Social Network Analysis of Liaison Librarian Relationships

Ellen Hampton Filgo and Joshua Been*

This study employs social network analysis (SNA) to visualize the relationships between liaison librarians and faculty at a university library. To enhance targeted outreach and support library engagement, this research aims to identify strong and weak departmental ties, liaisons who are central to the network, and strongly connected faculty. Findings reveal that longer-tenured liaisons generally maintain stronger connections, while active participation in campus activities enhances relationship-building. The results underscore the significance of fostering long-term institutional ties and suggest targeted outreach for departments with weaker connections. Future research could broaden the scope by including data from other library staff, exploring undirected networks, and cross-institutional comparisons.

Introduction

During the fall semester of 2022, the librarians of the Baylor Libraries' Research and Engagement (R&E) unit, which includes our liaison program, attended a working retreat. During the retreat, we participated in one exercise specifically because of several new liaison hires. During a break, we set out lists of the faculty in each department across campus. As we got up to stretch and get snacks, we directed all the librarians to take a look at the lists and to mark their initials by any faculty with whom they had a relationship and to write the nature of that relationship: "ordered resources for," "taught a class for," "our kids go to the same school," "served on a campus committee with," "supported them during the summer data fellowship," "we go to the same gym," and so on. We then gave the departmental lists back to each corresponding liaison. The hope was that discovering relationship contacts between the faculty in assigned departments and the librarians in R&E could help our new colleagues find introductions, connections, and ways to focus their outreach. As a bonus, it could possibly help the established liaisons create new connections as well. Being able to visualize the network of relationships that our liaison librarians have across campus is vital to the work that we do every day.

Using social network analysis (SNA)[†] in an academic library setting, this study explores the relationships between liaison librarians and faculty at Baylor University. By mapping these interactions, we aim to uncover patterns that influence collaboration, considering factors like liaison tenure, involvement in university activities, and departmental ties. This analysis aims to

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[†] *In this paper, the social networks being analyzed refer to the networks of social relationships and connections between people, not the platforms or websites that allow people to share content.*

highlight both strengths and areas for improvement within the liaison program, ultimately guiding strategies to enhance library outreach and support across different academic departments.

Relationship-building remains one of the fundamental aspects of liaison librarianship, particularly as the position has changed over the past few decades from a collections-centric to an engagement-centric model (Díaz & Mandernach, 2017; Jaguszewski & Williams, 2013; Kranich et al., 2020; Schlak, 2016). Liaisons build relationships with their constituents, listen to their needs, and provide resources and services accordingly. While it may be more straightforward to assess the results of these relationships—such as counting consultations, instruction sessions, resources ordered, and the like—it is much more challenging to assess liaison engagement itself, particularly the relationship network at the heart of it. Both Bracke (2016) and Corrall (2023) have suggested applying social network theory to the assessment of liaison librarianship, specifically to illuminate the relational activities and connections of liaisons in a wholistic manner. If "the invisible work of relationship building ... is critical to the success of new liaison models," can we visualize the invisible through social network analysis (Bracke, 2016, p. 138)? The purpose of this study is to attempt to do just that: visualize the invisible network of liaison librarian relationships.

Literature Review

According to Borgatti et al. (2018), "networks are a way of thinking about social systems that focus our attention on the relationships among the entities that make up the system" (p. 1). Social Network Analysis (SNA) as a research methodology investigates the "patterns and implications of these relationships" (Wasserman & Faust, 1994, p. 3). One particular aspect of SNA that is of importance to libraries is that the relational ties or links between the actors in a network are "channels for transfer or 'flow' of resources" (Wasserman & Faust, 1994, p. 4). Whether those are physical resources in the form of books or materials or non-physical resources such as information or innovation, the library network can be studied to see how these types of resources can diffuse throughout the network.

Within the last half century, higher education research has increasingly focused on the social networks of academia. Higher education is the site of several networks between faculty, staff, students, administrators, and their interactions with the public, including parents, industry, and the government. Biancani and McFarland (2013) reviewed the higher education research on social networks and found that "research on faculty networks tends to concern knowledge production (authoring) and consumption (citation, co-citation, author co-citation)" (p. 156). However, some higher education SNA research has looked at information flow. Quardokus and Henderson (2015) is a model study that examined academic STEM departments to investigate informal network structures around teaching discussions to plan initiatives that introduce pedagogical change. This study was able to identify network individuals with strong ties that could be targeted by change agents. They also identified "gatekeepers" that connect otherwise disconnected hubs in a network and can either function as information distributors or bottlenecks.

The social networks that exist in library organizations have been studied as a part of business management literature, which has traditionally explored worker satisfaction, communication, performance, collaboration, and innovation (Brass et al., 2004). Research investigating libraries as the location of network analysis has also uncovered patterns of functional organization (Guhde & Keith, 2020), collaboration (Bakkalbasi, 2016), and efficiency (Ujwary-Gil, 2019).

SNA as a methodology was introduced to the field of library and information science (LIS) by Haythornthwaite (1996) as an approach to studying "both the content and the pattern of relationships in order to determine how and what resources flow from one actor to another"

(p. 324), particularly when it comes to information exchange. Hicks et al. (2020) suggested SNA as a theoretical framework and methodology to provide "hard data" (p. 6) about public library connections to their community. Rogers et al. (2022) proposed gathering social network data to assess library spaces and programs, as these are places where connections and relationships are formed. Bracke (2016) described SNA for the assessment of liaison work as "an approach that has unique value in illuminating the roles of librarians within larger social contexts of their institutions and beyond ... to better understand in which campus networks [liaisons] are more central than others, and to understand where their roles played a role in connecting campus stakeholders to each other, to new ideas or to external networks" (p. 139). In a survey of academic liaison librarians, Schlak (2016) was able to elucidate aspects of liaison relational work that can be measured by SNA, namely, reciprocity, strength of relational tie, and network positionality.

