Investigating Political Polarization on Twitter: A Canadian Perspective

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Abstract: The paper investigates whether or not political polarization exists in social media by using social network analysis to analyze a sample of 5,918 Twitter messages (tweets) posted by 1,492 users on Twitter.com, a popular microblogging platform, during the 2011 Canadian Federal Election. The results suggest that there are some pockets of political polarization on Twitter, but at the same time Twitter as a communication and social networking platform may be able to facilitate open, cross-party, and cross-ideological discourse.

Keywords: Social Media, Twitter, Politics, Social Network, Canada, Election

Introduction

During the 2011 Canadian Federal Election, a lot was said about the influence of social media on the election (Curry, 2011). On some level this is not very surprising. In just a short period of time, social media have altered many aspects of our daily lives, from how we teach and learn (Young, 2010), to how we find and access health information (Fox & Jones, 2009). Now social media are also beginning to affect how elections and political discourse are conducted (Wattal et.al., 2010; Gulati & Williams, 2010; Robertson et.al., 2010; Chen & Smith, 2011). Politicians, party organizers, the media and the general public are moving in droves to promote and debate party platforms, solicit donations, organize political rallies or 'flashmobs,' recruit new supporters, and connect with other voters using social media. While this new reliance on social media has many obvious benefits, there is a growing concern that people are becoming more politically polarized on social media. This is especially prevalent among supporters of opposing political parties or ideologies (On the Media, 2011).

Political polarization often occurs in a so-called "echo chamber" environment, in which individuals are exposed to only information and communities that support their own views, while ignoring opposing viewpoints. In such isolation, ideas can become more extreme due to lack of contact with contradictory views. Modern examples of political polarization have been observed among audiences of cable news and radio talk shows (Dilliplane, 2011). On the web, political polarization has been found among political blogs. For example, Adamic and Glance (2005) found that liberal and conservative bloggers in the US tend to link to other bloggers who share

their political ideology. A similar tendency has also been observed on a popular social networking site, Facebook. For example, Gilbert and Karahalios (2009) discovered a weak connection between someone's political view and the likelihood that two people are connected on Facebook. Gaines and Mondak (2009) also observed a marginal tendency of some Facebook users (primarily students) to cluster together ideologically, a sign pointing to possible polarization. The presence of political polarization on social networking sites, blogs and other various web 2.0 platforms may be explained by a well-known phenomenon in sociology called *homophily* (McPherson et.al., 2001), where people in social networks tend to group around similar backgrounds and interests, including shared political views.

However, the literature in this area is not all one-sided in support of increased political polarizations in these so-called "echo chamber" environments. Mutz and Mondak (2006) found that among casual acquaintances (such as those that can be observed on Twitter), it is common to observe connections across ideological boundaries. In a more recent study by the Pew Internet and American Life Project and the National Science Foundation, Garrett and colleagues (2011) found that people who often visit web sites that support their ideological views also visit web sites that support the opposite political views and are not "stuck" or trapped within the "echo chamber".

The current study investigates whether or not users of Twitter, a popular microblogging platform for sharing short messages, are likely to cluster around shared political interests. Like blogs and Facebook, Twitter has actively been used for political discourse during the past few elections in the US, Canada and elsewhere (c.f., Shamma et.al., 2010), but it differs from both blogs and Facebook in a number of significant ways. Unlike blogs, Twitter provides social networking features that enable its users to find and connect to other users of this service and follow their status updates. In addition, unlike Facebook, Twitter's connections tend to be less about strong social relationships, such as those that exist among close friends or family members, and more about connecting with other people for the purposes of information sharing (Gruzd et.al., 2011). Since people can freely choose whom to follow (or unfollow) on Twitter, one would expect to see an even tighter clustering effect around political topics and possibly an even stronger "echo chamber" effect on Twitter than on Facebook.

