Library Advocacy Through Twitter: A Social Media Analysis of #savelibraries and #getESEAright

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Advocacy groups of all types use social media to reach their constituents. However, are messages of library advocacy disseminated through social media reaching those who can become allies in the quest to save libraries? How far reaching are library advocacy messages? This study addresses the use of Twitter for library advocacy. A review of the literature outlining social network analysis and the use of Twitter for advocacy, procedures for using NodeXL (a software package for social media analysis), and a taxonomy of Twitter conversations are provided. An analysis of the spread of the hashtags #savelibraries and #getESEAright through Twitter is then given. Findings suggest that both hashtags had moderate success by spreading beyond the "echo chamber". Finally, recommendations for libraries, librarians, and advocacy groups are outlined.

Introduction

Advocacy groups of all types use social media to reach their constituents. Social media platforms such as Twitter, Facebook, Pinterest, and Tumblr are among the popular options for these groups to communicate directly with interested parties. Utilizing social media is a powerful method to advocate for libraries in this time of austere budgets and waning support for public institutions. Many libraries are under increasing threat of budget reductions and de-professionalization (librarians with a terminal degree being replaced by less qualified paraprofessionals). However, are messages of library advocacy disseminated through social media reaching those individuals who can become allies in the quest to save libraries? Or are the messages relegated to the echo chamber? How far reaching are library advocacy messages?

This article outlines how two library advocacy groups use the hashtags *#savelibraries* and *#getESEAright* to advocate through Twitter. NodeXL software was used to capture and analyze these library advocacy tweets. This software allows for visual analysis of networks and relationships in social media. NodeXL provides a simple, yet powerful way to analyze these networks and relationships. By using NodeXL, libraries and library advocates can determine the spread of their messages through social media and identify strategies for further dissemination.

A review of the literature outlining social network analysis and the influence of Twitter for advocacy, procedures for using NodeXL, and a taxonomy of Twitter conversations are provided. An analysis of the spread of the hashtags *#savelibraries* and *#getESEAright* through Twitter is then given. Finally, recommendations for libraries, librarians, and advocacy groups are outlined.

Social Network Analysis

Social network analysis is a strategy for examining social structures (Otte & Rousseau, 2002) that is concerned with the study of patterns between relations. The tradition draws from social science disciplines and mathematical graph theory (Crossley, 2011). Social networks are a set of nodes (individuals) that are connected by one or more relations (Marin & Wellman, 2011). A variety of social structures, including social media, can be studied using the technique. Social network analysis can be approached in two ways. Researchers can study a whole network, which offers a bird's-eye view of a set of relations among nodes, or an egocentric network, which focuses on the network that surrounds one node (Marin & Wellman, 2011). This article is concerned with studying a whole network, in this case a Twitter network. Whole network analysis can provide insights about whether messages distributed across social media platforms are reaching the intended audience (Smith, Rainie, Shneiderman, & Himelboim, 2014).

When studying a whole network, researchers take into consideration the following factors: the number of relations between nodes (also known as degrees), the extent to which a particular node is a bridge to other nodes, the density of the nodes, the average path length necessary to connect one node to another, and the degree centrality of one or more nodes (Freeman, 1979). Degree centrality is the extent to which one node dominates the social network by having more connections (Crossley, 2011; Freeman, 1979). Other measures of centrality are betweenness centrality, which is a measure of the nodes that most often lie in the path connecting other nodes, and closeness centrality, which deems those nodes with the shortest paths to travel more central (Crossley, 2011). Tweets rarely travel five steps away from the originating account, so short paths are essential in spreading information (Yang & Counts, 2010). Centrality is "an indicator of prominence, importance, reputation, or power within the overall structure" (Mergel, 2011, n.p.) of the network.

One way to think of this concept is the game "telephone" (Yep & Shulman, 2014). In this game, a person whispers a phrase or word into the ear of the person sitting next to them. The message is passed down the line of game players until the last person repeats the word or phrase. Typically, the result is a different word or phrase than the original. This illustrates that the further away from the original person, the message can become garbled or distorted. In the "Twitterverse" the concept is the same, however, the message is usually spread through multiple paths by more than one retweeter. The message is more accurate if distributed through multiple paths.

Qualitative as well as quantitative methods can be employed in social network analysis and a variety of software packages have been developed to study them (Huisman & van Dujin, 2005). Finally, it is important to note that social network analysis is not a theory or method, but rather a perspective or paradigm that allows researchers to employ various methods to develop theories about the way networks and relationships work (Marin & Wellman, 2011).

Use of Twitter for Advocacy

Twitter is a social media microblogging platform that allows users to post 140-character messages to followers. Twitter has seen tremendous growth in the last four years, going from 30 million users in 2010 to 288 million users in 2014 (Statista, 2015). According to the Pew Internet and American Life Project, twenty-three percent of online adults in the United States use Twitter (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015).