Much of the current LIS research on social networks has used bibliometric data to explore research and citation networks, similar to what can be found in the higher education SNA literature. For example, social network methods have determined core LIS journals and highly cited LIS researchers (Al et al., 2012) and have discovered networks of international collaboration (Han et al., 2014). Fewer studies have used data from self-reported relational ties. Two examples come from similar studies that gathered data from professional development networks. Cooke and Hall (2013) surveyed the participants in the DREaM (Developing Research Excellence and Methods) Workshop, a professional development training opportunity for LIS researchers in the United Kingdom. Their analysis looked specifically at the change in research expertise awareness and social or research-related interaction. In the United States, Kennedy et al. (2017) studied a network of novice LIS researchers to explore how participation in The Institute for Research Design in Librarianship (IRDL) would change their professional networks. While no studies have used relational data from liaison librarians and the faculty they interact with on campus, Rinio (2019) investigated networks of secondary school librarians and the teachers they worked with, providing the closest example of a study similar to ours. Rinio was able to see a holistic picture of the collaboration that happened between colleagues, which can be improved upon as the school librarians use the data to build strategic relationships.

Context and Research Questions

Baylor University is a private R1 university enrolling a little over 20,000 students, three-fourths of whom are undergraduates. The Baylor University Libraries' main library includes the Research and Engagement (R&E) unit, which is made up of Public Services, the liaison program, Data and Digital Scholarship (DDS), and the Arts and Special Collections Research Center (A&SCRC). While most liaison librarians are under the liaison program, a few more librarians in DDS, A&SCRC, and the Associate Dean of R&E serve as liaison librarians as well. For our study, we collected and analyzed social network data from all 13 liaison librarians at the Baylor Libraries with the following aims:

1. Creating a visual representation of the relationships between liaison librarians and campus faculty to better understand their interactions and connections.
2. Identifying and categorizing departments based on the strength of their connections to the library, distinguishing between strong and weak ties.
3. Identifying liaison librarians who serve as central network hubs due to their strong ties across various campus departments.
4. Identifying individuals on campus who have extensive connections within the library and could potentially be developed as library "champions" due to their strong connectivity.

Methodology

SNA views social relationships as nodes (the individual actors) and edges (the relationship ties between the actors). Ties can be weak or strong. We want to measure the strength of the relationships, as "tie strength is important in assessing the overall connectedness of actors in an environment and the likelihood that information will flow from one actor to another" (Haythornthwaite, 1996, p. 327). When information is not just one way—from liaison to faculty member, for example about library policies, new library resources, or upcoming library events—but instead also flows from a faculty member to a liaison (e.g., about research interests or upcoming classes) the liaison can be better equipped to provide more tailored information. Rather than just an email sent out to everyone about new resources, it could be an email sent to an individual faculty member with information about a new resource or book or article that made the liaison think of that faculty's research specifically.

To categorize relationship connection strength, the liaisons collaboratively created the scale. We first determined that the normal liaison activities that we participate in during work most likely made up most of the ways we formed ties with the faculty across campus. Therefore, we listed different liaison activities that we determined the liaison librarians do often and gathered input from the liaison librarians for other ideas. We also listed different levels of social media interaction and in-person social interaction, as those can also help build relationships with faculty. With this list of interactions, we invited all the liaison librarians to respond to a Qualtrics survey that allowed them to sort these interactions into a scale from weaker to stronger ties. We then created the final scale by placing each interaction at the level that was the median response from the liaisons; the final scale can be seen in Figure 1.

In the scale, one can observe interactions increase in time, effort and occasion for face-to-face encounters or sustained interactions. For example, an email with a quick question is lower on the scale than substantial research assistance, which might involve multiple emails

FIGURE 1
Liaison Interaction Relationship Scale. This Scale Was Used to Quantify the Relationships Between Liaisons and Faculty.

Liaison Interaction Relationship Scale	
Level 0	No interaction
Level 1	Been introduced to them
	Sent email to them in a group
	Gotten email from: quick question
	Gotten email from: resource request
	Served on campus committee with (committee meets infrequently or does not have much interaction)
	Social media friends/followers
	Interact occasionally with on social media
Level 2	Sent email to them individually
	Taught a class for: one-shot
	Interact with often on social media
	Part of a campus organization or group with them
Level 3	Taught a class for: multiple semesters
	Taught a class for: collaboration on an assignment
	Substantial research assistance
	Consulting with them about systematic reviews
	Helped with tenure notebook stats
	Served on campus committee with (committee meets frequently or works closely on projects together)
	Social aquaintance
Level 4	Embedded in their class
	Collaboration with on research project
	Collaboration with on a systematic review
	Social/friendly outside of work

back and forth or a meeting. Teaching a one-shot instructional session is lower than teaching a class for multiple semesters, which is lower than being embedded into a class.

Using those categories from the collaboratively created scale, we created a second Qualtrics survey that the liaisons then used to rate the faculty in all the departments across campus according to the category of relationship tie. Every liaison librarian rated every faculty member, whether that faculty member was in their liaison department or not. The only faculty excluded from the study were the faculty in the School of Nursing and the Law School, as these two units have their own libraries with librarians who serve those populations and who aren't a part of our formal liaison program. Included in the data collection were the authors of this study: the director of the liaison program and the director of Data and Digital Scholarship. While the latter is not a liaison, he regularly interacts with faculty across campus, often together with a liaison librarian, as he is an integral part of the team of Research and Engagement faculty librarians. The data collected included responses from the 13 liaison librarians who ranked over 2,000 faculty members (all faculty members at the university, including adjuncts) each according to the scale. We began the data collection over a lunch meeting that was scheduled for 90 minutes, and most liaisons finished entering data within that time frame. In hindsight, we should have made each measure default to "No interaction" so that there was less clicking for each librarian to do.

Prepare Qualtrics Export for Analysis in Gephi

Our goal from the outset was to use Gephi, the Open Graph Viz Platform, which is an open-source and cross-platform software application designed to analyze and visualize network data and is commonly cited in social network analysis research (Bastian et al., 2009). As Gephi has very specific formatting requirements to import spreadsheet data, we used Microsoft's Power Query Editor (PQE) to transform the output spreadsheet from the Qualtrics survey. For this research, we created a comma-delimited table containing information about each liaison and each faculty member to represent the nodes in the network. This table includes columns for each faculty member's name and a randomized number representing each liaison. Additionally, each liaison's length of service at Baylor University was coded as 0–5 years, 6–10 years, 11–15 years, and over 15 years, based on a response to a question in the Qualtrics survey. Each faculty member's school, department, and title were also included. We also created a second comma-delimited table with the liaison's ranking of each faculty member to represent the relationship ties, or network edges. The PQE was used to unpivot the Qualtrics spreadsheet, restructuring the table (from wide to long) to meet Gephi's requirements. This edges table contains only three columns: source (representing each liaison), target (representing each faculty member), and weight (representing the assigned rank).

