

Politicians and the Policy Agenda: Does Use of Twitter by the U.S. Congress Direct *New York Times* Content?

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The conventional understanding of how elected officials affect the policy agenda is based on the argument that they use symbols and rhetoric to propagate a policy problem, primarily through the traditional media. The arguments presented in this article are largely consistent with this claim but account for the function of social media. More specifically, and framed by indexing theory, we argue that social media enhances opportunities for policy agenda builders in the U.S. Congress to share information with journalists. Across the key policy issues of 2013, tests for congruence between politicians' Twitter posts and New York Times articles confirm a connection, particularly for the policy issue areas of the economy, immigration, health care, and marginalized groups. Simultaneous discussion and debate between Democrats and Republicans about a particular policy issue area, however, negatively impact how the New York Times indexes a particular issue.

KEY WORDS: information technology and politics, political communication, agenda building, social media, Twitter

Introduction

The information provided in the traditional media is of fundamental importance for the policy-making process, signaling which issues are gaining traction, which are falling out of favor, and introducing entirely new problems for the public to digest (Baumgartner & Jones, 1993; Iyengar & Kinder, 1987; Kioussis & McCombs, 2004; McCombs & Shaw, 1972; Zhu, 1992).¹ Yet, the monopoly of the traditional media as a vehicle for disseminating information about the policy agenda is being superseded by social media (Deuze, 2008; Lewis, Holton, & Coddington, 2014; Neuman, Guggenheim, Jang, & Bae, 2014). Specifically, Twitter use by politicians influences traditional news content during elections and at other times (Hamby, 2013; Murthy, 2015; Wallsten, 2014). As a result, members of Congress are incentivized to keep information dissemination costs low (Gandy, 1982). They share their views frequently and compellingly, describing on Twitter their activities on Capitol Hill, informing potentially hundreds of thousands of Twitter followers which politician's efforts should or should not be supported, and directing others to websites that can be referenced for salient information

(Otterbacher, Hemphill, & Shapiro, 2012). This all stands in stark contrast to claims that the use of the Internet is overstated for members of Congress (Druckman, Kifer, & Parkin, 2014).

In this article, we identify how and to what extent the traditional media is impacted by politicians' Twitter posts. In the wake of a growing body of research, which focuses on the language officials use in the traditional media (Cook et al., 1983; Edwards & Wood, 1999; Entman, 2007; Kedrowski, 2000; Lee, 2009) and on websites that report statements and speeches of public officials (Gentzkow & Shapiro, 2011), we draw upon indexing theory to drive our expectations. Simply put, the media index their coverage and framing of key policy issues based on elite consensus or the lack thereof, so issues that are not debated are less likely to get attention in the news. There will, after all, be fewer opportunities for the media to discuss the issue as comprehensively if there is not sufficient discussion (Bennett, 1990, 2015). Our analysis focuses on the propensity for debate (or the lack thereof) via Twitter for all of 2013, examining how Twitter-based discourse by members of Congress impacts news content in the traditional media.

The broad questions answered in the following pages include the following: To what extent are the agenda setting efforts of members of Congress acknowledged by the traditional media? What, if any, are the advantages for one party over the other, measured by the traditional media's increased attention? And, with regard to both of these questions, is there variance across different policy issue areas? We show that the traditional media—the *New York Times* specifically—is largely responsive to congressional Twitter posts but with variance across policy issue areas. Contradicting indexing theory, however, we observe that greater levels of simultaneous debate between Democrats and Republicans about a particular policy issue area have a negative impact on how the *New York Times* indexes an issue.

Related Work

Much of the Twitter and/or social media-related political research focuses on elections: Why such techniques are employed by politicians (Chi & Yang, 2011; Golbeck, Grimes, & Rogers, 2010; Lassen & Brown, 2011; Peterson, 2012), the degree to which Twitter use is concentrated in the hands of only a few politicians (Tumasjan, Sprenger, Sandner, & Welppe, 2011), whether the public is affected by politicians' Twitter posts (Boutyline & Willer, 2015; Gainous & Wagner, 2014; Himelboim, McCreery, & Smith, 2013; Hong & Nadler, 2012; LaMarre & Suzuki-Lambrecht, 2013; Lee 2013; Murthy 2015), and who the intended recipients of the Twitter posts are (Gainous & Wagner, 2014; Williams & Gulati, 2015). Another set of research examines the longitudinal implications of Twitter-based political communications,² building on exploratory analyses of the websites, Facebook pages, YouTube pages, and Twitter-based communications of members of Congress (Evans, Cordova, & Sipole, 2014; Gulati, 2004; Gulati & Williams, 2007, 2011; Williams & Gulati, 2013). Our efforts here capture both of these areas

of research, as we employ a longitudinal analysis of politicians' Twitter posts with reference to *New York Times* articles and consider the communication strategies employed by members of Congress.

At stake is the hegemony of agenda setting theories—the process outlining how an issue is identified, defined, and then put onto the policy-making agenda—which focus strictly on the linear, politician-to-media transfer of information (Kingdon, 1984; McCombs & Shaw, 1972; Walker, 1977), and which are often studied in the context of the presidency or Congress (Bennett, 1990; Druckman & Holmes, 2004; Lippmann, 1922). As opposed to agenda setting, our focus is on how the agenda is built—the process by which the news determines what is publishable and the way that elected officials shift issues on the policy agenda based on how the media and, in turn, the public is influenced (Perloff, 1998). Journalists consider social media-based information such as Twitter when writing their articles (Hamby, 2013; Parmelee, 2013; Verweij, 2011), and journalists' Twitter posts are based on significantly less fact-checking of politicians when the information is conveyed from the politician via Twitter (Coddington, Molyneux, & Lawrence, 2014). There is also evidence that personal interactions between members of Congress and journalists matter, particularly politicians' tracking of how the media depicts them (Amira, 2013; Cook, 1989; Sigal, 1973).

What we know is that elected officials use Twitter to get widespread media attention (Wallsten, 2014), and journalists rely primarily on politicians for news fodder (Sigal, 1973; Soley, 1992). Simultaneously, political actors depend on the media to convey information to the general public (Lieber & Golan, 2011). The relationship is not always unidirectional, as the public can read politicians' Twitter posts, mobilize, and thus direct journalists' attention to a particular policy issue area; yet, this dynamic is tangential to our purposes here. Decades of the reciprocal relationship between politicians and the media allow us to safely assume that members of Congress post on Twitter with the understanding that journalists are following along. After all, the media rely on official Twitter accounts and cite them when reporting news (Moon & Hadley, 2014), and the majority of all Twitter posts in the media are made by politicians (Wallsten, 2014). As such, we assume that members of Congress, knowingly or otherwise (Bernhard, Dohle, & Vowe, 2016), use Twitter to communicate their policy agenda preferences to journalists in ways similar to official press statements.