A tweeter can follow another tweeter without being followed, or there can be a reciprocal follower-followee relationship. Messages can be spread using the RT (retweet) feature, which

allows them to be forwarded to wider audiences. Twitter includes both information providers (those who post original messages) and information transmitters (those who forward the messages to a wider audience using the RT feature) (Kim & Park, 2012). A common feature of Twitter is the use of hashtags (a word preceded by the # symbol) to identify and classify tweets. Following a hashtag makes it possible for Twitter users to observe and communicate on a given topic. Hashtags coordinate information and public discussion on news and political topics, among others, and allow *ad hoc* publics to form around emerging issues and acute events at incredible speed (Bruns & Burgess, 2012).

Advocates and activists use Twitter to spread messages that reach a wide variety of constituents. Mobilization around the 2010 BP Deepwater Horizon oil spill off the coast of Louisiana, USA (Starbird, Dailey, Walker, Leschine, Pavia, & Bostrom, 2015), the 2010 Arab Spring protests in Egypt and Tunisia (Price, 2013), and the 2014 protests around race relations in Ferguson, Missouri, USA that used the hashtag *#blacklivesmatter* (Garza, 2014) are a few examples of how advocates and activists have harnessed Twitter to mobilize movements.

Twitter has the power to spread information and mobilize advocacy groups (Larsson & Moe, 2012; Otterbacher, Shapiro, & Hemphill, 2013; Xu, Sang, Blasiola, & Park, 2014) and is beginning to influence the way libraries and library advocates communicate and spread messages. Obar, Zube, and Lampe (2012) asked fifty-three advocacy groups, including the American Library Association, whether they used social media as a vehicle for advocacy. Almost all respondents (46 of 48) replied that they used Twitter to communicate with their constituents nearly every day. The respondents also indicated that they believed that social media was a means to accomplish their goals related to both civic engagement and collective action. Qualitative analysis revealed that the use of social media increased the speed of communication by which advocacy groups could strengthen collective action efforts.

The library literature about Twitter primarily focuses on why and how Twitter should be implemented in library environments (Sewell, 2013). For example, school libraries can use Twitter and other social media tools for advocacy (Foote, 2010). Kaldenberg (2012) describes how having a social media presence for a school library builds influence with school administrators and colleagues, and in this case, tweeting resulted in the school library program being featured in the local media several times. Another example of school library advocacy through Twitter is the case of school librarian Kelsa Williams, who promoted her donorschoose.org campaign via Twitter, and subsequently received funding for books and materials after her standard budget was reduced to zero (Barack, 2011). Finally, Twitter can be used to dialogue with other professionals (Cox, 2010; Perez, 2012), thus creating a stronger advocacy network.

While there is limited empirical evidence for the use of Twitter in school library advocacy, there is some evidence of the efficacy of Twitter in advocating for academic libraries. For example, Gunton and Davis posited that Twitter plays a role in building community for academic libraries (2012), and by extrapolation, Twitter can build library support communities that include library users and advocates. For example, Twitter can be used for library fundraising (Price, 2011). Shulman, Yep, & Tomé (2015) analyzed the Twitter networks of two academic libraries using the software package NodeXL in order to discover the most influential accounts that connect to them. They found that the most influential accounts were not individual faculty, staff, or students. Rather, the most influential accounts were institutional, such as those maintained by colleges, departments, and programs. These results suggest that a strategic advocacy plan should be created to ensure that institutional accounts with many followers both follow and are followed by the originating Twitter account.

Partnering with highly connected accounts is a way to promote library advocacy messages (Yep & Shulman, 2014). Messages can be spread broadly if retweeted by influential accounts

(Shulman, Yep, & Tomé, 2015). For example, celebrities wield much influence within a Twitter network, not only because they have many followers, but also because they are re-tweeted often (Petrovic, Osborne, & Lavrenko, 2011). Another method for promoting library advocacy messages is to develop a team that is responsible for Twitter content. Cuddy, Graham, and Morton-Owens (2010) describe the development of a Twitter marketing team in their library that promotes tweets on the library website, print materials, cross-posting on Facebook, and word of mouth. In this manner, the library can set a strategic direction for promoting tweets. Finally, King (2015) outlines a strategy for managing social media. This includes:

- creating strategy and goals for social media channels;
- creating teams to run the library's (or advocacy group's) social media channels;
- connecting and communicating with constituents using social media; and
- tracking usage and engagement levels using analytics and insights (p. 1).

In particular, NodeXL, described in the next section, can be used to track usage and engagement levels.

NodeXL

NodeXL is a free and open source template for Microsoft Excel produced by the Social Media Research Foundation (Smith, Milic-Frayling, Shneiderman, Mendes Rodrigues, Leskovec, & Dunne, 2010). The plug-in works with Microsoft Excel 2007, 2010, and 2013 installed on Windows computers and can be downloaded at http://nodexl.codeplex.com/. A companion book, *Analyzing Social Media Networks with NodeXL: Insights from a Connected World* (Hansen, Shneiderman, & Smith, 2010) gives many examples of how to use the software plug-in. Another comprehensive resource is the Pew Research Foundation's publication, *How We Analyzed Twitter Social Media Networks using NodeXL* (2014).

