How [not] to caffeinate a political group:

Parent post influence on conversational network structure

Abstract

The attempted assassination of Representative Gabrielle Giffords in Arizona on January 8, 2011 spurred a surge of media reflection and criticism of the Tea Party Patriots and their violent rhetoric. The Coffee Party, created in 2010 as an oppositional force to the Tea Party, spent the days following the shooting discussing the various social, political, and moral aspects of the violence on their Facebook page. This work is part of an ongoing investigation on language in politically oriented online forums. Here, the 24 parent posts and following Facebook conversations are studied to investigate a connection between post sentiment and network structure. Using communication accommodation theory, Linguistic Inquiry Word Count (LIWC), and network analysis, relationship is located between social, affective, cognitive, perceptual, and biological constructs and network measures of betweeness, and core/periphery size. This research has implications regarding online network structures, new methods in Internet research, and online political activity research.

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Online social networks have become a place for political discussion and debate over the

decade and there is no indication that this trend is slowing down (Smitten, 2008). The ability for

people from all over the world to contribute to an online forum of ideas related to contemporary

and historic political events is seen as a unique possibility and opportunity for discourse. The

discussion is limited by both the technology of the social network and the discussion leaders who

chose a topic to initiate a conversation. As a result, it is the leaders of the online discussion group

that often direct the discourse around certain topics and ideas pertinent to the interests of the

group. The tone and sentiment of parent posts created by the group's facilitators should therefore

be studied to see how it relates and potentially influences the discussion network. This work

presents new methodology that can be used to understand new forms of online political

interaction.

The following study will investigate the responsive conversational network measures

correlated to the tone and sentiment of the original parent post on politically focused social

network forums. Using the Facebook group "Join the Coffee Party Movement," the largest

(406,118 online members) of the national groups associated with the grassroots United States

Coffee Party, it is possible to look at the conversations surrounding a specific event. The

attempted assassination of Representative Gabrielle Giffords in Arizona on January 8, 2011

spurred the group leaders to create 24 parent posts from January 8th to January 17th topically

related to the event. Media outlets suggested the shooting was associated with the violent

rhetoric of the Tea Party Patriots. The Coffee Party was created with the intention of diffusing

and countering the Tea Party's efforts and ideology, therefore, investigating the discussions

surrounding the Coffee Party's response would be pertinent to understanding the group's

ideology, network, and structure.

<div align="center">**Background**</div>

The Coffee Party

The Coffee Party is a politically focused movement that began on Facebook in January

2010 as a means to "advocate for the interests of the American people without having our

objectives, and the notions on which they are based, governed by powerful interests that already

have too much influence in Washington" (http://www.coffeepartyusa.com/about-us, para. 1). As

a self-described grassroots democracy movement, The Coffee Party states that their members

come to their own conclusions through debate and discussion using facts and principles rather

than the traditional rhetoric and ideology of political leaders and the media. Further, the

movement relies on technology stating "thanks to new technology available on the Internet, we

believe that Americans can meet the challenges of self-governance in the 21st century by

becoming active citizens rather than periodic consumers of partisan entertainment (About us,

para. 6). Because of the reliance on technology, the majority of the Coffee Party's information

distribution occurs through their website and their social networking page on Facebook. Most

discussion by group members occurs through these channels as well.

The Coffee Party also states that their mission is to fight the "cycle of corruption" which

involves reforming campaign finance, taxes, and Wall Street (Mission statement, para. 1). Also a

part of the cycle includes the "violent rhetoric" of the Tea Party Patriots (http://www.c-

spanvideo.org/program/CoffeeP, 00:05:11). Coffee Party creator Annabel Park states that the

coffee party is not "the opposite of the tea party, but a response or alternative" (http://www.c-

spanvideo.org/program/CoffeeP, 00:00:07). According to Park, the origins of the Tea Party's

rhetoric comes from political culture and social structure which both government officials and the public respond to. After observing the rhetoric surrounding the healthcare debates of 2010, Park wanted to create an organization which focused on "core issues in the country" and overcame the rhetoric of the Tea Party Patriots which is destructive to progress and fixing the "real problems" (http://www.c-spanvideo.org/program/CoffeeP, 00:05:11). These efforts were tested and demonstrated in the discussions on the group's Facebook page.

Shooting of Representative Gabrielle Giffords

On January 8th, 2011 Representative Gabrielle Giffords was a shot in the head by attempted assassin Jared Lee Loughner during a "Congress on your corner" event in Casas Adobes, Arizona. During the incident, 19 people were shot, six of whom died from the injury. In the days that followed the shooting, an increased focus was placed on the role of the Tea Party Patriots and the mindset of Jared Lee Loughner. Slate.com writer Jacob Weisberg (2011, January 10) summarized much of the media's and coffee party's thoughts when stating "the Tea Party movement did make it appreciably more likely that a disturbed person like Loughner would react, would be able to react, and would not be prevented from reacting, in the crazy way he did" ("The tea party and the Tucson tragedy," para. 2). Many blamed the incident on the far rights propaganda, rhetoric, and efforts to call into question the "legitimacy of U.S. government" (para. 3). Further, there was a connection drawn between the political rhetoric of the far right before the Oklahoma City bombing in 1995 and the backdrop to Loughner's attack (para. 3). Because of the connections being drawn between the political far right, the Tea Party Patriots, and their critique of the U.S. government, the media coverage became heavily followed by political groups and the public. The Coffee Party's responses and discussions of these connections were recorded on the groups Facebook page over the following week.

