

Twitter Use by the U.S. Congress

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Twitter is a microblogging and social networking service with millions of members and growing at a tremendous rate. With the buzz surrounding the service have come claims of its ability to transform the way people interact and share information and calls for public figures to start using the service. In this study, we are interested in the type of content that legislators are posting to the service, particularly by members of the United States Congress. We read and analyzed the content of over 6,000 posts from all members of Congress using the site. Our analysis shows that Congresspeople are primarily using Twitter to disperse information, particularly links to news articles about themselves and to their blog posts, and to report on their daily activities. These tend not to provide new insights into government or the legislative process or to improve transparency; rather, they are vehicles for self-promotion. However, Twitter is also facilitating direct communication between Congresspeople and citizens, though this is a less popular activity. We report on our findings and analysis and discuss other uses of Twitter for legislators.

Introduction

Talk is cheap, except when Congress does it.

Cullen Hightower

Twitter (<http://www.twitter.co>) is a popular microblogging and social networking service with approximately 7 million members. Twitter is one of the fastest growing sites on the Web in terms of usage (one estimate puts year-over-year growth at over 1300%; http://blog.nielsen.com/nielsenwire/online_mobile/twitters-tweet-smell-of-success/). The dramatic growth has created significant buzz about the site.

Twitter supporters see it as a potential solution for many information sharing problems. One manifestation of this is the TweetCongress initiative (<http://www.tweetcongress.org/>). TweetCongress is a grass-roots Web-based campaign with the goal of promoting transparency in government by encouraging representatives in Congress to use Twitter.

There is very little work that has studied how Twitter is used, particularly with respect to the content of the posts (Mischaud, 2008; Honey & Herring, 2009). In this study, we present a thorough analysis of how Congresspeople use the service. We look at the demographics (including party affiliation and home state), the frequency of posts, and, most important, the content of the messages they post. For this latter analysis, we analyzed the content of the vast majority of messages that had been posted by members of Congress to obtain a thorough picture of the type and intent of the messages. We have chosen not to study the underlying social network (followers, following, and friends), but this is a rich space for future work.

Based on this analysis, we show that Congress members are largely using Twitter to communicate the same type of information their offices would share in other media. They post links to news articles, blog posts, and descriptions of upcoming activities and use the tweets like titles for mini press releases. Congresspeople also use Twitter in the stereotypical way, posting about daily activities and events like meetings, dinners, and workouts. Those two types of tweets make up the vast majority of posts, but there is also a significant amount of direct communication taking place between Congresspeople and users who send them questions or comments.

This is an in-depth study of how a particular group uses Twitter with respect to the content of the messages they post. We begin by introducing our methods for collecting and coding data. Then, we present our observations about the background, posting, and interaction behavior of members of Congress. This is followed by a discussion of the results, including implications for government transparency, supporting cooperation between Congress and citizens, and broader applicability of our results. We conclude with a discussion of broader implications and future work in this area.

Related Work

Twitter first went online in 2006 and by 2007, it had already gained attention in the literature (McFedries, 2007). There has been some discussion of how Twitter can be used to support cooperative work (Zhao & Rosson, 2008). Several studies

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have specifically explored the issue of communication such as conversation (Honey & Herring, 2009), informal communication (Zhao & Rosson, 2009), and marketing (Jansen, 2009b). Other studies have looked at how Twitter is being used in various information sharing/broadcasting events, such as academic conferences (Reinhardt, Ebner, Beham, & Costa, 2009) and emergency response situations (Hughes & Palen, 2009).

Some research has analyzed the social network in Twitter. In Java, Song, Finin, and Tseng (2007), the authors look primarily at the network structure and geographic distribution, but they do dedicate some discussion to the content of posts. Regarding the social connections, they found that relationships tend to be reciprocal, users tend to be primarily in the United States and Europe, and network links tend to be with others on the same continent. They categorized tweets by content into general categories: daily chatter, conversations, sharing information/URLs, and reporting news. The authors form a general conclusion that people use Twitter to discuss daily activities and seek or share information. A year later, in 2008, another group conducted a similar study of social network structure in Twitter (Krishnamurthy, Gill, & Arlitt, 2008). They found similar results but on a larger dataset. Finally, Huberman, Romero, and Wu (2009) also found that relationships were largely reciprocal as well as observing that most communication between people on Twitter takes place in a social network that is not represented in the friends, followers, or followees network.

The content of posts has also been analyzed. Java et al. (2007) found that people use Twitter to share information and report on their activities. In Mischaud (2008), the author investigates the content of tweets seeking to understand if people are responding to Twitter's guiding question "What are you doing?" Using data from 60 users with 5,767 posts, the posts were initially coded positively or negatively as to whether they answered the question, and then later broken down into the following categories: personal, family/friends, information, work, small talk (with subcategories of food, pop culture, and weather), technology, activity, and miscellaneous.

In Honey and Herring (2009), the researchers try to understand the topic of users' tweets in an attempt to better understand the aspect of conversations on Twitter. To accomplish this, the authors conducted a content analysis on 200 tweets that were captured over different time periods. Using open coding the researchers created 12 unique categories with an emphasis on the issue of conversation. The categories were about addressee, announce/advertise, exhort, information for others, information for self, metacommentary, media use, opinion, other's experience, self experience, solicit information, and other.

Finally, Jansen et al. (2009a) analyze the content in terms of branding and opinions, whether mentioned by consumers or companies. They found that a large percentage of tweets, 19%, contain brand information. Of those, a sentiment analysis revealed 50% contained positive feelings and 33% were critical.