This work aims to add a Canadian perspective to previous US-centric studies on political polarization and Twitter by Conover et.al. (2011) and Yardi and boyd (2010). Looking at the Canadian use of Twitter in this context is especially interesting, since unlike the US, Canada has a parliamentary political system; as a result, different usage patterns may arise.

Method

For this study, we collected a sample of 5,918 Twitter messages (or *tweets*) about the 2011 Canada Federal election posted by 1,492 people between April 28-30, a few days before the federal election on May 2. This time period was chosen because it was late enough in the campaign for people to have an informed opinion, but still early enough for them to be persuaded as to how they should vote. To ensure that only tweets about the Canadian election were captured, only tweets containing the #elxn41 keyword (or *hashtag*) were collected. A hashtag is a convention that is unique to Twitter which allows users to denote that a tweet is related to or is

about a particular topic; making it easier for other Twitter users (or *tweeters*) to find related messages within the Twitterverse. Once the messages have been retrieved, Netlytic, a web-based system for automated text analysis and discovery of social networks (Gruzd, 2011) from electronic communication was used to discover who mentioned whom in this dataset, and to build a communication network based on the discovered connections. Figure 1 shows the resulting network visualized using ORA, a popular software package designed for social network analysis (Carley et.al., 2007).
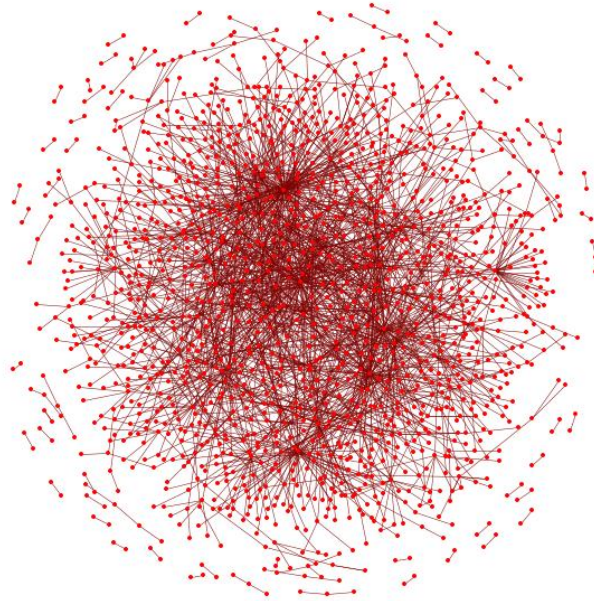
Figure 1: "Who mentions whom" Twitter network based on 5,918 messages about #elxn41, posted between April 28-30, 2011

Next, to determine if there is a clustering tendency among Twitter users with similar political views, all 1,492 users in the sample were manually classified based on their self-declared political views and affiliations. The classification was conducted by a human coder based on a manual review of each user's public profile and his/her 20 most recent messages posted in the month that immediately followed the election. Table 1 shows the resulting group counts based on the manual classification. Figure 2 shows the original Twitter network, along with all of the various classification labels. For the purpose of this paper, we only focused on people who expressed their support for a single political party. In total, there were 256 supporters of the Liberal Party of Canada (LPC), 221 - New Democratic Party of Canada (NDP), 83 - Conservative Party of Canada (CPC), and 48 - Green Party of Canada (GPC) that were selected for further analysis. The eight supporters of the Bloc Québécois and seven supporters of non-mainstream political parties such as the Anarchist Party of Canada were excluded from further analysis due to their relatively smaller numbers.

