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**The Daily Brew: The Structural Evolution of the Coffee Party on
Facebook During the 2010 United States Midterm Election Season**

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Abstract:

The activity of the Facebook Group, "Join the Coffee Party Movement" (Coffee Party) is studied during a 7-month period leading up to and following the 2010 United States Midterm election. During this time period, the Coffee Party Facebook Group Administrator account posted 872 parent posts which received 152,762 comments from participants. We examine the resulting electronic trace data utilizing a method for analyzing weighted social networks of discourse (Mascaro & Goggins, 2011). Our findings explore the network centralization and total post activity across three units of analysis: a) Time, b) Parent Post Category and c) Specific Parent Posts. We report three key findings. First, the structure, centralization and leadership within the network differ in four key time periods: the time preceding the midterm election, the week of the midterm election, the time following the midterm election and the time period when the new Congress was sworn in. Second, the Coffee Party Administrators act as agenda setters with the parent posts, but are also significant contributors to the discourse. Third, participants in the discourse alter their role depending on the specific parent post and category. Our findings have implications for issue groups and candidates who utilize social media tools to mobilize support, and engage with supporters and also provide a methodological contribution for computational social scientists that examine these groups.

The utilization of technology for disseminating information and mobilizing individuals is rapidly evolving. Recent events in the Middle East and North Africa illustrate the power that social media technologies such as Facebook and Twitter can have in coordinating activity and facilitating discourse among disparate groups of individuals (Allagui & Kuebler, 2011). In the United States, 22% of adult Internet users reference social networking sites for political information (Rainie, 2011). This increasing reliance of the United States public on social media to acquire political information and participate in the political process requires a further understanding of how political activity in social networks is structured (Rainie, 2011; Smith & Rainie, 2008).

We use the 2010 midterm election as the context to analyze the evolution of an online political group, Join the Coffee Party Movement (Coffee Party) that focuses on facilitating open dialogue among citizens of the United States. The Coffee Party started as a Facebook group in January 2010, but quickly moved to the physical world to mobilize support and spread its message of open, civil dialogue related to issues facing the United States. We use the Coffee Party as the group context, because the group lacks ties to traditional political mechanisms and instead relies on technology to disseminate its message and mobilize support. This dependence on a specific technology allows for a more comprehensive analysis of the activity as it is concentrated in the technology.

Our analysis builds on previous research by analyzing a longer time period of group activity (7 months) (Mascaro & Goggins, 2011). The analysis of the Coffee Party is done through analysis of the parent posts on the group page and the construction of a weighted social network that examines the behavior of actors within a group and their interactions with each other in the context of the group (Goggins, Galyen, & Laffey, 2010a; Goggins, Laffey, Amelung,

& Gallagher, 2010b; Mascaro & Goggins, 2011; Goggins, Mascaro, Mascaro, & Gallagher, 2012)¹. In our analysis, we operationalize a parent post as a post to the main Facebook Group page by the administrator of the page (Join the Coffee Party Movement).

Using social network analysis to understand large-scale group behavior, addresses recent calls for political science research to examine technologically mediated networks of actors (Lazer, 2011). Our methodological approach builds on prior work that has analyzed discourse in USENET forums and non-politically focused discussion forums such as Slashdot (Gonzalez-Bailon, S., Kaltenbrunner, A., and Banchs, R. E. 2010, Fiore, LeeTiernan, Smith 2002, Gomez, Kaltenbrunner, Lopez, 2008). These prior studies relied on the construction of networks and analysis of participation based on explicit connections made through replies to comments made by other individuals. Although Facebook enables a form of a reply structure, prior research demonstrates that a majority of the individuals do not utilize these technological affordances in on Facebook or other social media (Mascaro, Novak, & Goggins, 2012).

We address the limited utilization of explicit direct addressal behavior within the discussion thread by weighting comments based on time and proximity within a comment stream. The implicit connections that are developed within the comment streams allow for the identification of a core set of individuals who participate in different ways within the group. Through our analysis we identify three key findings. First, the network structure of the group varies greatly over the course of the studied timeframe. Second, the Coffee Party Administrator acts as an agenda setter with the parent posts that are included on the main page by choosing to include specific news articles and information. The Coffee Party Administrators also affect the network structure by participating in the discourse in different ways throughout the time period,

¹ The dataset that is utilized for the analysis is currently being used for a set of papers that are under review. The data can be provided to interested researchers by emailing the first author at cmascaro@gmail.com.

sometimes as participant observers and at other times as moderators. Third, discourse participants choose take on different roles, depending on the specific parent post. Some participants contribute to a broad range of topics while others emerge as “issue entrepreneurs” by only participating in a categorical subset of parent posts (McCarthy & Zald, 1987; Agre, 2004). These findings have implications for the analysis of social media use by issue focused groups and political candidates.

The Coffee Party

We use the Coffee Party as the context to develop an understanding of the network structure of an online political group in Facebook. Annabel Park, a documentary filmmaker, formed the Coffee Party Facebook group as a response to the Tea Party Movement in the United States in January 2010. The group was initially established for individuals to engage with others in an open forum. The critical mass of Facebook and the initial popularity surrounding the Coffee Party as an answer to the popular Tea Party movement helped the group gain popularity and become an active discourse space.

From its inception on January 26, 2010 through April 1, 2011, the Facebook group "Join the Coffee Party Movement" had amassed over 355,000 followers who posted 271,004 comments in direct response to 1,808 official Coffee Party parent posts. Over 977,400 “likes” were registered to these posts during the same period. On Facebook, being a follower is a low commitment form of group membership and a “like” is a single click mechanism for voicing agreement or support of a parent post or comment. In addition to participation on the main page, Facebook followers of the Coffee Party movement also set up 171 geographically specific Facebook groups, with followers of their own. Our analysis focuses on the main page of the Facebook group where the administrator account “Join the Coffee Party Movement” controls the

inclusion of the parent posts.

Moving from the virtual world to the physical world, The National Coffee Party drew 350 participants to its first convention in September 2010. Through Facebook, the Coffee Party also orchestrated numerous “National Meeting Days”, during which local chapters met at local coffeehouses. A “founding members” donation drive in early March 2011, raised over \$115,000. In Spring 2011, the Coffee Party began to develop its next set of goals identified as “Coffee Party 2.0,” that included holding elections for a Board of Directors and further developing the goals of the group. Analysis of the physical activity of the group is outside of the scope of this paper and is the subject of ongoing research.

We study The Coffee Party because it exemplifies a new form of virtual political organization in the United States. The organization is rooted online, but directed to action in the physical world. Such organizations appear to lower the barriers to entry for political organizers by effectively using social and participatory media like Facebook to disseminate information and mobilize supporters. Groups such as the Coffee Party can utilize social media to engage disparate groups of individuals who share a set of values and allow them to engage with each other in the Facebook Group that the Coffee Party calls its “virtual town hall.”