NodeXL automatically downloads Twitter and other social media data using an application-programming interface (API) directly into an Excel spreadsheet and produces both graphical and numerical data. Data can be downloaded from a variety of social media applications, including Twitter, Facebook, YouTube, and Flickr. After the automatic download, the data can be manipulated and visualized using the graph tool in the software. NodeXL displays data in the form of "edges", or connections between users. The connection can be a tweet, mention, reply, or follow. A tweet is a 140 character message that does not contain a mention, reply, or follow. A mention occurs when the tweet contains a user name preceded by the @ symbol (e.g. *Just spoke about library advocacy with @librarycampaign).* A reply is a type of mention when a user name is at the beginning of the tweet (e.g. *@librarycampaign library advocacy is important!).* Finally, if one author follows another author in the dataset, a "follows" edge is created. NodeXL then processes the raw data set using a selection of automated features and prepares the data, generating a series of graphs and other data points for analysis.

A Taxonomy of Twitter Conversations

Twitter conversations can be visualized using a taxonomy. Smith, Rainie, Shneiderman, & Himelboim (2014) of the Pew Research Center developed a taxonomy by visualizing thousands of Twitter conversations using NodeXL. Twitter conversations can be measured for reach and efficiency using visual mapping techniques (Smith, et al, 2014.). The process of analysis is similar to taking an aerial photograph where the maps constructed can show the actions of key individuals in perpetuating or limiting the network (Smith, et al, 2014). Figure 1 presents the taxonomy of Twitter conversations.

Figure 1. The six types of Twitter networks

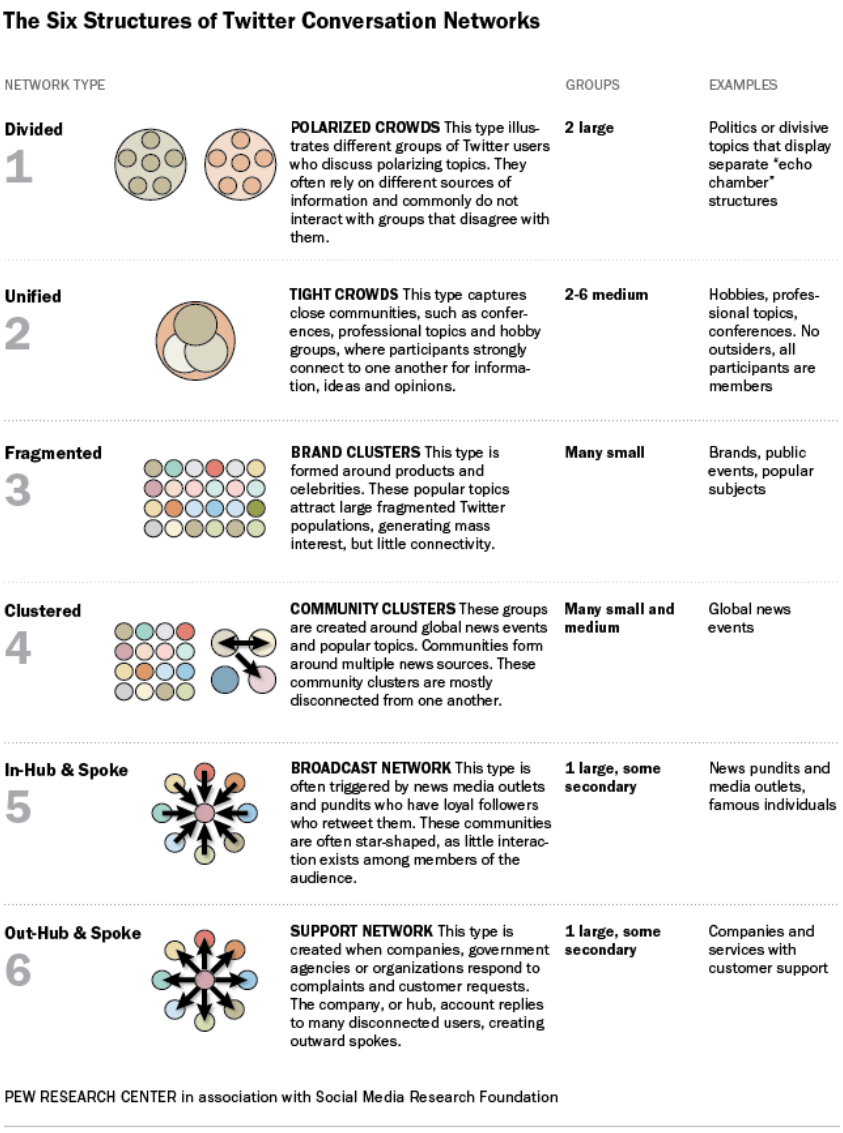


Image credit: http://www.pewresearch.org/fact-tank/2014/02/20/the-six-types-of-twitter-conversations/. Used with permission.