Online Political Discourse in Social Networks

Smitten (2008) describes the concept of online political discussion groups as being critical to the modern democratic process. As online communities, these groups have the capacity to both discuss and act upon physical world issues in online and physical spaces (Smitten, 2008). Because of the nature of the online medium, the groups have goals that extend into the physical space (Smitten, 2008). Similarly, the Coffee Party's goals include both online and physical space action and political participation.

Mascaro, Novak, and Goggins (2012) utilized similar methodology to look how political groups censor themselves and group members who disagree with the discourse within the network. In looking at the Tea Party Patriots facebook page, it is clear that dissenting members of online political groups are censored and addressed by both group administrators and group members. Similarly, other researchers have questioned the ability for online political groups to foster political debate and discussion that represents all perspectives on a subject. In groups where the primary purpose is political, democratic discussion is limited and deliberation is dominated by a small subset of discussion/position leaders (Wojcieszak & Mutz, 2009). This draws into question whether group discussions are as open and flexible as researchers like Smitten (2008) believe. Questions in the field remain: are dissenters or members influenced by more than just other group members? How does formalized leadership affect the conversational patterns of the group? This paper seeks to explore these questions and add to literature in the field. To do this, we utilize an approach that uses new methodologies which will be explained in the following sections.

Sentiment of the Parent Post influencing discussion

Communicative Accommodation Theory. Previous research in sociolinguistics has identified Howard Giles' accommodation theory as pivotal in understanding how the expectations of each individual in a conversational pair influences discussion. During interaction or communication, individuals adjust their behavior, language, and nonverbal communication to accommodate the perceived needs of others (Giles & Coupland, 1991). Although this theory was created in studying face-to-face pairs, Postmes, Spears, and Lea (2000) suggest that in computer mediated groups, the processes of accommodation theory are ever present. In forming group norms, members tailored their messages and online behavior to their perceptions of what other group members needed and wanted to see happen. Accommodation theory has since been used to study the behavior of communicators in both face-to-face and computer mediated interactions, such as looking at the influences of the sentiment of the parent post. The findings of this add to the body of work already on communication accommodation theory and its application in computer mediated communication.

Effect on Following Conversation. Previous research has suggested that the tone and intention of the initial speaker can have an effect on the following conversation or debate. Pardo, Jay, and Krauss (2010) also studied the relationship between the tone of the conversation's initiator and the responses of conversational partners. By studying accommodation theory and the phonetic convergence during conversational interaction, they found that partners often adjusted their tone based on the perceived identity of the initiator. In conversational pairs, individuals adjusted their conversational tones and phonetic pronunciations in an effort to accommodate the perceived goals and needs of themselves and their partner. Although in computer mediated communication the vocal element of conversation is removed, Pardo, Jay, and Krauss' (2010) theory that the role of the initiator can influence the conversation can be

tested when looking for the relationship between tone and sentiment of the parent post and the following structure of a conversational network. The following section will further explain these phenomena in computer mediated communication.

Computer Mediated Communication. Jeong (2006) found that the role that an individual leader takes in a conversation can influence both the frequency and responses of the group. Additionally, the type of language used in initial messages can also influence a following group discussion. "Messages with more conversational language were more likely to elicit responses to produce more critical discussions than messages with less conversational language." Jeong (2006) found that the tone of the original message influences the way that others respond to that individual or the group through the course of conversation and debate. Jeong (2006) adds that more research is needed to investigate the role of conversational style and parent posts and the responses generated by the group. This paper seeks to expand upon Jeong's work to describe the relationship between the sentiment of the parent post and the responders' conversational network.

Additionally, the culture of contributors and subject matter of the conversation influences network structure and measures of an online group. Montero-Fleta, Montesinos-López, Pérez-Sabater and Turney (2009) found that when comparing conversations of identical political or sports subject matter across international cultures, the structure of the conversational network and formalization of language differed. For example, English language computer mediated asynchronous communication on political topics "displayed markedly more oral elements than in Catalan and Spanish," as well as more message frequency and length. These results changed when the topic of the forum was sports related, thus showing that the network structure and use of formal language in user responses depends upon the topic of discussion as well as the culture

and language of contributors. This paper builds upon the ideas set forth by Montero-Fleta, Montesinos-López, Pérez-Sabater and Turney to look for a correlation between a political forum, language of the parent post, and the structure of the responding network.

Research Questions

1. Can a parent post influence the strength and features of a network, including density, centrality, and individuals in the core?

We must first look to see if the parent post has any effect on the network. To do this, the measures from LIWC and network measures will be tested for correlation and significance. This research question is critical because, should and effect be found, it can verify that communication accommodation theory is present in online interaction.

2. Are the structure of some networks different than others due to the linguistic processes of the parent post?

We anticipate that each of the 24 networks will be different due to the different amounts of people in the network as well as the different amounts of interaction. But, we have to take this further and ask why. Is there a statistically significant finding that suggests the diversity of network structures are a result of the diverse language processes used in the parent post?

3. Which linguistic process (social processes, affect processes, cognitive processes, perceptual processes, and biological processes) is the most related to network measures?

Should the first two questions result in findings that support a relationship between the sentiment of the parent post and the network structure, we can then look to see how forum leaders can alter their use of language in parent posts to influence measures of density, centralization and core membership. In short, which processes influence which measures?

Methodology

In the following section, we will discuss the combination of social networking, linguistic processes and communication accommodation theory that this paper is oriented in. In order to understand how members of the Coffee Party discussed and debated the issues surrounding the shooting of Representative Giffords, the entire set of 24 parent posts topically related to the event were utilized. In total, 24 parent posts were created and posted on the Coffee Party facebook page from January 8, 2011 at 2:56pm ET to January 17, 2011 at 7:19pm ET. This represents the complete data set, because after January 17, 2011, there were no more posts related to the shooting.