Literature Review

Online Agenda Setting and Framing

The Coffee Party’s Facebook Group acts as a combination of news source for participants and electronic bulletin board, suggesting that this social network hybrid has similar agenda setting strategies and effects as other media. Online agenda setting research has been primarily limited to political and news related blogs and online news sources (Woodly, 2008). Research in collaborative media systems such as Wikipedia has identified the ability for Wikipedia editors to

take on a gatekeeping and agenda setting role though the elimination of criticism in politically oriented Wikipedia articles (Oboler, Steinberg, & Stern, 2010).

Electronic bulletin boards that link to online newspapers and news sources, such as the New York Times and CNN.com illustrate similar agenda setting effects as their television and newspaper counterparts (Roberts, Wanta, & Dzwo, 2002). Certain technological and communicative differences exist between the electronic boards studied by Roberts, Wanta and Dzwo (2002) and the Facebook groups we study. Selection of news items and responses by participants follow a similar pattern, but in the Facebook environment such activity may be more impactful since Facebook identities tend to be of real users that have real world social capital at stake and as a result want to represent themselves truthfully (Lampe, Ellison, & Steinfeld, 2006; Ellison, Steinfeld, & Lampe, 2007; Lampe, Ellison, & Steinfeld, 2007).

Politicized issues, such as immigration, abortion, and taxes showed similar discussion trends on the electronic bulletin boards during both election periods and periods of heavy news coverage (Roberts, Wanta, & Dzwo, 2002). Because of this, leaders in these forums act as agenda setters when posting links to articles and drawing readers and contributors attention to a certain issue. Because only the group administrators have access to start threads, it is these individuals who take on agenda setting and gatekeeping abilities. Facebook group administrators take on similar roles as electronic bulletin board leaders and agenda setters because they initiate the postings within a group and use links to selected online news sources in order to support their positions.

Marshall McLuhan and Quentin Fiore (1989) suggested that “we shape our tools and they in turn shape us” (p. 26). The medium that delivers the message engages in a symbiotic relationship with its contents and helps shape perceptions, interpretations, and reactions (p. 26).

Considering the Coffee Party's Facebook account, the wall postings (the medium) and its contents (the message) act together to influence the reader and the ensuing direction of discourse. Due to account administrators linking their postings to offsite news sources, these postings (and what is not posted) also act as an agenda setting and gatekeeping tool for the topics of discourse that occur in the group (McQuail, 1994). The news sources act as a legitimizing and supporting force in the forum postings. It is the contents of the message, the linking to exterior news sources, and the message type that together, can embody agenda setting and gatekeeping, and influence online political discourse.

Further, framing these issues plays an important role in agenda setting because it is a mechanism used to enact the messages of the agenda. Framing is defined by Erving Goffman (1974) as a research method used to analyze how a source or subject understands activities, events, or situations. "Framing is the process by which a communication source, such as a news organization, defines and constructs a political issue or public controversy (Nelson, Oxley, & Clawson, 1997, p. 567)." Framing is apparent in online forums based on the way that information is presented. For example, by linking the postings to exterior news sources, the authors are choosing which information to expose readers to and which sources they wish to not acknowledge. It is in the choice of issues, sources, wording, and medium that the Coffee Party issues are framed and portrayed to the reader. This framing influences the type of participation in the Coffee Party Facebook group and the ensuing discourse that occurs within the group along with the nature of the discourse.

Social Networks and Conversational Discourse

Individuals that participate in online groups do so in different contexts. Formal leadership in groups is defined as "behavior or communication that influences, guides, directs, or controls a

group” (Bebbe & Masterson, 2009, p. 284). Leaders play an integral role in shaping the group as it evolves. Leadership is identified both by implicit and explicit activity. Online forum leaders are identified by the number of messages they initiate and the language they utilize (Cassell, Huffaker, Tversky, & Ferriman, 2006). Though leaders help to shape the dialogue, other participants become more influential as the group develops and take on informal leadership roles (Hersey & Blanchard, 1992). In Facebook Groups, such as the Coffee Party, the posting of specific news articles, participating in discourse, or a combination of both establishes individuals as leaders. In this specific group context, the only account that is able to start a discussion thread is the Coffee Party administrator account and as a result they take on a formal leadership role that allows them to set the agenda for the group.

Social Networks in the physical world are an integral part of information flow and discourse. Individuals often rely on their social networks for news about their surroundings, but also for information pertaining to matters important to them, such as health information (Spink & Cole, 2001). An individual’s immediate social network allows them to overcome resource barriers for gathering information by utilizing other individuals to obtain necessary information (Borgatti & Cross, 2003). The utilization of these networks for information gathering influences the type and scope of the information that individuals receive (Haythornthwaite, 1996).

Political discourse between individuals increases political participation in the electoral process. This interaction can occur both within formal group structures and through informal information interactions (McClurg, 2003). Individuals that interact with each other are likely to be of the similar demographic backgrounds and are likely to have similar value structures as a result of the context of the interaction (Feld, 1982; Marsden, 1987). This similarity of individuals with a shared context and shared “in-group” identity allows for the formulation of relationships

that have a greater influence on each other (Tajfel & Turner, 1986).

Social relationships play an integral part in political information exchange and discourse (Huckfeldt & Sprague, 1987). The *a priori* existence of shared contexts of individuals based on demographics helps to contribute to a shared set of information between individuals. Lazer *et al.* (2010) found that individuals do not rely on political views as a basis for relationship formation, but shift their political attitudes towards those of their social contacts after a relationship is formed. This shift in political attitudes leads to the emergence of a core group that has one set of views and a periphery with opposing viewpoints. This shared context of information is mimicked in online social networking group membership. Individuals with certain viewpoints will join and form a core network of participants while those who do not share these viewpoints will usually not join. If they do join, these individuals will use it as a place to participate in debates about the stated platform of the group.

Political Engagement on the Internet

Online social networking sites provide a unique context to the study of networks of political behavior as they extend the network of individuals one can interact with. The wide range of technologies available to individuals on the Internet allows for a lower barrier of entry to political discourse and may enable individuals who traditionally do not participate in political discourse to get involved (C.D & Dutton, 2006; Gil de Zuniga, A, E, & Shah, 2010). In 2010, 73% of adult Americans utilized the Internet to get political information or participate in a campaign in some manner. Overall, 22% of adult Internet users in the United States used social networking sites or Twitter to participate in the election process (Rainie, 2011). These statistics illustrate the importance of technology in facilitating political activity.

