



A LITTLE BIRDIE TOLD ME: Text Analysis of ACRL Conference Tweets & Programs

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This quantitative study maps connections between emerging conversation topics occurring on Twitter during ACRL conferences over the past decade. We focus on four topics that are increasingly prominent in the professional discourse within our field: race, diversity, gender, and critical librarianship. We examine the relationships between language used in Twitter discussions using the official conference hashtag and the same topics as presented in formal conference program titles and descriptions. Using computational text analysis methods, we analyze almost 45,000 tweets and the conference programs from each of the last five ACRL conferences (2011-2019). For each of the four topics, the terminology used on Twitter correlates with the language used in ACRL conference programs, and the prevalence of each of these topics increased overall on Twitter and the conference programs between 2011–2019.

INTRODUCTION

In any academic or professional setting, the topics and modes of discourse shift over time, and librarianship is no different. Until recent years, analysis of trends in scholarly communication required laborious coding of relatively limited collections of publications. However, with advances in research methods such as computational text analysis, it has become possible to get a broader overview and identify trends within disciplinary communication. In addition to new research methods, there are also new platforms for sharing thoughts, opinions, and insights within the academic community. Public social media posts provide datasets that can be analyzed in various ways.

In her book on invisible colleges, Diana Crane explores informal networks of communication and collaboration that can spring up among a wide range of people with shared interests, and their influence on scholarly communication.¹ Professional library conferences have traditionally provided one nexus between professional development and informal networking opportunities. Conferences such as ACRL can

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foster invisible colleges by connecting librarians beyond the boundaries of their own institutions. With the mainstream use of social media increasing over the last decade, conference content can now be shared beyond the walls of the conference center, as well as foster interaction among attendees, expanding these invisible colleges. The low barriers to participate in conference-related conversations on Twitter allow us to explore how content in the official conference program relates to these less formal discussions that comprise an invisible college.

Social listening is a technique used widely to monitor public, online conversations surrounding a particular company or brand.² The model of listening and observing social media conversations around a topic can be applied to professional discourse as well and may provide insights into our community of practice. We apply the concept of social listening to academic librarianship.

Tracking public posts on Twitter related to academic librarianship as a whole is unmanageable, so we focus on ACRL conferences, as one of the largest and well-regarded professional conferences for academic librarians. Using computational text analysis, we analyze almost 45,000 tweets and the conference programs from each of the last five ACRL conferences (2011-2019). We concentrate on topics that are increasingly prominent in the professional discourse within our field, including race, diversity, gender, and critical librarianship. We examine the relationships between language used in social media discussions using the official conference hashtag, and the same topics as presented in formal program titles and descriptions. Specifically, we ask whether informal conversations on Twitter related to these topics preceded their emergence as topics within the formal setting of ACRL sessions.

The staggering volume of content on Twitter is well known. As of October 2020, Twitter included over 340 million accounts posting approximately 500 million tweets per day.³ This vast corpus includes public tweets on a multitude of topics, and researchers from a broad variety of fields have analyzed Twitter using a variety of methods, providing a look into a multitude of social trends. Although several library conference sessions and articles relate to the practical use of Twitter by libraries and librarians, there is little in the way of textual analyses of tweets within the library literature. Further, none of the previous studies compared conference twitter content to conference program content.

LITERATURE REVIEW

The number of research articles using Twitter as a dataset has exploded in recent years as it provides an unprecedented record of public discourse.

Ethical Considerations in Twitter Research

When new areas of research surface, ethical and legal guidelines often play catch-up after the research has already begun. Access to Twitter users and their public posts has been appealing to many researchers, but there is no clear consensus on whether public information online is required to undergo IRB review for research on human subjects.⁴ In an exploratory survey asking 268 Twitter users how comfortable they felt about their content being available for researchers, Fiesler & Proferes⁵ found that many users were not aware that researchers use tweets for research purposes, and had varying comfort levels depending on the context of potential research. Their survey sample reported higher levels of comfort with anonymous and aggregate analysis, but efforts by researchers to anonymize social media datasets by removing identifiable information is sometimes insufficient, resulting in unintended privacy breaches.⁶

Within librarianship, Mannheimer et al.⁷ raise ethical questions for academic libraries using twitter data to research their users and Wheeler⁸ presents ethical considerations for scholarly communications librarianship related to conducting or facilitating social media research, including hosting datasets within a library.

Some researchers have taken up the call to develop ethical guidelines and best practices conducting research using big data such as Twitter.⁹ Additionally, academic organizations have developed guidelines for their members and the broader research community.¹⁰

Communities of Practice

Twitter has facilitated the creation of invisible colleges within numerous academic areas of study. A study of disciplinary differences in Twitter use between a variety of scientific and social science communities of practice revealed differing levels of Twitter use for sharing research, developing research connections, and professional communication among peers.¹¹

April Hathcock has written about Twitter as a method for creating communities of practice in librarianship through the use of #critlib Twitter chats and the #libleadgender hashtag.¹² This allows librarians with similar perspectives to communicate across institutional lines, especially in cases where they may be the sole librarian focused on those topics within their own library setting. In a network analysis of the #critlib community, Coombs & Rhinesmith¹³ mapped the participation of Twitter users in #critlib conversations, and the impact of edge perspectives in “networked participatory environments” by less well-established voices within LIS scholarship. In another community of practice created by school librarians in Texas, Judi Moreillon¹⁴ conducted a netnographic (“ethnography conducted online”) study to learn about the motivations for participants using the #txlchat hashtag. Given the solitary nature of many school librarians’ work, many have found a strong sense of belonging through scheduled community Twitter chats.

