

Twitter activity and scientific collaboration of LIS schools and faculty members

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Introduction

The use of Twitter by researchers provides an ideal medium to extend scientific conversations as it allows researchers to disseminate their findings to a broader audience (Bik & Goldstein, 2013). Several studies indicate that Twitter can reflect other impact of scientists such as public outreach and science communication, not measured by traditional bibliometric indicators (Haustein, Bowman, & Holmberg, 2014; Haustein, Peters, Sugimoto, Thelwall, & Larivière, 2014). This paper proposes to compare social media connections, in terms of Twitter activity, and formal scientific connections, in terms of scientific collaboration, studying a formal network of library and information science (LIS) schools accredited by the American Library Association (ALA) across the United States, Canada and Puerto Rico. More specifically, we aim to answer the following research questions: 1) How much do ALA accredited schools and their faculty members use Twitter? 2) How do ALA schools and their faculty members connect via Twitter? 3) How does the Twitter network compare to the co-authorship network of ALA-accredited schools' faculty members?

Methodology

The list of ALA accredited LIS schools as well as their faculty members was obtained from the ALISE 2013 Directory of Library and Information Science Programs and Faculty in the United States and Canada. We searched all schools and faculty members on Twitter using their full name (and the acronym for schools) as well as other information available on the Twitter profiles retrieved. Of the 858 faculty members listed for the 61 LIS schools, we found an account for 294 faculty members and 49 institutions. As a result, faculty members who did not use their full name could not be found and are thus excluded from this study. We used the Twitter API to retrieve the date of creation, the number of tweets, and the list of followers for each account found. The data was collected from August 4th to 11th 2015 (Twitter handles) and August 13th to 19th 2015 (account information). To analyze the formal collaboration network of ALA faculty members, we retrieved all their publications in the Web of Science (WoS) from 2008 onwards using their last name and their first initial. We found a total of 652 papers published by 166 faculty members. We used Gephi to visualize the Twitter followers network and the co-authors network based on the retrieved publications.

Results

Figure 1 shows the highly skewed distribution of tweets. A minority of users are responsible for the majority of tweets.

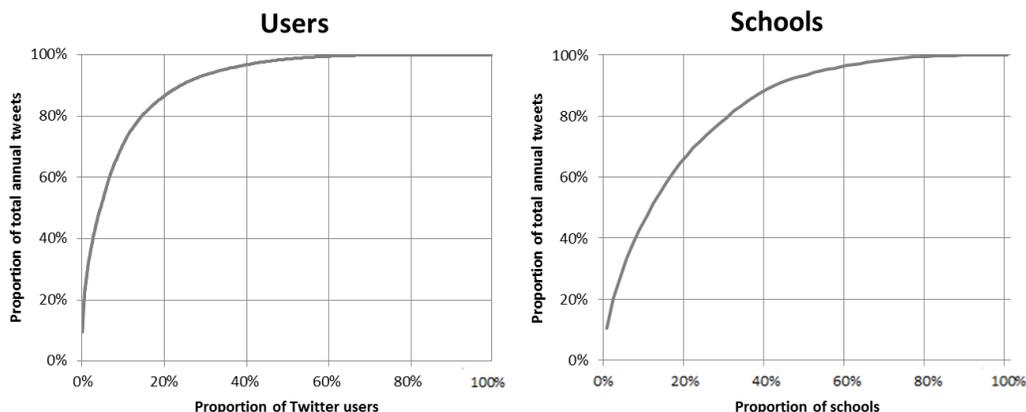


Figure 1. Distribution of tweets among Twitter users (left) and schools (right)

This type of distribution is found at any level of aggregation, whether we look at a single school or the ALA community as a whole. Indeed, as shown in Table 1, few schools account for most of the tweets. Thus, the ranking of the ten most active schools is influenced by a minority of highly active users. For example, Chapel Hill ranked first despite the fact that only 12% of its faculty members (3 persons) are using Twitter. Moreover, a single user (Zeynep Tufekci) is responsible for more than 90% of the school's annual tweets. Similarly, 96% of SHSU annual tweets and 91% of SJSU annual tweets can be attributed to one of their faculty member (Teri Lesesne for SHSU and Michael Stephens for SJSU).¹

Table 1. Top ten most active schools on Twitter

Schools	Faculty members	% faculty on Twitter	Total tweets	Total tweets per year
Chapel Hill	25	12%	54,510	12,644.68
Cuse	34	35%	55,192	11,455.60
College Park	19	84%	32,810	8,086.73
SHSU*	4	75%	42,861	7,390.16
Simmons	20	25%	27,728	6,662.57
FSU	22	41%	25,391	5,291.50
UIUC	26	38%	25,544	4,945.07
SJSU	21	48%	28,484	4,782.85
UK	15	27%	13,132	4,345.45
Bama	19	32%	13,991	4,152.00

Note: Number of tweets includes school Twitter account.

