the campaign. Overall, a total of 6,612 unique hashtags were used by the presidential candidates.

Given this universe of political Tweets from the 2016 race, how might one observe the relative polarization of these official communications? The answer lies in borrowing an approach of network science. By calculating the modularity of the entire population of tweets, as well as the subset of just Democratic or Republican candidates and PACs, one can observe the degree to which the various camps affiliate only with hashtags specific to their candidate and the extent to which they tweet to hashtags shared by all campaigns. A

network graph in which each campaign only tweeted to a small subset of the unique hashtags would have little to no overlap with "channels" used by other campaigns and thus be considered highly polarized.

Beyond measures of modularity, which measure the division of communities within the entirety of a network graph structure, one can place a metric on the relative polarization of a hashtag by measuring its network centrality. While there are many different measures of the concept (see Newman 2010 for a comprehensive explanation), the general idea of network centrality is a quantification of the connections that one node in a graph has with the others. This measure of a graph's overall connectedness, i.e. how many ties nodes from differing communities have to one another, have been used in the past to measure both the polarization in the U.S. Congress and groups of users on Twitter (see Newman 2006; Smith et al. 2014; Waugh et al. 2009).

To measure the polarization of a hashtag, I use two measures of network centrality–in-degree centrality and closeness centrality. In-degree centrality is simply a sum of all the edges connecting a node that originate from another node. Thus, a hashtag in this study can have a maximum in-degree centrality of 46 if all 23 candidates and all 23 Super PACs used it in a tweet. To prevent skewness in the measure, each candidate/PAC tweet to a hashtag was only considered once–obviating the issue of a hashtag used frequently, but by only one campaign, having a higher in-degree centrality than one used by multiple campaigns.

As evinced by the figure below, a majority of the hashtags studied were used by only a single account. These included mostly esoteric hashtags referring to a single campaign, such as #carsonforprez, used only by Republican candidate Ben Carson's official account. On the other end of the spectrum are hashtags such as #gopdebate or #fitn, the latter referring to the Iowa caucuses, the "first in the nation."

In−Degree Centrality Distribution
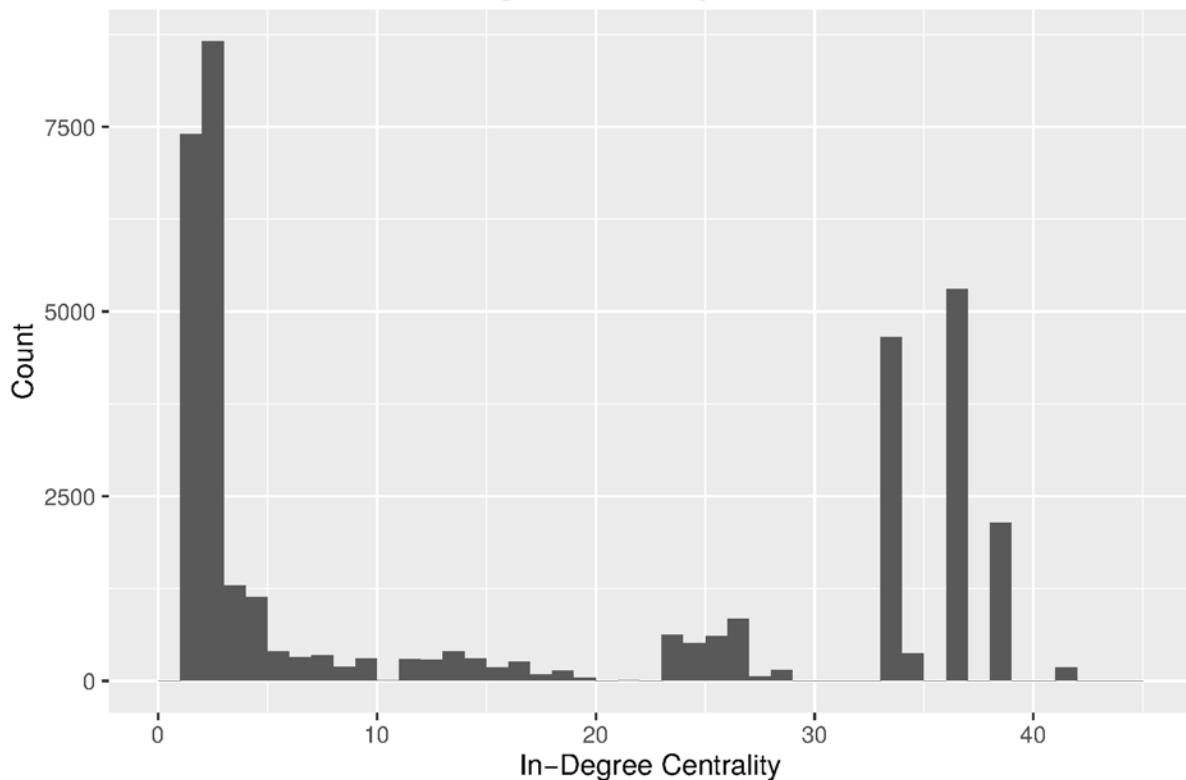
In contrast to in-degree centrality, closeness centrality is a measure of the distance of one node to all the other nodes in the graph. As Newman (2010) describes it:

> "This quantity takes low values for vertices that are separated from others by only a short geodesic distance on average. Such vertices might have better access to information at other vertices or more direct influence on other vertices. In a social network, for instance, a person with

lower mean distance to others might find that their opinions reach others in the community more quickly than the opinions of someone with higher mean distance."

Simply put, the closeness centrality of a given node is an average of the number of edges one must traverse to access all the other nodes in the network (Newman 2010). Returning to our previous examples, the hashtags #gopdebate and #fitn have closeness centralities at the high end of the distribution, (about 0.4824, while hashtags like #constantcontact from former Arkansas Gov. Mike Huckabee and #mandatory from Republican Sen. Rand Paul rounded out the bottom end of the distribution with a closeness centrality of about 0.2411.

Closeness Centrality Distribution
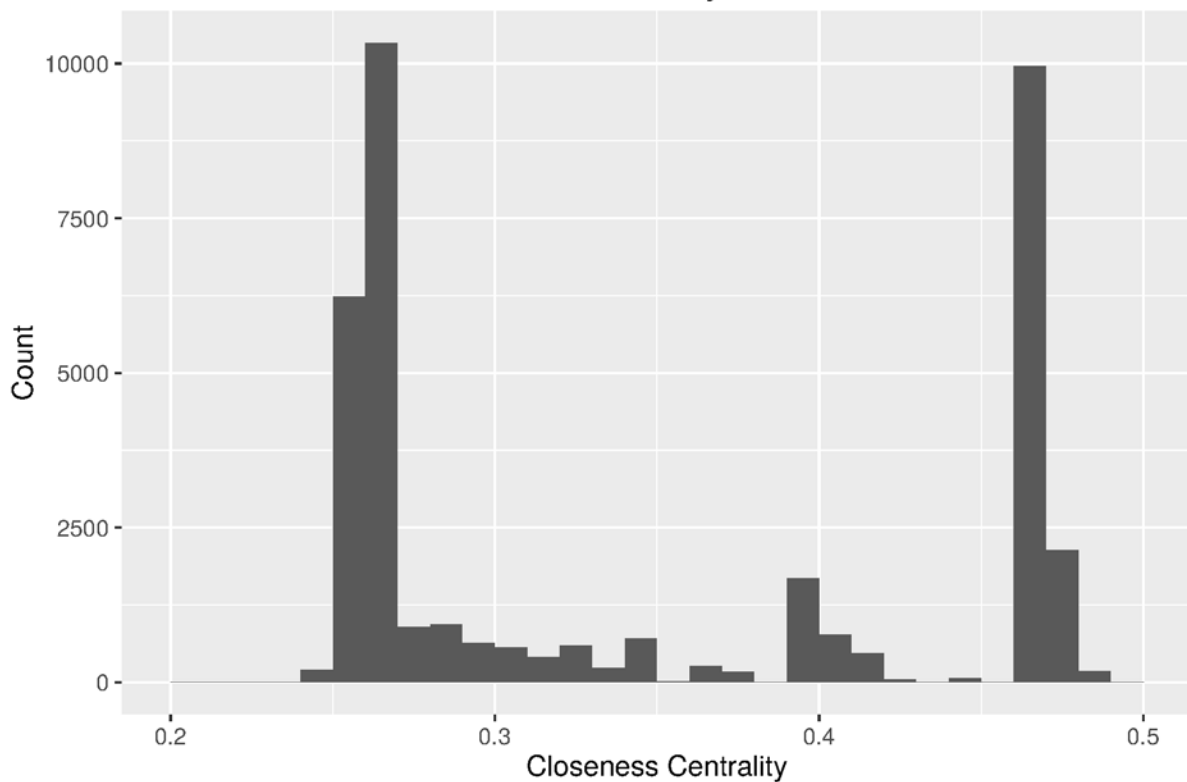
Viewing the entirety of the graph, it becomes apparent that the various candidate and PAC accounts exist almost as planetary bodies with a plethora of tweets orbiting around them. Notably, the mass of each accounts hashtags exist at the corners of the graph, indicating the hashtags were unique to that account alone. Yet no account tweets exclusively into its own universe–evinced by the fact that all accounts have some edges leading to central hashtags.