Libraries & Twitter

The majority of library articles related to Twitter focus on how libraries use the Twitter platform to promote and market resources, events, and information about library facilities.¹⁵ Additionally, Xie and Stevenson investigate the role that Twitter can play to foster engagement and a sense of community with digital library users.¹⁶ Stewart & Walker¹⁷ focused on the Twitter accounts of HBCU libraries, finding that tweets with higher engagement were of the “institutional boosterism” (p.122) variety—promoting university events, rather than library-specific topics.

Shulman et al. and Yep et al. have published work identifying influential nodes in Twitter library networks,¹⁸ Sewell has analyzed followers of library Twitter accounts,¹⁹ Moreillon has reviewed the use of Twitter for professional development,²⁰ and Ewbank has investigated the use of Twitter as a tool for library advocacy.²¹

Twitter Use at Conferences

The literature on “tweeting the meeting” is vast. One major area of conference tweet research centers on Twitter’s role as a conference backchannel communication tool. Another common theme was the use of Twitter as a professional development opportunity for those who miss a session or cannot attend a conference. Some of these studies indicate that more research is needed to determine whether conference tweeting actually provides professional development.²² Other work has found value in Twitter for disseminating research findings and trending topics in conferences.²³

Network analysis, the study of who is participating on Twitter and how they connect, is also common in conference tweeting research.²⁴ Some have compared the use and reach of conference attendees on Twitter with non-attending participants, by looking at the geographic location of the tweets.²⁵

Finally, a few articles have covered negative side effects of conference tweeting. Kalia et al. identified a few issues with live tweeting at conferences, including the presentation of unpublished data, the lack of clarity regarding a presenter’s consent to be tweeted about the misrepresentation of scholarly content as “sound bites,” and the potential for slides to be used or misused without acknowledgment.²⁶ Additionally, intellectual property concerns have been raised with regards to attendees tweeting out presenter slides.²⁷ Ghose et al. note that the American Diabetes Conference banned tweeting photographs of presenter slides, after allegations of insider trading occurred when a pharmaceutical company’s slides were tweeted out by attendees.²⁸ A few authors identified concerns of bullying and snarkiness on Twitter toward presenters and attendees.²⁹

Although “tweeting the meeting” research abounds in a variety of disciplines, the published research on library conference Twitter use is scant. Of those that do exist, our study is unique in including a comparison of conference Twitter posts and conference program content.

METHODS

Data from two primary sources were collected to enable the comparison of the language used on Twitter to discuss the ACRL conference and the language used to describe sessions in the conference programs. The first dataset includes tweets with the official ACRL conference hashtags that were published during the conferences of 2011, 2013, 2015, 2017, and 2019. The second dataset includes the session titles and short descriptions for every ACRL conference session extracted from the official conference programs for the same years. The analysis of both datasets included three stages: (1) data collection and cleaning, (2) the construction of dictionaries of terms related to key topics and (3) the analysis of term and dictionary frequencies to plot the relative prevalence of key terms and themes.

Data Collection & Cleaning

Tweets that included the official conference hashtags from ACRL conferences from 2011 to 2019—#ACRL2011, #ACRL2013, #ACRL2015, #ACRL2017, and #ACRL2019—were collected from two sources. Data from the 2019 conference were collected by the authors over the course of the conference using the Twitter Archiving Google Sheet (TAGS) tool developed by Martin Hawksey.³⁰ Tweets from the 2011-2017 conferences were acquired with campus faculty development grant funds from Gnip, a social media data aggregator owned and operated by Twitter, using the Historical PowerTrack API. For each conference, tweets from the official conference days plus two days before and after were analyzed. While the Historical PowerTrack API provides access to results from the “full firehose” archive of tweets, TAGS utilizes a publicly accessible Search API that provides access to a subset of tweets available via the Twitter search interface, and so does not provide as comprehensive coverage of tweets for any given search as Gnip. However, research by Wang et al. and Kergl et al. indicates that the sample available from Twitter is appropriate for this type of analysis.³¹

The tweet data was acquired from Gnip as JSON files and from TAGS in a Google Sheet, the latter of which was exported to a CSV file. The JSON and CSV files were imported into a Python computing environment, and concatenated into a Pandas dataframe³² after normalizing metadata columns to follow the same structure. This initial data table included 85,389 tweets. To reduce the repetition of duplicate and similar content from the dataset we removed: 25,786 tweets that were retweets or quote tweets; 9,207 “manual” retweets (those including “RT”); and 6,105 duplicate tweets. This reduced our final dataset to 44,921 “original” tweets.