Twitter and social media are a new technological option through which members of Congress can communicate. There has been some research conducted on the topic of U.S. Congressional communication, i.e., how members of Congress communicate, interact, and engage with citizens, constituents, and the public at large (Lipinski & Neddenriep, 2004; Oleszek, 2007; Thurber, 2003; Johnson, 2004). Congressional communication mainly focuses on studying the Congressperson as a serving elected official and not as a political candidate running for office. Although the two are tangentially related, this distinction is important as the focus of studying how a political candidates use media to communicate when campaigning is study elsewhere in greater detail in the literature.

Historically, Congressional communication methods include: personal appearances, radio, television, newspaper, postal mail, e-mail, and Web sites. Methods are divided into two categories: mediated methods (television, radio, and newspapers) and directed methods (personal appearances, postal mail, e-mail, Web sites) (Lipinski, 2004). Mediated methods have been generally been avoided for a variety of reasons, but mainly because of a lack of consistency and equity in local media coverage for politicians (Lipinski, 2004). Therefore, for practical purposes, most scholarly studies have been focused towards studying directed methods (Lipinski, 2004).

In the past, previous Congressional communication studies had been hindered because of the significant amount of effort, time, and resources that are associated with gaining access to the data (Lipinski, 2004). This has significantly changed with the introduction of the Internet. Therefore, within the research of Congressional communication, the use of the Internet is a much more well-researched area of study (Bimber, 1999; Owen, Davis, & Strickler, 1999; Carter, 1999; Fitch & Goldschmidt, 2005; Goldschmidt & Ochrieter, 2008; Thurber, 2003; Johnson, 2004). Previous research has explored and studied how congressional communication occurs over e-mail (Goldschmidt, Folk, Callahan, & Shapiro, 2002) and over Web sites (Gulati, 2004; Jarvis & Wilkerson, 2005; Taylor & Kent, 2004).

Most research on Internet based Congressional communication explores a particular communication medium or method in detail. Some studies have attempted to look at the growth, adoption, and general usage of a particular media (Fitch & Goldschmidt, 2005; Goldschmidt & Ochrieter, 2008). Other studies have done interviews, surveys, or focus groups to understand Congressional communication from the varying perspectives of stakeholders (e.g., Congressional staff, citizens, etc.; Fitch & Goldschmidt; Goldschmidt & Ochrieter). Other studies have looked at how Congress people communicate with a particular group (e.g., journalists) (Lipinski, 2004). Some studies have attempted to evaluate Congressional Web sites by performing a content analysis using simple predetermined qualifications (i.e., does it contain contact info, photograph, member's schedule, 508 requirements, etc.; Taylor & Kent, 2004; Jarvis & Wilkerson, 2005; Gulati, 2004; Johnson, 2004). Other studies have

attempted to ascertain content by grouping into basic rudimentary categories such as positive or negative messages, or policy or procedure, etc (lipinski2004). However, no previous study has presented a framework for viewing or understanding the content of Congressional communication through the capturing and categorizing of individual messages.

The Internet (e-mail and World Wide Web) has greatly redefined the Congressional communication paradigm (Gulati, 2004; Fitch & Goldschmidt, 2005; Goldschmidt, et al., 2008) and has slowly become the primary source for citizens to learn, interact, and communicate with Congress (Fitch & Goldschmidt; Goldschmidt, et al.). Moreover, the majority of congressional staffers (79%) believe that the Internet has made it easier for citizens to participate in public policy process (Fitch & Goldschmidt) and 91% believing that Internet has helped to increase citizen interaction (Fitch & Goldschmidt). According to a recent study, 90% of all the communications sent to Congress by citizens are electronic (Fitch & Goldschmidt).

As Twitter grows in popularity, questions about how it is being used to communicate with citizens become important. In this study, we look specifically at the type of content being posted by legislators.

Research Objectives and Process

This study aims to understand how members of Congress communicate through Twitter. Our focus is on the communication flowing from the government to the public and not on how the public uses this information or communicates back to the government. As such, we have collected, coded, and analyzed Twitter posts from all members of Congress using the service at the time. In this section, we will describe the data collection and description process. That will be followed by a description of our observations and an analysis of the implications of these results.

Data Gathering

TweetCongress provides a list of all members of the U.S. House and Senate using Twitter. In this section, we present an overview of usage as of September 14, 2009. A full list, including state and party affiliation, can be found at <http://www.tweetcongress.org/>. Data were collected in two parts. First, we collected the 200 most recent posts (also called “tweets”) for each Congressperson listed on TweetCongress on February 6, 2009 (69 people total). Because of technical restrictions at the time of the initial data collection, 200 was the maximum number of retrievable tweets per user account (Makice, 2009). When users had fewer than 200 tweets, we collected all the tweets in their histories. It is important to note that the overwhelming majority of Congressional Twitter users did not have more than 200 tweets at this time. There were, however, a few Congressional Twitter users that did have more than 200 tweets. These users were very early adopters and power users and often had thousands of tweets. We chose not to attempt to include these tweets as this we would have led to the overall data being skewed

by a few users. The tweets were analyzed to provide insights into the content and types of posts. All together, we found 4,959 tweets from Congressional users as of that date. This cross-sectional, exhaustive sample of tweets was used for the bulk of our analysis. We also conducted a follow-up analysis, repeating the same procedure for all tweets posted in June 2009 and August 2009 (1,516 tweets) to see if the patterns of usage had changed or remained the same.