Looking closer, one can see the most central hashtags relate to the Iowa and New Hampshire caucuses, as well as a hashtag related to the Republican Party debates. Interestingly, #demdebate, the corresponding tag for the Democratic debates didn't achieve the same prominence as its Republican counterpart, indicating that Republican campaign accounts largely avoided it. Hashtags referring to topical events, such as #isis and #irandeal, as well as hashtags referring to news programming–e.g. #morningjoe and #hannity–were also utilized by a majority of the accounts.

Polling data was collected from realclearpolitics.com, a site that aggregates a variety of polls done both nationally and at the state level. For my initial analysis, I collected polling data on a candidate's national standing, as well as state-level polling data from Iowa and New Hampshire in order to capture effects from early state primaries[2]. From this polling data, I calculate a monthly average for national polling as well as

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[2]Polling data available at http://www.realclearpolitics.com/epolls/latest_polls/pres_primary/.
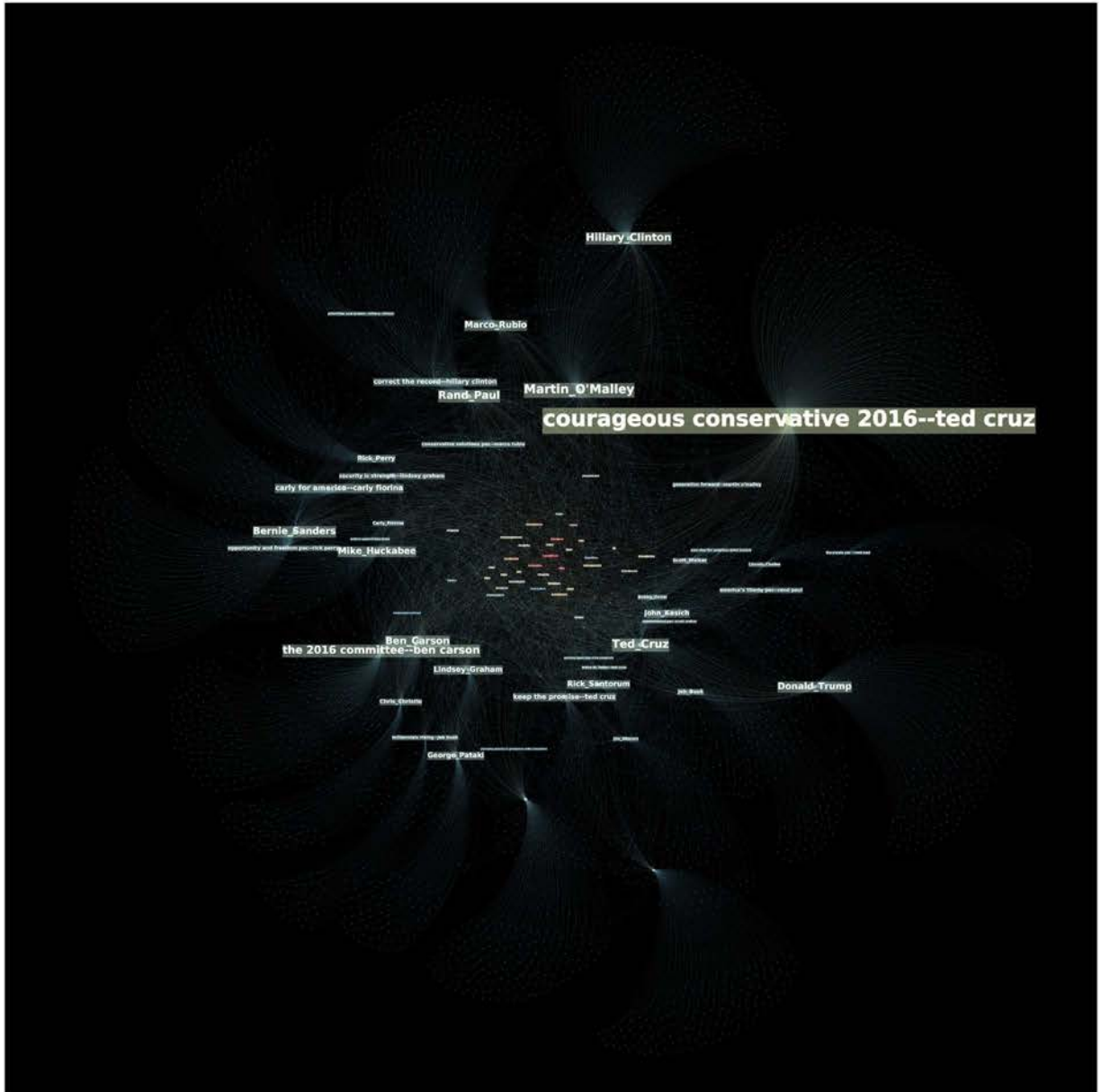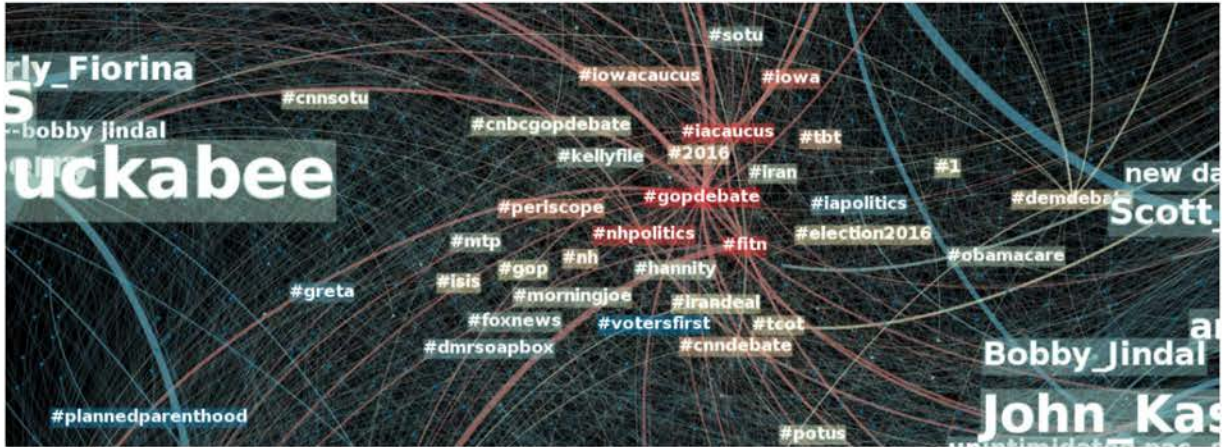
Figure 1: Hashtag Network Map

Figure 2: Central Hashtags, (red equals higher closeness centrality)

the aforementioned early primary states. Taking the difference between the current month's polling average and the month before it, I find the net change in monthly polling average, the key independent variable of this analysis.