The text of the tweets was cleaned and normalized in several steps, creating three different versions of tweet text: the original tweets, “cleaned” tweets, and “stemmed” tweets. For the cleaned tweets, hashtags, URLs, digits, and punctuation were removed, and the remaining characters were converted to all lowercase letters. Commonly used terms with little value to our analysis— terms such as *the*, *a*, *an*, *in*—were removed using the Natural Language Toolkit’s (NLTK) English language stop word list.³³ In addition, we removed the terms *library* and *librarian*, singular and plural. Cleaned tweets were duplicated and stemmed using the NLTK Snowball Stemmer to reduce terms to their morphological affixes: *academ*, for example, is the stemmed version of *academy*, *academic*, and *academe*. Table 1 shows the original, cleaned, and stemmed versions of a sample tweet from the dataset, as well as a processed program session. Metadata related to the Twitter users represented in the dataset and metadata about the tweets themselves (e.g., the number of likes and retweets) were not utilized for the following analyses.*

PDF files of the official ACRL conference programs from 2011 to 2019 were downloaded from the ACRL website. The PDFs were parsed using Python to extract four pieces of information for each session listed in the *Daily Schedule* section of the program: the title, description, presenters, and official hashtag(s) for each session. For this paper only the session titles and descriptions were utilized. Two of the study authors manually compared

*While this paper does not identify or leverage metadata about any individuals, original tweets are inherently open to re-identification. Our aggregated Tweet and program data is available in the Data Repository for the University of Minnesota (<https://doi.org/10.13020/559w-2z68>). The Tweet data follow Twitter’s Terms of Service by only including unique tweet IDs, not the text of tweets themselves. This allows Twitter users the option of deleting their tweets, thus protecting their privacy and respecting their right to be forgotten.

Google Sheets of the parsed sessions for each conference with the PDF programs, checking for errors. Inaccuracies in the parser were then corrected and re-run, while errors resulting from the unstructured nature of the PDFs were manually corrected in the shared spreadsheets. The final program session data, reflecting 2,450 different sessions, was exported to CSV from Google Sheets, and imported into a single Pandas dataframe. Titles and descriptions from each session were concatenated into a single field, which was cleaned and stemmed according to the same process as the tweet dataset described above (see table 1).

TABLE 1	
Examples of original, cleaned, and stemmed tweets and program sessions	
Sample tweet	
Original	#acrl2017—you've completed 1,000 postcards to help #saveimls! We're printing more so come back to the booth if you haven't got one yet https://t.co/6hsBtOYble
Cleaned	completed postcards help were printing come back booth got one yet
Stemmed	complet postcard help were print come back booth got one yet
Sample program session	
Original	Strategic Project Evaluation This poster session will display a sample project evaluation tool that has been adapted by an academic library. A project evaluation tool is used to prioritize an organization's projects and strategic initiatives. In any organization, projects and strategic initiatives compete for limited human and financial resources. Librarians can use this tool to critically and objectively analyze competing projects, and select and prioritize only those that make the greatest impact.
Cleaned	strategic project evaluation display sample project evaluation tool adapted academic project evaluation tool used prioritize organizations projects strategic initiatives organization projects strategic initiatives compete limited human financial resources use tool critically objectively analyze competing projects select prioritize make greatest impact
Stemmed	strateg project evalu display sampl project evalu tool adapt academ project evalu tool use priorit organ project strateg initi organ project strateg initi compet limit human financi resourc use tool critic object analyz compet project select priorit make greatest impact

Construction of Dictionaries

To track the presence of our primary themes—race, diversity, gender, and critical librarianship*—in the tweet and program datasets, the authors assigned lists of keywords to each theme. These keyword lists were constructed to support a dictionary-based text analysis approach, which enabled tracking the appearance of clusters of terms related to a few central concepts across large volumes of tweet and program text. Lei Guo et al.—comparing the efficacy of an automated dictionary-based approach to the topic modeling of a large collection of tweet data—found that the dictionary approach was best suited for research that explored a few specific issues or topics.³⁴ Dictionaries were constructed through a combination of examination of key outputs from the tweet and program datasets to determine relevant terminology used for each theme, and the extraction of terms from glossaries related to each theme.

To find terms relevant to the themes in both the text of the tweets and the program sessions for each year, two kinds of primary outputs were generated and evaluated. First, the CountVectorizer tool from the scikit-learn

* Initially, the authors also constructed a dictionary to attempt to capture conversations related to “open access” but found that too many of the key terms related to open access—such as the term “access” itself—were too widely used in other contexts to be helpful.

Python package was used to generate lists of the most common hundred words from each year for both the tweet and program session datasets.³⁵ Second, scikit-learn's TfidfVectorizer was used to find the hundred terms with the highest Term Frequency Inverse Document Frequency (TF-IDF) scores for each year in both the tweet and program datasets.³⁶ TF-IDF can represent how important or unique a particular term is to a specific conference year, by balancing its frequency in that year with its frequency across other conference years. In this way, TF-IDF was used to generate lists of terms that were uniquely prevalent to the tweets and programs from each given conference year.

Several authors of the study then combed over the outputs above, to compile lists of terms that are related to the themes of race, diversity, gender, and critical librarianship. These themes were chosen to track trends of clear and growing importance to the field during the period of review. For the diversity and race taxonomies, for example, authors found terms such as *diversity* and *white* from the most common term lists, while less common but relevant terms such as *allies* and *microaggressions* surfaced via TF-IDF.