The number of Congresspeople using Twitter grew during this time as well. There were 69 when we conducted our first analysis in February 2009, 134 in May 2009, and 159 in early September 2009.

Coding

Three reviewers coded the tweets. Each reviewer was assigned two thirds of the collection to code so every tweet was coded by two reviewers. Each tweet was classified into as many classes as was appropriate. The classes for this coding scheme were developed using an open coding approach (Pandit, 1996) creation, similar to previously conducted work (Honey & Herring, 2009). Classifications were original and not based on previous studies of Congressional communication, because there was not an existing framework or taxonomy. Moreover, previous studies had not attempted to classify communication content with such granularity in this manner. To determine classification categories, all tweets were organically organized into groupings and then were given names that described the underlying pattern. As the tweets were organized, groups evolved and split based on the underlying pattern. Once stabilized, the name of the groupings formed the classifications.

- **dc** Direct Communication: A message directed at a specific person, either with the @id convention or in the text of the message. Direct Communication was divided into the following two mutually exclusive subclasses.
 - **ic** Internal Communication: This included messages from one Congress person to another or from a Congress person to a staff member.
 - **oc** External Communication: All other messages, such as those to constituents, were marked as external communication.
- **pm** Personal Message: These are non-business oriented messages or notes, such as holiday greetings or other personal sentiments.
- **Activities**: A message reporting on the Congressperson’s activities. This was divided into two mutually exclusive subclasses.
 - **ob** Official Business: This included any official business in Congress, including voting, committee meetings, or making speeches on the house floor.
 - **la** Location or Activity: This code was used when a Congressperson was describing non-official activities including trips, meetings with constituents, lobbyists, or non-Congressional organizations, or activities in the home district.
- **in** Information: This code describes a message that provides a fact, opinion, link to an article, position on an issue, or resource.

- **ra** Requesting Action: When a Congressperson requests constituents to take some action like signing a petition or voting, the message is coded this way.
- **fu** Fundraising: Messages occasionally ask for donations and contributions, and we code those as fundraising.
- **xx** Unknown: Some messages cannot be classified, like when they are only URLs with no text, test messages, or other mistakes like a single character.

The code book was pre-tested on approximately 200 tweets by each reviewer. This allowed us to clarify the code book (e.g. mutual exclusivity of the ob and la codes).

When there was perfect agreement on codes, we counted this as a match. This achieved an inter-rater agreement of 92.2%. In addition, there were 53 partial matches. This occurred when both coders assigned the same code, but one coder included an additional code. These were not counted as matches in determining our inter-rater agreement. However, we did use this data in our analysis; we included the tweets and used only the code that both coders assigned. Thus, all together we included 92.2% of all tweets in our analysis, for a total of 4,626.

The majority of tweets had only one code. There were a few with two codes (71 or 1.6% of the analyzed tweets) or three codes (3, <1%).

Observations

TweetCongress provides data about members of Congress using Twitter.

Who is Tweeting?

As of September 14, 2009, there are a total of 159 members using Twitter, 39 Senators and 120 Representatives. This is

roughly the same percentage of members in both chambers. Republicans dramatically outnumber Democrats, 102–57.

By state, larger population states generally have more Congress members using Twitter. However, this is not a rule. California tops the list with 11 members, followed by Texas and Ohio with nine each. Ten states have no Congressional Twitter users at all, including some larger population states like Maryland and Massachusetts. Percentages of Congresspeople using Twitter in each state are shown in Figure 1.

The number of tweets by each person is, of course, dependent on how long they have been using Twitter as well as the frequency at which they post. The average number of tweets is 125.3 and the median is 55. Rep. John Culberson has the most posts at 2,076. On days that they posted, most users (72%) averaged less than 2 tweets per day. There were a few notable outliers: Rep. Earl Blumenauer averaged 9 posts per day; Rep. Denny Rehberg averaged 8; and Rep. John Culberson (who has the most posts of anyone to date) averaged just over 7.

Among all Congresspeople, Twitter use tended to coincide with their work week. There is a marked difference in the number of posts during the week versus the weekend, with over three times as many posts on average during the week. We might expect to see similar usage patterns when Congress is in and out of session and this is confirmed in our updated content analysis.

Tweet Types and Content

The tweets analyzed in this section were gathered from the 69 users on Twitter as of February 6, 2009.

Content analysis. The majority of tweets were informational (in), accounting for 54.7% of the total. This was