SNA Analysis Using Gephi

Given the four research aims we chose (above), we needed to make four key decisions while analyzing the network: network type, network layout, centrality measures for each faculty member, and centrality measures for each liaison. We constructed a *directed network* in Gephi, representing a one-way relationship where we captured the strength of ties from 13 liaisons directed toward 2,037 faculty members. This configuration resulted in a network comprising 2,050 nodes and 26,481 edges (network visuals below). The strength of the ties in this directed network were derived from a single scale, which indicates a uniform and

consistent edge type across the entire network. Furthermore, this directed network is fully connected, as every possible edge (connection) that could exist from liaison to faculty member does exist.

When visualizing social networks, there are various algorithms that can be employed to organize the placement of nodes in the visual representation. For this research, we implemented the ForceAtlas2 algorithm for our layout (Jacomy et al., 2014). In this algorithm, nodes repel each other while edges (connections between nodes) act as attractive forces. ForceAtlas2 is ideal for this project for four reasons. First, it works very well with directed networks, where the directionality of relationships or ties is significant. Second, it is very effective in handling large networks, making it suitable for our dataset of 2,050 nodes and 26,481 edges. Third, it is widely used in academic research, providing us with confidence in its suitability for our analysis. Fourth, this algorithm produces visually appealing layouts to clearly communicate relationships across the network (Zhansultan et al., 2021). Using ForceAtlas2, faculty who are visually closer together scored similarly across the liaison tie rankings. This makes it convenient to identify patterns and trends. That network visualization revealed interesting patterns, but we also applied the Noverlap layout function, which stops the nodes from overlapping, to see patterns in the center of the visualization.

The centrality measure for each faculty member indicates their importance or centrality within the overall network. Faculty with the highest mean central scores are most likely to have the strongest connectivity. We focused on *eigenvector centrality* as it is most suitable given the directed nature of our network and its fully connectedness. Eigenvector centrality measures each node's (faculty member's) influence in the network based on the quality (strength) and quantity of connections (ties) (Bonacich, 1987). Other centrality measures, such as betweenness, closeness, and eccentricity, are more suited to undirected networks or less complete networks as they emphasize the distance (number of nodes) between nodes.

As the liaison librarians were not scored by each other nor by the faculty, the strength of liaison ties cannot be calculated using eigenvector centrality. Instead, to measure the strength of liaison ties, we used the *weighted outdegree* measure for each liaison. The weighted outdegree was calculated for each liaison, combining the quantity of non-zero ties (ties with a score of at least 1) and the strength of each tie. Liaisons with higher weighted outdegree values have more numerous and/or stronger connections to faculty members and are likely to have stronger ties across campus as they are actively engaged with a larger number of faculty members who have been ranked highly.

Visualizing Gephi Measures

Once we completed using Gephi to calculate centrality measures for the liaisons and faculty members, as well as create various visualizations of the social network, we exported the eigenvector centrality score for each faculty member and the weighted outdegree score for each liaison as comma-delimited tables. Using Microsoft Excel, we created the following pivot bar charts to help answer both of our remaining research questions, as well as questions that arose in the analysis: 1) mean eigenvector by academic department, 2) mean eigenvector by school, 3) mean eigenvector by faculty title, 4) mean eigenvector by the number of liaisons who currently or previously served as liaison to the faculty member's department, 5) mean eigenvector for individual faculty, and 6) mean weighted outdegree for each liaison, by length of service.

Discussion

Relationship Network Between Liaisons and Faculty

Figure 2 shows the network where each color represents faculty from a school or college. Liaison librarians can be found at the center of multiple connection points. This visualization clearly shows that there are a few colleges that have a lot of unconnected faculty, including the Business School, the School of Education, the School of Social Work, the College of Health and Human Sciences, and a few departments in the College of Arts and Sciences. In the network visualization in Figure 3, the Honors College, the Provost's Office, and the School of Music are closer to the center and therefore more closely connected.

Departments with Strong Ties and Weak Ties

In examining the network visualizations (see Figures 2 and 3) and the ranked list of departments by their average eigenvector centrality measure (see Figure 4), we began to see some patterns. We noticed that the College of Health and Human Sciences both disconnected from the network and that several departments from that college were at the bottom of the list. Sheble at al. (2016) has suggested that within a network a lack of ties might mean a lack of support. We hope to identify which departments have looser ties to the library as well as probe why those ties are weaker. In doing so, we can identify what kind of engagement and

FIGURE 2

Network of Relationships Between Liaisons and Faculty, in Which Each Color Represents Faculty from a School or College, as Shown in the Legend. This Visualization Demonstrates that Faculty Along the Outside of the Network Primarily have Strong Relationships with Their Assigned Liaisons, While Those Faculty in the Center of the Network have Ties to Multiple Liaisons.