Table 1: Results of the Manual Classification of 1,492 Twitter users

Supporters of a Single Political Party:	Num. of Users
Liberal Party of Canada (LPC)*	256
New Democratic Party of Canada (NDP)*	221
Conservative Party of Canada (CPC)*	83
Green Party of Canada (GPC)*	48
Bloc Québécois	8
Supporters of non-mainstream political parties	7
Other Accounts:	
Undeclared (no declaration of the support to any of the parties)	349
Left-leaning but undecided supporters	305
Undisclosed / Organizations**	106
Spam	87
Supporters of more than one party (not all left-wing)	13
Protected (no information available)	9

Included into the subsequent analysis

** Accounts of political organizations, media organizations or journalists, businesses and educational institutions who did not openly support any of the parties.
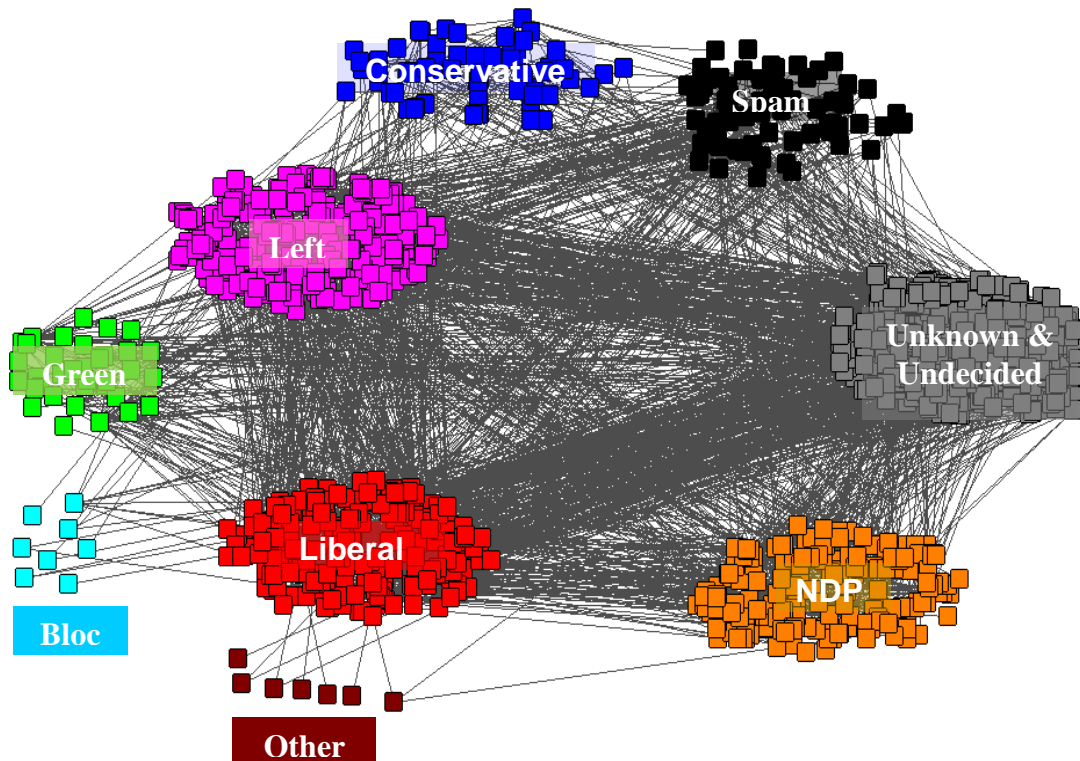
Figure 2: "Who mentions whom" Twitter network indicating types of accounts based on party affiliations.

Note: The nodes in the network have been re-arranged and grouped based on shared political views. Such visualization demonstrates the presence of cross-ideological connections between people.

To analyze this network, a multi-method approach was adopted using both social network analysis (SNA) and content analysis of online messages. First, SNA was applied to users who have declared their support for a single political party. This is to determine whether there is a tendency for people to cluster around shared political views. Second, all Twitter exchanges between people who had declared their support for only one political party were manually analyzed in order to better understand the nature of cross-party connections found within the network. In total there were 226 tweets exchanged between single-party supporters to supporters of a different party than their own. The researcher read and analyzed each of these 226 cross-party tweets to determine whether they tend to be hostile in nature or whether they are examples of an open dialog between people who belong to two different parties.