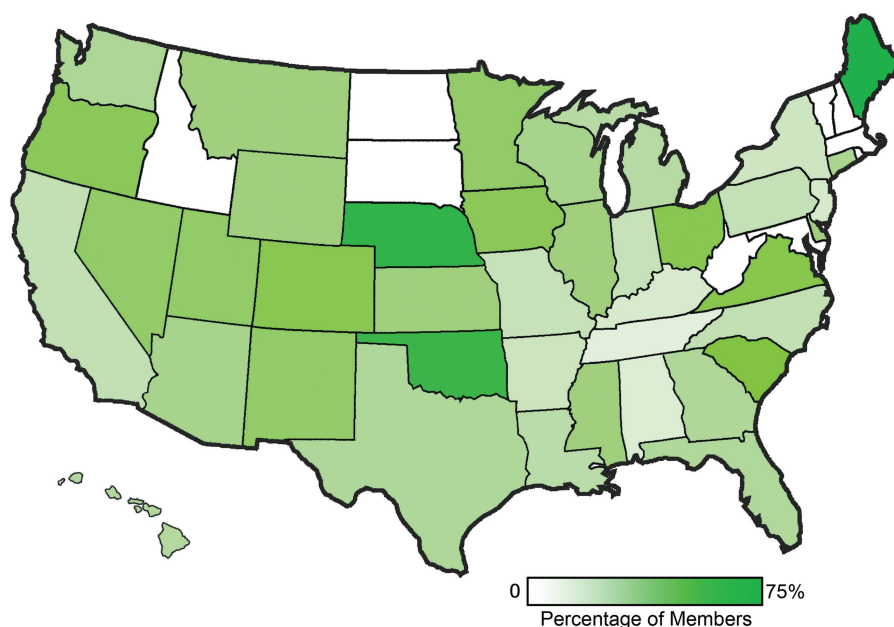


FIG. 1. A map of the U.S. indicating the percentage of Congresspeople using Twitter in each state. Stronger colors indicate a higher percentage of members. Alaska is not shown and has no Congresspeople using Twitter.

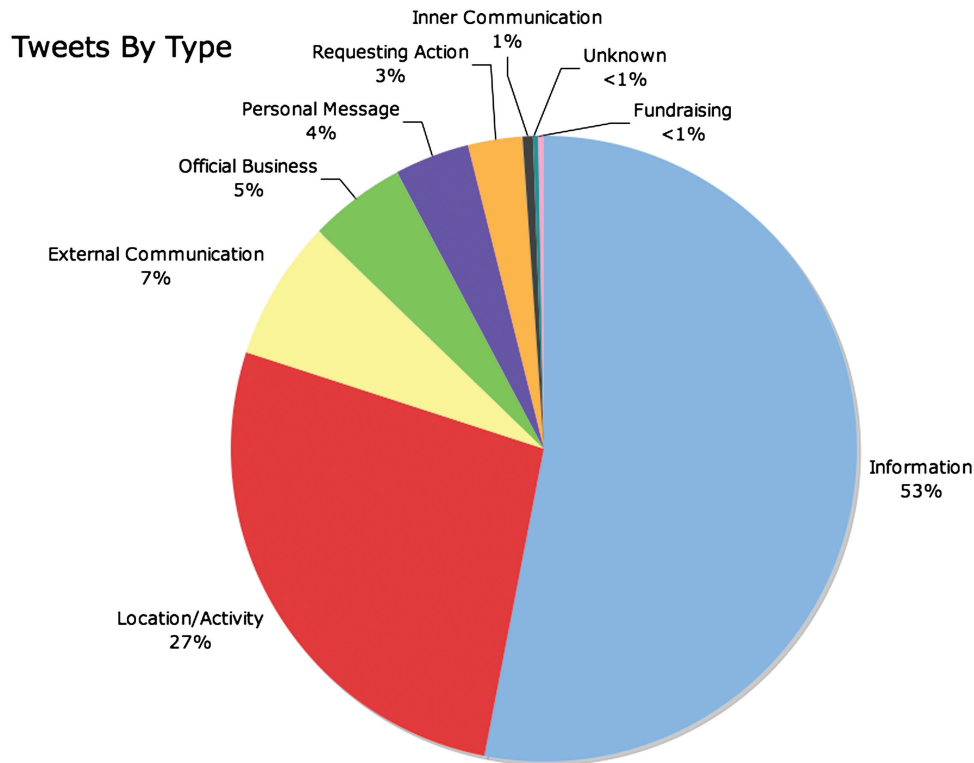


FIG. 2. The types of content posted.

followed by posts about the user's location or activities that were not official Congressional business. Official business (ob) including votes and activities in hearings or committee meetings were 5.1% of the total. Communication to people outside Congress (oc) accounted for 7.4%. There were relatively few posts requesting action on the part of followers (only 2.9%) and only 7 posts total about fundraising. Figure 2 shows the full distribution of codes on the tweets. Note that tweets could be coded into several classes, but this was very infrequent, with only 74 posts being labeled with more than one code.

The vast majority of information (in) posts, approximately 72%, contained links. Information posts often read like mini-press releases. The following sample of tweets provides an accurate snapshot of the type of content posted.

- NancyPelosi: Rep. DeLauro On Fair Pay <http://twurl.nl/bbylkl>
- MarkWarner: #DNC08—Watch Mark Warner deliver the keynote address LIVE—<http://tinyurl.com/5hgf4l>
- RoyBlunt: Blunt Statement on Passing of William F. Buckley, Jr. <http://tinyurl.com/234dwh>
- JimDeMint: Why I voted against Hillary Clinton <http://tinyurl.com/cxpclz>
- EricCantor: Eric Cantor weighs in on America's global competitiveness at the new BizCentral.org blog. <http://tinyurl.com/2syph>
- JohnCornyn: is fighting for open Government
- greshambarrett: Barrett announces 10 campaign events: Congressman Barrett will campaign in his district this week. <http://tinyurl.com/6puxze>

- virginiafoxx: my latest thoughts on the 'stimulus': <http://tinyurl.com/foxxstimulus>
- jasoninthehouse: Ratio of total debt in all U.S.A is now 360% of GDP. In 1980 it was roughly 150%
- jiminhofe: Blog: No bail out bill is acceptable: Thank you so much for voting no on the bail-out bill. Unfo. <http://tinyurl.com/4pkqyd>

As mentioned above, the vast majority of these posts contain links. Most of them point to longer posts written by the Congressperson. A few point to pages or resources from other people (e.g., Nancy Pelosi's link and the link to live coverage of Mark Warner at the Democratic National Convention). The posts without links contain facts (e.g., from jasoninthehouse) or policy statements/opinions (e.g., JohnCornyn post).