In addition to the terms identified qualitatively from examining the outputs from the Twitter and conference programs datasets, the authors consulted glossaries related to each broad theme to ensure that the dictionary of terms used to track the prevalence of each topic would be as robust as possible. While these collections of terms are not intended to be comprehensive, efforts were made to compile as many terms as possible from the primary sources under scrutiny as well as outside literature on the topics. The “critical librarianship” dictionary acted as a meta-dictionary, including all of the terms from the race, diversity, and gender dictionaries, as well as a small subset of terms qualitatively identified by reviewing tweets using the official hashtags (#claps2018 and #claps2020) from the 2018 and 2020 *Critical Librarianship & Pedagogy Symposiums*. The dictionary terms and glossaries are available in the Appendix.

Word Frequencies and Dictionary Methods

The prevalence of the clusters of terms that belong to each of the four dictionaries was calculated for the programs and tweets for each conference year using Pandas. First, word counts were calculated by year for each dataset. The prevalence of each term was then calculated by dividing the word count for a term by the total number of words in the programs and tweets each year. The sums of the prevalence scores for every term in each dictionary were plotted by year, providing a visualization of how frequently terms from each dictionary were used relative to the total number of terms in the tweets and programs per year. Shifts in prevalence of each dictionary of terms were compared across the tweet and program datasets. Our initial hypothesis suggested that we would see an overall trend in which the prevalence of terms from each dictionary would be higher on Twitter before increasing in the ACRL programs.

Terms from the dictionaries were not stemmed at this stage of analysis, but rather were matched against the “cleaned” texts since stemming at this stage led to potential inaccuracies. Most significantly, the stemmed reductions of certain terms would lead to false positives when a term's root was not an accurate representation of its inclusion in a particular dictionary. The term *accessibility* from the diversity dictionary, for example, would be stemmed as *access*, which would lead to a significant overcount of mentions in phrases such as “online resource access” that are not relevant to the diversity theme. While the approach of matching on exact terms improves the accuracy of matches, it can lead to undercounting terms when exact matches aren't found. While the authors attempted to include common variations of key terms—including *ableist* and *ableism* in the diversity dictionary, for example—there are less common variations (e.g., *ableists*) that would not be counted using this approach.

The tweet dataset was unevenly distributed from year to year, with a low of 6,016 tweets in 2011, and a peak of 11,855 tweets in 2017, which mirrors the growth of Twitter as a platform[†] for conversation related to academic libraries (see table 2). It's likely that the drop to 8,455 tweets in 2019, after higher counts in 2015 and 2017, does not reflect an actual decrease in tweets using the official ACRL conference hashtag from that year, but rather a difference in the reach of the search query via the TAGS tool as opposed to the query as run by Gnip for previ-

† There were 19 million active Twitter users in the United States in the first quarter of 2011, compared to 69 million in 2017 (Twitter 2019).

ous years. The number of actual sessions extracted from the ACRL programs is much lower than the number of tweets from each conference. The minimum and maximum number of program sessions took place in 2011 with 367 and 2019 with 571, though they did not consistently rise from year to year, but dipped briefly in 2017. The mean number of tweets per year was 8,984, with a standard deviation of 2,515, while the mean number of program sessions was 490, with a standard deviation of 81.

Year	Number of tweets	Number of program sessions
2011	6,016	367
2013	7,326	462
2015	11,855	555
2017	11,269	495
2019	8,455	571

FINDINGS

In examining plots of the prevalence of terms on Twitter and in the ACRL programs from each of the four key themes—race, diversity, gender, and critical librarianship—there is little evidence to support the hypothesis that conversations related to these themes happened first on Twitter using official conference hashtags, influencing their eventual inclusion in future ACRL conference programs. Rather it appears to be the case that the terms used on Twitter are closely aligned with the terms used in the official ACRL program.

Figure 1 shows the prevalence of the race dictionary terms in programs and tweets. In both corpora the terms were used more frequently at each conference from 2011 to 2019. In the tweet corpus the use of these terms rose sevenfold from 2011 to 2019, going from a prevalence value of .001029—meaning one term from the race dictionary appeared for every thousand words in the tweets—to .007260—or about seven race terms for every thousand words. In the programs, the terms were used less frequently overall, but still rose by a factor of about 4.5 over the course of the years of analysis: from .000813 in 2011 to .003650 in 2019. The overall frequencies are similar until 2015, after which the race terms were used far more frequently in tweets than in the programs. There's actually a slight decrease in their prevalence from 2015 to 2017 in the programs.