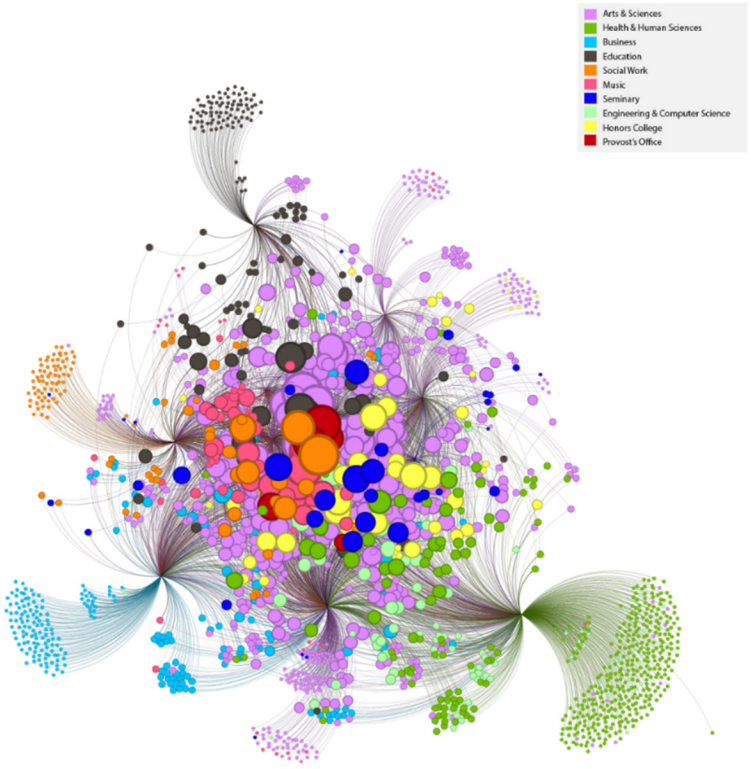
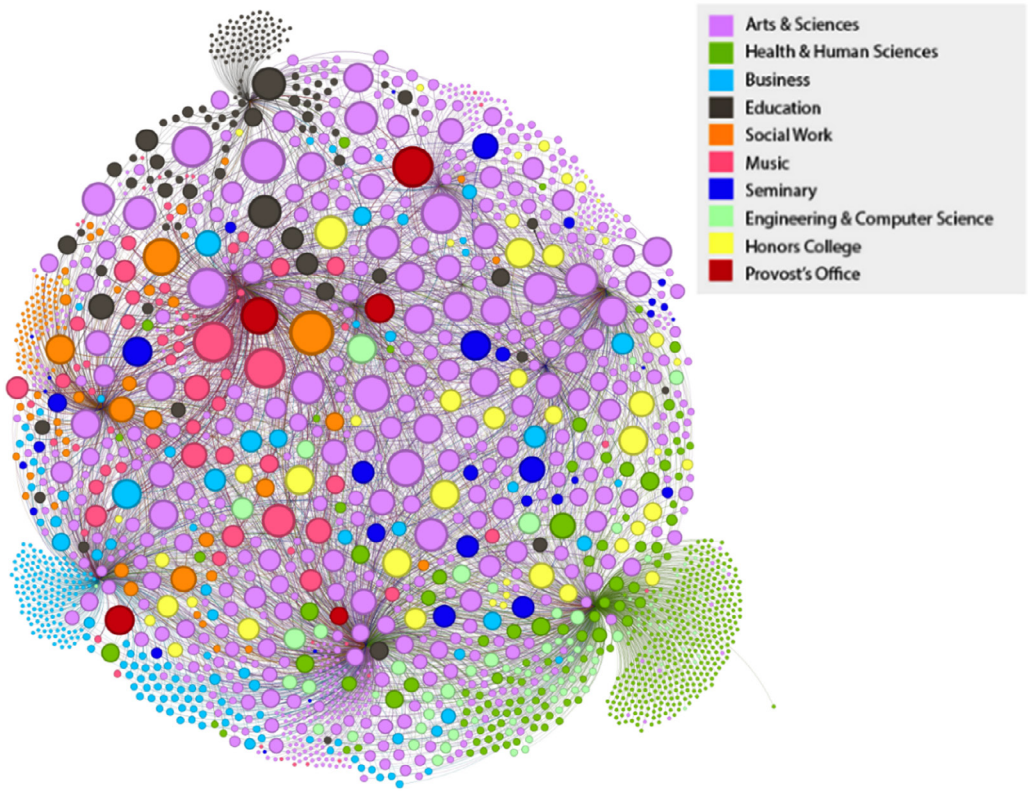


FIGURE 3

The Noverlap Layout Function in Gephi Restricts Nodes from Overlapping. This Allows Us to See the Patterns in the Center of the Visualization, Specifically that Faculty in the Honors College, Provost's Office, and School of Music are More Closely Connected to Multiple Liaisons.