The extent to which the media index their coverage (and framing) of a policy issue is a function of how members of Congress debate the issue. As we have stated already, an event is less reportable in the media when politicians are not discussing it sufficiently (Bennett, 1990, 2015). We know this occurs with regard to U.S. foreign policy and other international relations-related issues (Zaller & Chiu, 1996). There are exceptions to the rule, such as when political candidates fail in their attempts to direct media content during electoral campaigns (Zaller, 1998). Whatever the case, we conflate this notion of indexing with issue salience in the media, in line with Kioussis (2004), and offer the following hypothesis:

H1a: The index of news about a particular policy issue grows in proportion to the breadth of debate about the issue on Twitter.

That is, to what extent does the news media reference a particular policy issue as a function of how vociferously members of Congress debate the issue, where “debate” is measured by simultaneous interparty discourse? As an alternative, we test the following:

H1b: The index of news about a particular policy issue grows in proportion to the dominance of one party over the other in its Twitter-based discourse.

Determining whether congressional Twitter discourse is a function of debate (H1a) or one-sided discourse (H1b) provides a more conclusive test of the veracity of the indexing hypothesis.

Debate and discussion is a function of the partisan nature of a policy issue. Thus, we can expect variance across policy issue areas in terms of the aforementioned hypotheses. Historical analyses of the evolution of policy issue areas along a single, party-based dimension indicate that non-partisan-oriented voting in Congress is the exception rather than the norm. For example, policy issue areas related to economics, health care, and civil rights are a function of more partisan voting in Congress relative to policy issue areas related to the environment and energy (Jochim & Jones, 2012; Snyder & Groseclose, 2000).³ This is not simply a matter of identifying whether a policy issue area is discussed more strongly by one party than the other but how in fact votes about each policy issue area are predicted by party. Indeed, we are not dismissive of evidence that individual policy issue areas are rooted in partisan discourse in Congress, as such discourse is present with regard to energy and the environment (Lowry, 2008; Shipan & Lowry, 2001). Variance in roll-call voting across multiple policy issue areas, however, is another story and leads us to pose the following test:

H2: Less partisan issues on Twitter such as energy and the environment yield less indexing of news.

All of these claims are based on major shifts in the operations of the media. We recognize that, structurally, the current journalistic environment has moved beyond Tuchman’s (1978) initial observations regarding the beat system as it affects indexing on news content. New journalistic practices represent an environment where the digital and nondigital news worlds interact (Revers, 2014). We are referring specifically to the convention of hashtags (i.e., keywords) on Twitter, through which journalists track discussions among members of Congress about policy issues (Zappavigna, 2012). Culturally, this redefines what it means to be a journalist, urgently working to filter and transfer massive amounts of information (Dailey & Starbird, 2014), yet, faced with the immediacy and instantaneity of Twitter (Papacharissi & de Fatima Oliveira, 2012; Usher, 2014). In sum, new journalistic practices involving online content such as Twitter

require us to recognize a redefined journalist–subject relationship (Broersma & Graham, 2012, 2013; Chadha & Wells, 2016; Ekman & Widholm, 2015).^{4,5}

Materials and Methods

Within the 140-character limit of Twitter is the even more abbreviated convention of using hashtags (i.e., keywords), which help Twitter followers and readers track and contribute to the discussion on a particular topic. We identify policy issue areas according to the most popular hashtags used by members of Congress. Shorthand phrases instituted and subsequently used by politicians are often adopted by journalists (Lewis & Reese, 2009), so it is not unrealistic to assume that hashtags are part of the “new shorthand,” allowing journalists to track particular policy areas without the burdensome task of reading each and every Twitter post.

We operationalize indexing as the extent to which the *New York Times* covers an issue relative to all other issues. Such an index can be presented as a simple rank-ordered listing of popular topics presented in the *New York Times*, and in fact a preliminary step in the subsequent analysis is to describe the *New York Times*’s index of policy issue areas in the traditional media. To properly understand why the newspaper covers an issue and predict the daily *New York Times* content, we model *New York Times* content as a function of all of the previous day’s policy issue areas as well as all of the previous day’s Twitter posts about all of the policy issue areas by Democrats and Republicans. Given that the media’s understanding of the issues and thus its attention to the issues is a function of elite debate (Bennett, 1990, 2015), we operationalize (the lack of) debate in terms of the daily difference in discussion between Democrat and Republican members of Congress.⁶

Twitter

Using Twitter’s REST API,⁷ we collected all Twitter posts made in 2013 by the accounts associated with members of the U.S. Congress.⁸ In all, we collected 275,816 Twitter posts from 502 accounts. Twenty-eight thousand one hundred twenty-three different hashtags were used a total of 266,501 times for all Twitter posts made by members of Congress in 2013. It should be stated explicitly that we are not distinguishing between more and less prolific Twitter posters in Congress, the latter of which may be cited significantly more in the media (Wallsten, 2014). Rather, our unit of analysis is the party in order to highlight macro-level trends and avoid incidental agenda building effects through the use of social media, as identified in Bernhard et al. (2016).

To assist with the data cleaning and coding processes, and based on the assumption that a hashtag is only as valuable as its usage, we limit our discussion to those hashtags that were used at least 200 times in 2013.⁹ In aggregate, these selected hashtags appear in half of the population of Twitter posts by members of Congress in 2013, making the coding process much more manageable. We then

omit hashtags that are unrelated to policy topics such as those that refer to a specific member of Congress's district and/or state (e.g., "TX" for Texas or "COPolitics" for Colorado politics) or those that relate to specific events or memes (e.g., "FF" for "follow Friday"). We also omit those hashtags that addressed foreign policy broadly speaking (e.g., "Benghazi," "Cuba," "Egypt," "Iran," and "Syria") or American political institutions (e.g., "AskDems," "Congress," "GOP," "IRS," "NSA," "Obama," "POTUS," "SCOTUS," "SCTweets," "Senate," and "SOTU"). The refined list amounts to 617 unique hashtags from 106,467 Twitter posts made by 493 members of Congress. A final cleaning process collapses these 617 hashtags into 143 hashtags. For example, "#CIR" (Comprehensive Immigration Reform) is used as a hashtag in the following four ways: #CIR, #cir, #Cir, and #CiR. We collapsed all of those tags into a single "CIR" topic. To assist in conveying the meaning about what might be considered otherwise cryptic combinations of letters, we present in Table 1 the entire, final list of hashtags. For ease of comprehension, we capitalize all acronyms as well as each word's first letter in multiword hashtags.