The diversity dictionary includes general terms related to diversity, equity, and inclusion (e.g., *discrimination*, *microaggressions*, *stereotype*) but not any terms that make specific reference to racism or racial categories (e.g., *black*^{*}, *bipoc*, *indigenous*, *racist*), which are included instead in the race dictionary. The prevalence of diversity terms also show steep increases in both the tweet and program corpora over time (see figure 2). In the programs, prevalence rose from .003401 to .013190 (by a factor of 3.8), and in the tweets from .001976 to .010208 (a factor of 5.16)[†]. The di-

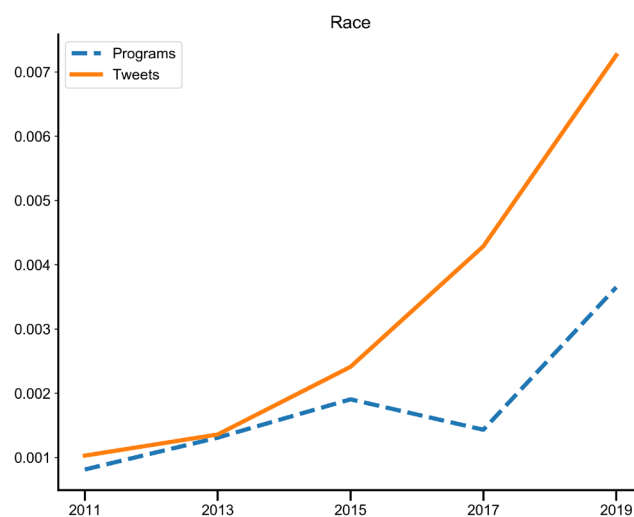


Figure 1. Prevalence of race dictionary terms over time

* When the authors refer to terms such as black and white, or the acronym BIPOC, as they appear in the cleaned (lower-case) dictionaries, we do not use capitalization. When referring to racial identity (e.g., “Black or White librarians”) they are capitalized, following Chicago Style.

† Note that the prevalence of the race and diversity dictionaries are not comparable since they include different numbers of terms overall.

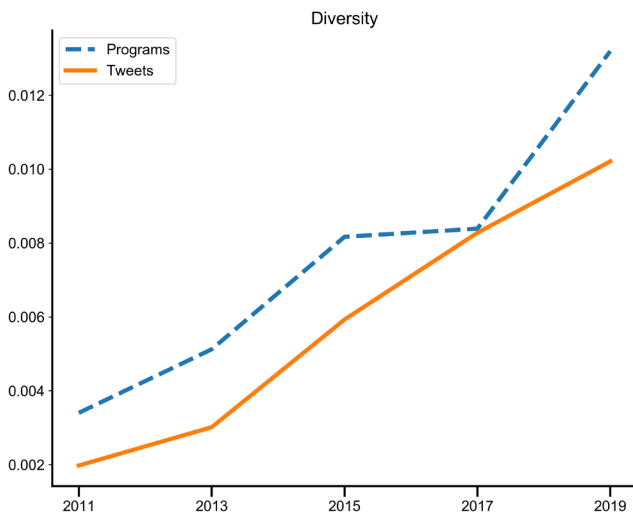


Figure 2. Prevalence of diversity dictionary terms over time

diversity terms were slightly more prevalent in the programs than in the tweets each year. The smallest increase in the prevalence of the diversity terms from conference to conference appears in the programs between 2015 to 2017—a time period that also showed a decrease in prevalence of terms from the race dictionary—when they only increased from .008166 to .008387.

The prevalence of the gender dictionary terms vacillated from conference to conference in the tweets and the programs, rather than trending upwards consistently as seen for both the race and diversity dictionaries (see figure 3). The terms' prevalence rose and fell concurrently in tweets and programs, though the scale by which they shifted were not always the same. From 2015 to 2017, for example, gender terms in the programs rose from a prevalence of .000408 to .001773 (a factor of 4.3) while they rose in the tweets from .000472 to .003285 (a factor of nearly 7). The gender terms were more prevalent in the tweets consistently from 2011 to 2017, and then in 2019 they were used slightly less frequently than in the programs.

The critical librarianship dictionary includes all of the terms from the race, diversity, and gender dictionaries, as well as 22 terms unique to the category (e.g., *neoliberal*, *neutrality*, *radical*; see Appendix for a full list of terms). Figure 4 shows the prevalence of these 221 terms in the programs and tweets from 2011 to 2019. The prevalence of the terms increased in every conference year in both the tweets and programs. The terms' prevalence in the programs increased from 0.005915 in 2011 to .020662 in 2019, while in the tweets they rose from .004157 in 2011 to .020838 in 2019. While the shifts varied from conference year to conference year, overall their prevalence increased by 3.5 times in the programs and 5 times in the tweets.