There are two kinds of Twitter users within the taxonomy: hubs and bridges (Smith, et al, 2014). Hubs are Twitter users who have followers who often retweet or repeat what they say. Bridges are Twitter users who have links across group boundaries and connect disparate Twitter users by passing information from one group to another. Bridges are important in the spread of Twitter messages that "go viral".

Two types of Twitter networks in the taxonomy are expanded upon for the purposes of this analysis: (2) unified and (6) out-hub and spoke networks. Unified networks occur when Twitter users who retweet a hashtag are highly likely to follow and reply to others who mention the hashtag (Smith, et al, 2014). Unified networks form around topics that are of interest to a small community and have limited general appeal, and the users form connections to each other, sharing

information about their particular interest (Smith, et al, 2014). In other words, in a unified network, the tweets are circulated and re-circulated among a tight crowd who are interested in an esoteric topic. Hobbyists, those who attend conferences, and professionals who use technical terms are all represented in unified networks (Smith, et al, 2014). In a unified network, tweets stay confined to the network, and do not "go viral".

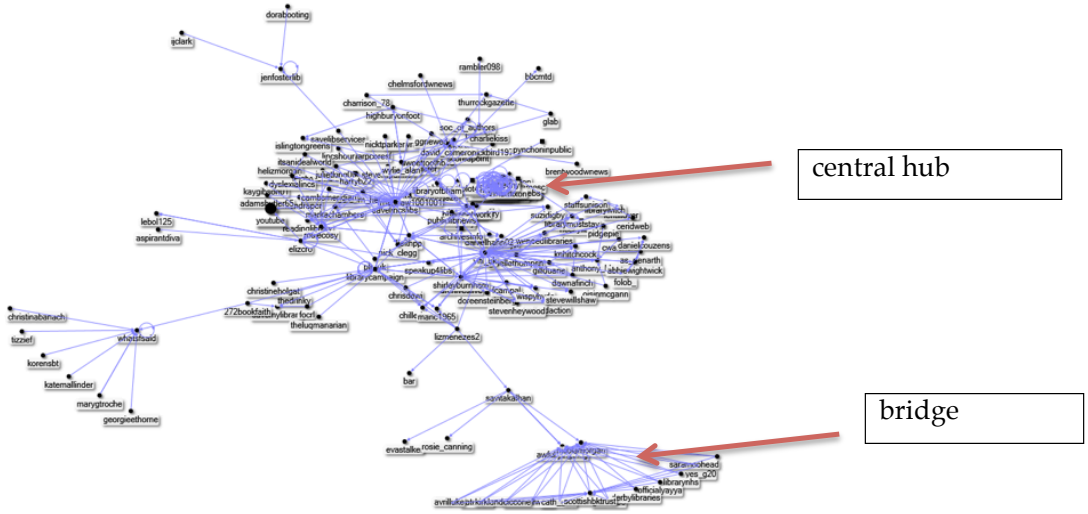
On the other hand, the out-hub and spoke network occurs when individuals retweet messages originating from a central account. The members of this type of Twitter network are not necessarily connected to each other, but rather to the central source of the hashtag. Out-hub and spoke networks contain both hubs and bridges that further the hashtag beyond the confines of the network. Typical Twitter conversations in the out-hub and spoke configuration include companies and services responding to customer complaints and concerns (Smith, et al, 2014). In the following two examples of *#savelibraries* and *#getESEAright*, each Twitter network is classified using the Pew Research Center taxonomy in order to determine whether library advocacy messages are spreading beyond the library community in an out-hub and spoke fashion, or if they are limited to a unified network.

Methodology

#savelibraries as a Vehicle for Advocacy

NodeXL was used to gather and analyze tweets and retweets marked with the hashtag *#savelibraries*. The Library Campaign, a British national charity, uses this hashtag widely. The group is an independent organization that supports Friends of Libraries groups in Great Britain and campaigns for improved services in publicly funded libraries (The Library Campaign, 2015). For this project, a Twitter API was used to download tweets with the hashtag *#savelibraries* directly into NodeXL. The graph feature in NodeXL was then used to analyze the tweets. Tweets (n=344) were collected between January 20-January 27, 2015. Below (Figure 2) is a graphical representation of the *#savelibraries* Twitter network using the Harel-Koren Fast Multiscale algorithm (2000), one of two algorithms available in NodeXL.

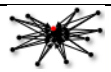
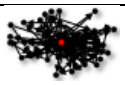
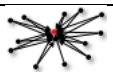
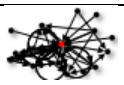
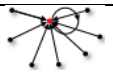
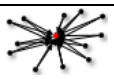
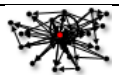
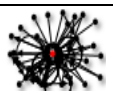
Figure 2. *#savelibraries* Twitter network using Harel-Koren Fast Multiscale algorithm



Both patterns present as an "out-hub and spoke network" (Smith, Rainie, Shneiderman, & Himelboim, 2014). In the *#savelibraries* example, the original tweet emanates from the central account of @librarycampaign. This tweet is then retweeted by its followers, and followers of those followers spread the tweet by retweeting.