The relevance of a hashtag is a function of whether it references a particular issue. Thus, after familiarizing ourselves with each of the 143 hashtags, we identify six policy issue areas that receive sustained attention from one or both parties: The economy, immigration, environment, energy, health care, and marginalized groups (e.g., LGBT, military veterans, specific racial or ethnic groups, etc.).^{10,11} It should be noted that, in 2013, there were specific micro-agendas present within these broader policy issue areas. For example, discourse on the budget dominated the economy agenda, "comprehensive immigration reform" dominated immigration, the Keystone XL Pipeline directed the energy policy agenda, and the Affordable Care Act (ACA) dominated the health care policy discourse. As well, there may be overlap between narratives employed when discussing, for example, the economy and health care or certain types of marginalized groups, such as Latinos, and immigration. We confirm through multiple surveys of randomly sampled Twitter posts by members of Congress that our categorization has content validity. For example, Latinos are in fact a distinct topic from immigration; when a member of Congress intends to conflate two policy issue areas, she/he includes hashtags associated with both (e.g., #immigrationreform and #latism). Our hashtag coding scheme for these six issue areas is presented in Table 2, representing a total of 55,988 unique Twitter posts.

News Articles

From the *New York Times*, the benchmark of American news media affecting readers' conception of the policy agenda (Althaus & Tewksbury, 2002), we collect all articles published in 2013, including those from the Associated Press, Reuters, and others as provided by the *New York Times's* Articles API,¹² totaling 209,389 articles. Our content analysis led to a culling of those articles covering extraneous topics such as art, fashion/style, crosswords, dining, movies, obituaries, sports, and theater, a random sample of which reveals no connection to policy issues at

Table 1. Politics/Policy-Related Hashtags Used More Than 200 Times in 2013

4Jobs	Debt	GetCovered	MOW50	PayCheckFairness	StopTheSequester
ABetterBargain	DebtCeiling	GOP	MarketplaceFairness	Pinet	StudentLoan
ACA	DefundObamacare	GOPShutDown	MarketplaceFairnessAct	POTUS	StudentLoans
ACAATurns3	DemandAVote	Gosnell	MFA	Prolife	Syria
ActOnClimate	DOMA	HCR	MarriageEquality	RaiseTheWage	TaxDay
Ag	DontDoubleMyRate	Healthcare	Medicare	RateShock	TCOT
AskDems	DontFundIt	Immigration	MemorialDay	RequireAPlan	TImeIsNow
AskSebelius	Economy	ImmigrationReform	Military	Sandy	TImeToBuild
BalancedBudget	Education	Inaug2013	MJIA	SCOTUS	TrainWreck
Benghazi	eFairness	Infrastructure	MST	SCTweets	Veterans
Bipartisan	Egypt	Iran	NavyYardShooting	Senate	Vets
Boston	ENDA	IRS	NDA	SenateMustAct	VeteransDay
BostonMarathon	EndHungerNow	IRSScandal	NeverForget	Sequester	VRA
BrokenPromises	Energy	Jobs	NoBudgetNoPAY	Sequestration	WarOnCoal
Budget	EnoughAlready	KeepYourHealthPlan	NoNetTax	Shutdown	Women
ChainedCPI	EntrepreneursDay	KeepYourPlan	NSA	SkillsAct	WomenSucceed
CIR	EPA	Keystone	Obama	SmallBiz	WRRDA
CIRMeansJobs	Equality	KeystoneXL	Obamacare	SNAP	YourTime
CISPA	EqualPay	KXL	ObamacareInThreeWords	SocialSecurity	
Climate	EqualPayday	KidsFirst	ObamaFlightDelays	SOTU	
ClimateChange	FairnessForAll	Latism	Obamaquester	SpeechesDontHire	
Coal	FarmBill	LGBT	OffTheSidelines	SpendingIsTheProblem	
Congress	FiscalCliff	MakeItInAmerica	P2	StandUpForWomen	
Cuba	FixNotFight	Manufacturing	PassENDA	STEM	
CutWaste	FullRepeal	MarchOnWashington	PassMJIA	StopGovtAbuse	

Table 2. Issue-Specific Hashtags Used by Members of Congress in 2013

	Economy	Immigration	Environment	Energy	Health Care	Marginalized Groups
4Jobs		CIR	ActOnClimate	Coal	ABetterBargain	ChainedCPI
BalancedBudget		CIRMeansJobs	Climate	Energy	ACA	DOMA
DebtCeiling		Immigration	ClimateChange	Keystone	ACA Turns3	ENDA
Economy		ImmigrationReform	Coal	KeystoneXL	AskSebelius	EndHungerNow
FiscalCliff		TimeIsNow	EPA	KXL	DefundObamacare	Equality
GOPShutDown			TimeToBuild	TimeToBuild	DontFundIt	EqualPay
Jobs			WarOnCoal	WarOnCoal	FairnessForAll	EqualPayday
NoBudgetNoPay			WRRDA		FullRepeal	Latism
ObamaFlightDelays					GetCovered	LGBT
Obamaquester					HCR	MarchOn
RequireAPlan					Healthcare	Washington
Sequestration					KeepYourHealthPlan	WomenSucceed
Shutdown					KeepYourPlan	
SNAP					Medicare	
SpendingIsTheProblem					Obamacare	
StopTheSequester					ObamacareInThreeWords	
					RateShock	

all. This reduces the population of 2013 articles to 46,753, from which we engage in content analysis of article keywords identified by the *New York Times*. Among the more than 26,000 different keywords identified, we analyze only the 324 keywords used at least 123 times. Their combined usage represents half of the 231,634 times keywords were used in 2013.¹³ Our content analysis of these 324 keywords is framed by the policy issue areas discussed most prominently by members of Congress, namely those related to the economy, immigration, the environment, energy, health care, and marginalized groups. Our coding process results in the list of issue-specific keywords presented in Table 3 that are connected to 8,486 unique articles. As an example, the August 1, 2013 article titled “Judge dismisses suit to end deportation deferrals” with the following topics/keywords, “Napolitano, Janet; Immigration and Emigration; Homeland Security Department; Immigration and Customs Enforcement (US); Decisions and Verdicts; Deferred Action for Childhood Arrivals; Deportation; Suits and Litigation (Civil)” is classified as immigration-related.