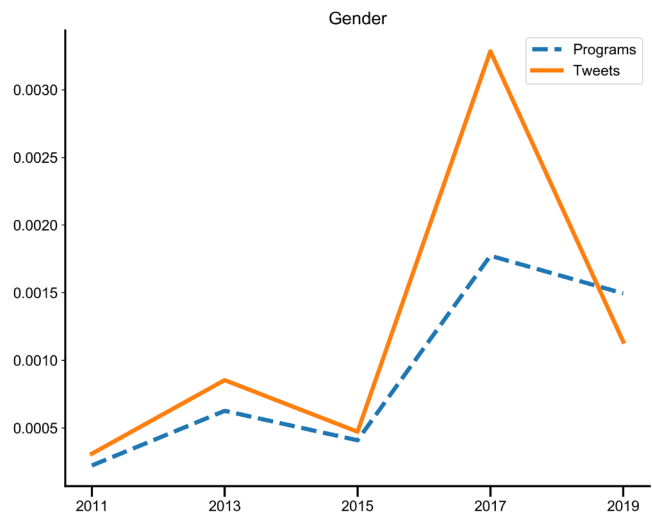


Figure 3. Prevalence of gender dictionary terms over time

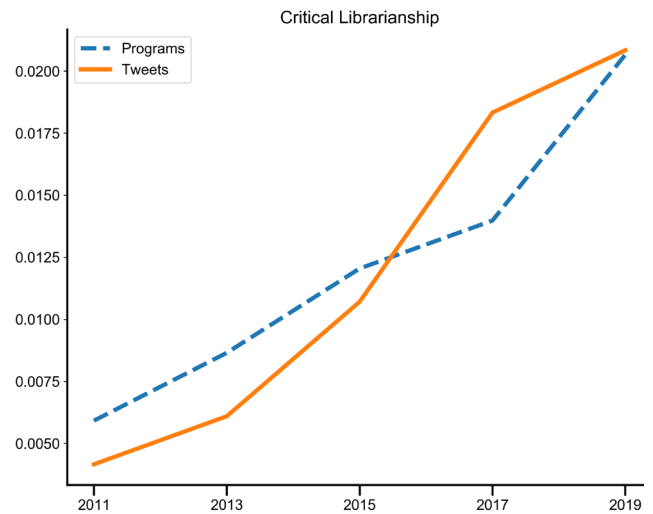


Figure 4. Prevalence of critical librarianship dictionary terms over time

DISCUSSION

There is not clear evidence that conversations related to race, diversity, gender, or those under the broader umbrella of critical librarianship appear on Twitter posts that use the official ACRL conference hashtags before making their way into official ACRL programs. Rather, the plots of the thematic dictionaries in Twitter and in the ACRL conference programs appear to be closely correlated with one another. In other words, when the ACRL conference program includes terms reflecting those themes, they also appear on Twitter. This aligns with previous work reporting that Twitter is often used to disseminate research findings and share trending topics at academic conferences.³⁷ The clearest example of this trend can be observed in the plot of the gender dictionary over time, in which the prevalence of the terms rise and fall across both the tweets and programs synchronously. From 2011 through 2015 the use of the terms across tweets and programs is closely aligned, rising from 2011 to 2013, and then falling slightly from 2013 to 2015. Then, in both datasets, the terms rise sharply from 2015 to 2017, though the increase is steeper in the tweets, falling again slightly in 2019. The correspondence of these shifts strongly suggest that the language in the conference programs and tweets are related, and we can speculate as to the causes of particular shifts, such as the dramatic spike in gender-related terms in 2017. Although there's nothing in the 2017 theme ("At the Helm") or call for proposals that refers to gender or the larger landscape of critical librarianship, this spike could be in reaction to the U.S. President who was sworn in a few months before the conference. In fact, if we consider

the changes in prevalence for each dictionary from conference to conference in binary terms—does it rise or fall?—the only instance in which the programs and tweets are not aligned is in the race dictionary from 2015 to 2017 (see table 3). In the other eleven of twelve possible cases, the shifts of prevalence in tweets and programs were in sync.

	Gender	Diversity	Race
	Tweets/Programs	Tweets/Programs	Tweets/Programs
2011 to 2013	rise/rise	rise/rise	rise/rise
2013 to 2015	fall/fall	rise/rise	rise/rise
2015 to 2017	rise/rise	rise/rise	rise/fall
2017 to 2019	fall/fall	rise/rise	rise/rise

For all themes, there are notable increases in prevalence from 2011 to 2019, despite some momentary declines from one conference to the next. In both the programs and on Twitter, the dictionary of terms related to critical librarianship without exception rose from one conference to the next. The critical librarianship terminology appeared 3.5 times more frequently in conference programs and 5 times more frequently in the conference tweets over the course of eight years, reflecting a clear increase in professional interest and attention. This appears to be influenced by the introduction and gradual adoption of specific jargon related to critical librarianship in the professional discourse over this period. Overall, it's striking how rarely any of the 221 critical librarianship terms appeared in 2011. In the 2011 programs, terms from the critical librarianship dictionary appeared only 80 times (or about six times for every 1,000 words), while in 2019 they appeared 719 times (about twenty times for every 1,000 words). In the 2011 tweets, terms from the critical librarianship dictionary appeared 202 times (four times for every 1,000 words), and then 1,923 times in 2019 (roughly 21 times for every 1,000 words).

It's worthwhile to compare the plots of terms from the race dictionary (collecting terms specifically related to race, racism, and other racial language) with those in the diversity dictionary. While the terms related to diversity are consistently more prevalent in the programs than in the tweets, the inverse is true of the race terms, which are more common in the tweets. This is particularly striking from 2015 to 2019, when the prevalence of terms related to race rose at a far greater pace on Twitter than they did in the programs. The use of these terms on Twitter rose sevenfold from 2011 to 2019 while in the programs the terms were used less frequently, and rose by a factor of about 4.5. There is a steep increase in their use on Twitter from 2015 to 2019, while there was a slight increase in the programs. If the prevalence in the programs continues to rise in 2021 and beyond, we'd have an example that aligned with our original hypothesis of the conversation emerging first on Twitter.