Furthermore, a microanalysis of subgraphs of the most influential bridges reveals that each bridge also has an out-hub and spoke network (Figure 4), further distributing the tweet. The most influential bridges include a politician, several advocacy groups, authors and self-described "library campaigners". The number of followers is one measure of the popularity of a tweeter (Hansen, Shneiderman, & Smith, 2010). An analysis of the number of followers for each influential bridge reveals that each has at least 1,400 followers (with @scottishbktrust topping the list at 24,200 followers). However, the most influential Twitter user is @vftl_uk, as demonstrated by the density of its subgraph. While @scottishbktrust has the most followers, @vftl_uk is retweeted more often. Both accounts are essential in spreading the *#savelibraries* hashtag, but @vftl_uk is more impactful.

Figure 4. Subgraphs for 10 influential Twitter users in *#savelibraries* network

Twitter Handle	Subgraph	Role	Number of Followers
@scottishbktrust		Advocacy Group	24,200
@vftl_uk		Advocacy Group	7,108
@nicolamorgan		Childrens' Author	6,110
@rosiecosy		Politician	5,073
@librarycampaign		Advocacy Group	2,795
@whatsfsaid		Children's Author	2,399
@awfullybigblog		Group of Childrens' Authors	2,269
@elizcro		Library Campaigner	2,216
@shirleyburnham		Library Campaigner	1,461
@savelincslibs		Advocacy Group	1,439

#getESEAright as a Vehicle for Advocacy

A recent Twitter campaign by the American Library Association (ALA) asked advocates to contact their Senators to urge them to include school libraries in the reauthorization of the U.S. Elementary and Secondary Education Act (ESEA) by supporting an amendment called the SKILLS (Strengthening Students' Interest in Learning and Libraries) Act (ALA, 2015a). In this instance, the American Library Association promoted among its members that they participate in a "Twitter storm," (Janssen, 2015) which is a tactic to promote a particular message during a specified time that is intended to produce a spike in activity surrounding a particular topic.

In this case, rather than promoting a separate hashtag, the American Library Association joined a Twitter storm organized by the U.S. National Education Association (2015). The intent was to leverage tweets related to school libraries and the SKILLS Act within the broader context of education reform. In the days leading up to the Twitter storm, The American Library Association alerted members of the impending event, which took place on April 9, 2015, through social media, blog posts, and email lists. The ALA provided sample tweets that included the hashtag *#getESEAright,* and directed advocates to tweet and retweet the messages during a one hour timeframe, including mentions of particular legislators in the tweet. Below are the example tweets:

- School #libraries receive over 1.3 billion student visits a year! #getESEAright - include funding for school libraries with the SKILLS Act.
- Studies show test scores trend higher in schools with full-time, certified school librarians. #getESEAright with the SKILLS Act.
- Strong school libraries drive student achievement! http://ow.ly/LaDHo #getESEAright - include the SKILLS Act!
- @PattyMurray Help us #getESEAright – include the SKILLS Act! Listen to teens speak out about the importance of #libraries http://ow.ly/LaCAo
- @SenAlexander #getESEAright – include the SKILLS Act and support dedicated funding for school libraries (ALA, 2015b, n.p.).

Tweets from April 9, 2015 were analyzed. There were a total of 4,498 tweets with the hashtag *#getESEAright*. Of those 4,498 tweets, 643 (15%) contained hashtags referencing the SKILLS Act or libraries in some way. The resulting network maps (Figures 5 and 6) reveal that, like *#savelibraries,* the Twitter conversation around *#getESEAright* presents as an out-hub and spoke network, suggesting that the tweets spread beyond the tightly connected Twitter users who generated the most tweets on the topic.