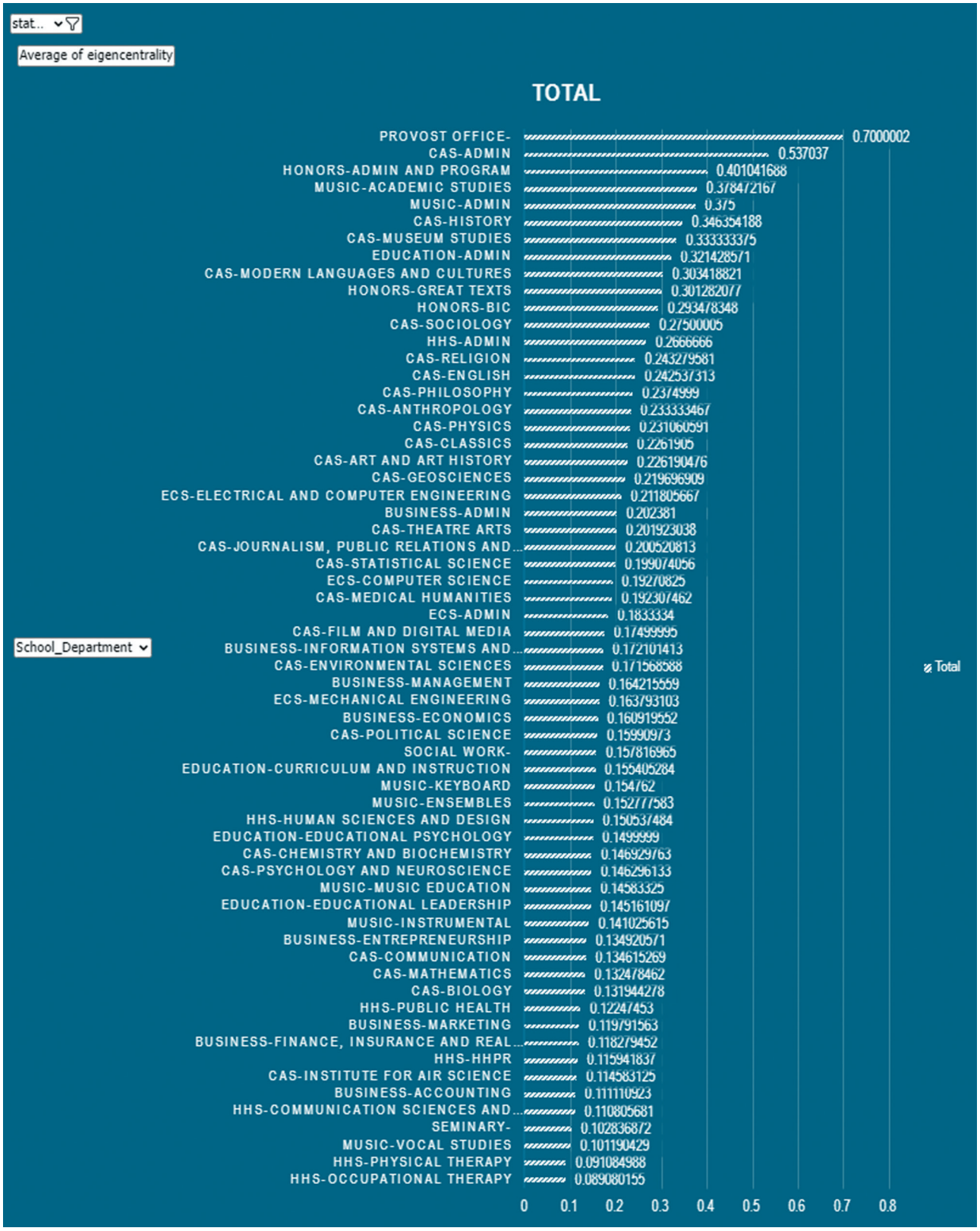


outreach efforts might need to take place. For example, the two departments that rank the lowest are physical therapy (eigenvector score of 0.091) and occupational therapy (eigenvector score of 0.089), from the College of Health and Human Sciences. These departments are two of the newest departments on campus, serving completely online programs and whose faculty work remotely and include 75% to 80% adjuncts. It is expected that the faculty from these departments are less connected to the liaison librarians, as the liaisons cannot stop by their offices, bump into them on campus, or engage in other impromptu or informal activities that support relationship-building (Filgo & Towers, 2020). However, the knowledge that these departments are not as connected to the library can help us plan targeted outreach specific to remote faculty (Bonella et al., 2017; Hines, 2006).

On the other hand, in investigating which departments have the strongest ties across the library, we discovered that many administrative personnel from schools and colleges and the provost's office floated to the top. Because many of our liaisons cultivate relationships with the decision makers across campus, this was not a surprising finding. The provost's office had the strongest average on campus (eigenvector score of 0.700), which bodes well for library priorities on campus. This can also be seen in action on the ground, as the library has a record of partnering with and supporting provost initiatives, such as providing training in digital humanities methods, highlighting diverse faculty research, and hosting a faculty author lecture series.

FIGURE 4

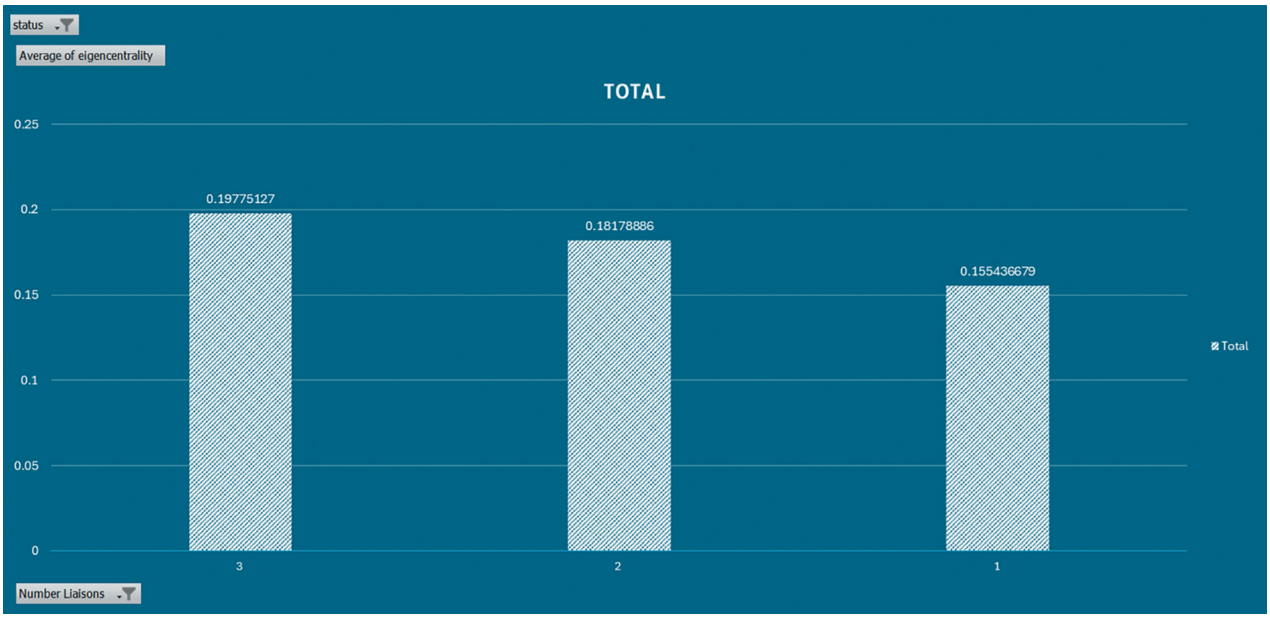
Departments Ranked by Average Eigenvector Centrality Score, a Measure of a Node's Influence in a Network Based on the Strength and Quantity of its Connections. Departments with Higher Scores have Stronger Ties to the Library.