Descriptive Statistics

Twitter posts can be posted at any time, whereas *New York Times* articles are posted throughout the day or in bulk at midnight. To normalize both data sets, Twitter posts and *New York Times* articles are collapsed and summed for each day, creating a total of 365 different time points for the entire year. For each policy topic and for each information source, descriptive statistics for the daily Twitter posts by Democrats and Republicans, for the daily difference between Democrats and Republicans, and for the daily number of *New York Times* articles are presented by policy area in Table 4. It should be noted that Democrats and Republicans can frame a policy in very different terms, and that hashtags may be co-opted much like narratives more generally are co-opted, as described in Coyle and Wildavsky (1987), Christensen (2013), and Bode, Hanna, Yang, and Shah (2015), Distinguishing and thus controlling for variance in the use of party-pure versus co-opted hashtags is extremely difficult given the nature of our approach to coding and analyzing Twitter and media content over time. It also implies that we cannot properly assess the effects of inter-party polarization about specific policy issue areas, of which there is expected to be variance.¹⁴

The contents of Table 4 reveal a degree of consistency across the *New York Times* and Twitter posts by members of Congress with regard to the economy. It is popular across all three units of analysis, published an average of 10.75 times per day in the *New York Times*, and posted by Democrats and Republicans on Twitter, respectively, an average of 19.11 and 20.94 times per day. Yet, in 2013, Democrats are most likely to post about marginalized groups, whereas Republicans most likely to post about health care. Table 4 also indicates that Democrats tend to frequently post about health care and immigration but infrequently about energy. Republicans, in contrast, post least about marginalized groups and immigration but with much greater frequency

Table 3. Issue-Specific Keywords for *New York Times* Articles

Economy	Immigration	Environment	Energy	Health Care	Marginalized Groups
<ul style="list-style-type: none"> • Economic conditions and trends • Federal budget (US) • Income tax • Labor and jobs • Layoffs and job reductions • National debt (US) • Recession and depression • Shutoffs (institutional) • Taxation • United States economy • Unemployment • Wages and salaries 	<ul style="list-style-type: none"> • Illegal immigrants • Illegal immigration • Immigration and emigration 	<ul style="list-style-type: none"> • Environment • Global Warming • Greenhouse gas • Emissions • Pollution (air pollution; water pollution) 	<ul style="list-style-type: none"> • Natural gas • Nuclear energy • Oil (petroleum) and gasoline • Power (electric light and power; Energy and Power) 	<ul style="list-style-type: none"> • Healthcare.gov • Health insurance and managed care • Medicaid • Patient Protection and Affordable Care Act 	<ul style="list-style-type: none"> • Blacks • Civil rights and liberties • Discrimination • Elder care • Elderly • Homosexuality • Hispanic-Americans • Income inequality • Minimum wage • Poverty • Race and ethnicity • Same-sex marriage, civil unions, and domestic partnerships • Sexual harassment • Unemployment insurance • Veterans • Women's rights

Notes: We make two exceptions to our coding scheme: "Veterans" is ranked 329th and was used as a keyword in 122 articles; "Healthcare.gov" is ranked 349th and was used as a keyword in 116 articles. These two keywords fall just below the assigned threshold but are both relevant for the topics covered under Table 2.

Table 4. By Policy Issue, Descriptive Statistics for Daily Twitter Posts and *New York Times* Articles

	Economy	Immigration	Environment	Energy	Health Care	Marginalized Groups
Twitter posts—Democrat						
Mean	19.11	12.35	3.66	1.10	14.54	23.98
S.D.	46.23	22.71	8.24	1.98	30.91	50.07
Maximum	461	218	99	20	302	538
Twitter posts—Republican						
Mean	20.94	2.78	5.61	10.17	46.86	1.17
S.D.	31.77	5.82	17.76	30.96	75.26	5.59
Maximum	224	66	198	457	669	98
Twitter posts—Daily diff.						
Mean	20.23	9.86	4.66	9.24	33.72	22.83
S.D.	4.10	19.40	14.66	29.78	55.21	47.17
Maximum	414	152	191	437	402	507
<i>New York Times</i>						
Mean	10.75	2.10	2.15	1.92	2.39	6.52
S.D.	4.60	1.64	1.61	1.78	2.01	3.19
Maximum	28	11	9	13	14	18

than Democrats with regard to energy, an average of 10.17 times per day. It is also notable and somewhat surprising given our expectations about indexing theory that posts about the economy and health care, which are both relatively important to both parties on the basis of their Twitter-based discourse, are among those policy issue areas with the greatest daily difference between parties, indicating that frequency of posts does not equate with simultaneous daily debate.

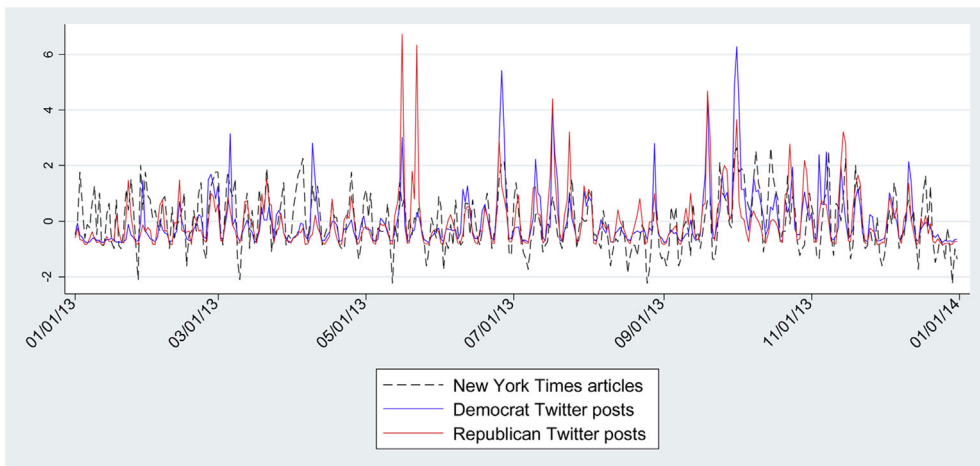


Figure 1. Standard Scores for Twitter Posts and *New York Times* Articles for all Issues, 2013.