Figure 5. *#getESEAright* Twitter network using Fruchterman-Reingold algorithm

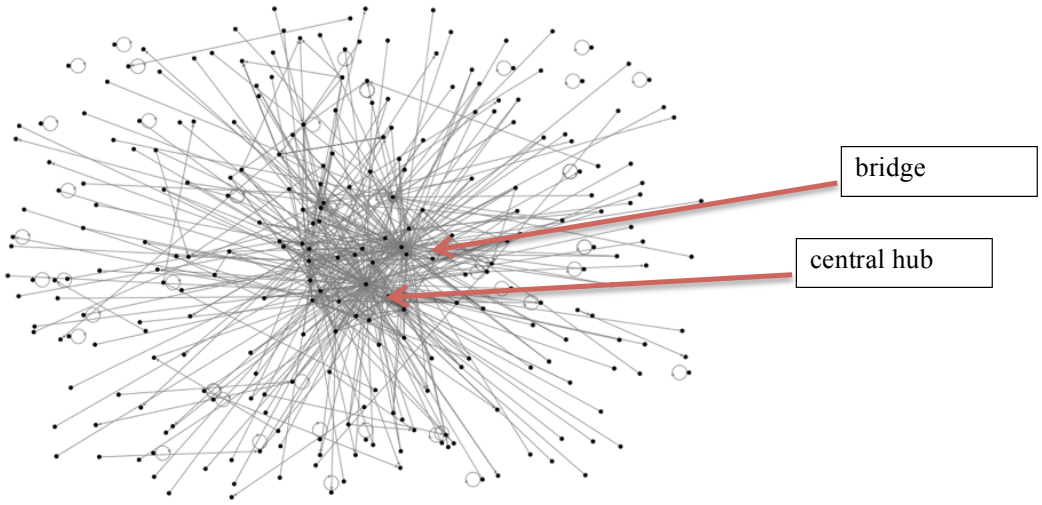
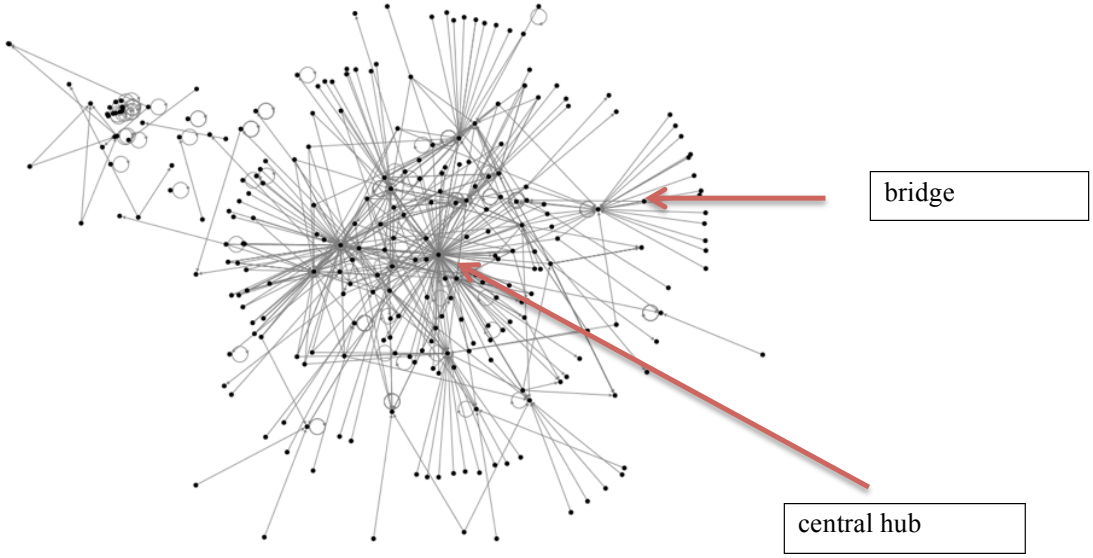
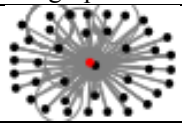


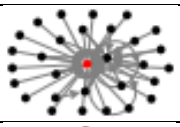
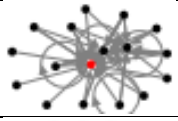
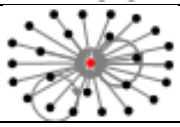
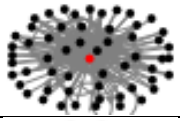
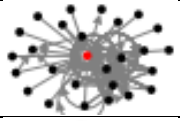
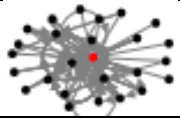
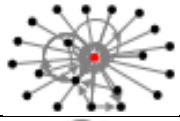
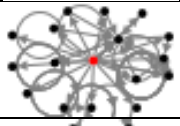
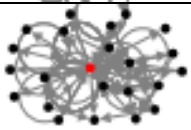
Figure 6. *#getESEAright* Twitter network using Harel-Koren Fast Multiscale algorithm



The most influential bridges (Figure 7) include American actress and children's author Julianne Moore (@_juliannemoore, who served as the spokesperson for the 2015 U.S. School Library Month) and the American Association of School Librarians (@aasl).

Figure 7. Subgraphs for 10 influential Twitter users in *#getESEAright* network

Twitter Handle	Subgraph	Role	Number of Followers
@_juliannemoore		Actress, children's author, library spokesperson	597,000

@alalibrary		Advocacy Group	63,800
@yalsa		Advocacy Group	30,200
@ilovelibraries		Advocacy Group	23,100
@aasl		Advocacy Group	13,000
@ccassinelli		Librarian	6,784
@scsdmedia		Librarian	3,851
@mluhtala		Librarian	3,222
@nancyosborne180		Teacher	1,091
@pamlibrarian		Librarian	667

As with the *#savelibraries* case, the most influential tweeter is not the person with the most followers, as demonstrated by the density of the subgraphs. Rather, for *#getESEAright*, the most influential tweeter is @aasl, The American Association of School Librarians, an advocacy organization.

Limitations, Recommendations and Conclusion

While the present analysis is useful for visualizing the type and structure of the Twitter conversations around *#savelibraries* and *#getESEAright*, there are several limitations. First, the analyses took place in a short timeframe (one week for *#savelibraries* and one day for *#getESEAright*). The analyses are snapshots, which do not capture the full richness of a prolonged Twitter conversation. Future analyses should include a longer data collection period. Second, the analyses are limited to visualizing the entire network and are classified by a taxonomy (Smith, Rainie, Shneiderman, & Himelboim, 2014). The analyses provide some interesting insights about the scope and reach of *#savelibraries* and *#getESEAright.* However, future analyses can be more detailed, including investigating egocentric networks inside the whole network.