Results

Social Network Analysis

Based on an absolute count of all possible connections between Twitter users in the study, single-party supporters of the four largest mainstream parties in Canada had more connections to people in other parties than to supporters of their own party (See Table 2). For example, the LPC supporters were 1.76 times more likely to talk to people who are not supporters of LPC than to the LPC supporters, and for the NDP supporters, this ratio was even higher – 2.75. This fact may suggest that there is no clustering around political views on Twitter.

Table 2: Ratio of Observed/Expected Connections among Parties' Supporters on Twitter

	Number of connections to…		Ratio
	Members of their own party	Everyone else in the network	
LPC	418	737	1.76
NDP	144	396	2.75
CPC	48	127	2.65
GPC	30	134	4.46

However, when the observed communication network is compared to 10,000 randomly generated networks (using UCINET, software for social network analysis; Borgatti et.al., 2002), the answer is not as straight forward as it first appeared. Only LPC, NPD, and GPC supporters had connections to other groups that appear more likely than by chance alone: specifically, LPC to GPC, NDP to LPC, and GPC to LPC. As for CPC, although CPC supporters talked to other groups, statistically speaking, the number of external connections to LPC, NDP and GPC is much smaller than what would be expected by chance alone. At the same time, when examining the number of internal connections (within the group) for all four parties, this number is higher than what would be expected in a random network and especially high for GPC, CPC and LPC (see Table 3). This suggests that all four parties exhibited a tendency to talk to people with shared political views, but at the same time they are also likely to talk to people from at least one other

party. The only exception is CPC supporters who seem to be the most polarized group in this sample. The latter observation is somewhat expected since CPC has the most different political ideology comparatively to the three largest left-leaning parties in Canada (LPC, NDP and GPC). This is also supported by the fact that, Stephen Harper, the CPC leader, had the highest number of "loyal" Twitter followers among the five party leaders (followers who did not follow any other party leader). As of April 15, 2012, among the 126,000 users who followed Harper's Twitter account, 51% did not follow any other party leaders; while Ignatieff (LPC leader), Layton (NDP), and May (GPC) had about the same number of "loyal" followers, estimated in the 27-29% range.

Table 3: Ratio of Observed/Expected Connections among Political Parties' Supporters on Twitter

	LPC	NDP	CPC	GPC
LPC	**3.43**	0.52	0.40	1.71
NDP	1.47	**1.60**	0.40	0.69
CPC	0.79	0.34	**3.71**	0.79
GPC	1.71	0.40	0.26	**6.99**

These results suggest that there are some pockets of political polarization on Twitter, but at the same time Twitter as a communication and social networking platform may be able to facilitate open cross-party and cross-ideological discourse. The latter is supported by the presence of cross-party connections for the three parties in the study, and by the fact that about 43% of the accounts in the sample still had not explicitly stated their support to any party or stated support to more than one party. The previous research in this area by Yardi & boyd (2010), Conover et. al. (2011) and Herdağdelen et. al. (2012) made similar observations regarding the presence of cross-ideological connections on Twitter. However, Yardi and boyd (2010) concluded that even though people are likely to be exposed to a variety of points of views on Twitter, it is not an effective platform to carry on meaningful discussions.

The next section will focus on the content analysis of the messages that form across ideological and party connections on Twitter. It will address whether most of these messages do in fact lack "meaningful discussions" or if there is something unique about the Twitter platform that allows for more cross-ideological connections, making it a truly democratic medium for political discourse.

Content Analysis

When examining messages exchanged between parties that are closely related ideologically such as LPC and NDP, it is noted that these messages often contained negative comments about their ideological opponents: the Conservative Party (CPC), its Members of Parliament and their leader. For example, out of 125 tweets between LPC and NDP supporters, 64 tweets (or 51%) had some negative sentiments towards CPC, its leader and members. As demonstrated by the following tweet:

> *RT @phdinparenting: People question where @jacklayton will get $ for social programs, but they don't question where @pmharper will get $ for F-35s? #elxn41*

Where @phdinparenting is a Twitter handle of a user who originally posted this message, @pmharper is a Twitter handle of Stephen Harper, the CPC leader, and @jacklayton is Jack Layton's account, the NDP leader.