Results

Given scaling differences between Twitter and *New York Times* data, we normalize all variables as standard scores,¹⁵ transforming (what are typically) data that follow zero-inflated Poisson or negative binomial distributions to normal distributions. Figure 1 presents these converted measures, aggregated across all six policy issue areas for 2013, as line plots of *New York Times* articles and Twitter posts by party. Not presented here for reasons of brevity are line plots breaking down each of the six areas, revealing periods during which both parties talk about the economy more than usual (March and October).¹⁶ As well, Democrats actively discussed immigration-related issues all year long, whereas Republicans stopped discussing them in the second half of the year, a pattern which is also reflected in the *New York Times*. For environment-related issues, Democrats, Republicans, and the *New York Times* engaged in discussions for four to five days and then stopped for extended periods of time. In terms of energy-related issues, Democrats mentioned energy all year long, but Republicans' discussions were well-spaced bursts. We attribute this to a number of key events in 2013 such as Federal Reserve Chairman Bernanke's May 22nd testimony before the Joint Economic Committee of Congress¹⁷ as well as the September 19th meeting of the subcommittee of the House Energy and Commerce Committee, which discussed the impact of President Obama's Climate Action Plan.¹⁸ For health care-related issues, the first half of the year was relatively quiet except for Republicans' Twitter posts surrounding the House vote to repeal the ACA on May 16th. In the second half of the year, health care received significantly more attention from Democrats, Republicans, and the *New York Times*. Finally, for issues related to marginalized groups, both Democrats and *New York Times* articles contributed to the discussion periodically, whereas Republicans made a concerted effort to focus on marginalized groups on the August 28th celebration commemorating the 50th anniversary of the March on Washington.

Based on our earlier transformation of these data into standard scores, standardized coefficients derived from least-squares regression results are presented in all subsequent statistical tables. In Table 5, by policy issue area, *New York Times* articles are modeled as a function of the previous day's *New York Times* articles, the previous day's Twitter posts by Democrats, and the previous day's Twitter posts by Republicans. To demonstrate that the effects of Twitter posts by members of Congress are issue specific, all issues are simultaneously considered as explanatory variables. As well, the previous day's articles were included as a control for the *New York Times*'s ongoing discussion on a particular issue and to effectively remove autocorrelation.

The results presented in Table 5 provide initial insight into how politicians' Twitter posts about the gamut of policy issue areas impact the propensity for the *New York Times* to report about each policy issue area. For two of the six policy issue areas, the economy and immigration, *New York Times* reporting is predicted by our policy classifiers;¹⁹ for the environment and energy, there are no strong policy issue-specific predictors of today's *New York Times* content. For the

Table 5. *New York Times* Articles as a Function of the Previous Day's Articles and Twitter Posts, by Party

Yesterday's Content	Today's <i>New York Times</i> Articles					
	(1) Economy	(2) Immigration	(3) Environment	(4) Energy	(5) Health Care	(6) Marginalized
<i>New York Times</i>						
Economy articles	0.243*** (0.06)	0.006 (0.06)	0.046 (0.06)	0.135* (0.06)	-0.107* (0.05)	-0.083 (0.06)
Immig. articles	0.090 (0.05)	0.146** (0.05)	0.079 (0.06)	0.088 (0.06)	0.023 (0.05)	0.117* (0.05)
Envir. articles	-0.005 (0.05)	-0.035 (0.05)	0.098 (0.06)	0.031 (0.05)	0.066 (0.05)	-0.039 (0.05)
Energy articles	0.004 (0.05)	-0.014 (0.05)	-0.048 (0.06)	-0.055 (0.05)	0.092 (0.05)	-0.103* (0.05)
Health articles	0.008 (0.06)	0.014 (0.06)	0.024 (0.06)	0.157* (0.06)	0.322*** (0.05)	-0.004 (0.06)
Margin. articles	-0.016 (0.05)	-0.096 (0.05)	-0.006 (0.06)	0.023 (0.06)	0.017 (0.05)	0.216*** (0.05)
Congress						
Dem. economy	0.254*** (0.06)	-0.001 (0.06)	-0.033 (0.07)	0.073 (0.07)	0.194*** (0.06)	-0.085 (0.06)
Dem. immig.	0.057 (0.07)	0.129 (0.07)	-0.047 (0.08)	0.113 (0.07)	-0.016 (0.06)	-0.050 (0.07)
Dem. envir.	-0.020 (0.06)	0.054 (0.07)	0.076 (0.07)	-0.089 (0.07)	0.063 (0.06)	0.088 (0.07)
Dem. energy	0.081 (0.06)	-0.032 (0.07)	-0.011 (0.07)	0.110 (0.07)	-0.131* (0.06)	-0.080 (0.06)
Dem. health care	-0.014 (0.07)	-0.016 (0.08)	-0.130 (0.08)	-0.076 (0.08)	-0.091 (0.07)	0.124 (0.08)
Dem. margin.	0.036 (0.06)	-0.042 (0.07)	0.027 (0.07)	0.046 (0.07)	-0.027 (0.06)	0.162* (0.07)
Repub. economy	0.122* (0.06)	0.011 (0.06)	0.071 (0.06)	0.138* (0.06)	-0.060 (0.05)	0.256*** (0.06)
Repub. immig.	-0.076 (0.07)	0.261*** (0.07)	0.040 (0.08)	-0.090 (0.07)	-0.068 (0.06)	0.015 (0.07)
Repub. envir.	0.011 (0.10)	-0.112 (0.10)	-0.032 (0.11)	0.107 (0.11)	0.069 (0.09)	-0.064 (0.10)
Repub. energy	-0.067 (0.10)	0.208* (0.10)	0.030 (0.11)	-0.127 (0.11)	-0.071 (0.09)	0.094 (0.10)
Repub. health.	-0.014 (0.08)	-0.101 (0.09)	0.204* (0.09)	0.096 (0.09)	0.295*** (0.08)	0.045 (0.09)
Repub. margin.	0.050 (0.06)	0.034 (0.06)	-0.060 (0.06)	0.022 (0.06)	-0.020 (0.05)	0.023 (0.06)
N	364	364	364	364	364	364
R ²	0.271	0.205	0.067	0.166	0.367	0.239
F	7.124	4.944	1.369	3.810	11.13	6.016

Notes: Each count of articles and Twitter posts is a standard score, and thus beta coefficients for each predictor are reported. Predictors' significance are indicated with asterisk where *, **, and *** represent $p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively.

remaining two policy issue areas, health care and marginalized groups, there is apparent conflation between policy issue areas. That is, the current day's health care articles are significantly predicted by the previous day's health care-related Twitter posts by Republicans as well as the previous day's Democrat Twitter posts focusing on the economy. The converse is true with regard to the current day's *New York Times* articles about marginalized groups, which are shown to be predicted by the previous day's Democrat Twitter posts focusing on marginalized groups as well as the previous day's Republican posts about the economy.