To understand the sentiment used in these parent posts and to look for a connection between the parent post and the network structure and composite, Language Inquiry Word Count (LIWC) was used. The text of the 24 parent posts (not including web links, and thumbnail text from news stories) was run through the tool producing measures of five key categories: social processes, affect processes, cognitive processes, perceptual processes, and biological processes. The output of which was used in comparison to measures of density, centrality, and core/periphery produced by UCINet analytic technologies.

Figure 1 in Appendix: Example of Parent Post

Because this study emphasized looking for conversations and direct addressals in a social network, we created 24 directed valued and directed matrices corresponding to the 24 individual parent posts created in the days that followed the shooting. Because we were looking at specific responses to individuals, this is a directed network. It is valued because some individuals addressed each other multiple times. These values can be seen in the thickness of the line, where a thicker line denotes more addressals between a pair. The weighting and directing data collected makes measuring for indegree and outdegree centrality possible. Each of the 24 networks are

separate because although there are some members who posted under multiple parent posts, there

is a unique combination of individuals in each network. Further, developing a network for each

parent posts allows us to segment the conversation and look for the separate relationships based

upon specific initiations set forth by administrators.

Figure 2 in Appendix: Example of directed and weighted Social Network (10)

Only the actors who addressed another individual by name were included. To

demonstrate that they were addressing individuals, contributors used two different methods.

First, they used the "@" sign placed before the addressee. This is a technological affordance used

on other social networking sites such as Twitter to link a comment to another's profile or post.

Alternatively, some contributors did not use the "@" sign and instead placed the addressee's

name in text of their message. When a post was addressed to multiple people, this was noted and

included in the data set. From these posts, 24 matrices and networks were developed which

corresponded to the 24 parent posts created by the leaders of the Coffee Party Facebook page.

Figure 3 in Appendix: Example of addressing with the "@" sign

Utilizing the tools of UCINet, measures for network density, core/periphery, and

centralization were collected for each of the 24 conversational networks. The text of the parent

post was run through the LIWC software and the output was recorded. Although LIWC gives an

output of over 80 measures, only five measures (social, affect, cognitive, perceptual, biological

processes) were utilized in this study. These major five measures encompassed and incorporated

many of the additional 75, meaning that they include measures for more words and with higher

judged validity than the other measures (http://www.liwc.net/descriptiontable1.php). Thus, this

makes them the five strongest measures of the LIWC output. This too will be discussed in further

sections.

The data collected was inputted into SPSS to look for correlation. Using the Bivariate

Pearson one-tailed test, correlation and significance were tested for every combination of

processes and measures.

Network Analysis

Network analysis is helpful in understanding groups and language because it provides

visualization and statistical measures for members of a group and the group as a whole. These

measures include density, centralization, and number of members in the core and periphery.

Density. Density relates to "the completeness of the network: the extent to which all

possible relations are actually present" (Scott, 2009, p. 32). Density is one of many factors that

social network designers strive for. A dense network is a strong network because members are

talking to all other members and information is easily and quickly disseminated. Density is

measured as a percent or decimal, the closer to 100% or 1.000 the measure is, the higher the

density and stronger the network will be.

Centralization. Centralization is one of the oldest measures of social networks and is

concerned with network activity and involvement by all members (Scott, 2009). Because this is

a directed network, each member has a measure of indegree centralization and outdegree

centralization. This measure is a ratio of the amount of messages sent by the member (outdegree)

or received by the member (indegree) compared to all other directed messages in the network.

Network centralization then is a ratio of "the actual sum of differences (between in and out

degree) to the maximum possible sum of differences" (p. 90). These measures take into account

degree (the level of involvement by each member), betweeness (measures where connections are

located in the network), and closeness (how quickly and effectively members can interact). A

strong network has both high measures of in- and out-degree centrality.

Core. Finally, the number of individuals in the core network structure suggests the size of the group of people who make up the majority of the conversation. In networks, there is usually a group of individuals who are very involved with each other and communicate frequently. The other group of people sit on the outside of the network, infrequently talking with each other, or members of the core. A strong core (the larger the core is) the more effectively and efficiently the group can communicate.

Although there are many other measures that can be found using UCINet and Social Network Analysis, the results of this study found measures of density, centrality, and core/periphery to be the most significant. By measuring for these three factors of the 24 responding networks and looking for positive and negative correlations between the increase of social, affective, cognitive, perceptual, and biological processes from linguistic inquiry and word count we can look for evidence of a positive or negative increase in density, centralization, number in the core, and the language of the parent post. These language processes will now be discussed in detail.

New linguistic tools

To understand this discourse and language we will use a new combination of network analysis, and linguistic inquiry and word count (LIWC) methodology. LIWC is a content analysis tool used to determine "the degree to which people use different categories of words across a wide array of texts" (www.liwc.net, para. 1). Using a dictionary of thousands of words, the program determines the frequency and degree of which words signify specific processes. For example, the program associates certain words with different forms of communication. This study analyzed the five major processes described by LIWC. Social, affective, cognitive, perceptual, and biological processes were measured using the corresponding words identified by

the LIWC program. Each process is identified based on the presence of words which are

associated with it. A list of examples of the words that denote each process can be found in

Figure 4: Examples of words included in LIWC. Because all five processes can be found in the

words of one text or post, the output of the program measures the co-presence of each word

which denotes a specific process. Therefore, a sentence can have words and measures for all five

processes.