In addition, I control for the candidate's party, (a dummy variable where Democrats = 1), whether the Twitter account belonged to a candidate or a super PAC and the ideological leaning of the candidate based on the spatial model developed by Bonica (2013). Further, I transform the Bonica score by taking its absolute value to calculate a value for political extremism.

Table 1: Hashtag Network Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Closeness Centrality	37,597	0.347	0.094	0.241	0.482
In-Degree Centrality	37,597	15.664	15.357	1	41
Democrat	37,597	0.314	0.464	0	1
PAC	37,597	0.356	0.479	0	1
Extremism	37,597	0.829	0.284	0.010	1.669
Iowa Change	33,093	−1.127	4.896	−15.738	9.833
New Hampshire Change	34,025	−0.246	2.896	−12.500	10.500
National Change	34,037	−0.529	3.521	−13.333	9.807

To model the effect of a candidate's polling change on the polarization of their tweets, I use a Poisson count model. The choice of this functional form is appropriate in this context as in-degree centrality, the dependent variable, is comprised of discrete integers and is bound at 0. Further, the in-degree centrality of previous tweets should not have an effect on the in-degree centrality of subsequent hashtags, a key assumption for this functional form (see King 1998). Looking just at bivariate regressions illuminates the basic relationship between polling shifts and polarization of messaging. The results indicate that gains in the polls result in candidates choosing more popular hashtags to tweet to.