The Library Campaign had moderate success with the spread of the hashtag *#savelibraries* during the specified time frame. As seen in the graphical representations of the Twitter network, in both the Harel-Koran and Fruchterman-Reingold generated graphs, there are out-hubs that stem from the central hub, a very tightly connected group that circulates and re-circulates *#savelibraries* tweets. Similarly, the American Library Association was moderately successful in promoting *#getESEAright* among its constituents. Again, the out-hub and spoke network is seen, with one influential tweeter (@_juliannemoore) receiving 200 retweets. The Smith et al (2014) taxonomy uses the example of companies and services responding to customer complaints and concerns as represented in the out-hub and spoke network. Through this analysis, a new example for the taxonomy emerges—that of advocacy organizations hoping to spread their messages beyond the confines of the group.

Increasing the number of out-hubs on the graph is a measure of success in promoting library advocacy messages. In order to grow more out-hubs from the central hub, library supporters should connect via Twitter with influential users who can effectively further the hashtag. Running an analysis using NodeXL can identify these individuals. The analysis can help library advocates identify who is re-tweeted often so that the advocacy group can build a relationship with these individuals. Moreover, the analysis can identify those Twitter users who are bridges in the network. Library supporters would do well to strategically connect with those with more Twitter influence. A successful library advocacy campaign using Twitter requires more than just hoping a tweet will go "viral"; it requires forethought and planning in order to achieve maximum success. In conclusion, through setting a strategic direction for library advocacy tweets informed by analytic tools such as NodeXL, advocates can become more successful at spreading their message through the Twitterverse.

References

American Library Association (2015a). Sens. Reed and Cochran introduce school library bill. Retrieved from http://www.districtdispatch.org/2015/02/sens-reed-and-cochran-introduce-school-library-funding-bill/.

American Library Association (2015b). Make some noise for school library funding! Retrieved from http://www.districtdispatch.org/2015/04/make-some-noise-for-school-library-funding/.

Barack, L. (2011). With a little help from Twitter. *School Library Journal*, *57*(11), 12-15.

Bruns, A., & Burgess, J. (2012). The use of Twitter hashtags in the formation of *ad hoc* publics. Paper presented at the *6th European Consortium for Political Research General Conference*, 25 - 27 August 2011, University of Iceland, Reykjavik. Retrieved from http://eprints.qut.edu.au/46515/.

Cox, E. J. (2010). Twitter for all: expanding professional dialogue with social media. *Library Media Connection*, *28*(5), 52-53.

Crossley, N. (2011). Social Network Analysis. In *Encyclopedia of consumer culture*. Thousand Oaks, CA: Sage Publications.

Cuddy, C., Graham, J., & Morton-Owens, E. (2010). Implementing Twitter in a health sciences library. *Medical Reference Services Quarterly, 29,* 320-330. DOI: 10.1080/02763869.2010.518915.

Duggan, M., Ellison, N., Lampe, C., Lenhart, A., & Madden, M. (2015). Social Media Update 2014. Retrieved from http://www.pewinternet.org/2015/01/09/social-media-update-2014/.

Freeman, L. (1979). Centrality in social networks: Conceptual clarification. *Social Networks, 1,* 215-239.

Fruchterman, T.M.J. & Reingold, E.M. (1991). Graph drawing by force-directed placement. *Software: Practice and experience, 21*(11), 1129-1164.

Foote, C. (2010). Everyday advocacy: making a case for libraries is easy with web tools. Here's how to get started. *School Library Journal, 56*(8), 28.

Garza, A. (2014). A herstory of the #blacklivesmatter movement. *The Feminist Wire,* October 17, 2014. Retrieved from http://thefeministwire.com/2014/10/blacklivesmatter-2/.

Gunton, L., & Davis, K. (2012). Beyond broadcasting: Customer service, community and information experience in the Twittersphere. *Reference Services Review, 40*(2), 224-227. DOI: 10.1108/00907321211228282

Hansen, D., Shneiderman, B., & Smith, M. (2010). *Analyzing social media networks with NodeXL: Insights from a connected world.* New York: Morgan-Kaufmann.

Harel, D., & Koren, Y. (2000). A fast multi-scale method for drawing large graphs. In: AVI '00: *Proceedings of the Working Conference on Advanced Visual Interfaces*. pp. 282-285. ACM, New York, NY, USA.

Huisman, M., & van Dujin, M. (2005). Software for social network analysis. In P. Carrington, J. Scott, & S. Wasserman (Eds.). *Models and methods in social network analysis* (p. 270-316). London: Cambridge University Press.

Janssen, C. (2015). What is a Twitterstorm? Retrieved from http://www.techopedia.com/definition/29624/twitterstorm.