To assess the potential for reverse causality in this foundational model, that is, that politicians are not affecting news items but are reacting to them, we examine a series of regressions (not reported here in tabular form) which interchange the dependent and independent variables. With the exception of health care for both parties, which we attribute to the topic's extreme popularity in the latter half of 2013, and marginalized groups for Democrats only,²⁰ our predicted causal direction is largely confirmed: The previous day's *New York Times* content on the issue does not strongly predict the current's day's Democrat or Republican Twitter posts on the same topic. We also conduct a check with a specification mirroring Table 5 but including two-day lagged independent variables. The patterns that we have already identified in Table 5 remain present under this two-day lag specification.

To formally test whether the index of news about a particular policy issue grows in proportion to the breadth of debate about the issue, we present two related sets of regressions. First, by policy issue area, Table 6 models *New York Times* articles as a function of the previous day's *New York Times* articles, the previous day's Twitter posts by Democrats, the previous day's Twitter posts by Republicans, and the respective interactions between Twitter posts by Democrats and Republicans. If we assume that greater levels of daily discussion (about a particular policy issue area) can be represented by the interaction between Democrats and Republicans about an issue, the contents of Table 6 are useful for predicting at least in part whether daily discussions have a significant effect, as proposed in H1a. To demonstrate that the effects of Twitter posts by members of Congress are issue specific, all issues are simultaneously considered as explanatory variables. The previous day's articles were included as a control for the *New York Times*'s ongoing discussion on a particular issue and to effectively remove autocorrelation.²¹

Shown in Table 6, the interaction terms for Democrat–Republican daily Twitter posts about each policy issue area are statistically significant and negative when predicting the following day's *New York Times* content for the economy, immigration, and health care. This implies that the main effects on *New York Times* content (Table 5) diminishes with simultaneous Twitter-based discussions among members of Congress from both parties. Our second test for whether the index of news about a particular policy issue grows in proportion to the breadth of debate about the issue focuses on the effects of interparty differences in frequency of Twitter posts for each of these six policy issue areas. Thus, after converting party differences into standardized scores, we model today's *New York*

Table 6. *New York Times* Articles as a Function of the Previous Day's Articles and Twitter Posts, With Interactions Between Parties

Yesterday's Content	Today's <i>New York Times</i> Articles					
	(1) Economy	(2) Immigration	(3) Environment	(4) Energy	(5) Health Care	(6) Marginalized
<i>New York Times</i>						
Economy articles	0.208*** (0.06)	-0.002 (0.06)	0.048 (0.06)	0.124* (0.06)	-0.119* (0.05)	-0.079 (0.06)
Immig. articles	0.115* (0.05)	0.106 (0.06)	0.072 (0.06)	0.066 (0.06)	0.048 (0.05)	0.112* (0.06)
Envir. articles	0.007 (0.05)	-0.033 (0.05)	0.098 (0.06)	0.031 (0.05)	0.066 (0.05)	-0.051 (0.05)
Energy articles	-0.015 (0.05)	0.001 (0.05)	-0.040 (0.06)	-0.053 (0.05)	0.078 (0.05)	-0.089 (0.05)
Health articles	-0.010 (0.06)	0.042 (0.06)	0.078 (0.07)	0.176** (0.06)	0.264*** (0.06)	-0.014 (0.06)
Margin. articles	-0.018 (0.05)	-0.074 (0.05)	0.008 (0.06)	0.030 (0.06)	-0.004 (0.05)	0.202*** (0.05)
Congress						
Econ. interact.	-0.101* (0.04)	-0.014 (0.04)	0.016 (0.04)	-0.025 (0.04)	-0.039 (0.04)	0.030 (0.04)
Immig. interact.	0.025 (0.01)	-0.039** (0.01)	0.004 (0.02)	-0.019 (0.01)	0.012 (0.01)	-0.012 (0.01)
Envir. interaction	-0.007 (0.02)	0.037 (0.02)	0.019 (0.02)	0.012 (0.02)	-0.029 (0.02)	0.037 (0.02)
Energy interact.	0.014 (0.01)	0.009 (0.01)	-0.013 (0.01)	-0.014 (0.01)	0.009 (0.01)	0.000 (0.01)
Health interact.	-0.008 (0.02)	0.018 (0.02)	0.044 (0.02)	-0.001 (0.02)	-0.051** (0.02)	-0.040 (0.02)
Margin interact.	-0.000 (0.03)	-0.007 (0.03)	-0.020 (0.03)	0.041 (0.03)	-0.014 (0.03)	-0.042 (0.03)
N	364	364	364	364	364	364
R ²	0.296	0.231	0.088	0.179	0.397	0.263
F	5.941	4.241	1.356	3.086	9.302	5.032

Notes: Each count of articles and Twitter posts is a standard score, and thus beta coefficients for each predictor are reported. Predictors' significance are indicated with asterisk where *, **, and *** represent $p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively. Not presented here but included when calculating these results are the main effects of Democrat- and Republican-based Twitter posts.