The technological affordances in technologically mediated political groups allow for rich interaction between individuals. To engage in direct conversation with others in these open spaces on social networking sites such as Facebook and Twitter, individuals utilize direct addressals through the technological affordance of the “@” symbol, followed by a name to denote the individual for whom the message is intended. Individuals also utilize more commonplace conversation mechanisms such as the individual’s first name without the preceding @. These messages form a subset of interactions within the parent posts and when analyzed together these posts form a sub-network of conversation (Mascaro et al., 2012). These networks of conversation are more explicitly identified than previous research on conversations within larger scale forums and allow for a much richer analysis of the networks of discourse that emerge (Fisher et al., 2006).

Early research on political groups on the Internet within USENET found that political discussion within USENET groups was more popular than in other groups with limited technological affordances (Hill & Hughes, 1997). Specific activity within these groups found that leaders of discussion threads play an integral role in facilitating the discussion by both initiating topics and continuing to participate as the discussion develops. More recent research on USENET illustrates that such technologies expose individuals to other political and cultural viewpoints even when individuals choose to only associate with one group (Kelly, Fisher, & Smith, 2005). This exposure is the result of crosscutting discussion threads between individuals of different viewpoints within the context of a group with a specific viewpoint. This activity can lead to heated discourse. Further, Kelly, Fisher, and Smith (2005) found that the relationships formed within forums like USENET are partially responsible for shifting political attitudes. Recent research on political discussions within non-political groups has also found that political

discussions tend to be more active than others (Gil de Zuniga et al., 2010; Gonzalez-Bailon, Kaltenbrunner, & Banchs, 2010).

In 2006 as it was opening its membership up to more individuals, Facebook introduced *Election Pulse*, a portion of the website that allowed individuals to engage in political behavior pertaining to 2006 campaigns. This further developed Facebook and social networking sites in general as a place for political behavior. Analysis of Facebook's utilization in the 2006 and 2008 elections demonstrated that candidates that utilized Facebook did obtain electoral voting gains that were attributable to the website (Williams & Gulati, 2007; Williams & Gulati, 2008; Williams & Gulati, 2009). The establishment of *Election Pulse* helped to establish Facebook's position as a tool for future election cycles, and drew the attention of issue groups and political candidates as a place for establishing a presence.

Even with the focus on and welcoming of political activity on Facebook, previous research of political discourse and candidate activity has been limited. Early research of political activity on social networking sites analyzed the Facebook walls of 67 Democratic and Republican candidates in the 2006 United States midterm election and found that individuals utilize these technologies to engage with other supporters in a shallow manner (Sweetser & Weaver Lariscy, 2008). Analysis of the 2008 Presidential campaign found that individuals utilized these social networking sites to post and share information with others and to discuss topics of interest. This activity equated Facebook walls to that of a virtual town square (Robertson, Vatrappu, & Medina, 2009; Kavanaugh, Perez-Quinones, Tedesco, & Sanders, 2010; Robertson, Vatrappu, & Medina, 2010).

The existing literature illustrates the presence of numerous threads of prior research that inform the analysis of conversational discourse on the Internet; but these activities do not occur

in a bubble. The context of the group and the backgrounds of its participants play a significant role in the direction and tone of the conversation. The context of parent posts that are associated with a controversial topic space allows for an examination of the attitudes and views of individuals in a politically affiliated group. Our findings represent a significant initial contribution to understanding interactions within a politically focused online social media group by demonstrating how participants take on informal leaderships roles and how formal leaders such as the group administrators reflexively shape discourse.

Research Questions

This research builds understanding of the behavior of actors within a politically oriented Facebook group through context dependent social network analysis. The behavior of the actors changes over time and is affected by both external events such as news stories and the actions of the administrator and individuals within the group. Understanding the evolution of social networks and behavior in these forums over time will increase understanding of how topic selection influences and is influenced by discourse in the larger political environment. We use the following four research questions to guide our research of the Coffee Party Facebook group.

1. What are the salient topics that the Coffee Party includes as parent posts in the main Facebook Group?
2. How does the network of discourse vary based on the topical categories of the parent posts?
3. Who are the prominent actors in the network and what are their roles as identified through social network measures such as betweenness?
4. To what extent does the network evolve over time as a result of the political environment that is reflected in the Coffee Party Facebook Group?

Methods and Dataset

The Coffee Party Facebook Group (Join the Coffee Party Movement) is our context of study. We specifically examine agenda setting activity, networks of participation and discourse in this Facebook group. All of the parent posts with more than 25 comments from the Coffee Party Facebook group were collected during between August 1 2010, - February 28, 2011. We chose topics with more than 25 comments based on the interaction and discourse focused nature of our research questions, and the limited network analysis that would result from very small networks. Only 32 parent posts were excluded through this criteria and analysis of activity within the excluded comments indicates that the corresponding parent posts were mostly informational.

The total sample examined 872 parent posts and 152,762 comments, with a total of 28,975 participants, including the one Coffee Party Administrator account. In our analysis, we operationalize a parent post as a topic thread posted to the main page of the group by the administrators of the page, in our case the account “Join the Coffee Party Movement.” Each parent post and its associated comments were collected no less than 6 days after the initial posting to allow for the maturation of discourse. A random sample of parent posts were revisited 2 months after the initial collection and no further comments were identified, illustrating the low likelihood of significant additions to the comment streams.

The parent posts and comments were then parsed using a custom built script used in a previous analysis of Facebook groups (Mascaro & Goggins, 2011). Following the parsing, the parent posts were coded by the authors through a process of open coding for salient theme of the parent post until saturation (Glaser & Strauss, 1967; Charmaz, 2006). After two rounds of open coding, similar codes were grouped and axial coding was performed by the authors to finalize the set of codes. In total, there were 25 codes applied to the 872 parent posts. Each parent post received one code, except in the instance when the parent post had an explicit call for action

(Code: Mobilization, n=98). In this instance, a parent post received two codes. The authors discussed cases where two codes were initially applied, and a single code was chosen prior to performing network analysis. Mobilization was determined to be the salient theme in 24 of the 98 posts originally coded as both mobilization and one other code.

Following the coding, the researchers built a weighted social network from the electronic trace data utilizing three units of analysis: day (n=213), individual parent post (n=872) and categories of parent post derived from the open coding (n=25) (Goggins et al., 2010a; Goggins et al., 2010b). In our construction of the network, each comment in a thread has some relationship to all the comments before it, but the strength of that relationship decays along two dimensions. First, the strength of connection between a comment and the comments immediately before it, which are displayed while a comment is being added, are strongest. Comments that occur within one hour of each other have a more significant strength of connection than comments that occur after a 1-hour window. This decay is sloped with each hour until one day is reached, after of which the connection between the comments is given no weight.