Kaldenberg, K. (2012). @dvocacy: Using your PLN to build support for the school library program. *Knowledge Quest, 41*(2), 42-45.

Kim, M., & Park, H. W. (2012). Measuring Twitter-based political participation and deliberation in the South Korean context by using social network and Triple Helix indicators. *Scientometrics, 90*(1), 121-140.

King, D. L. (2015). Managing your library's social media channels. *Library Technology Reports, 51*(1), 1-35. DOI: http://dx.doi.org/10.5860/ltr.51n1

Larsson, A. O., & Moe, H. (2012). Studying political microblogging: Twitter users in the 2010 Swedish election campaign. *New Media & Society, 14*(5), 729-747. DOI: 10.1177/1461444811422894

The Library Campaign (2015). About us. Retrieved from http://www.librarycampaign.com/.

Marin, A., & Wellman, B. (2011). Social network analysis: An introduction. In J. Scott & P. Carrington (Eds.), *The SAGE handbook of social network analysis* (p. 11-25). Thousand Oaks, CA: SAGE.

Mergel, I. (2011). Network analysis. In *International encyclopedia of political science*. Thousand Oaks, CA: Sage Publications.

National Education Association (2015). #getESEAright Twitter storm instructions. Retrieved from http://www.nea.org/home/61979.htm.

Obar, J., Zube, P., & Lampe, C. (2012). Advocacy 2.0: An analysis of how advocacy groups in the United States perceive and use social media as tools for facilitating civic engagement and collective action. *Journal of Information Policy, 2,* 1-25.

Otte, E., & Rousseau, R. (2002). Social network analysis: A powerful strategy, also for the information sciences. *Journal of Information Science Research, 28*(6), 441-453.

Otterbacher, J., Shapiro, M. A., & Hemphill, L. (2013). Interacting or just acting? A case study of European, Korean, and American Politicians? Interactions with the public on Twitter. *Journal of Contemporary Eastern Asia, 12*(1), 5-20.

Perez, L. (2012). Innovative professional development. *Knowledge Quest*, *40*(3), 20-22.

Petrovic, S., Osborne, M.,& Lavrenko, V. (2011). RT to win! Predicting message propagation in Twitter. *Fifth International AAAI Conference on Weblogs and Social Media.* Retrieved from http://www.aaai.org/ocs/index.php/ICWSM/ICWSM11/paper/viewPaper/2754.

Pew Research Foundation. (2014). *How we analyzed Twitter social media networks using NodeXL.* Retrieved from http://www.pewinternet.org/files/2014/02/How-we-analyzed-Twitter-social-media-networks.pdf.

Price, L. (2011). Social media brings in the money. *Public Libraries, 50*(2), 24.

Price, E. (2013). Social media and democracy. *Australian Journal of Political Science, 48*(4), 519-527. DOI: 10.1080/10361146.2013.846296

Sewell, R. (2013). Who is following us? Data mining a library's Twitter followers. *Library Hi Tech, 31*(1), 160 – 170.

Shulman, J., Yep, J., & Tomé, D. (2015). Leveraging the power of a Twitter network for library promotion. *The Journal of Academic Librarianship*, *41*(2), 178-185. DOI: 10.1016/j.acalib.2014.12.004.

Smith, M., Rainie, L., Shneiderman, B., & Himelboim, I. (2014). Mapping Twitter topic networks: From polarized crowds to community clusters. Retrieved from http://www.pewinternet.org/2014/02/20/mapping-twitter-topic-networks-from-polarized-crowds-to-community-clusters/.

Smith, M., Milic-Frayling, N., Shneiderman, B., Mendes Rodrigues, E., Leskovec, J., & Dunne, C. (2010). NodeXL: a free and open network overview, discovery and exploration add-in for Excel 2007/2010. Retrieved from http://nodexl.codeplex.com/.

Starbird, K., Dailey, D., Walker, A.H., Leschine, T.M., Pavia, R., & Bostrom, A. (2015). Social media, public participation, and the 2010 BP Deepwater Horizon oil spill. *Human and Ecological Risk Assessment, 21,* 605-630. DOI: 10.1080/10807039.2014.947866.

Statista (2015). Number of monthly active Twitter users worldwide from 1st quarter 2010 to 4th quarter 2014 (in millions). Retrieved from http://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users/.

Xu, W.W., Sang, Y., Blasiola, S., & Park, H.W. (2014). Predicting opinion leaders in Twitter activism networks: The case of the Wisconsin recall election. *American Behavioral Scientist, 58*(10), 1278-1293, DOI: 10.1177/0002764214527091

Yang, J., & Counts, S. (2010). Predicting the speed, scale, and range of information diffusion in Twitter. *Fourth International AAAI Conference on Weblogs and Social Media.* Retrieved from http://www.aaai.org/ocs/index.php/ICWSM/ICWSM10/paper/view/1468.

Yep, J., & Shulman, J. (2014). Analyzing the library's Twitter network using NodeXL to visualize impact. *College & Research Libraries News*, *75*(4), 177-186.

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