By process, LIWC means to suggest that it looks for words that identify a psychological

construct. Through rigorous testing combining human coders and other content analysis

software, words, phrases and punctuation are used to see how a text relates to the five

psychological constructs of: Social, affective, cognitive, perceptual, and biological processes.

For example, the sentence "You hear about crazy, but it's rarer than you think," is high in

perceptual processes because of the words, "hear," "crazy," "think," and "you." The ratio of

psychological processes is high because most of the words correspond to this psychological

construct. LIWC also produces measures for the other four categories, thus allowing us to have a

full analysis of all five processes for each post.

Previously, LIWC has been utilized to measure the changes in sentiment expressed in

textual form over the course of an event or period of time. Back, Küfner and Egloff (2010) used

the LIWC tool to investigate the emotions expressed through text messages sent after the terrorist

attack on the World Trade Center in September 2001. By analyzing a database of 58,000 text

messages sent over the first 18 hours after the attack, the researchers looked for patterns of anger,

sadness, and anxiety and plotted their frequency. As a result, they were able to create the

"emotional timeline" of the hours following the attacks and study the public's reactions to

specific events within that time frame.

This paper builds upon the ground work set forth by Back, Küfner and Egloff (2010). Although they were primarily interested in the emotional (affective processes) of a specific event, we look at how these processes might influence following conversation. These findings are thus oriented and grounded in communication accommodation theory.

The following will summarize the findings for the correlation between each linguistic process and measures for density, centrality, and size of core groups

Findings

To look for the relationship between parent post and network structure, network statistics were collected and compared. Because the parent post suggests a theme and discussion topic, we propose that the following conversational network is influenced by the linguistic processes prevalent in the post.

Table 1: Network Measures (highlighted portions not included)

	Social processes	Affect proceses	Cognitive processes	Perceptual processes	Biological processes	Density-Avg Value	Network Centralization (Outdegree)	Network Centralization (Indegree)	Average Degree	Starting Fitness	Final Fitness	Individuals in Core
1.txt	12.5	0	6.25	0	6.25	0.0337	0.030	0.038	0.034	0.501	0.501	4
2.txt	4.17	12.5	8.33	4.17	4.17	0.0395	0.069	0.069	0.069	0.285	0.285	4
3.txt	18.42	15.79	15.79	0	2.63	0.0151	0.024	0.034	0.029	0.239	0.239	9
4.txt	10.71	3.57	12.5	3.57	1.79	0.0196	0.041	0.041	0.041	0.021	0.089	12
5.txt	8.33	4.17	18.75	0	2.08	0.047	0.097	0.051	0.074	0.128	0.128	4
6.txt	16.28	11.63	20.93	0	0	0.0523	0.054	0.066	0.060	0.134	0.175	4
7.txt	12.24	6.12	20.41	6.12	0	0.0226	0.046	0.074	0.060	0.073	0.073	8
8.txt	9.68	3.23	3.23	3.23	6.45	0.0737	0.127	0.072	0.100	0.095	0.160	6
9.txt	14.89	10.64	19.15	2.13	0	0.0272	0.061	0.035	0.048	0.070	0.071	6
10.txt	14.29	8.57	17.14	4.29	1.43	0.0744	0.080	0.074	0.077	0.202	0.202	3
11.txt	20.37	9.26	22.22	3.7	5.56	0.0394	0.129	0.027	0.078	0.147	0.147	2
12.txt	25	8.33	16.67	8.33	0	0.0474	0.086	0.086	0.086	0.000	0.084	10
13.txt	22.22	11.11	7.41	3.7	3.7	0.0625	0.180	0.109	0.144	0.196	0.196	3
14.txt	13.33	10	16.67	3.33	3.33	0.0224	0.145	0.020	0.083	0.206	0.206	3
15.txt	16	4	20	0	0	0.0456	0.176	0.116	0.146	0.294	0.294	1
16.txt	14.04	15.79	21.05	0	3.51	0.0966	0.072	0.063	0.068	0.101	0.101	5
17.txt	16.67	12.5	12.5	16.67	0	0.0632	0.070	0.070	0.070	0.000	0.000	5

18.txt	25	5.77	26.92	0	1.92	0.0192	0.048	0.144	0.096	0.078	0.095	7
19.txt	7.69	7.69	7.69	0	0	0.045	0.065	0.065	0.065	0.103	0.103	3
20.txt	11.63	6.98	25.58	0	0	0.0495	0.112	0.112	0.112	0.000	0.125	7
21.txt	12.82	12.82	30.77	5.13	2.56	0.031	0.115	0.034	0.075	0.252	0.252	1
22.txt	10.71	14.29	12.5	0	1.79	0.1263	0.078	0.084	0.081	0.183	0.183	3
23.txt	6.06	6.06	9.09	3.03	0	0.1727	0.180	0.235	0.208	0.062	0.062	4
24.txt	16.67	4.17	20.83	0	0	0.1342	0.056	0.056	0.056	0.129	0.129	2

Social Processes

These processes include language directed to the themes of family, friends, and human beings. The highest amount of correlation found with social processes was the density of the corresponding conversational networks. A correlation of -.246 with a significance level of .123 was found. This suggests that as the amount of social processes found within a parent post decreases, the density of the network increases. There was minimal correlation found between degree of network centralization (in or outward ties) and social processes. Positive correlation was found between social process and number of actors in the core group. Although not strong, .155 positive correlation and a .235 significance level was measured. This suggests that as more social linguistic processes are used in the parent post, the number of individuals in the core structure also increases.