After constructing the network, we perform weighted network analysis on the trace data utilizing the same three units of analysis: day, parent post and topic, calculating network centralization for the entire network and betweenness for each actor using the TNET package (Opsahl, 2009) in the statistical software program, R (Team, 2010). Network centralization is a measure used to identify the relationship between the most highly centralized actors in a network and the least centralized actors in a network (Freeman, 1979). A centralized network will have many links dispersed around a few nodes while a decentralized network will have a more equal distribution around each node. The higher the centralization of a network, the fewer number of

individuals that play an integral part in the discourse. Lower centralization is a characteristic of many disparate groups of discourse.

Betweenness centrality is an actor-based measure that identifies the position of an individual in a network (Freeman, 1977; Freeman, 1979). An individual with high betweenness is in a position of being on the shortest path between a high number of individuals in a network. We use betweenness as a measure to identify individuals who traverse multiple subgroups of discourse and play a brokering role in conversational discourse.

Findings

We present findings from an analysis of the 212 days from August 1, 2010 – February 28, 2011. This time period encompasses a politically active time in the United States that included the 2010 Midterm Election, Lame Duck Session of Congress, and the seating of the newly elected Senators and Representatives. On average, there were 4.10 official Coffee Party parent posts each day. In total, there were 28,975 individuals who commented on a Coffee Party Parent Post and thus were factored into the network construction and subsequent analysis.

[insert table 1 here]

The participants fit into five distinct categories based on their rate of participation detailed in Table 1. As the table illustrates, only a small number of participants commented more than 200 times within the comment stream. This subset of individuals included the Coffee Party Administrator account, which commented 1547 times, the most any of the actors during the time period. There was also a larger set of individuals who were highly active in certain time periods or within a category of specific parent posts as detailed in later sections. Approximately 46% of the individuals who commented only did so once.

The Coffee Party Topical Agenda

A group the size of the Coffee Party on Facebook, with such heavy activity covers a wide range of topics. We therefore code each parent post for a dominant topical theme in order to bring a broad view of the Coffee Party topical agenda to the surface. The cross cutting theme of mobilization – a basic activity for any political group – was dominant, along with discourse focused on setting a more formal agenda, campaign finance and “inspiring quotes”. Three of these four themes are organizational in nature, and the fourth, campaign finance, represents a specific issue that the Coffee Party identifies as a significant part of their platform.

The frequency of parent post categories is detailed in Table 2. Most notable is the existence of 98 parent posts (11%) focused on mobilization. These posts included requests for participants to call an elected official or attend a meeting. These mobilization messages were often coupled with other news stories that served as an impetus for the call to action on behalf of the group.

The three most prevalent parent post categories included: Defining the Platform (n=88), Quotes (inspiring or relevant, historical quotations by well known people) (n=82) and Campaign Finance (n=81). The parent post category “Defining the Platform” was assigned to those parent posts that included a message that identified and further developed the views and beliefs of the Coffee Party as a whole. These parent posts mostly focused on the encouragement of open dialogue and civility. The parent post category “Quotes” was assigned to parent posts that included a quote from a famous individual such as a President, social leader or popular culture icon. This parent post category often sparked a significant amount of participation and was the most centralized parent post category in our data set because a core set of discourse participants remained interacted across the numerous parent posts categorized as quotes.

[insert table 2 here]

The parent posts that focused on campaign finance were often accompanied with a call for mobilization, as it is one of the Coffee Party's fundamental ideologies to limit the influence of money in the electoral process in the United States. The parent post category "Campaign Finance" was assigned to all of the parent posts that were related to the Citizens United Supreme Court ruling and a significant amount of activity in the middle to late January 2011 corresponded with a meeting in Washington, D.C. to protest the one-year anniversary of the Supreme Court Case. A separate category was established for Campaign Finance as opposed to including the posts in the "Defining the Platform" category in an effort to better develop granularity in salient theme and to reach coding saturation.

The other parent post categories received varying amounts of participation levels depending on the topic as illustrated in later sections. The inclusion of a specific parent post on the main group page was often temporally associated with salient news events. Therefore, many of the parent post categories such as "Convention", "Giffords" and "Middle East Revolutions" only appear in small subsets of the temporal data. Categories such as "Employment", "Spending" and "Social" are relatively steady over longer periods of time, as they were often the result of a news stories that persisted over the time period.

Participation by Parent Post Category

Party leaders and participants have different degrees of interest in different topics. The Administrators start more discussions around issues that are common in the contemporary popular press; but these are often different than the topics that people actually want to discuss online. Figure 3 represents the percentage difference in the number of comments a parent post category received and the percentage of overall parent posts that the category comprised and this illustrates the differences in interests between the participants and the administrators. Positive

differences in the below illustrate the interest of the group as a whole. Parent post categories with a negative differential illustrate the interests of the Coffee Party Administrators, as these topics were included on the main page more frequently. At the macro level, this chart can be utilized to examine the disparity between the interests of the group and the interests of the participants.

The parent post category “tax” received 7.82% of total comments, but only comprised 5.05% of the total parent posts, a difference of almost 3%. This illustrates a high level of interest among participants in the discourse that lead to more comments. This occurrence is likely a result of the controversial nature of extending the Bush era tax cuts that occurred during the lame duck session of Congress. Similar disparities occurred in the parent post categories of Giffords and Wisconsin.

An inverse disparity occurred in the parent posts related to the Middle East Revolution and Campaign Finance. In total, 4.82% of the total number of parent posts were focused on the early 2011 Middle East Revolutions, yet only 2.78% of the total comments were contributed to these posts. Similarly, 9.29% of the total parent posts were focused on Campaign Finance issues, yet they only received 6.09% of the total comments. Religion and the Economy were two other parent post categories that received less attention from the group participants.

[insert figure 3 here]

Individual Participant Behavior

Individual participants exhibited different behavior in the various parent posts where they participate. For example, some individuals utilize the group to voice general comments to a larger set of participants, while others utilized the comment stream to engage with other, individual participants directly. We refer to the latter as “direct addressal”. The direct addressal practices of the top contributors to the group overall illustrate that the purpose and nature of

those comments varies by topic. Table 4 demonstrates the overall number of comments and the percentage with a direct addressal that contained @. The inclusion of @ and a person's full name within a comment thread (being "tagged in a post" in Facebook parlance) will alert the individuals of the presence of a comment addressed to them and is likely to draw them back into the comment thread to respond. As a result of certain privacy settings that Facebook users can control it is possible that individuals may not allow others to tag them in a post. It is for this reason we do not analyze the specific characteristics of the conversational networks that arise from the utilization of @ and instead use the @ as a measure of intended conversational discourse from participants.

[insert table 4 here]

The Coffee Party Administrators were the most prolific contributors to the discourse, with 1,547 comments but only used the automated direct addressal mechanism in 11% of the posts. Further analysis of the subset of posts by the Coffee Party administrators illustrates that at least 25% of their comments included a form of an informal direct addressal that utilized an individuals name without @.