Times content as a function of the previous day's *New York Times* articles, the previous day's Twitter posts by Democrats, the previous day's Twitter posts by Republicans, and party-based differences in how frequently a particular policy issue area is discussed. In stark contrast to our expectations about the importance of debate for how the media indexes an issue, the results in Table 7 show that an imbalanced discussion among Democrat and Republican members of Congress in their previous day's Twitter posts has a positive effect on the present day's *New York Times* article content with regard to the policy issue areas of the economy, immigration, health care, and marginalized groups. In combination with the results from Table 6, these results make it apparent that the greatest effect on the

Table 7. *New York Times* Articles as a Function of the Previous Day's Articles and Differences in Twitter Posts Between Parties

Yesterday's Content	Today's <i>New York Times</i> Articles					
	(1) Economy	(2) Immigration	(3) Environment	(4) Energy	(5) Health Care	(6) Marginalized
<i>New York Times</i>						
Econ. articles	0.295*** (0.05)	-0.023 (0.06)	0.058 (0.06)	0.163** (0.06)	-0.080 (0.05)	-0.087 (0.06)
Immig. articles	0.075 (0.05)	0.239*** (0.05)	0.094 (0.05)	0.076 (0.05)	-0.005 (0.05)	0.121* (0.05)
Envir. articles	0.006 (0.05)	-0.021 (0.05)	0.116* (0.05)	0.043 (0.05)	0.059 (0.05)	-0.019 (0.05)
Energy articles	0.015 (0.05)	-0.030 (0.05)	-0.032 (0.06)	-0.037 (0.05)	0.073 (0.05)	-0.061 (0.05)
Health articles	0.020 (0.06)	-0.008 (0.06)	0.030 (0.06)	0.128* (0.06)	0.349*** (0.05)	0.013 (0.06)
Margin. articles	-0.006 (0.05)	-0.057 (0.05)	-0.004 (0.06)	0.043 (0.05)	-0.030 (0.05)	0.282*** (0.05)
Congress						
Econ. difference	0.247*** (0.06)	0.011 (0.06)	-0.042 (0.06)	0.119* (0.06)	0.140** (0.05)	0.080 (0.06)
Immig. diff.	0.013 (0.05)	0.219*** (0.06)	-0.013 (0.06)	0.056 (0.06)	-0.019 (0.05)	-0.045 (0.06)
Envir. difference	0.043 (0.09)	-0.143 (0.09)	-0.072 (0.10)	0.122 (0.09)	0.177* (0.08)	-0.069 (0.09)
Energy diff.	-0.058 (0.09)	0.220* (0.09)	0.088 (0.10)	-0.095 (0.09)	-0.231** (0.08)	0.103 (0.09)
Health diff.	-0.025 (0.06)	-0.089 (0.06)	0.135* (0.06)	0.036 (0.06)	0.232*** (0.05)	0.081 (0.06)
Margin diff.	0.066 (0.05)	0.009 (0.06)	0.011 (0.06)	0.056 (0.06)	-0.041 (0.05)	0.172** (0.06)
N	364	364	364	364	364	364
R ²	0.241	0.150	0.054	0.143	0.342	0.182
F	9.266	5.175	1.665	4.865	15.18	6.503

Notes: Each count of articles and Twitter posts is a standard score, and thus beta coefficients for each predictor are reported. Predictors' significance are indicated with asterisk where *, **, and *** represent $p < 0.05$, $p < 0.01$, and $p < 0.001$, respectively.

current day's *New York Times* content is not a vociferous discussion about a particular policy issue area but rather a one-sided presentation by one of the parties, supporting H1b.

Triangulating the results from Table 7 with those of Table 5, we observe that both parties' Twitter posts about the economy increase the number of economy-related *New York Times* articles, although the effects of Democrats' Twitter posts on the economy are greater than those of Republicans. The same is true with regard to immigration. Details regarding the other two relevant policy issue areas identified in Table 7 lead us to speculate that members of Congress are attempting to frame policy issue areas by or around other policy issue areas. For example, as shown in Table 5, Democrats may be invoking the economy with regard to health care, and Republicans may be invoking the economy with regard

to marginalized groups. Whether or not this is the case, the aggregated results presented here provide evidence in support of H2, namely that the partisan nature of energy and the environment is less than that of more partisan issue areas such as economics, immigration, health care, and marginalized groups. Thus, less indexing—that is, less coverage of a particular issue relative to other issues—occurs in the *New York Times* with regard to the environment and energy.

Discussion and Conclusion

The above analysis confirms earlier research which shows that journalists rely on the source of information—typically a press release—when constructing their articles (Gans, 2003; Turk, 1986). Our research, however, also confirms that the contemporary “press release” is manifested for several policy issue areas as Twitter-based statements and hashtags by members of Congress. This project offers yet another demonstration that Twitter is a legitimate political communication vehicle for our elected officials, that journalists consider Twitter when crafting their coverage, and that Twitter-based announcements by members of Congress are a valid substitute for the traditional communiqué in journalism, particularly for issues related to immigration and marginalized groups and especially for issues related to the economy and health care.

We acknowledge three areas in which our argument is potentially deficient. First, we do not distinguish between statements which are issue oriented and those which are election campaign oriented, an important distinction in terms of what is reported in the traditional news media (Kaid, 1976). It was assumed that focusing on a nonelection year such as 2013 would enable us to avoid conflation between the policy issues and the electoral campaigns. Second, we offer little discussion with regard to second-level agenda setting efforts; that is, qualities and attributes assigned either to the policy issue area or to the politician making the Twitter post. This can eventually be addressed with a focus on how Twitter posts vary in their sentiment. Second-level agenda setting efforts are important overall (Kiousis, Mitrook, Wu, & Seltzer, 2006), and there has been a significant growth in both semantic and sentiment analysis of politicians’ Twitter posts (Otterbacher, Hemphill, & Shapiro, 2013). Third, and perhaps most critically, we do not control for other activities of members of Congress nor do we control for other public relations activities by interest groups, institutions, agencies, etc. While potential spurious relationships are addressed with our inclusion of lagged communications from politicians, lagged *New York Times* articles, and the gamut of policy-related Twitter and *New York Times* content, we acknowledge that there are missing elements from the model. For example, press releases, floor speeches, media interviews, and the like can all be included here as controls for the effects of Twitter-based discourse.

Nonetheless, our approach provides an important addendum to existing findings about indexing theory. Specifically, for a “debate” about an issue to occur—and thus to provide a basis for media reporting—Twitter posts from each debating group cannot occur simultaneously (i.e., on the same day). This is

particularly true with regard to the economy, immigration, and health care, as we have shown with regard to our interaction- and party-difference-related specifications. Shown in Table 6 with regard to the daily interaction between parties on a particular policy issue area, the *New York Times* is in fact less likely to discuss an issue the more it is discussed on Twitter by members of Congress from both parties. Perhaps more complex dynamics for *New York Times* content are present, namely that journalists collect information over several days before synthesizing congressional discourse for the general public, but this would be inconsistent with the nature and purpose of a daily newspaper. Alternative explanations include the possibility that journalists are unable to decipher the complex narrative emanating from members of Congress or that Democrats and Republicans are not debating but are actually engaging in something like an online “shouting match.” Or, perhaps journalists are simply unable to identify both sides of the debate because their Twitter networks are biased toward one party or single politicians. Given the extensive online interaction between journalists and elected officials, future research should confirm the extent to which journalists are indeed imbalanced in their ability to track the policy agenda building process.