The academic department with the strongest ties was academic studies from the School of Music (eigenvector score of 0.537), which is the department that offers the music survey, history of music, and research methods classes. In wondering why it specifically topped the list of academic departments—over English, history, modern languages, and the other (mostly humanities and social science) departments that were in the top 20—we realized that three of the liaisons who entered data had previously been, or currently were, the liaison to the School of Music during their time working at the library. Would that account for the stronger tie? To explore this question further, we coded each department with the number of current liaisons who are or have been liaisons to each department. Due to restructuring of liaison roles or librarians serving as an interim in between hires, many departments that have had more than one liaison. We found a direct link between the strength of tie to the library and the number of liaisons who are currently, or have been previously, connected to a department (see Figure 5).

FIGURE 5

Average Eigenvector Centrality of Departments by the Number of Liaisons. Departments with Three Liaisons Have the Highest Average Eigenvector Centrality.

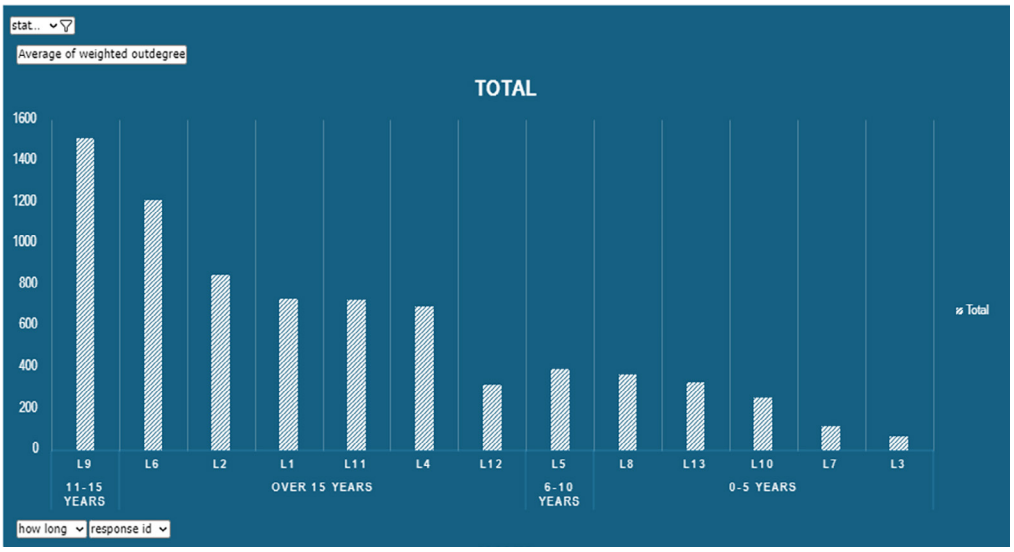


Our analysis shows that finding ways for multiple liaisons to connect to a department can strengthen their overall network connection. It also shows that our liaisons can maintain relationships even when their liaison assignments may change. Connecting more liaisons to a department could be done through rotating liaison assignments, creating team-based liaison models (Andrade & Zaghloul, 2010; Banfield & Petropoulos, 2017) and team interdisciplinary research support. If there are multiple points of connection, the overall network of relationships will not suffer as much in the loss of one node. Indeed, the literature on liaison librarian turnover argues for similar measures, that is, team liaison models, rotations, and multiple points of contact supported by knowledge sharing (Kalinowski, 2022). This analysis also underlines that collaboration between liaisons, rather than territoriality, creates a stronger network.

Liaisons with Strong Ties

The only demographic information we collected from the liaisons was the length of time they have been at the Baylor Libraries, as our hunch was that a longer term would mean stronger connections across the university. Our hunch was correct, but with a notable exception. In Figure 6, one can see that, for the most part, the average weighted outdegree tends to fall off by the number of years each liaison librarian has been at the library. While we have six liaisons who have been at the library for over 15 years, liaison L9, who has been at the library between 11 and 15 years, has the highest average weighted outdegree measure. To help explain this, we noted that L9 has two roles on campus committees that help to provide connection widely across campus, one as a member of the committee on committees and one as the chair of the Faculty of Color Alliance. In each of these roles, L9 emails faculty regularly to discuss committee assignments and invitations to meetings. We also looked at liaison L6, the second-highest ranked liaison. L6 has been at the library for over 15 years but in the liaison role only for about 5 years. However, in a previous role L6 served as the interlibrary loan librarian, again a position that provided connections broadly across campus, emailing faculty to help them connect with the resources they needed. While the surface takeaway might be for liaisons to start emailing faculty, a better one may be for liaisons to find places on campus—such as affinity groups, committees, task forces, and even informal settings like pickup basketball groups or musical ensembles—in which they can build relationships and strengthen their networks (Filgo & Towers, 2020; Kinnie, 2002).

FIGURE 6
Average Weighted Outdegree, from Highest to Lowest, for all Liaisons. L9 has the Highest Average Weighted Outdegree, While L3 has the Lowest.



We also discovered where liaisons worked together within the network. In Gephi, we performed the "modularity" calculation, which measures how a network breaks down into communities (Blondel et al., 2008). We found that our large network had eight distinct communities, five of which were centered around individual liaisons and (mostly) the faculty in their assigned departments (see Figure 7); however, there were several communities that had

more than one liaison at the center. One community consisted of three liaisons who work with music and fine arts departments and who make up the group of liaisons who have been at one time the liaison to the School of Music (see Figure 8). Another community was humanities-focused and contained a new liaison and the liaison who had spent considerable time as either the assigned liaison or the interim liaison to the departments currently assigned to the new liaison (see Figure 9).

Individual Faculty with Strong Ties

In the list of the top 50 faculty with the strongest average eigenvector centrality measure (which we are not sharing for privacy reasons), we found four faculty related to current or former librarians, three faculty who are a part of university units that work very closely with the library (for example, the Academy for Teaching and Learning, which is housed in the library), and 17 faculty who have been a "Fundamentals of Data Research" library summer fellow. These faculty meet every week over the summer with the director of data and digital scholarship (one of the authors of this paper) and their liaison librarian to support a digital humanities research project. As Kessenides and Brenes (2022) have pointed out, the network is strengthened when subject specialists with relational capital collaborate with functional specialists; our data support this.