Much of the direct addressal behavior by the Coffee Party administrators using both the @ symbol and individual names occurred within specific, typically controversial, topic threads. The Coffee Party publicly acknowledges that comments are moderated, but these activities become more common when there are discussions that take on a negative tone. The Coffee Party Administrators notify participants of their presence by posting a comment to the forum identifying themselves, and their role. If comments are judged to be a "personal attack, slur or otherwise inflammatory" statement, they are deleted. This deletion of a comment or a set of comments is often identified as occurring by the Coffee Party administrator. This moderation

role places the Coffee Party in the conversation and allows for their participation to play a significant role in the construction of the network.

The utilization of the @ sign also varied significantly among the individuals who were the most prolific posters. The most prolific poster beyond the Coffee Party Administrators was user 41148. This individual self-identifies as being older and participates in an effort to try to facilitate effective and productive discussion utilizing direct addressals in 52% of his posts. User 41148 states in his comments on numerous occasions that he is interested in having a valid discussion about the merit of others beliefs and does not want to engage in senseless name-calling. This user utilizes the automated direct addressals to single out other individuals who make productive, discourse contributions to the forums and to encourage another participant to further clarify a point.

User 4109, a Coffee Party supporter, utilized the @ sign in 89% of his total posts, signifying an increase from previous studies that analyzed a narrower timeframe (Mascaro & Goggins, 2011). This individual utilized comments to engage in conversations with others and to voice support for a user's particular contribution to the discussion. In contrast, user 4330 only utilized the automated form of direct addressal in 9% of his posts and exhibited different behavior from the other prolific participants. Most of user 4330's comments were stated as general support of the Coffee Party's ideals of open dialogue and civility. User 4330 did not utilize the direct addressal mechanism except to voice support for points from other individuals who were participating, or to single out specific participants. This behavior of singling out specific dissenters allowed him to refute specific points and highlight the dissenting behavior that was occurring within the group. The utilization of @ has an effect on the network behavior as it draws individuals into the conversation.

Key Actors in the Network by Time Period

Network analysis of the seven month time period illustrates four distinct periods of activity corresponding to different phases of the electoral cycle. These four phases are: August 1 (Day 1) – October 27 (Day 88) [Pre-election], October 28 (Day 89) - November 4 (Day 96) [Election Week], November 5 (Day 97) – January 2 (Day 155) [Lame Duck Congress] and January 3 (Day 156) – February 28 (Day 212) [New Congress]. The level of participation and the specific participants vary significantly throughout these time periods. We speculate that this phenomenon occurs as a result of the different political activities that take place in each phase of the election cycle. Figure 5 illustrates a daily computed average of network centralization based on participant activity within each specific day of activity that was analyzed. The y-axis measures relative centralization over the time period.

[insert figure 5 here]

The four time periods illustrate different levels of centralization. The first two time periods that comprise the pre-election time period and the week of the election have similar centralization measures. The overall centralization of the network drops by about 15% during the lame duck session of Congress. This drop in centralization indicates a decreased level of network activity among a core set of participants and more disparate groups of participants. The fourth time period is measured as being twice as centralized as time period 3, which is likely a result of significant political events that occurred during this time period, and the ensuing, intense discussion among a core set of participants.

The week that starts the fourth time period is notable because it is when the newly elected members were seated and also the week that Arizona Representative Gabrielle Giffords was shot

in Arizona. This is a highly active time period within the group because of the discussion surrounding her shooting and the contributing factors related to it. Many within the Coffee Party Group argued that violent political rhetoric from the “Tea Party” contributed to the shooter’s motivation. Our analysis of the discourse within the parent posts related to the shooting illustrates the presence of heated discussion.

Analysis of actors that have high levels of betweenness centrality in these different time periods illustrate the variation in topics and participant activity throughout the different time periods. Table 6 illustrates the top 10 individuals in betweenness centrality for each of the time periods. The Coffee Party Administrators (Coffee) appear as highest in betweenness centrality in the pre-election and lame duck time period, but are the ninth highest in betweenness during election week and second during the New Congress time period. This reduction in ranking during election week is likely the result of a higher amount of informational discourse occurring within the parent posts and a possible result of specific events that are addressed in the next section. The fact that the Coffee Party is not number one in the time period of the New Congress is heavily influenced by user 41148, who becomes highly active in parent post categories related to the US President’s State of the Union and the Middle East Revolutions.

[insert table 6 here]

Coffee Party Administrators are the only actors who are in the top 10 in betweenness centrality in all of the time periods. No other actors are ranked high in betweenness in more than 2 categories. Those actors that are ranked high in betweenness in 2 categories include: 4109, 4330, 4560, 5159 and 10628. Of these five actors, the only one that does not appear in the top 10 in betweenness in the overall time period is actor 5159, who is ranked 13th in overall betweenness centrality in the network.

The presence of different actors as high in betweenness in different time periods illustrates that different individuals play integral roles in different time periods of our examination. The fact that the Coffee Party ranks the highest in 2 of the four time periods illustrates the formal leadership role that they have in dictating the discourse after they set the topical agenda. The varying position of other actors in the four time periods relative to the overall time period also illustrates that individuals take on different informal leadership roles in the discourse during different times in the group.

Network Activity by Day

Analyzing the network in a more granular manner enables us to examine factors that contribute to variance in network centralization within the four phases we study. The centralization of the network by day is shown in Figure 5. The day with the lowest centralization was November 25, 2010, Thanksgiving Day. This was a day with limited activity and the parent posts by the Coffee Party were also limited sentiments like, “Happy Thanksgiving.” The day with the second lowest centralization was October 28, 2010, the Thursday before the election. On this day, the activity within the Coffee Party group was mostly focused on identifying news pertaining to the election, which did not create any significant discussion. This was also the Thursday before a large rally in Washington D.C. hosted by Jon Stewart and Steven Colbert, of which the Coffee Party Administrators were attending and encouraging others to do so. It is likely that many individuals were traveling or participating in events surrounding the rally as opposed to participating in the Facebook Group. Our dataset did not include other technologies such as Twitter so it is unknown if the limited activity in Facebook was a result of individuals using other technologies.

The day with the highest centralization during the period of study was January 11, 2011.

On this day, there were four parent posts that did not have high centralization of their own, but the combination of the four of them sparked a significant amount of discussion. Three of the four parent posts on that day were directly related to the shooting of Representative Gabrielle Giffords and the fourth post was about the upcoming anniversary of the Citizens' United Supreme Court decision. The combination of these four parent posts and the shooting three days earlier drew a significant amount of activity to the group as these two issues, civility and campaign finance were the foundations of the Coffee Party Platform. In total, 4 of the top 5 most centralized days in the examined time period occurred during the week of the Gabrielle Giffords shooting. This indicates a high degree of ongoing discussion among a highly connected group of individuals.