Since both LPC and NDP are left-leaning parties, such a high ratio of tweets with anti-CPC sentiments between supporters of these parties are not surprising – this is something that both of these left-leaning parties can agree on. The remaining tweets between NDP and LPC supporters in the data set were conversational and informational in nature covering topics such as latest polling information, links to election-related news stories, updates from rallies, and discussions around either NDP or LPC programs and initiatives, as shown by the following tweet from an LPC-leaning person asking for the latest polling data:

> *Does anyone have data, or know where I can find, regarding polling numbers for #bgm? #elxn41 @jagmeetNDP @gurbaxmalhi @BalGosal #brampton*

Only a small number of tweets (seven) were negative towards the addressee of the tweet.

A similar pattern was observed in tweets between GPC and LPC and between GPC and NDP supporters. In these cases, most of the cross-party discussions contained anti-CPC sentiments. Interestingly, LPC and NDP supporters were relatively positive towards the leader of the Green Party. It is likely that supporters of left-oriented parties did not feel threaten by GPC, since the Green Party has never had an elected seat in the Parliament and was trailing other parties in polls. As seen in the following re-tweet from an LPC supporter:

> *RT @Elxn41_Truth: Happy Earth Day Elizabeth! Can you be our next Environment Minister pls? @ElizabethMay #elxn41 #cdnpoli*

However, when a message was between a CPC supporter and a supporter of a left-leaning party, discourse tended to be more confrontational and sarcastic. For instance, the following message is from an NDP supporter addressing a CPC supporter:

> *@TOProfessional and harper wanted to get rid of these regulations; we could be US now but we are not #cdnpoli #elxn41*

Or this tweet posted by a CPC supporter in reply to an NDP-leaning user:

> *@willsamuel $39K to the federal NDP is a fed contribution. What's not to get? Fed NDP broke the law. http://bit.ly/jQfxkn #elxn41 #cdnpoli*

In total, out of 47 tweets between CPC supporters and supporters of left-leaning parties, there were 19 messages (or about 40%) similar to the ones above. The remaining were conversational and informational in nature (positively or neutrally-charged), messages criticizing one of the other parties or simply calling to go and vote regardless of one's party affiliation. In sum,

although there were relatively few exchanges between CPC and supporters of other parties, less than half were confrontational.

Conclusions

We found that overall people do tend to cluster around shared political views on Twitter, since supporters of each of the four parties in the study were more likely to tweet to other supporters of the same party than to supporters of other parties. The low interaction among supporters of different parties may indicate that party supporters are avoiding open confrontation on Twitter, possibly as a conflict avoidance strategy. We can generally assume that they do see messages posted by supporters of other parties since all of the people in our sample used the same hashtag in their tweets - #elxn41 - to indicate that they are talking about the 2011 Canadian Election and are thus aware of the content and purpose associated with this hashtag within the Twitterverse.

Nevertheless, in some cases, we did observe open cross-ideological discourse, especially among supporters of left-leaning parties such as NDP and LPC. Based on the content analysis, cross-ideological interactions among supporters of left-leaning parties tended to be agreeable in nature, but often at the expense of the party in power, the CPC. People from these left-leaning parties also shared general information and updates about the election (e.g., results of the latest poll) as well as debated various issues around their party platforms with each other.