Network 23 (January 17, 2011 8:34am), a post about a news story on the current state of Giffords (nearly one week after the shooting) and the communities response to her progress, demonstrates the relationship between low social processes and high density. The quoted material from post states "The camera rolling, a man stormed out of the Gadsden Hotel, a historic landmark. He screamed that Giffords was about to get "thrown out" of office, creating such a scene that police intervened." The social processes output was 6.06 (the second lowest of all the posts) and the density was .1727 (the highest of all the posts).

Figure 1: Network 23
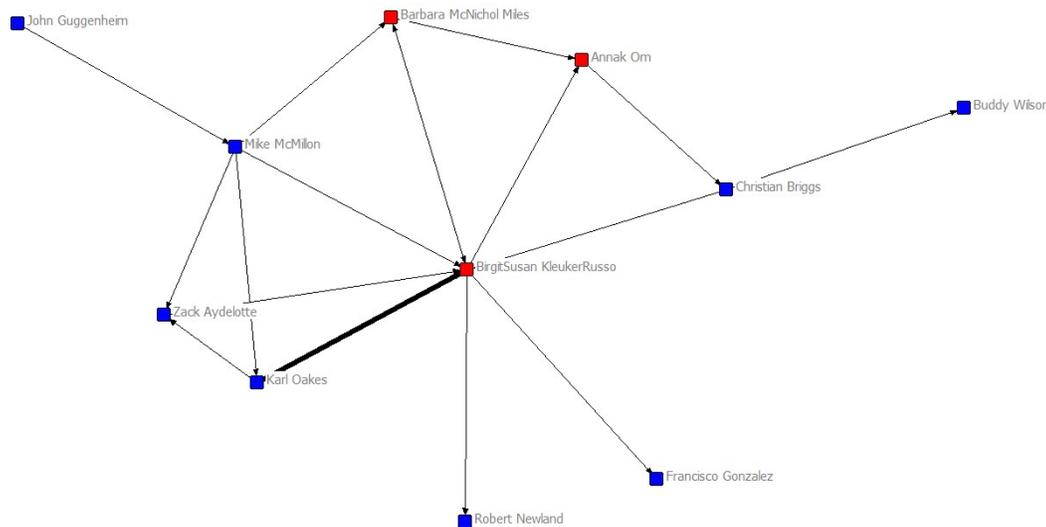
Affect Processes

Affect Processes measures the emotional language of the parent post, including anxiety, anger, and sadness. The highest amount of correlation detected with affect processes regarded the measure of network centralization indegree. Here, a -.182 correlation was found with a significance level of .198. This suggests as the amount of affect process rises in the parent post, the amount of indegree centrality decreases for the network. Negligible results were found in the comparisons of number of actors in the core, network centralization outdegree, and density.

Network three (January 8, 2011 4:34pm), instructions from the Coffee Party Organization, show the relation of high amounts of affect processes to low amounts of indegree centrality. The quoted portion of the parent post states "Friends, this is not the moment to justify anger and hatred directed at our own perceived opponents. This is the time to unite in our love for peace and the well-being of our community, country and humanity..." Here, the affect processes measure 15.79 (the highest of all the networks) and the indegree centrality .034 (the third lowest of all networks).

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[1] Names in all networks have been changed to protect users identity

Figure 2: Network 3
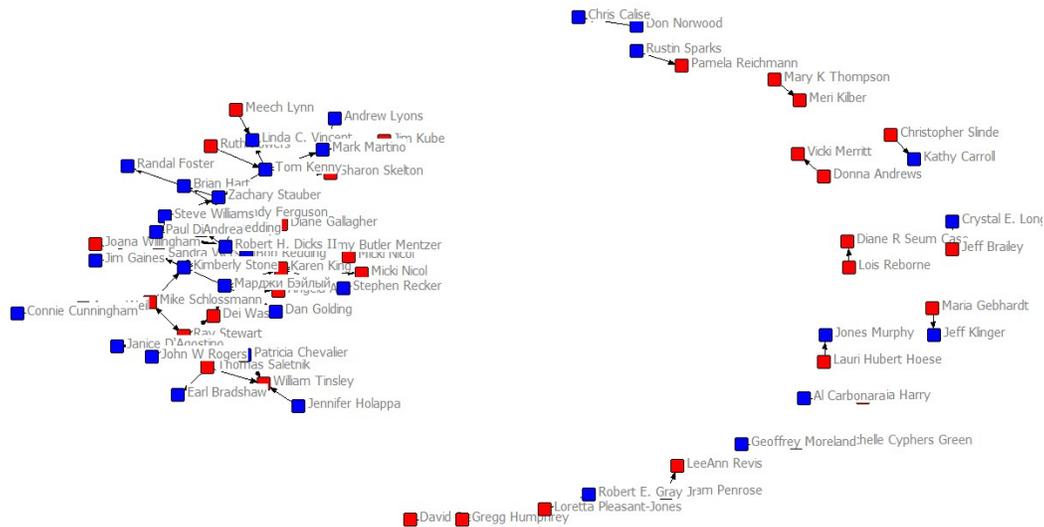
Cognitive Processes

Cognitive processes measures look for language related to causation, certainty, and insight. The strongest correlation found with cognitive processes was network density. A -.229 correlation and .141 significance level was found between the variables of cognitive process and network density. This suggests that as the amount of cognitive processes rise in the parent post, the density of the conversational network increases. Negligible results were found for network centralization, and number of actors in core structure.