The days with the highest centralization in each of the four identified time periods illustrate days in which highly salient news items of each of the specific time period were included on the Coffee Party Facebook group page. These salient news events are able to draw in significant amount of activity; and, it appears, a group of people with more intense opinions and interest in discourse than on days where less controversial topics dominate. In the pre-election time period, the day with the highest centralization was August 22, 2010. On this day, the parent posts discussed the upcoming Coffee Party convention in late September and the Coffee Party platform. Two of the four parent posts on this day were explicit calls for change in the current political system and the comments within the parent posts were focused on bringing about this change in the upcoming election. Coffee Party participants in the pre-election period are motivated by the idea of fundamental political change, and this shows up in our network analysis as high network centralization.

In the second time period, the week surrounding the election, the most centralized day

was November 4, 2010. This day represented a regrouping by individuals in the Coffee Party following the Republican electoral victories and the takeover of the House of Representatives. The Coffee Party Administrators utilized the parent posts to highlight some electoral wins such as voters rejecting a plan for oil companies in California to circumvent existing environmental laws. The Coffee Party also included a parent post on this day to solicit ideas for what COFFEE should represent as an acronym. The parent post elicited 300 comments and many ideas including “Country Of Freedom For Everyone & Everything” and “Citizens Organizing For Freedom, Empowerment, and Ethics.”

During the third time period, the lame duck session of congress, the most highly centralized day was December 1, 2010. On this day, there were 4 parent posts that were mostly focused on health care and the economy, two of the most salient legislative items handled in the lame duck session of Congress. The overall nature of the four parent posts on that day expressed concern for the state of the economy and called for health care programs such as Medicare and Medicaid to not be cut. One of the parent posts on the economy also highlighted the release of information by the Fed of the special lending programs that it utilized during the 2008/2009 economic crises.

The most highly centralized days in the fourth time period were the days immediately following the shooting of Representative Gabrielle Giffords as the centralization of the network spiked on January 8, 2011, the day of the shooting. The highest centralized day occurred on January 11, 2011, when more information was coming out surrounding the shooting. These days illustrated a very important time within the group as the political events exemplified much of the Coffee Party’s platform of civility in politics. The shooting surfaced discussion about some of the core issues that the Coffee Party Administrators were trying to advance. This highly salient

news event leads to a highly centralized time period that was maintained throughout the end of the analyzed time period.

Network by Parent Post

Temporal analysis of the network by day illustrates how behavior varies over time during the period of study. Using each specific parent post as a unit of analysis allows for further analysis of the type of information and content of parent post that lead to increases in network centralization. Parent posts surrounding salient and controversial items in the news tended to measure as more highly centralized as they drew in conversation between individuals.

The most highly centralized parent post of the whole time period occurred on September 21, 2010. This parent post discussed the pending Senate vote on the passage of the “Don’t Ask, Don’t Tell” and DREAM Act Amendments. This parent post received 362 comments and had 144 individuals participate in the conversation. In total, 81 (23%) of the comments in that thread contained the @ sign as a mechanism of automated direct addressal and manual coding of informal direct addressals identified another 60 comments (17%). The conversation that occurred within the thread was mostly in support of the inclusion of these two amendments. A significant portion of the direct addressals occurred between a subset of individuals who were debating whether such measures should be enacted. Centralization at the parent post level indicates intense, material debate in our data.

The second most centralized parent post occurred on November 3, 2010, the day after the election. This post was a summary of the current Republican gains from the previous day and projections for the outcomes of races that had yet to be decided. The parent post drew 463 comments with 258 participants with only 63 comments contained a form of direct addressal. Much of the discussion that occurred centered on what the Republican take over of the house

meant for the direction of the country, with many expressing skepticism that much would change even with a new party in control. The discussion in this post appeared to be much more of a general discussion than one between specific participants as in the post about the DREAM Act.

Parent Posts in Key Time Periods

Analyzing highly centralized parent posts can help to identify salient political events representative of the studied time period. During the lame duck session of Congress the most highly centralized parent post occurred on November 21, and was an article about exiting GOP Representative Bob Inglis from South Carolina. The article received 320 comments, of which 94 contained a direct addressal. The article discusses Representative Inglis' disinterest in getting involved in name calling and buying into negative political rhetoric and how his actions along with his moderate voting record made him unpopular among his colleagues. The article asserts that Representative Inglis was voted out as a result of the Tea Party movement and further discusses his beliefs about how the current populist movement lead by the Tea Party will end. This parent post by the Coffee Party facilitated a significant discussion that agreed with the situation regarding the Tea Party and how the movement was already showing some signs of slowing down after the electoral victories two weeks earlier.

The fourth time period that included the seating of the New Congress had many days of highly centralized activity, but the parent posts during that time were not highly centralized compared to parent posts that occurred during the other time periods. The most highly centralized parent post in the fourth time period was a parent post from January 9 that received 574 comments with 109 direct addressals. This article discussed Representative Giffords shooting, but more specifically discussed the killing of the 9-year old Christina Green who was also shot. The comments within the parent post expressed their condolences for the tragic

situation, but within the post there was also a conversation between participants that occurred about the motivating factor behind the shooting.

Though there were no parent posts that were highly centralized within the fourth time period, the overall network centralization was greater than any other time period as illustrated during the previous section. This is likely the result of the events of the New Congress leading to more debate about the direction of the country and also the fact that the shooting of Representative Gabrielle Giffords and the events surrounding it personified the platform of the Coffee Party of open and civil dialogue. The sustained high centralization within the fourth time period was also a result of two significant series of events the Middle East Revolutions and the state budget debate in Wisconsin. These two news events received significant amounts of attention on the page and were highly controversial and illustrated two significant events.

Important Actors by Parent Post Category

Through analysis of high betweenness individuals in the topical categories of the parent posts it is possible to understand the important roles that certain individuals play in shaping specific discourse within parent post categories derived from our topical coding of parent posts. The presence of prolific posters as high betweenness actors in a subset of categories is novel in the sense that it illustrates a specialization of comment activity that other analysis does not uncover. The Coffee Party Administrators have the highest betweenness in 12 of the 25 parent post categories and are in the top 10 actors in 7 of the 25 parent post categories. The 6 parent post categories that the Coffee Party Administrators are not in the top 10 in betweenness were Environment, Health Care, Giffords, State of the Union, Tax and Middle East Revolutions. The existence of the Coffee Party Administrators as high betweenness actors in a significant number of categories suggests that they are highly involved in the group discourse.

In three of the six categories (Environment, State of the Union, Middle East Revolution), where the Coffee Party Administrators did not occur as high in betweenness, the second most prolific individual, user 41148, was the most highly between individual. In another category (Giffords), the third most prolific participant, user 41240, was the individual with the highest betweenness. These two actors also had high betweenness in many of the categories in which the Coffee Party Administrators were high in betweenness.