On the other hand, interactions between parties that are ideologically distant may indicate some level of conflict between the parties. As we observed, about 40% of the messages between supporters of left-leaning parties (LPC, NDP or GPC) and CPC tended to be negative or hostile in nature. Based on the previous literature, such negative interactions between supporters of different parties have shown to reduce enthusiasm about political campaigns in general, and make people less certain about their political beliefs and even postpone the decision to vote (e.g., Hopmann, 2012; McClurg, 2006; Mutz, 2002). Furthermore, such interactions can also reinforce "ingroup and outgroup affiliation" even further (Yardi and boyd, 2010). But, at the same time, according to Huckfeldt et. al. (2004), negative cross-ideological discourse "does not encourage people to back away from their commitments as citizens" (p.92). Huckfeldt et. al. (2004) also noted that "[u]nless citizens come into contact with divergent political viewpoints, collective deliberation among citizens will fail to play a productive role within politics." (p. 91) Furthermore, Parsons (2010) observed that disagreements can actually depolarize emotions by decreasing negative attitudes towards a candidate of the opposite party. Therefore, we can conclude that even though there is some negative, cross-ideological discourse between supporters of some parties happening on Twitter, it may suggest that supporters of different parties are aware of each other's presence on Twitter, and that the Twitter communication platform is conducive to exposing people with opposing points of views.

Another concern that some scholars (e.g., Yardi and boyd , 2010) raised in this area is that the short length of Twitter messages does not allow for "meaningful discussions" around politics to occur on Twitter. Although it is true that it is difficult to express oneself within 140 characters allowed by Twitter; 34% of tweets (77) between supporters of different parties included links to external sources such as news stories, blog posts or YouTube videos. Thereby directing online

participants to secondary sources and other virtual places where they can get more information and possibly continue their discussion. A sample tweet below demonstrates such instance when a GPC supporter directed his followers and people with other party affiliations to his blog post to discuss his intention to vote Green.

> *RT @Markhorejsi: I was impressed by @acoyne column about voting intentions, so I blogged about own decision http://bit.ly/jDmbxT #elxn41 #cpc #lpc #ndp #gpc*

Future work will focus on examining the nature of the URLs shared among supporters of the same and different parties. In future work, we also plan to examine cross-party connections in Twitter communication and followers networks during an off-election period.

In sum, the answer to the main question of this paper concerning whether there is political polarization on Twitter is more complex than a simple 'yes' or 'no'. On the one hand, we did observe a clustering effect around shared political views among supporters of the same party in the communication network on Twitter. On the other hand, there was evidence of cross-ideological connections. More specifically, in cases involving connections to CPC members, the hostility was towards the other discussant in the dyadic relationship. However, in case of cross-party connections involving left-leaning party supporters, the hostility was towards the shared "opponent": in this case, CPC government members or supporters.

Acknowledgements

References

Adamic, L. A., and Glance, N. (2005). The political blogosphere and the 2004 U.S. election: Divided they blog. *Proceedings of the 3rd International Workshop on Link Discovery*, LinkKDD '05 (pp. 36–43). New York, NY, USA: ACM.

Borgatti, S.P. and Everett, M.G. and Freeman, L.C.(2002). *Ucinet for Windows: Software for social network analysis*. Harvard: Analytic Technologies.

Carley, K.M., Columbus, D., DeReno, M., Reminga, J. and Moon, I. (2007) ORA user's guide 2007. Carnegie Mellon University, SCS ISRI, *Technical Report* (07-115).

Chen, P. J., and Smith, P. J. (2011). Digital media in the 2008 Canadian election. *Journal of Information Technology & Politics, 8*(4), 399-417.

Conover, M.D., Ratkiewicz, J., Francisco, M., Goncalves, B., Flammini, A., and Menczer, F. (2011). Political polarization on Twitter. *Fifth International AAAI Conference on Weblogs and Social Media*. Retrieved from http://truthy.indiana.edu/site_media/pdfs/conover_icwsm2011_polarization.pdf

Curry, B. (2011, March 28). Canada's first social media election is on, but will people vote? *Globe and Mail*. Retrieved from http://www.theglobeandmail.com/news/politics/canadas-first-social-media-election-is-on-but-will-people-vote/article1959166

Dilliplane, S. (2011). All the news you want to hear: The impact of partisan news exposure on political participation. *Public Opinion Quarterly, 75*(2), 287 -316.