*No school Twitter account was found.

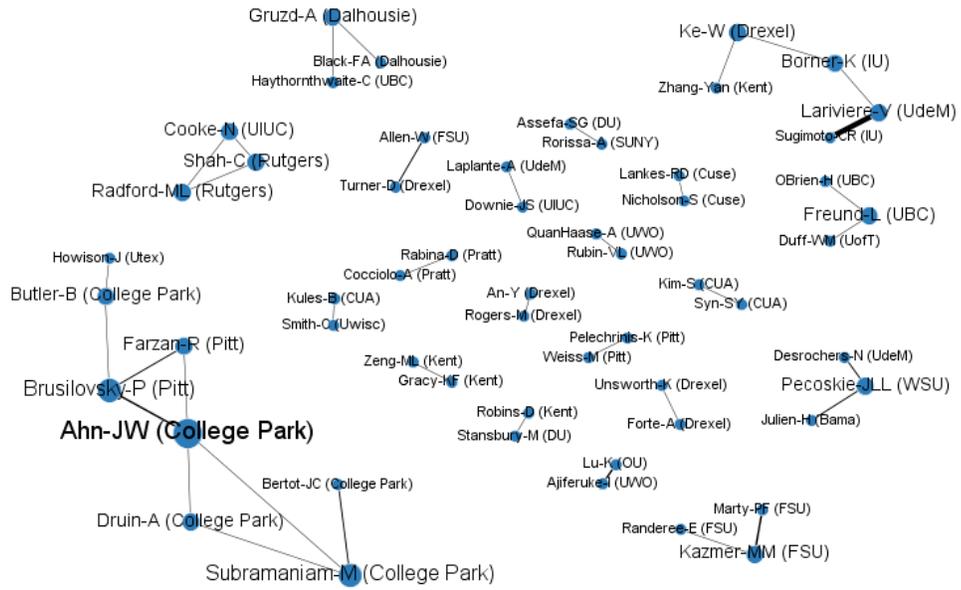
Figure 2 shows the connections between Twitter users in terms of followers and followees. The clusters formed by faculty members affiliated to the same school suggest that the act of following another user on Twitter may be more linked to one's affiliation than to other factors such as shared research interests. Despite the presence of such clusters, the network is characterized by a high density of interconnections between users. This is not surprising given that following someone on Twitter does not require a high level of engagement and does not imply any formal interaction. Furthermore, the most active users identified previously (i.e. Zeynep Tufekci, Teri Lesesne and Michael Stephens) are not the most visible in that network. This means that most of their followers are not part of the ALA community network suggesting that their Twitter activity may not be linked to the information science community.

Co-authorship is a formal and selective connection based on shared research interests of scholars while users following each other on Twitter constitute much looser and informal relationships. This is reflected by the differences found between the Twitter network (Figure 2) and the co-authorship network (Figure 3), the latter including only the researchers for which we found a Twitter account. This network displays smaller clusters that are not interconnected to each other. Moreover, neither the most active (number of annual tweets) nor the most followed (number of followers) users appear as notably prominent actors in the co-authorship network thus furthering the distinct nature of the social media network from the scientific collaboration network.

Conclusion

Overall, we found highly skewed Twitter activity studying ALA schools and faculty members: few users are responsible for most of the tweets made by the community. The clusters and the high connection density of the Twitter network reflect the social links related to one's affiliation to a school and, more broadly, to the formal membership to ALA accredited schools. The analysis of the Twitter network informs us of the broad social and informal connections between users and institutions but tells us very little about formal scientific connections reflected by the co-authorship network. In other words, it is difficult to presume any relationship between Twitter connections and co-authorship. As shown by Darling, Shiffman, Côté, & Drew (2013), traditional scientific relationships are time consuming whereas building networks on Twitter constitute a lesser investment. The next step of this study will be to look at Twitter mentions where

¹ For each account we calculated the average number of tweets per year by dividing the total number of tweets by the number of days since the creation of the account and multiplying it by 365. The total tweets per year of a school is the sum of the average number of tweets per year of their faculty and institutional accounts.



Note: Node size is based on their weight (i.e. the number of links)

Figure 3. Co-authorship network of ALA faculty members with Twitter accounts