Network 21 (January 15, 2011 12:31pm) demonstrates the negative correlation between cognitive process and density. This network features a quote from Mohandas Gandhi. The parent post states "'anger and intolerance are the enemies of correct understanding.' - Mohandas Gandhi. Friends, let's focus on seeking the truth and reaching understanding instead of finger-pointing and fighting. We all need to do some soul-searching and looking in the mirror." The cognitive processes was 30.77 (the highest for all 24 networks) and the density measure was .031 (the seventh smallest of all 24 networks).

Figure 3: Network 21
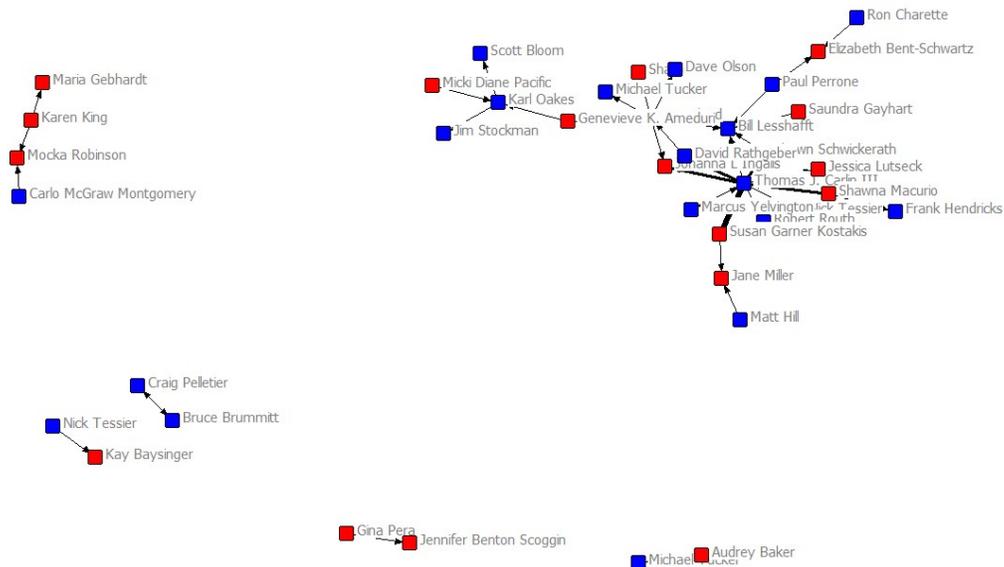
Perceptual Processes

These processes deal with language related to sensory items. The most correlation found

with perceptual process regarded the number of actors in the core structure. A .162 correlation

and .224 significance level were measured with these variables. As perceptual processes

increase, the amount of individuals in the core structure also increases. There were negligible

results found with network degree and density.

Network 12 (January 11, 2011 8:03pm), featuring a quote by Jon Stewart, demonstrates

the positive relationship between perceptual processes and number of individual actors in the

core structure. "'You hear about crazy, but it's rarer than you think.' - Jon Stewart" The

perceptual processes measure is 8.33 (second highest for this measure) and 10 actors in the core

(second highest for this measure).

Figure 4: Network 12
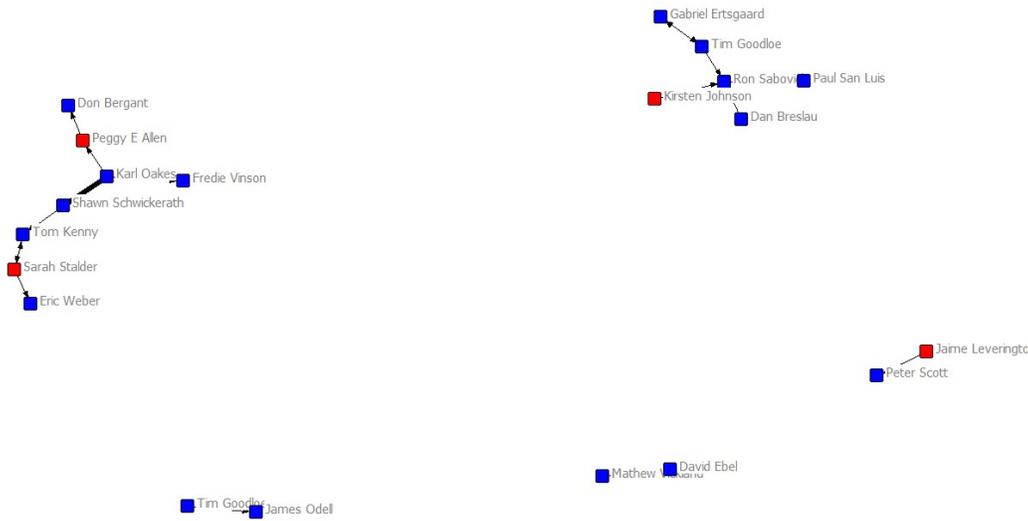
Biological Processes

These measures look for language related to the body, health, or sexuality. The strongest

amount of correlation in all networks was found between biological processes and network

centrality indegree. A -.341 correlation and .051 significance level was found between these

variables, suggesting that as the biological processes increased in the parent post, the indegree

centralization would decrease. Correlation was also found between density and biological

processes. A -.173 correlation and .209 significance level was measured, suggesting that as

biological processes increase, the density of the network decreases. Negligible results were found

between network centrality outdegree and number of actors in the core group.