Fox, S. and Jones, S. (2009). *The social life of health information*. Washington, DC: Pew Internet & American Life Project.

Gaines, B. J. and Mondak, J. J. (2009). Typing together? Clustering of ideological types in online social networks. *Journal of Information Technology & Politics, 6*(3-4), 216-231.

Garrett, R. K., Carnahan, D., & Lynch, E. K. (2011). A Turn Toward Avoidance? Selective Exposure to Online Political Information, 2004–2008. Political Behavior. doi:10.1007/s11109-011-9185-6

Gilbert, E. and Karahalios, K. (2009). Predicting tie strength with social media. *Proceedings of the 27th international conference on Human Factors in Computing systems* (CHI '09). ACM, New York, NY, USA, 211-220.

Gruzd, A. (2011). Studying Virtual Communities with the Internet Community Text Analyzer (ICTA). In *Ben Kei Daniel (Ed.), Handbook of Research on Methods and Techniques for Studying Virtual Communities: Paradigms and Phenomena*. IGI Global, pp. 205-223.

Gruzd, A., Wellman, B., and Takhteyev, Y. (2011). Imagining Twitter as an imagined community. *American Behavioral Scientist, 55*(10), 1294-1318.

Gulati, G. J., and Williams, C. B. (2010). Congressional candidates' use of YouTube in 2008: Its frequency and rationale. *Journal of Information Technology & Politics 7*(2-3), 93-109.

Hopmann, D. N. (2012). The consequences of political disagreement in interpersonal communication: New insights from a comparative perspective. *European Journal of Political Research*, 51(2), 265–287.

Herdağdelen, A., Zuo, W., Gard-Murray, A., and Bar-Yam, Y. (2012). An Exploration of Social Identity: The Geography and Politics of News-Sharing Communities in Twitter. *arXiv*:1202.4393.

Huckfeldt, R., Mendez, J. M., and Osborn, T. (2004). Disagreement, Ambivalence, and Engagement: The Political Consequences of Heterogeneous Networks. *Political Psychology*, *25*(1), 65–95.

McClurg, S. D. (2006). The Electoral Relevance of Political Talk: Examining Disagreement and Expertise Effects in Social Networks on Political Participation. *American Journal of Political Science*, 50(3), 737–754.

McPherson, M., Smith-Lovin, L. and Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology, 27*, 415–444.

Mutz, D.C. (2002). The Consequences of Cross-Cutting Networks for Political Participation. *American Journal of Political Science*, 46(4), 838- 855.

On the Media. (2011, June 17). The echo chamber revisited: Transcript. Retrieved from http://www.onthemedia.org/2011/jun/17/echo-chamber-revisited/transcript

Parsons, B. M. (2010). Social Networks and the Affective Impact of Political Disagreement. *Political Behavior*, 32(2), 181–204.

Robertson, S. P., Vatrapu, R. K., and Medina, R. (2010). Online video "friends" social networking: Overlapping online public spheres in the 2008 U.S. Presidential election. *Journal of Information Technology & Politics, 7*(2-3), 182-201.

Shamma, D.A., Kennedy, L., and Churchill, E.F. (2010). Tweetgeist: Can the Twitter timeline reveal the structure of broadcast events? CSCW 2010, Savannah, Georgia, USA.

Wattal, S., Schuff, D., Mandviwalla, M., and Williams, C. B. (2010). Web 2.0 and politics: The 2008 U.S. presidential election and an E-politics research agenda. *MIS Q, 34*(4), 669–688.

Yardi, S., and boyd, d. (2010). Dynamic debates: An analysis of group polarization over time on Twitter. *Bulletin of Science, Technology and Society, 30*(5), 316-327.

Young, J.R. (2010, July 22). How social networking helps teaching (and worries some professors). *The Chronicle*. Retrieved from http://chronicle.com/article/How-Social-Networking-Helps/123654