When we had investigated the liaison librarians' connections, we looked at length of time and whether that affected the strength of the connections. We did not have the data on the

FIGURE 7
Community Centered Around One Liaison, with a Strong Connection to Their Assigned Departments. This Visualization Represents the Strong Ties Between Liaisons and Faculty in Their Assigned Departments, While also Highlighting the Connections Built Through Other Campus and Social Activities.

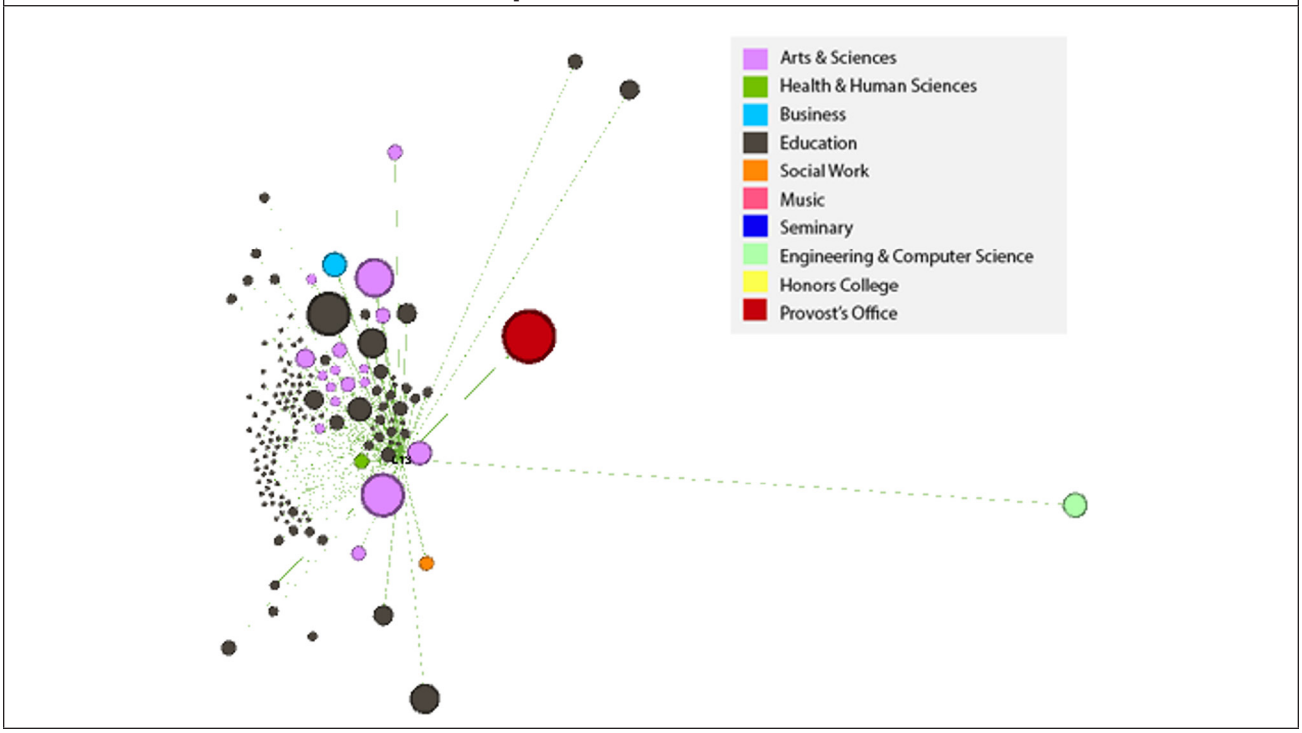
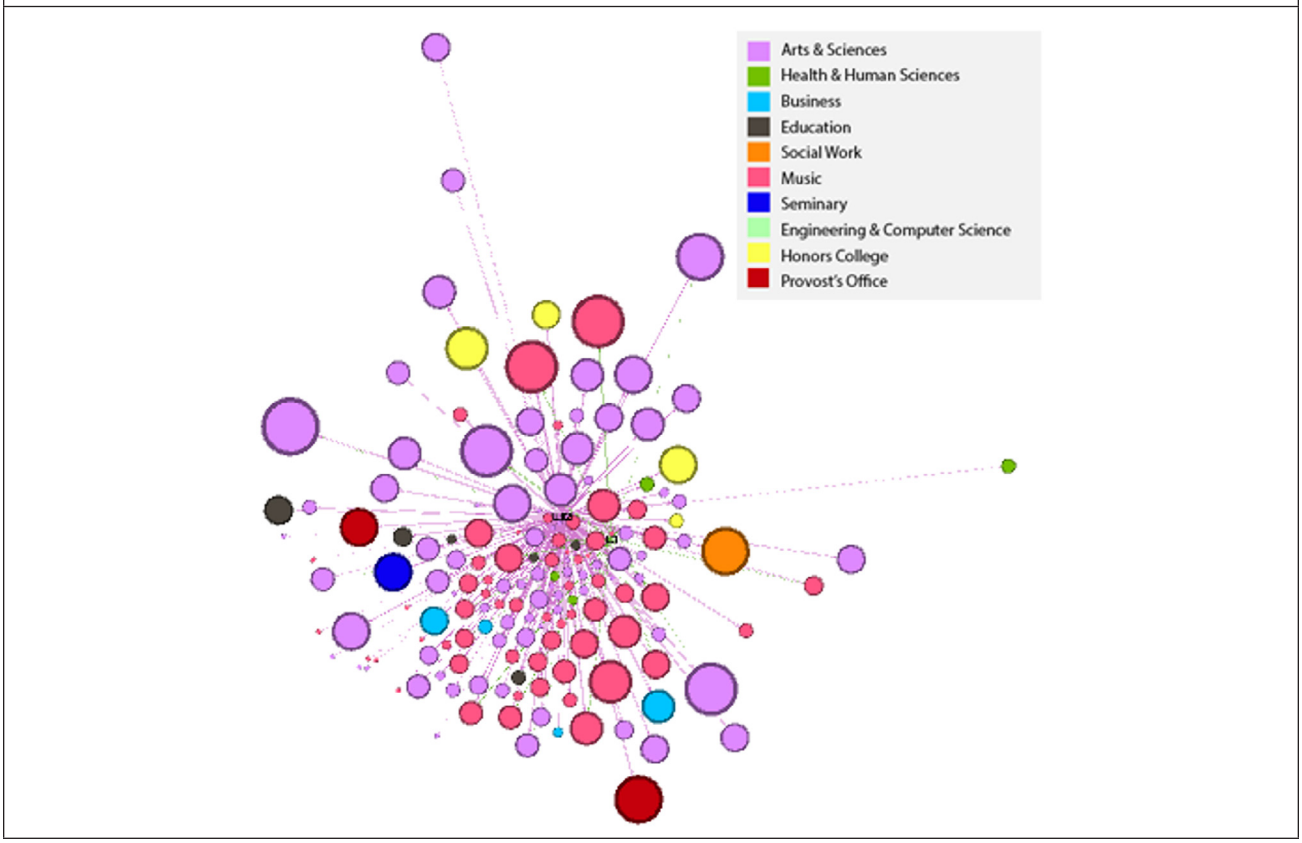