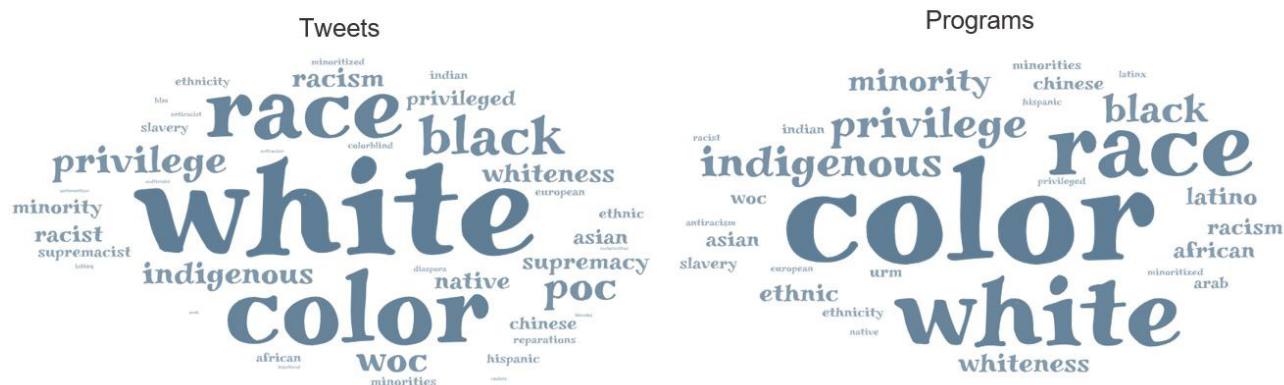


Figure 5. Word cloud showing prevalence of race terms in tweets and programs

We also took a closer look at differences between the specific language used in the programs and on Twitter. The word clouds in figure 5 display the most frequently occurring race-related terms from each source.

Although there are many terms that are used widely both on Twitter and in the programs, the language difference seen here between the Twitter dataset and the conference programs is quite striking: both *white* and *color* are frequent terms. Looking at the original context of their uses, *color* usually appears in the phrase “people of color.” The word *white* is used in several ways within the programs, most often relevant to the term dictionary for race. When using the dictionary method, there is a potential for false positives, and in this case there were some instances of *white* referring to “white papers” or places names within the programs. When we looked at the Twitter dataset, the term *white* almost exclusively referred to race, with occasional mentions of white papers. Many of the instances of the term *white* on Twitter in 2017 were in response to Roxane Gay’s keynote. One of the commonly retweeted quotes from her talk was a recommendation to White people: “Don’t center your whiteness.”

As demonstrated in the word clouds, White people and whiteness take up a lot of space in the conversation related to race in ACRL tweets and programs. This is not particularly surprising, since academic librarianship is overwhelmingly White³⁸ and the racial disparity in librarianship has a longstanding history. Diversity initiatives in librarianship have been around for decades, and yet the racial and ethnic makeup of the profession has not significantly shifted.³⁹ Much of the professional discourse surrounding these efforts uses terminology related to “diversity” without naming race explicitly. While race is not entirely absent from the official ACRL conference discourse, these findings do correspond with Rapchak’s work highlighting the lack of attention to race and racism in the ACRL Framework for Information Literacy for Higher Education.⁴⁰ It certainly appears to be the case that language referencing race and racial categories has been used less frequently in official conference program session descriptions than in the tweets from the same conferences.

For additional context, we looked at ACRL conference themes and calls for participation, particularly the session proposal form. Starting in 2013, when submitting proposals for the ACRL conference, potential presenters were required to assign session “tags” related to the proposal topic. The evolution of diversity-related terms in this proposal tagging process are interesting to review along with the program content and conference tweets. The tag “Diversity” appeared in the first list of 2013 session tags, though tags were not printed in the program that year. Starting in 2015, there were two categories of tags: *Primary* and *Secondary*. From 2015 to 2019, “Diversity” appeared in the *Secondary* category, but only *Primary* tags were included in the programs. 2021 is the first year that diversity-related topics are included in the *Primary* tag category (as well as *Secondary*), under an “Equity, Diversity, and Inclusion” tag. Although program tags are not included in the text under analysis, the trend illustrates how the terminology that ACRL uses is mirrored by presenters in their proposals and session descriptions, which has been more closely aligned to diversity than race.

One limitation of this study, which likely influences our findings, is that the subset of Twitter under analysis does not accurately reflect the complete dialogue related to the conference. Rather it captures the conversation

from Twitter users who have opted to use the official conference hashtag. As Zeynep Tufekci has pointed out, “In hashtag datasets, a tweet is included because the user chose to use it, a clear act of self-selection. Self-selected samples often will not only have different overall characteristics than the general population, they may also exhibit significantly different correlational tendencies which create thorny issues of confounding variables.”⁴¹ In our case, the subset of Twitter that we have captured likely over-represents conference-related tweets that authors perceived as appropriate or professional enough to post using the official hashtag. Tweets that users suspect could fall outside the perceived boundaries of what ACRL communities might deem appropriate may still be posted, but more likely as subtweets or as tweets with no official conference hashtags.