Analysis of user's 41148 and 41240 postings shows that much of their activity was commensurate with stated platform positions of the Coffee Party such as open and civil dialogue and the attempt to understand both sides of the issue. In addition to being the most highly between individuals in these categories, user 41148 was also the most prolific poster in the Environment and State of the Union categories and the second most prolific poster in the Middle East Revolution category. User 41240 was the most highly between individual in the category of Giffords. The high betweenness of these two individuals in specific categories illustrates a role of informal discourse leadership and illustrates the presence of "issue entrepreneurs (McCarthy & Zald, 1987; Agre, 2004)," individuals who specialize in one or a set of issues.

There are two parent post categories where the highest betweenness individuals were not Coffee Party Administrators and do not participate significant in other parts of the network (Health Care, Tax). User 5406 was the most highly between individual in the category of Health Care and user 13713 was the most highly between individual in the category of Tax. The presence of these individuals in only these categories illustrates further specialization of individuals in topical discourse.

Health Care: User 5406 made 110 comments throughout the 212-day time period, of which 87 (79%) were made within those parent posts coded as Health Care. This was the most of

any individual within that parent post category. These comments were made within a set of 6 parent posts from November 29 2010, - January 18, 2010, illustrating a prolonged participation period. In 4 of the 6 parent posts, user 5406 made at least 12 comments and as many as 32 in one of the parent posts. The parent post that user 5406 contributed 32 comments to was a link to an article about cutting the deficit by eliminating health care benefits that employers offer. Within this parent post, 27 of the 32 comments made by user 5406 were addressed to other individuals within the comment stream who made disparaging remarks about the health care system.

Tax: Similarly, user 13713 made 86 total comments, of which 64 (74%) were made within parent posts coded as Tax. This placed user 13713 as the 5th most prolific poster within the parent post category Tax. These comments were mostly evenly split between a set of 13 parent posts that occurred between December 6, 2010 – December 17, 2010 a time in which there was a significant debate going on about whether to extend Bush Era tax cuts. User 13713 commented 22 times in a parent post on December 9, 2010 that discussed the rejection of the current tax bill without further changes. Within the context of the parent post, user 5406 engaged with other individuals who were arguing that these tax cuts were needed in their current iteration during the economy. It was during these comments in the context of the parent post that user 5406 identifies himself as an individual who is participating in the Coffee Party to protest the Tea Party and what they are doing to the economy and the current political atmosphere.

Discussion

There are three main implications for the use of social media in politics that emerge from our analysis of the Coffee Party on Facebook. First, slicing data and analysis by topic, time and other units of analysis builds a more comprehensive view of how groups form, how political agendas are set and how participants engage differently through social media over time. Our

findings illustrate how time, parent post and parent post category analysis can be used to identify the key individuals in a network and how the network evolves over time. At the actor level we can see how certain individuals specialize in topical discourse, while some individual participate in a broad range of topics. At the network level we can develop a high level understanding of the aggregate behavior of the actors. For example, we know that the centralization of the network on the Coffee Party site is greatest after the lame duck session, when the newly elected Congress, opposed to many of the ideas advocated on the Coffee Party page takes office.

Centralization of a political discourse network seems, then, to increase when a group is, quite literally, regrouping after defeat. Our work demonstrates how to identify these types of phenomena in technologically mediated political discourse and how existing quantitative methods coupled with qualitative methods can be applied to understand a more complete role. This type of analysis can be used by candidates or elected officials to gauge responses to public actions or messages.

Within the group, actors respond differently to the various parent posts that are a reflection of the external political atmosphere and events. These responses by actors are captured in the technology and from these interactions political discourse behavior can be studied without direct involvement. This creates a database of interactions that are pure and not influenced by researchers. The only influence exerted within the group is that by other participants. Identifying important individuals that influence the discourse in a large network can be beneficial to groups or candidates who wish to further influence the direction of dialogue in these larger groups.

The second implication of the work is methodological in nature. The reliance of elected officials, candidates running for office and issue groups on social media for mobilization means that the barrier to entry into the political process are lowered and traditional theories of political

mobilization and engagement may not apply to the understanding of technologically mediated interactions. The Coffee Party Facebook Group is not structurally different than any Facebook group page as the technological affordances are the same across the different groups in the technology. What distinguishes groups from each other are the topics posted, the extent of response and the ways that people interact with each other. Much of these interactions and activity of users is shaped by the actions of the administrators (the formal leaders) of the group. Participants respond to these actions and topics by choosing to either participate or not participate in the discourse.

Facebook groups develop a specialized and local culture in which the activity varies based on the administrative control, but also the other individuals that are present in the group. How Facebook groups are used by political organizations define the local group; and the sorts of messages that draw people in to participate are more likely to persist than those with no response. The environment is discursive, but it is a discourse that emerges from the citizenry. Technology is not the center; it is increasingly invisible as individuals exist independent of the technology and participate accordingly uninhibited. The message of the Coffee Party administrators and members drives the structure of discourse. Similar findings may also apply to even more unstructured technologies such as Twitter.

Third, the challenge for 21st century political networks researchers and computational social scientists is to understand, examine, and possibly guide the use of social media for connecting human interests to government policy through better communication channels between the citizenry and elected officials. For example, ideas emerge and are developed through direct addressals among participants in the Coffee Party. These direct addressals vary in intent and purpose, but are generally utilized to clarify information or engage in mutual discourse

with each other. These directed interactions lead to the development of ideas between members and the identification of problems and solutions that exist in society. The discourse that develops allows for the participants to receive feedback from their like-minded peers in the context of a larger group of interactions.

The participation of elected officials in technologies such as Facebook and Twitter may allow for interested citizens to voice their concerns using direct addressals and other technological affordances and now have another channel to deliver the ideas they discuss in this technologies. Our findings illustrate that the presence of an administrator in a larger group of discourse can lead to greater discourse and can also help to facilitate activity among participants. The participation of an elected official in a group may allow individuals to feel as though they are being heard and may help the elected official or candidate for office develop better ideas. These ideas are aspirational and ideal and further research on the actual behavior of such officials and candidates for office is needed before generalizations can be made across groups and technologies.

Conclusion: Limitations, Methodological Implications and Political Network Design

Our findings illustrate that automated analysis of large-scale datasets for the presence of conversational discourse and prominent actors may be missing significant amounts of information utilizing existing methods. Therefore, network analysis of discourse such spaces is difficult. The lack of utilization by individuals of technologically formalized mechanisms of direct addressal, such as the @, also means that individuals who are participating in the comment streams may not be made aware of comments addressed to them and thus do not respond appropriately. This may limit the amount of activity that occurs as individuals may be drawn back to the discussion if they were alerted of a comment addressed to them. Additionally, the

context of the group of large and without more granular units of analysis such as individual parent post and parent post category, important actors may be overlooked.