Within the Locations and Activities (la) category, the posts vary widely. They often include personal details like what the Congressperson had for lunch and where, notes stating that the Congressperson is having meetings with constituents, corporations, and other groups, and information from and about events they attended. Again, a random sampling of five posts from this category provides an accurate representation of the type of content that can be found there.

- neilabercrombie: @neilabercrombie just completed weightlifting workout at the Nuuanu Y. Advertiser featuring him on July 10; it's part of a regular feature.
- JudgeCarter: Finished votes in the House yesterday, back next Wednesday. Washington will be a madhouse with the massive crowds next Monday/Tuesday.
- clairecmc: Having lunch with the president of AB (that's Anheuser-Busch for those of you not from Missouri)

- boblatta: I will host @RoyBlunt on a tour of my district (OH-5) next week to tour alternative energy facilities <http://tinyurl.com/6o7d5v> #dont go
- jaredpolis: is in Cambridge for new member orientation. Dinner with friends Thurs, Dec 4th (Join us): Bombay Bistro 57 JFK Street Cambridge, MA
- TomLatham: is working to help Iowans as they contend with all of the flooding throughout the state.
- CandiceMiller: Listening to Jim Warner, and am honored to serve Michigan's 10th district, especially our brave POW's.
- CongJoeWilson: On my way to WVOC Studios to join Keven Cohen on the radio at 3:00
- MarkWarner: Stopped for a quick bite to eat at Sting-Rays in Cape Charles.
- SteveDriehaus1: What a great weekend of meeting voters all across the First Congressional District – from the Hispanic Fest to the Taste of Springdale!

These two classes make up 82% of all the tweets. In the smaller classes, several patterns of communication are clear. The official business (ob) tweets are very similar to those location and activities tweets above, except they are restricted to official Congressional business. For example,

- keithellison: Marking up the Credit Cardholder's Bill of Rights in the Financial Services Committee
- timryan: I'm now voting for the Emer Extended Unempl compensation act of 2008. How cajn we as a country, at a time when American's are getting squeez.

The communication coded tweets, both Internal Communication (ic) to others within Congress and External Communication (oc) to people outside Congress, show messages sent directly from a Congressperson to another Twitter user. These are usually single exchanges in response to a link or question posted by a user to the Congressperson. However, interesting debates can also be found within these messages. Consider the following debate on oil drilling between John Culberson (R-TX) and Tim Ryan (D-OH), which took place during the summer of 2008 when gasoline prices in the United States rose dramatically to nearly double the price they had been a few months earlier. Note that some messages span two tweets because of the character limit.

- johnculberson: On the floor- last votes of the week. Once again no vote permitted to fund our troops around the world- Pentagon starts to run out of money (2:34 P.M. Jun 12th, 2008)
- johnculberson: Around July 1 – and they won't let us vote to open up domestic oil fields like ANWR and offshore and shale oil (2:40 P.M. Jun 12th, 2008)
- timryan: @johnculberson ANWR would, after 20 years, reduce gas by only 2 cents a gallon. That's not an energy plan (2:50 P.M. Jun 12th, 2008)
- johnculberson: I understand my Dem colleague Tim Ryan says here he opposes ANWR drilling because it will only reduce gas prices by 2 cents – it will be (3:17 P.M. Jun 12th, 2008)
- johnculberson: Much more than that – but even if true I want to be that much less dependent on foreign oil and our economy will benefit from cheaper gas (3:20 P.M. Jun 12th, 2008)

- timryan: @johnculberson Clarifying for my Republican colleagues, will bring down price of gas 2 cents.20 YEARS FROM NOW! (3:22 P.M. Jun 12th, 2008)
- timryan: @johnculberson The oil companies have 8,000 leases to drill in the outer continental shelf where 80% of oil is. Why only use 25%? (3:34 P.M. Jun 12th, 2008)
- timryan: @royblunt @johnculberson If it hadn't been for Bush's failed economic policies, maybe they would have been able to work longer than 10 days (3:39 P.M. Jun 12th, 2008)
- johnculberson: @timryan let's use 100% of the leases and ANWR, Shale oil, Rocky Mountain gas, offshore Calif Fla and East Coast but Dems made it illegal (4:20 P.M. Jun 12th, 2008)
- johnculberson: @timryan I am glad we are having this high tech debate Tim – what is your source for this factoid? It is far too small to be believable (10:17 P.M. Jun 12th, 2008)

This exchange is followed by 26 tweets (oc) that John Culberson sends in response to messages sent by followers on the topic, the last one at 2:16 A.M. on June 12th.

This leads to a discussion of external communication (oc). These tweets comprised 7.4% of the total, and included responses from Congresspeople to links, questions, and challenges from constituents and organizations with Twitter presences. Below is a random sample of five of these tweets; they are representative of the whole collection of (oc) coded posts.