Including controls into the regression modulates the degree to which polling gains decrease the polarization of the hashtags chosen, but the underlying relationship remains. The following Poisson regressions utilize robust standard errors to control for violations of the distribution assumptions inherent to the Poisson model (see Cameron and Trivedi 2009).

The effect of a candidate's relative extremism is striking when considering the general trend in hashtag polarization. A Republican moderate, like former New York Governor George Pataki, will tweet to a far

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Table 2: Bivariate Regression Analysis

	Dependent variable:		
	In-Degree Centrality		
	(1)	(2)	(3)
National Change	0.064***		
	(0.0004)		
NH Change		0.057***	
		(0.0005)	
Iowa Change			0.050***
			(0.0003)
Constant	2.761***	2.757***	2.787***
	(0.001)	(0.001)	(0.001)
Observations	34,037	34,025	33,093
Log Likelihood	−337,166.600	−344,168.300	−326,768.900
Akaike Inf. Crit.	674,337.100	688,340.500	653,541.800

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

more polarized hashtag than a relative extremist like Kentucky Sen. Rand Paul, the most extreme Republican according to the Bonica (2013) data. Given, for example, a hypothetical five point increase in polling for both candidates, an extremist Republican would utilize a hashtag with an in-degree centrality about 28 degrees higher.

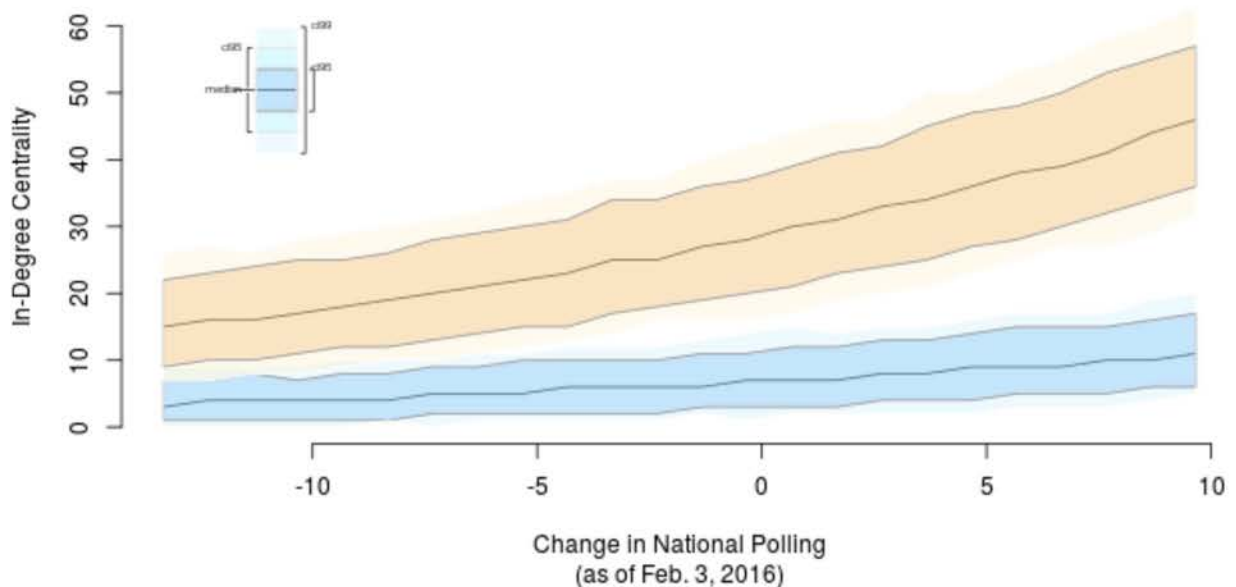## GOP Candidates' Predicted Values, (Extremist Candidate in Red)


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Table 3:

	Poisson Regression w/ Robust S.E.		
	In-Degree Centrality		
	(1)	(2)	(3)
National Change	0.048***		
	(0.002)		
Iowa Change		0.032***	
		(0.001)	
NH Change			0.041***
			(0.002)
Extremism	1.208***	1.232***	1.247***
	(0.027)	(0.028)	(0.026)
PAC	−0.205***	−0.246***	−0.239***
	(0.012)	(0.012)	(0.012)
Dem	1.371***	1.303***	1.404***
	(0.055)	(0.053)	(0.055)
Extremism * Dem	−1.260***	−1.207***	−1.306***
	(0.060)	(0.058)	(0.060)
Constant	1.689***	1.711***	1.663***
	(0.027)	(0.028)	(0.026)
Observations	34,037	33,093	34,025
Log Likelihood	−308,124.500	−297,880.200	−310,871.100
Akaike Inf. Crit.	616,261.000	595,772.400	621,754.200

Note: *p<0.1; **p<0.05; ***p<0.01

The picture changes, however, when looking to Democrats. In this case, the most moderate Democrat in the race–former Rhode Island Gov. Lincoln Chaffee, (a former Republican)–generally tweets to less polarized hashtags than the most extreme Democrat in the race–Harvard law professor Lawrence Lessig. The difference, however, is almost null, as evidenced by the significant overlap. Though the difference in the Bonica scores between the two candidates is in fact larger than the variance in the Bonica scores of the Republicans, the tweeting strategy of these Democratic candidates remains essentially identical.

Dem. Candidates' Predicted Values, (Extremist Candidate in Red)

Change in National Polling
(as of Feb. 3, 2016)
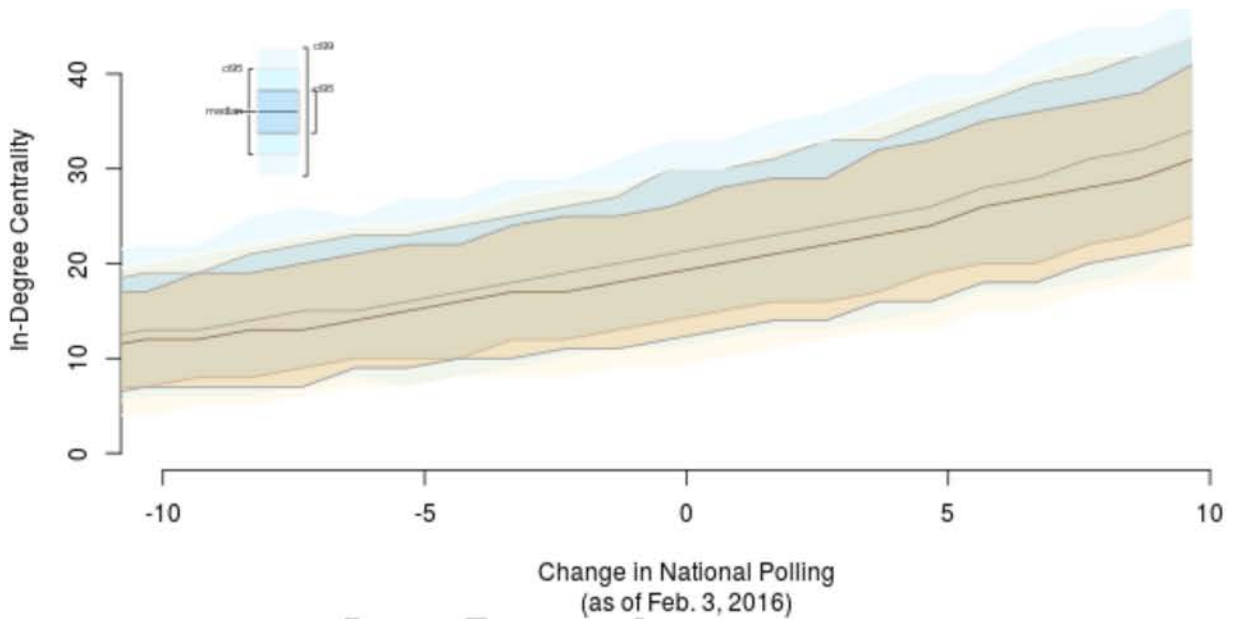
One finds similar results when testing these polling effects on closeness, rather than in-degree, centrality. Like the other measure of centrality, candidates who find themselves rising in both national and early state polling tend to tweet to less polarized channels. Even controlling for fixed effects on the week in order to capture unmodeled heterogeneity based on the differing phases of the campaign season, a strong effect of polling rises inspiring a diminished polarization of channel, if not language, can still be observed. The effect is more pronounced for Democrats than for Republicans, though as was the case with our previous measure of polarization, extremist Democrats will tweet to more polarized channels than their GOP counterparts.