Network eight (January 9, 2011 9:10pm), featuring a news story about Giffords'

relationship with her constituents and the story of another shooting victim, demonstrates the

negative correlation found between indegree centrality and measures of biological processes. The

parent post states "Though a Republican, Phyllis Schneck had come to shake Rep. Gabrielle

Giffords' hand. She had moved to escape the New Jersey winters; her husband died of cancer a

few years ago." The biological processes measure was 6.45 (highest for all 24 networks) and the

indegree centrality is .072 (tenth smallest for all networks).

Figure 5: Network 8
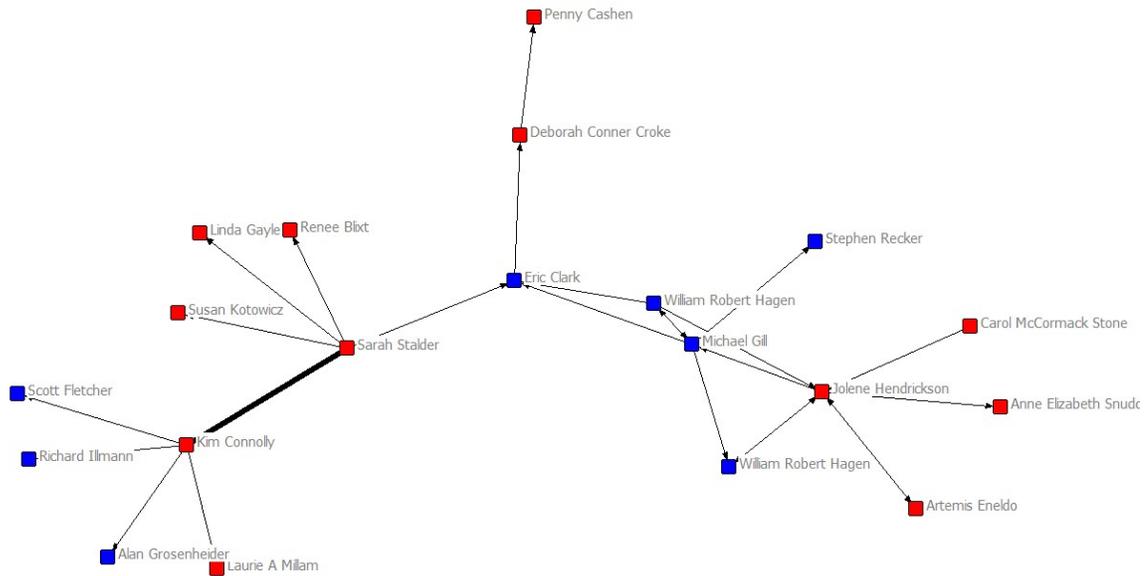
Discussion and Application

This paper seeks to investigate the relationship and possible correlations between LIWC

outputs of social, affect, cognitive, perceptual, and biological processes and network structure.

The communication field has previously identified how the conversation initiator can direct the

conversation of a small group or online community (Pardo, Jay, & Krauss, 2010, p. 2254). These

findings are supported by communication accommodation theory. This paper seeks to contribute

to this literature and look at how group leaders can direct and influence the conversational

network through the linguistic processes used in the parent post of an online forum. The results

of this paper potentially suggest that by changing the processes used in the parent post, forum

leaders can influence network structural elements such as centrality, density, and number of

individuals in the core group. Although these results are not widely generalizable, these

implications extend beyond online political groups dealing with emotional national events.

In all 24 networks, the most linguistic processes were from the cognitive category. These include measures for insight, causation, discrepancy, certainty, and inhibition (http://www.liwc.net/). This supports the idea that this group was responding to the event by blaming other political groups (i.e. the Tea Party Patriots) and looking for cause and effect relationships between those groups and the latest information on the shooting. This supports Back, Küfner, and Egloff's (2011) concept that affect processes are less prevalent than cognitive processes when dealing with a longitudinal look at a traumatic event (p. 1417).

The strongest correlation was found between biological processes and network centralization indegree. Biological processes include measures for words about the body, health, sexuality, and ingestion. Although biological processes were not the most prevalent throughout the 24 networks, the findings regarding correlation have important implications. The more biological processes included in the parent post of a network, the more directed comments (indegree network centrality) can be expected (Scott, 2009, p. 69). This suggest if an online political group leader wants to increase the amount of directed posts in the conversational network, they can increase the amount of references to biological processes in the parent post. This strong level of correlation answers the first research question. Linguistic processes in the parent post can influence the structure of the network.

Other findings in this study support this as well. Social, cognitive, and biological processes were also found to be negatively correlated with network density. In all three cases, these measures were negatively correlated, suggesting that as these processes increase, the density of the networks decrease. Martino and Spoto (2006) state that "density indicates in an immediate way how our network is cohesive as a whole" (p. 67). To increase the amount of cohesion in the conversational network, leaders creating a parent post could try decreasing the

amount of social, cognitive, and biological processes. Our results indicate that these have the potential to create divides and fewer connections between actors in the network. This supports Jeong's (2006) notion that "messages with more conversational language were more likely to elicit responses to produce more critical discussions than messages with less conversational language" (p. 390). Following Jeong's theory and use of accommodation theory, perceptual and affective linguistic processes have more conversational language because of the higher density and more critical discussions produced. This could be because the other three processes often imply that respondents must take a firm stance of support or opposition to the statements made in the parent post. Rather than encouraging conversation and discussion, these posts boost a different response.

The strongest connections between parent post linguistic processes and the structure of the network are related to density, and indegree network centrality. Perceptual processes also support that the amount of actors in the core of the network is related to the parent post. For a stronger core, leaders should create parent posts with high amounts of perceptual processes such as seeing, hearing, and feeling. The core and periphery of the network are important to an online group because this can demonstrate the most active members. The strength of the connections between actors in the core can also relate to the desire for future participation and involvement in the group.