- tomudall: @ariherzog: (retweet) I support responsible drilling & other solutions, not divisive or partisan hoaxes to stall critical votes on VA & Mil\$
- MicheleBachmann: @conservatweet I hope so, but Congress hasn't even been sworn in yet. There's still a lot of time to bring forth bad legislation like this.
- johnculberson: @Maverick_NY There were many hearings lots of debate etc on going to war as it should be here w one of biggest spending bills in history
- zachwamp: @kyfortaxreform Will have primary but will win with conservative base, party activists and good govt groups.
- mlfudge: @williamspace I will certainly do my best to help the 11th Congressional District and fulfill the promise to continue Stephanies work!

Finally, the tweets requesting action (ra) generally remind users to vote or to ask them to visit a Web site, sign a petition, or watch an appearance by the Congressperson on television. There are surprisingly few fundraising posts (fu), only seven total, and four of those come from Mark Warner.

Links in tweets. Links are extremely common in tweets. 2044 (44.8%) of tweets contained links. The vast majority, over 87%, were in Information (in) posts, and most information posts contained links (approximately 72%).

To understand what type of information was being shared in links, we selected 100 random links (approximately 5% of links). The links were fairly evenly distributed among different types of sites. Roughly 20% were links to articles on online news Web sites of mainstream news outlets (e.g., the Wall Street Journal, local newspapers, etc.), 20% were blog posts by the Congressperson, 15% were links to the Congressperson's personal Web site, and 15% were links to

articles or Web pages on the Web sites of political action committees or other partisan organizations. In this latter group, nearly every organization was conservative.

A smaller percentage of links were used for purposes related to transparency or government engagement. Of the 100 sampled links, three were links to online petitions, two links to the text of proposed legislation or official voting records, two links pointed to video or audio of activities on the floor, and two links pointed to scanned versions of official letters from members of Congress to the White House.

Other content. A “retweet” refers to the act of reposting a tweet posted by another user. Retweets are used to either quote a user or to repeat the content of a tweet as another tweet for the purposes of emphasizing or sharing to additional users. By convention, retweets are prefixed with the text “RT.” Although retweeting is common on Twitter, it is rarely seen among Congresspeople. Of the 4,626 tweets, there was only five retweets. The lack of retweeting among Congresspeople could be explained one of two ways: (a) members of Congress are sharing and repeating content in tweets from other users but do not know of the formal process of retweeting, i.e., retweeting without identifying the source or giving proper attribution; and (b) members of Congress do not repeat the content of the other users.

“Hashtags” are also a popular convention on Twitter. A # character before a word or phrase is used to connect the tweet to a particular subject. Hashtags are often created for particular subject or event as a way of virtual aggregating or collocating all related tweets posted at or about that event. For example, the #pork hashtag was occasionally used to indicate posts about wasteful government spending, or “pork.”

Although hashtags are frequently used by average Twitter users, they are not particularly popular among Congressional users. We found 344 tweets with hashtags, only 0.08% of all tweets we examined. The low usage of hashtags could be explained as either a lack of understanding etiquette or that Congressional users simply do not adhere to the process of hashtags. Of the hashtags that were present over half (189) were #tcot, the tag indicating Top Conservatives on Twitter. Another 88 were part of the Don’t Go Movement, a conservative group created to object to the summer 2008 House adjournment.

Updated Tweet Content Analysis

We conducted a new analysis using the same methods over tweets posted in June 2009 (5/31/09–6/30/09, 855 tweets) and August 2009 (8/2/09–9/1/09, 661 total tweets). As before, each tweet was coded by two people and we achieved an inter-rater agreement of 92.4%. Our coding scheme held up and was still an accurate categorization scheme for all the tweets we encountered.

Overall, the percentage of tweets in each category was nearly the same (see Table 1). If we looked at the new tweets by month, however, we found some differences. The rate of “Official Business” tweets was quite different. In the original

TABLE 1. Frequency of tweet classes in the original dataset and the June/August 2009 update.

	Original data	June/August 2009	June 2009	August 2009
Information	54.7%	56.3%	61.3%	49.8%
Locations and activities	27.7%	31.4%	24.1%	40.6%
Official business	5.1%	6.4%	10.8%	0.2%
External communication	7.4%	6.1%	5.0%	8.2%
Personal message	3.8%	1.3%	0.8%	1.8%
Requesting action	2.9%	1.3%	0.6%	2.1%
Inner communication	0.7%	0.3%	0.2%	0.3%
Unknown	0.5%	0.1%	0.1%	0.0%
Fundraising	0.2%	0.1%	0.2%	0.0%

data, these tweets made up 5.1% of the total. In June, the rate was much higher (10.8%), and in August, it was much lower (0.2%, only 1 tweet). In both months we saw some minor differences in the rate of “Information” tweets and in June a slight drop in “Location/Activity” tweets. However, in August “Location/Activity” tweets were far more common than in the original data (40.6% vs. 27.7%).

These two differences can be explained by a consultation of the Congressional schedule. Congress was in session in June, explaining the high rate of “Official Business” tweets. Congress was out of session in August for a district work period, explaining both the low rate of official business and the higher rate of “Location/Activity” tweets as Congresspeople attended events in their home districts. A comparison with the tweets from June and August in 2008 shows very similar patterns of content types to the same month in 2009.

Thus, we can conclude that the way Twitter is used by Congresspeople has not changed since the original analysis, but the Congressional calendar obviously impacts the activities of the Congresspeople and thus the content of their tweets.