This highlights a socio-technical limitation that should be overcome in future implementations of systems that house and facilitate online discourse. It is imperative that the analysis of these online spaces is truly interdisciplinary, as one research perspective will not allow for a full understanding of the implications of the interactions occurring on these websites. The inclusion of social scientists, computer scientists and design professionals in the emerging field of computational social science will allow for the collection of the activity, an understanding of what is going on and how this understanding can inform better design and development of these systems. In this way, studies of technologically mediated political networks will benefit from engagement with emerging research programs on various types of socio-technical systems.

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Figures and Tables

Table 1: Categories of Actors

Number of Posts	Number of Actors
Greater than 200	45
50 - 200	361
5 - 49	5,797
2 - 4	9,275
1	13,497
Total	28,975

Table 2: Parent Post Categories

Parent Post Category	Frequency
Campaign Finance	81
Congress	38
Convention	23
Defining the Platform	88
Economy	77
Election 2010	46
Employment	25
Environment	25
Giffords	25
Health Care	16
Immigration	16
International	18
Media	24
Mobilization	98/24
Organizational Info	19
Quotes	82
Religion	16
Middle East Revolution	42
Security	22
Social	36
State of Society	46
State of the Union	8
Spending	18
Tax	44
Wisconsin	13
Total	872

Figure 3: Differential Between Comments and Parent Post Category Percentage

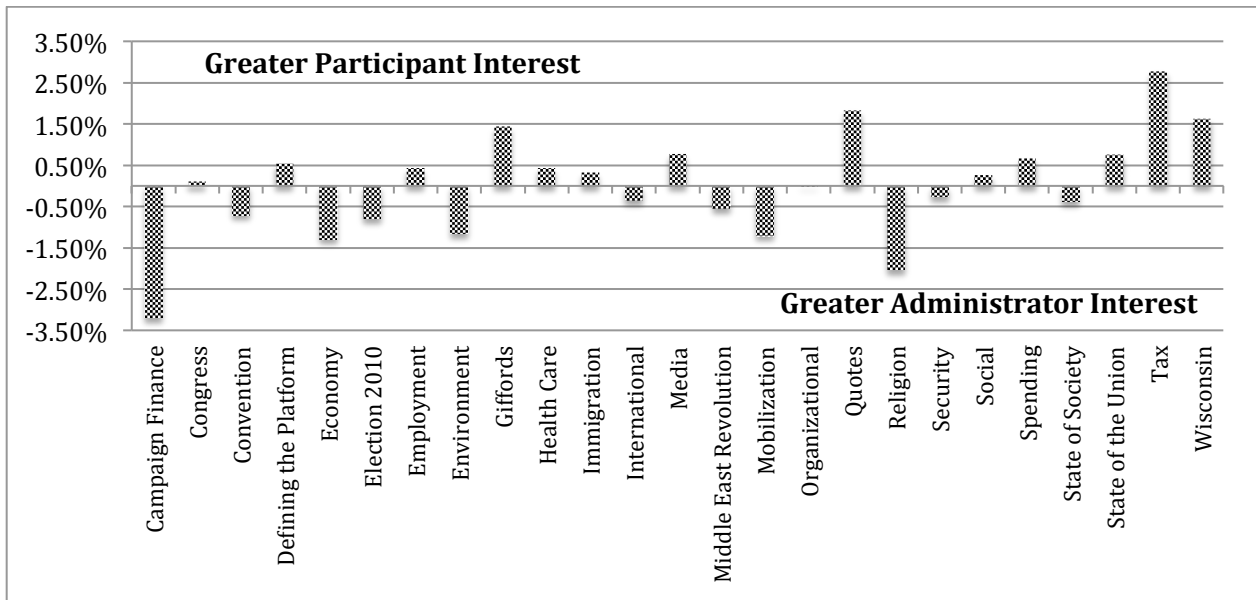


Table 4: Top 7 participants in Discourse

User ID	Comments	Percent with @
Coffee	1547	11%
41148	913	52%
41240	700	41%
4633	493	68%
4330	492	9%
4109	480	89%
10628	471	16%

Figure 5: Network Centralization by Time Period

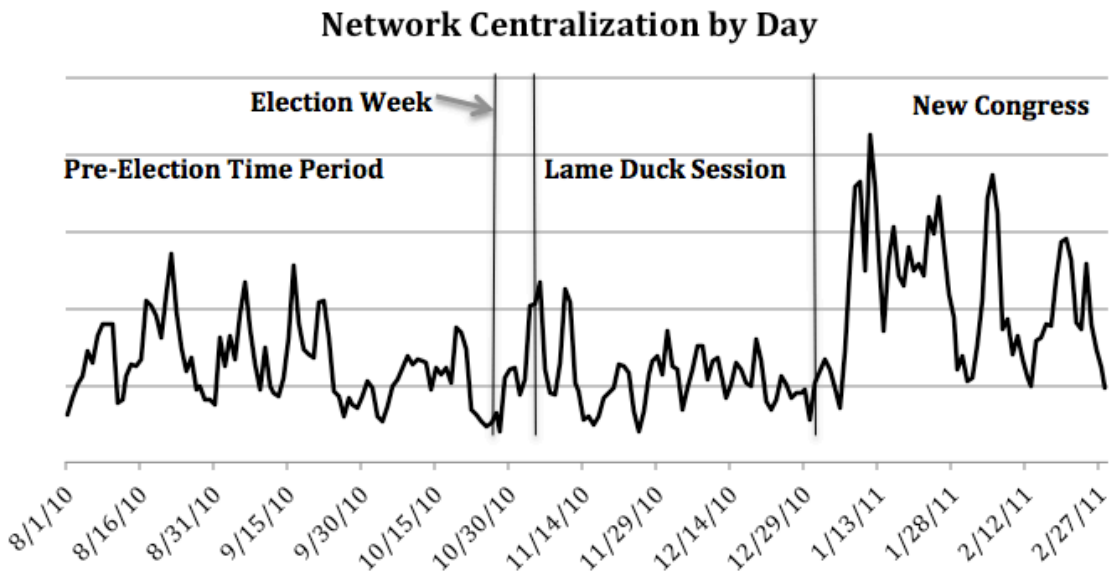


Table 6: Top 10 Betweenness Individuals by Time Period

		Betweenness									
		1	2	3	4	5	6	7	8	9	10
Time Period	Overall	Coffee	41148	41240	4109	4330	4408	4560	4086	10628	5930
	Pre-election	Coffee	4109	4283	4945	4960	4330	5267	4633	4121	5159
	Election Week	4560	5159	4957	4749	4475	5134	4408	5007	Coffee	4096
	Lame Duck	Coffee	4824	4109	10628	6590	4694	4171	13713	36769	4690
	New Congress	41148	Coffee	41240	10628	4139	5930	5178	4330	5503	4560