Communication Accommodation Theory

While this paper originally sought out to look at the presence of communication accommodation theory, strict and generalizable results were not found. However, this remains a very important area of research when it comes to online communication. Communication accommodation theory is often described as an unconscious process of adapting to the needs of a

conversational pair. While we found that the tone of the administrator most certainly influences

the network, it is unclear if this is the result of accommodation on an individual level. A

qualitative approach could be used to study this, by examining the content of messages in

addition to their tone. Further, applying LIWC to the actual content of the conversational

messages could investigate an effect that goes beyond network measures and further examine

message content. This could have stronger evidence to support or oppose the presence of

communication accommodation theory in online political networks.

Future studies

Beyond gaining an understanding of the way that LIWC and network analysis can be

used together methodologically, this study provides insight into the new forms of political

interaction in online contexts. The Coffee and Tea Party are relatively new political movements

and forces, which gained widespread acceptance and support in the 2010 midterm election

season (Mascaro, Novak, Goggins, 2012). Because both groups were founded online, it is

important for researchers to understand how their online communication is structured. This paper

begins to examine this by looking at the influence of parent posts on the conversational network,

but this far from completes the investigation. Questions remain regarding the extent of this

influence, as well as the construction of the conversational pairs. What are the other influences

on the conversational network? What role did this subject matter and content of these posts play

in the conversational network? How could this study be improved using qualitative methods?

How much of an influence does the political orientation of the group have on the structure of

conversation?

<div align="center">**Conclusion**</div>

The findings of this study suggest that the structure of a conversational network in an online political group is related to the linguistic processes of the parent post. Network measures such as density, degree centrality and number of actors in the core are correlated with different amounts of psychological constructs. Further research needs to be done on other network measures such as betweeness, closeness, cliques, and centrality and power. Additionally, looking at the other 75 linguistic measures could also produce statistically significant results regarding the smaller linguistic processes. This methodology could also be used to look at other active and historical political online groups. We are only beginning to understand how parent posts and group administrators can influence the direction and structure of online group discussion and debate. However, as these results show, influence goes far beyond topical and can impact the way that group members address the group and each other.

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Appendix

Figure 1: Example of Parent Post

Figure 2: Example of directed and weighted Social Network (10)
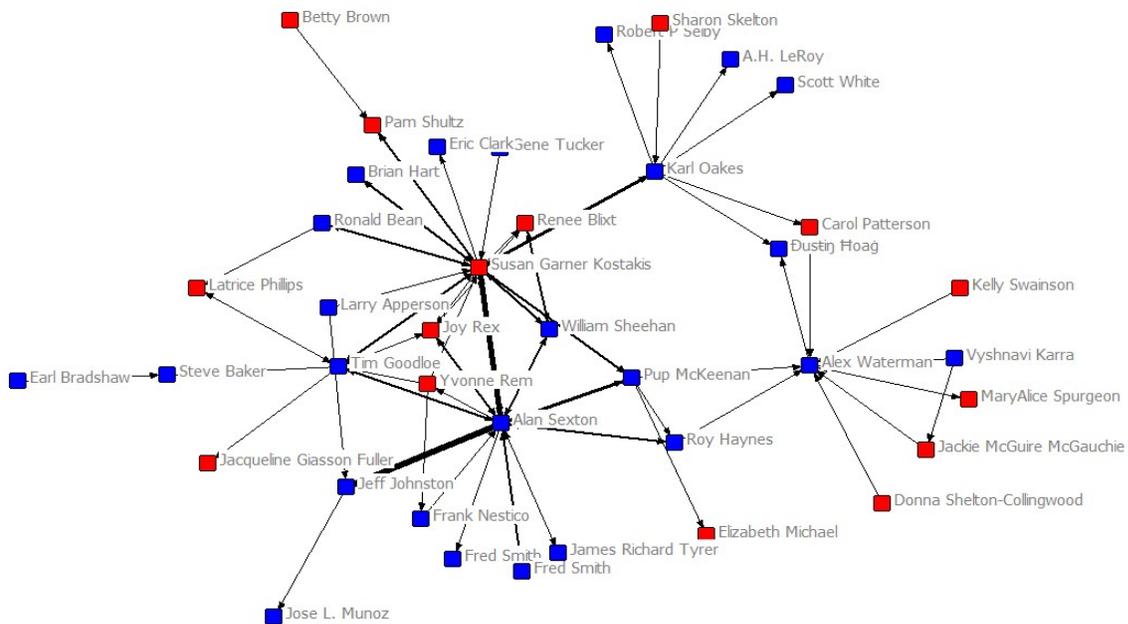
Figure 3: Example of addressing with the "@" sign

Figure 4: Examples of words included in LIWC

Psychological/ Language Construct	Examples
Social	mate, talk, they, child, daughter, husband, aunt, buddy, friend, neighbor, adult, baby, boy
Affective	happy, cried, abandon, love, nice, sweet, hurt, ugly, nasty, worried, fearful, nervous, hate, kill, annoyed, crying, grief, sad
Cognitive	cause, know, ought, think, know, consider, because, effect, hence, should, would, could, maybe, perhaps, guess, always, never, block, constrain, stop, and, with, include, but, without, exclude
Perceptual	observing, heard, feeling, view, saw, seen, listen, hearing, feels, touch
Biological	eat, blood, pain, cheek, hands, spit, clinic, flu, pill, horny, love, incest, dish, eat, pizza