Beyond the United States

U.S. Congresspeople are not the only representatives using Twitter. There is a similar movement in the United Kingdom. The Web site Tweetminster (<http://tweetminster.co.uk/>) is the U.K.’s parallel to Tweet Congress, listing all the members of Parliament (MP) using Twitter. As of May 6, 2009, 54 MPs are using Twitter. The party distribution is a bit more complex; 34 members (77.3%) are from the Labour Party, 11 (25%) are Liberal Democrats, 8 (14.8%) are Conservatives, and one is a member of Respect – The Unity Coalition.

The statistics regarding number of tweets is approximately the same as what we observed in the United States. The average number of tweets is 199 (vs. 125.3 in the United States) and the median is 57.5 (vs. 55 in the United States). Tom Watson of the Labour Party was the most prolific poster with 1,894 updates (vs. 2,076 for John Culberson in the United States).

A sample of posts from these users showed that the type of posts had essentially the same distribution as those of

their U.S. counterparts. Using the same method described above, we gathered the latest 20 tweets from each user, or all tweets when users had a total of less than 20. We then selected 10% of this dataset to code, a total of 86 posts. Within that set, Information posts (in) were again the most popular, accounting for approximately 40%. Links were found in 72% of those. Locations and activities (la) made up 35%, External Communication (oc) was 10.5%, and Official Business (ob) was 4.7%. The order of commonality is identical to that of the U.S. Congress' tweets, and even on this small sample, the percentages of each code are nearly the same.

Even within the language of the tweets, the content looked very similar. Below is a random sample of five tweets from U.K. PMs.

- Ifeatherstone: My views on Haringey Council staff sackings over death of Baby P – new YouTube film – <http://tinyurl.com/cwhdzb>
- philwillismp: If some research intensive unis close their doors to new diplomas, it has potential to undermine the whole diploma program: <http://is.gd/xckX>
- DavidWrightMP: Homeowners Mortgage Support package announced today. In contrast to govts in previous recessions, we are taking steps to help homeowners
- DavidLammyMP: met with Open Rights Group they gave a spirited case for fair use & freedom on the net citing Obama image & how it was mashed up across web.
- AdamAfriyie: Back to Parliament to be lobbied by the NUJ and some constituents

These results offer strong evidence that our observations reflect the way representatives use Twitter, not just in the United States, but more broadly. Future work that builds on these results including insights into how Twitter can support cooperation between legislators and citizens, policy discussions in this domain, and supporting applications will likely be useful outside the United States and potentially at other levels of government.

Discussion

If Twitter's guiding question were used as a litmus for evaluating Congressional usage, only 27% of Congressional tweets attempted to answer it by providing either activity or location based information (LA or OB). However, over the course of the study, Twitter's guiding question morphed from "What are you doing" into "What's happening?" Although this is contextually similar, the new guiding question is much more expansive in interpretation than the previous.

There is no "right" or "wrong" way to use Twitter. In its current state, it is not surprising how legislators are using it. Twitter has become a medium for sharing links to existing information or for promoting positions, ideas, and events. At the same time, Twitter creates opportunities for new types of communication and increased government transparency. In this section, we discuss these issues and the related future work in each area.

Communication

Communication is an important dynamic between citizen and representative. Almost half of all voting age citizens have attempted to contact their Congressperson (Goldschmidt & Ochrieter, 2008). Of those that attempted to contact their Congressperson, 43% used the Internet, double that of telephone or postal mail (Goldschmidt & Ochrieter). Still, many citizens feel disconnected from their Congressperson and would like to be engaged (Goldschmidt & Ochrieter). The intimacy of Twitter may provide a solution for citizens to feel more personally connected with their representative.

One benefit that does appear to arise from Congresspeople using Twitter is the potential for increased direct communication with constituents. This communication accounted for 7.4% of the tweets (338 total messages). The exchanges that take place are meaningful, as well. As mentioned above, citizens post questions, links, or challenges to the Congresspeople and receive direct answers back. The conversations are meaningful public exchanges about issues and information.

Although these types of messages are not the main use of Twitter by Congresspeople, it shows that this type of behavior is already taking place. Improved communication can be seen as one benefit that Twitter offers in this domain. However, on the other hand, it may only be successful because Twitter has not yet reached a large enough audience. Personal, meaningful, direct communication between Congresspeople and citizens cannot take place beyond a certain scale. Although techniques for summarizing citizen feedback on Twitter could be used, the power of direct one to one communication would be lost. Thus, although direct communication can be a major benefit that Twitter offers in this domain, it is one that we can only expect to see if the growth rate for the site does not continue on its current trajectory.

The introduction of e-mail to Congress exemplifies the problem of scaling. From 1995 to 2004, Congress saw a 300% increase in citizen communication because of the use of e-mail (Fitch & Goldschmidt, 2005). Now Congress collectively receives an estimated 200 million e-mails per year (Fitch & Goldschmidt). This results in e-mail becoming a less effective mode of communication between citizen and Congressperson.

Transparency

The use of Twitter in Congress has been a long contentious issue for both citizens and members of Congress. When members of Congress first started using Twitter, there was an open debate as to whether the use of Twitter and other similar third-party social media tools violated existing Congressional rules. The most notable concern was the implications of Twitter use and the Franking Commission, which regulates Congressional mass communication. The debate surrounded whether or not existing rules required that content be submitted and vetted by the Franking Committee before it could be posted publicly. After much debate, the many of the rules were relaxed to allow the unrestricted use of social

media tools such as Twitter (Feinberg, 2008). Since this time, members of Congress have slowly explored the use of Twitter with a variety of results. Besides existing rules and regulations that govern all communication, there are no specific rules that uniquely regulate or prohibit content on Twitter.