Two other limitations are worth noting. First, it’s possible that the authors of the tweets are often the very same individuals as those presenting at the conference. The language used in those cases are aligned because the presenters may be promoting their conference sessions and/or taking part in conversations related to their own sessions. There are possibilities for further research in this area using social network analysis. Second, the authors have chosen to limit the data to unigrams, and have not attempted to track two or three-word phrases, or otherwise apply keyword-in-context methods. Riffe et al. note that one “problem with dictionary-based approaches is that they give no information about how words are used in context,” which is the case here.⁴²

CONCLUSION

We did not find evidence from our dataset that conversations about emerging topics started on ACRL conference Twitter before being included in conference programs. This may be because the tweets on emerging topics do not include the ACRL conference hashtags. We did find that race and diversity-related terms are increasing, both in Twitter and conference programs. Race is a more prevalent topic on Twitter than in programs, while diversity is a more prevalent topic in conference programs than on Twitter. Gender-related terms have also been increasing over time, with a dramatic spike on Twitter in 2017, perhaps related to the new presidential administration that year. And there is a correlation between the language being used in the conference programs and on Twitter during ACRL conferences. Overall, the discussion surrounding critical librarianship has been increasing steadily over the past decade.

The dictionary method proved to be a good technique in order to focus the scope for computational text analysis. We have just scratched the surface of what can be analyzed from these corpora. Additional insights could be gained by research into network and sentiment analysis as well as an examination of session and corresponding hashtags used by ACRL Twitter participants.

APPENDIX: TERMS IN DICTIONARIES

Diversity dictionary

Diversity terms: ableism, ableist, accessibility, acculturation, adhd, ageism, ageist, allies, ally, assimilation, asd, atrisk, autism, assimilationist, bias, bigot, bigotry, classism, classist, colonial, colonialism, colonization, colonize, colonizer, colonizing, crosscultural, cultural, culture, decolonization, decolonize, dei, disabled, disability, discriminate, discrimination, diverse, diversity, equality, equity, essentialism, fragility, harass, harassment, homeless identities, identity, implicit, inclusion, inclusive, inclusiveness, intercultural, intersectional, intersectionality, justice, marginalization, marginalize, marginalized, microaffirmation, microaggression, microaggressions, multicultural, neurodiverse, neurodiversity, neurodivergent, neurodivergence, oppress, oppression, power, prejudice, prejudicial, privilege, privileged, religion, stereotype, stereotypes, tokenism, undocumented

Glossaries consulted: Racial Equity Tools Glossary (<https://www.racialequitytools.org/glossary>) and the Equity, Diversity, and Inclusion Glossary of Terms from the University of Washington School of Public Health (https://epi.washington.edu/sites/default/files/website_documents/DEI%20Glossary_Formatted_20190711.pdf)

Race dictionary

Race terms: african, abolitionism, abolitionist, antiracism, antiracist, antisemitism, arab, asian, bicultural, bi-poc, biracial, black, blm, blm, caucasian, chinese, color, colorblind, diaspora, ethnic, ethnicity, ethnocentric, ethnocentrism, eurocentric, eurocentrism, european, hispanic, indian, indigenous, latino, latinx, minorities, minoritized, minority, multiethnic, multiracial, native, poc, privilege, privileged, race, racialization, racism, racist, racists, reparations, slavery, supremacist, supremacy, urm, white, whiteness, woc

Glossaries consulted: Racial Equity Tools Glossary (<https://www.racialequitytools.org/glossary>) and the Equity, Diversity, and Inclusion Glossary of Terms from the University of Washington School of Public Health (https://epi.washington.edu/sites/default/files/website_documents/DEI%20Glossary_Formatted_20190711.pdf)

Gender dictionary

Gender terms: agender, androgynous, androgyny, aromantic, asexual, asexuality, biphobia, biphobic, biromantic, bisexual, bisexuality, butch, childcare, cisgender, cissexism, demiromantic, demisexual, dyke, feminism, feminist, femme, gay, gender, genderfluid, genderqueer, grayromantic, hetero, heteronormative, heteronormativity, heterosexism, heterosexual, homophobia, homophobic, homoromantic, homosexual, homosexuality, intersex, lesbian, lgbt, lgbta, lgbtiqq, lgbtq, lgbtqia, misogynist, misogynoir, misogyny, monosexism, monosexual, nonbinary, nonconforming, panromantic, pansexual, pansexuality, patriarchal, patriarchy, pronouns, queer, queering, sex, sexism, sexual, trans, transfeminism, transgender, transmisogyny, transsexual, transphobia, transphobic

Glossary consulted: English language Glossary from the Gender and Sexuality Center at the University of Texas at Austin (<https://diversity.utexas.edu/genderandsexuality/glossary/english/>)

Critical librarianship dictionary

Critical librarianship terms: [all terms from the Race, Diversity, and Gender dictionaries], critical, deconstruct, deconstructs, harm, marx, marxist, neoliberal, neoliberals, neoliberalism, neutral, neutrality, radical, radicals, radicalism, representation, representations, resilience, shaming, theory, troll, trolling, trolls

Other sources consulted: Tweets using the official hashtags (#claps2018 and #claps2020) from the 2018 and 2020 *Critical Librarianship & Pedagogy Symposiums*.

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