We offer two calls for action. First, given that highly polarized Twitter posts by members of Congress may affect policy quality, as better policies are implemented when elected officials are less extreme (Großer & Palfrey, 2014), and given that politics was extremely polarized in 2013 largely because of issues related to the economy and health care, the stakes are high if there is a “shouting match” via Twitter or other social media. Invoking Downs’ (1972) “issue-attention cycle,” where the traditional media facilitate electoral mistakes by targeting partisan audiences and engaging in persuasion (Bernhardt, Krasa, & Polborn, 2008; Caillaud & Tirole, 2007), the *New York Times* can play a crucial role in mitigating serious hazards. Second, we must understand better how journalists follow and use certain Twitter posts. A journalist may rely extensively on what members of Congress say via Twitter rather than confirming in-person or via telephone interviews, or a journalist may simply be using congressional Twitter posts to gauge legislators’ positions before establishing direct communications with them. Twitter, thus, can serve very different functions for journalists but with very different implications.

In terms of differences across specific policy issue areas, we make one additional comment. First, Twitter remains an ineffective tool for Congress to use to gain media attention for issues related to the environment and energy. Given our expectations related to the indexing theory, indeed, the lack of virtually any significant effect from Twitter posts relating to the environment is surprising. At the heart of this is a challenge to indexing theory, as discussions by Democrats and Republicans are relatively balanced and thus should have positively affected indexing by the *New York Times*. Much like existing research that shows that other issues such as social security are discussed by both parties but are nonetheless indexed less in the media (Jerit, 2006), we believe that the environment is an especially complicated issue given its connections to climate change, science knowledge, and cultural norms.²² On this basis, Twitter may be an inconsistent

substitute for more traditional sources of news indexing. That is, partisanship does not consistently explain the agenda setting efforts of members of Congress for all policy issues (Jochim & Jones, 2012). The environment and energy are the exceptions. Apart from these caveats, we have shown here that Twitter serves a legitimate role in news indexing for the remaining four policy issue areas.

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Notes

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1. More details can be found at the Policy Agendas Project website (<http://www.policyagendas.org>).
2. See Barberá, Bronneau, Jost, Nagler, and Tucker (2013) and Freelon, Lynch, and Aday (2015) for recent examples of longitudinal analyses.
3. In the language of the political polarization literature, congressional roll call voting records confirm that certain policy issue areas—science, trade, agriculture, public lands, and transportation—are farther from a single dimension of conflict among members of Congress, where a single dimension is strictly party or ideology based. Other policy issue areas—labor/employment, housing, economics, health care, crime/law, and civil rights—closely adhere to the party-based dimension (Jochim & Jones, 2012). Energy and the environment are closer to the former group, that is, partisanship alone does not determine congressional roll call votes about these two policy issue areas.
4. Counterarguments, such as Reich’s (2013) claim that the telephone allows for richer discourse between reporter and subject, are now in the minority.
5. Concerns that there is a crucial distinction between journalists publishing only online and those publishing both online and in print are unwarranted. New journalistic practices have been employed at the *New York Times* since 2010, as explained in detail in Nikki Usher’s *Making News at The New York Times* (2014). The newspaper, particularly under the direction of former executive editor Jill Abramson, has striven to remain at the forefront of digital journalistic practices, tasking journalists with producing material across both print and online domains.
6. Specifically, we calculate for each day the absolute value of the difference between the number of Democrat and Republican Twitter posts for each particular policy issue area.
7. See <https://dev.twitter.com/docs/api/1.1> for details.
8. The full list of Twitter posts is available here: <http://share.iit.edu/handle/10560/3809>. The code we use to collect and parse Twitter posts is publicly available at doi: 10.5281/zenodo.51321.
9. All coding exercises described in the following pages involved both authors being simultaneously present. No intercoder reliability statistics are provided (or necessary) because there was complete agreement.
10. It can be argued that, prior to 2012–13, immigration was a less pivotal and a less prominent policy issue area than after 2012–13 (Fennelly, Pearson, & Hackett, 2015).
11. Other policy issue areas typically considered alongside economy, immigration, etc., are omitted from our analysis, as there is comparatively less discussion about them by members of Congress. For example, education (e.g., “Education” and “STEM”) and Internet-oriented policy (e.g., “eFairness” and CISPA”) are both excluded because they are less to central legislative discourse in 2013. Total Twitter posts by members of Congress on these topics amounted to less than 400 for both education and Internet-oriented policies. For the six policy issue areas included in our analysis, the number of Twitter posts ranged from nearly 3,400 (environment) to more than 22,000 (health care).

12. See http://developer.nytimes.com/docs/read/article_search_api_v2. The code we use to collect articles is publicly available at doi: 10.5281/zenodo.51320.
13. As before, it is simply not feasible to code for every single keyword.
14. Future efforts may be able to address this by employing techniques correlating conventional ideology measures such as DW-Nominate (Poole & Rosenthal, 1997) with hashtag use (Hemphill, Culotta, & Heston, 2013).
15. Standard scores have a mean of 0 and a standard deviation of 1.
16. March and October likely reflect, respectively, discussions about changes in the food assistance program (Women, Infants, and Children Program) and the debt ceiling crisis.
17. Chairman Bernanke highlighted the connections between the slow rate of inflation and declines in consumer energy prices (<http://www.federalreserve.gov/newsevents/testimony/bernanke20130522a.htm>).
18. See <http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf> for details.
19. Democrats' Twitter posts related to immigration are just outside of our threshold for statistical significance ($p < 0.05$).
20. Regarding marginalized groups, the reverse causality test reveals a much smaller statistically significant coefficient (0.109) relative to the original model (0.162, Table 2).
21. Table 6 provides only the coefficients for the *New York Times* and the interaction term for reasons of brevity; the main effects of both Democrat and Republican Twitter posts are excluded in the presentation of these results.
22. See, for example, work by Kahan et al. (2012), Kahan (2015), Bolsen, Leeper, and Shapiro (2014), and Druckman and Lupia (2016).

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