There are several policy issues and implications for Congress's use of Twitter. The most important question towards citizens and democracy is whether the use of Twitter by Congress is an effective tool for improving access to information, citizen communication, citizen outreach, and government transparency. The TweetCongress effort has argued that Twitter use can help lead to increased communication and greater transparency.

Yet, there is a strong distinction between transparency and outreach (or self-promotion). Outreach is the practice of promoting and disseminating information and ideas to a specific or general audience. Transparency is the activity of making information free, open, and easily accessible to the public to help ensure accountability. Ed Felten (2009) from the Center for Information Technology Policy clarifies the difference between the two, stating that "outreach means government telling us what it wants us to hear; transparency means giving us the information that we, the citizens, want to get." Although both outreach and transparency have value to citizens, they are clearly two separate activities.

Transparency is necessary to obtain accountability, as it is believed that a transparent government is less prone to corruption because of public oversight. Although easily defined, transparency is a highly contextual concept and can take many forms. Transparency can include activities such as allowing meetings to be open to the public or by maintaining and providing access to government documents and records (Piotrowski, 2007).

One form of transparency could be seen in the action of providing citizens with current information about the activities of elected officials, such as a record of their daily schedule. By knowing the daily activities of elected officials, citizens could then better hold them accountable for their actions. This form of transparency lends itself heavily to the Twitter service, as Twitter's guiding principle question is always "what are you doing?" Congresspeople could use the Twitter service as an informal self-reporting public record of their schedule and activities, and we see some of this taking place in the locations and activities tweets. The posts categorized as describing Congresspeople's locations and activities could be considered transparency-oriented. Indeed, it is possible that Twitter could be used to allow citizens a form of radical transparency, i.e., the ability to immediately know what their Congressperson is doing at any given moment. The links provided by the Congressional users we studied were rarely informing readers of new information. They either went to longer posts by the Congressperson (essentially going around the Twitter forum), the Congressperson's Web site, or to articles in the media. Very few informational posts did anything to improve transparency in government. The posts generally expressed sentiments or opinions in a form similar to a sound bite. Certainly the limitations of the Twitter

format restrict how much can be expressed in one post, but taken collectively the posts do little to provide new insights or education to readers. Rather, they read like headlines on press releases from the Congressional office.

Although our results indicate that Twitter is not currently being used by Congress to promote government transparency, this is a broad topic for future work. First, there is a question about whether Twitter should be used this way at all. Currently, only anecdotal evidence, positive and negative cases, has been amassed. Examples include Rep. Culberson's (R-TX) use of Twitter to tweet closed door meetings between Republican leadership and the President or Rep. Hoeskstra's (R-MI) accidental tweet, which identified his location in Iraq during a secret fact-finding mission. It will be necessary to develop metrics for describing transparency and its impacts if this discussion is to be furthered.

Our study has focused on the content of posts by legislators. To evaluate the effectiveness and benefits of these posts to citizens, future work is needed that measures citizen reaction. There is much research to be done in understanding why citizens follow legislators on Twitter, what they derive from the content, if and how they communicate with legislators, and what other effects might come out of the service. Previous research has studied how users benefit from consuming posts written by others (Zhao & Rosson, 2009), and analyses following on these could be a way to start the citizen-oriented study.

Conclusions

We have presented a comprehensive study of the content posted to Twitter by members of the U.S. Congress. Their tweets were coded into the following classes: Informational, Locations and Activities, Official Business, External Communication, Internal Communication, Personal Message, Request for Action, and Fundraising. Two researchers coded each tweet and we achieved an inter-rater reliability of 93.3%.

We found that informational posts are most common, accounting for just over half of all posts. The majority of these contained links that the Congressperson was sharing. Locations and Activities posts followed next, making up 27% of posts, and these detailed the daily activities of the Congressperson off the floor. Although the other types of messages were less common, interesting Internal and External Communication debates and discussions can be seen across the data. A small secondary study of posts by members of Parliament in the United Kingdom match these results very closely, indicating both their accuracy and broader applicability.

Advocates of Congressional Twitter use argue that it can be used to increase transparency and improve communication. From this data, we draw several conclusions that directly address these points. Twitter does indeed provide a forum in which direct communication between Congresspeople and their constituents is supported. However, this is unlikely to scale, because there is a limit to how much meaningful

personal communication one person can undertake. Until that threshold is crossed, Twitter is a venue that can facilitate this type of interaction.

On the other hand, Congresspeople are using Twitter primarily for outreach, not for improving transparency. Although there are certainly limits to what can be communicated in 140 characters, we found the content of the tweets does little to improve insight into the activities of Congress, improve governmental transparency, or educate the readers about legislation or issues. From this perspective, the Twitter forum is not being used for new types of Congressional communication.

There is much future work to be done both on Twitter generally and in the context of government in particular. A similar analysis to what we presented here performed with a broader target group is important for establishing baselines of use habits. Within the government context, we see several spaces of future research. As mentioned above, metrics for evaluating impact will be necessary as research progresses. There are some existing services that measure how often posts are retweeted, which measures the reach of the posts. New metrics to measure impact will also be necessary. Finally, examining the connections and communication patterns between citizens and Congresspeople, particularly with respect to location may be useful. This can help Congresspeople focus their attention to their constituents as Twitter grows and to understand the perspectives being shared with them through the service.

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