Table 4:

	Data as of Feb. 3, 2016		
	log-Closeness Centrality		
	(1)	(2)	(3)
National Change	0.009***		
	(0.002)		
Iowa Change		0.005***	
		(0.002)	
NH Change			0.008
			(0.006)
Extremism	0.268**	0.292***	0.284**
	(0.112)	(0.108)	(0.113)
PAC	−0.059	−0.069	−0.070
	(0.053)	(0.049)	(0.054)
Dem	0.392***	0.377***	0.400***
	(0.128)	(0.129)	(0.133)
Extremism * Dem	−0.378**	−0.368**	−0.388**
	(0.163)	(0.165)	(0.172)
Fixed effects/Clustered S.E.	Week/Campaign	Week/Campaign	Week/Campaign
Observations	33,149	32,205	32,841
R^2	0.164	0.175	0.162
Adjusted R^2	0.163	0.174	0.161
Residual Std. Error	0.243 (df = 33120)	0.242 (df = 32179)	0.244 (df = 32812)

Note: *p<0.1; **p<0.05; ***p<0.01

Conclusions:

If the first months of the 2016 Election are indicative of campaigns generally, then politics in the digital age does not take place in the balkanized echo-chamber that exists in the imaginations of many political pundits. Rather, candidates and political organizations make strategic choices about whom to address and when, depending on other factors in the electoral landscape. The causal pathway to polarization that starts with a fragmented media and ends with Congressional gridlock is not only overly simplistic, but as this analysis of the 2016 presidential campaign suggests, decidedly incorrect. Polarization is not an impediment to coalition building, but rather a feature of the modern political landscape to be exploited.

While an analysis focused only on Twitter hashtags may be limited given the plethora of other mass-communications technologies available, the ubiquity of Twitter and its impact on political discourse make it emblematic of digital communication generally and of audience-targeting specifically in a world beyond the mere dozens of television channels that characterized the presidential campaigns of generations past. Inserting one's self into the popular discourse in a world with an almost infinite number of competing voices requires skillful manipulation of the shifting infrastructure of the digital era. Whereas the old order could be characterized by Pres. Lyndon Johnson's famous proclamation regarding the increasingly untenable

situation in Vietnam–"If I've lost Cronkite, I've lost the country[3]"–the internet age offers no parallel and no singular gatekeeper guarding the living rooms of nation.

What the internet age has instead are curators of contents, those who aid in sifting the wheat from the endless chaff churned out by the machinations of the web. These curators, some informal and autonomous like hashtags, act as beacons to connect consumer to content. Some are fairly obvious–#iacaucus received at least one tweet from each candidate and PAC. Others act as shibboleths to attract the already-initiated. Hashtags like #ccot–"conservative Christians of Twitter"–was a perennially popular hashtag with Republican candidates. Others went deeper still, hashtags like #theyfeelpain which was popular with Sens. Lindsay Graham and Ted Cruz during Senate proceedings on a proposed late-term abortion ban in the summer of 2015.

This analysis demonstrates that politicians are ambidextrous. They speak to isolated groups when they are low in the polls and broaden their audiences as their electoral favors rise. Extremism and polarizing discourse, rather than being an immutable trait of certain politicians, is a tactic by those concerned with electoral victory. After all, polarization by definition requires that these candidates make their way into office.

This study of Twitter hashtags in the 2016 Primary races is but a first step in a longer examination of Twitter as a communications medium specifically and political communication in the digital era more broadly. However, these preliminary analyses indicate that rather than political candidates fragmenting a normally unitary electorate with their divisive words, aspirants for higher office know when to speak narrowly and when to speak widely. Electoral success means modulating one's extremism, building steam with small polarized factions before transitioning to the more populous center. To the extent that polarization is to blame for legislative paralysis or skewed representation, the results of this analysis seem to suggest that successful politicians are simply playing the tune the voters themselves are calling for.

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[3]As quoted here: http://www.nytimes.com/2012/07/08/books/review/cronkite-a-biography-by-douglas-brinkley.html

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