FIGURE 8
Community Centered Around Three Liaisons with a Strong Connection to the School of Music, as Shown by the Nodes in the Center of the Visualization. This Visualization Represents the Strong Ties Between Liaisons and Faculty in the School of Music, Built Over Time as Each of the Three Liaisons has Served as the Liaison to the School of Music



length of time each faculty member had been at the university; however, we did have the titles for each faculty member, which, we realized, could serve as a stand-in for length of time. The vast majority of faculty spend 6 to 7 years as an assistant professor before getting tenure and promotion to associate professor and about that much time again before promotion to full professor. The university has a similar path from lecturer to senior lecturer as well. Also, barring outside hires, chairs and deans usually have been at the university for a longer amount of time. When we analyzed the data from the faculty titles, we discovered that a higher title/longer term at the university was linked to a stronger connection, similar to the liaison data (see Figure 10).

Limitations and Future Research

Our social network analysis only used data from the liaison librarians. However, we might also want to use data from the rest of the librarians and archivists, particularly those who also interact often with the faculty. Our liaisons often work in collaboration with the Special Collections librarians, similarly to how they work with the Data and Digital Scholarship unit. Therefore, getting data from the Special Collections librarians who do work similar to the liaisons, such as teaching classes and providing research support, would provide a fuller picture of how the faculty are connected to the library.

FIGURE 9

Community of Two Liaisons with Strong Inter-Related Ties to Faculty in the Humanities Departments in the College of Arts & Sciences.

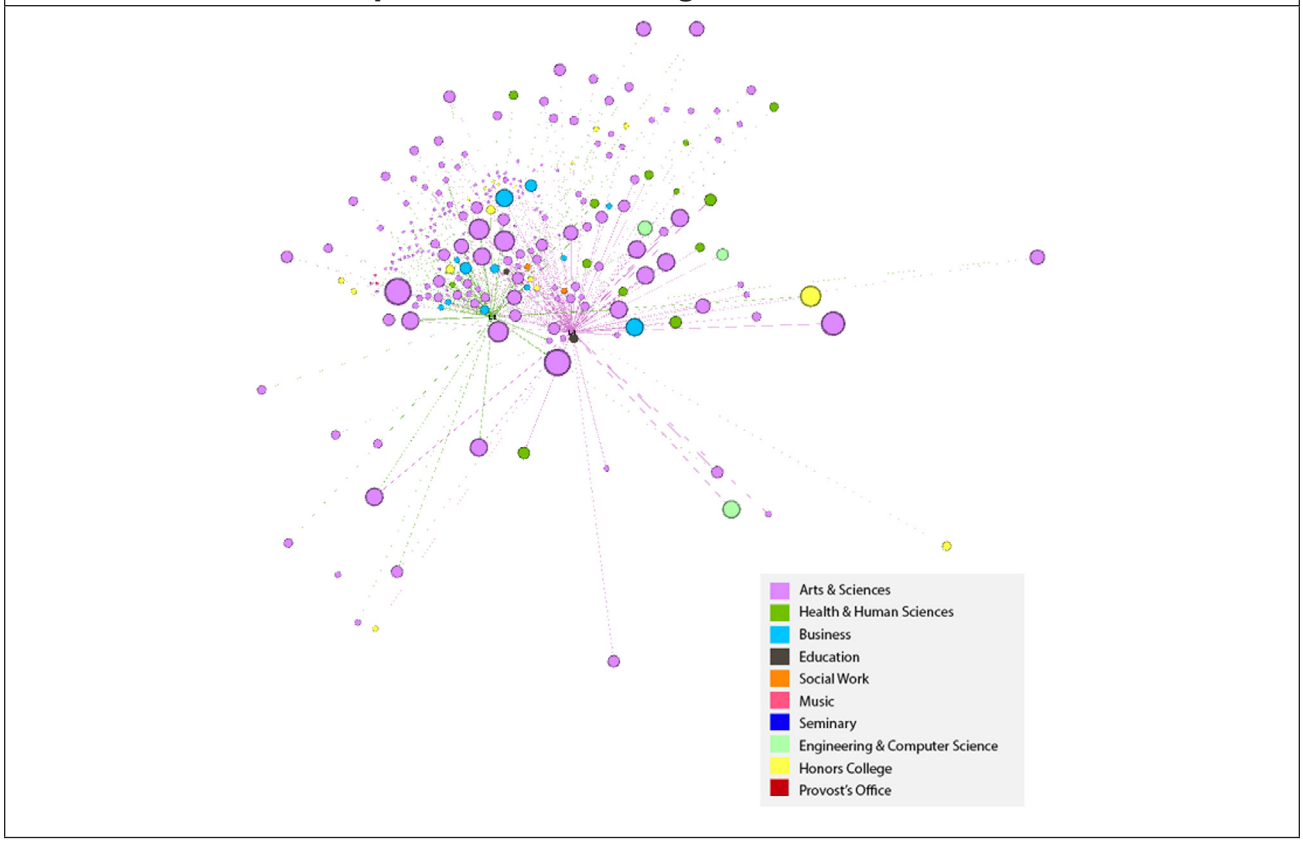
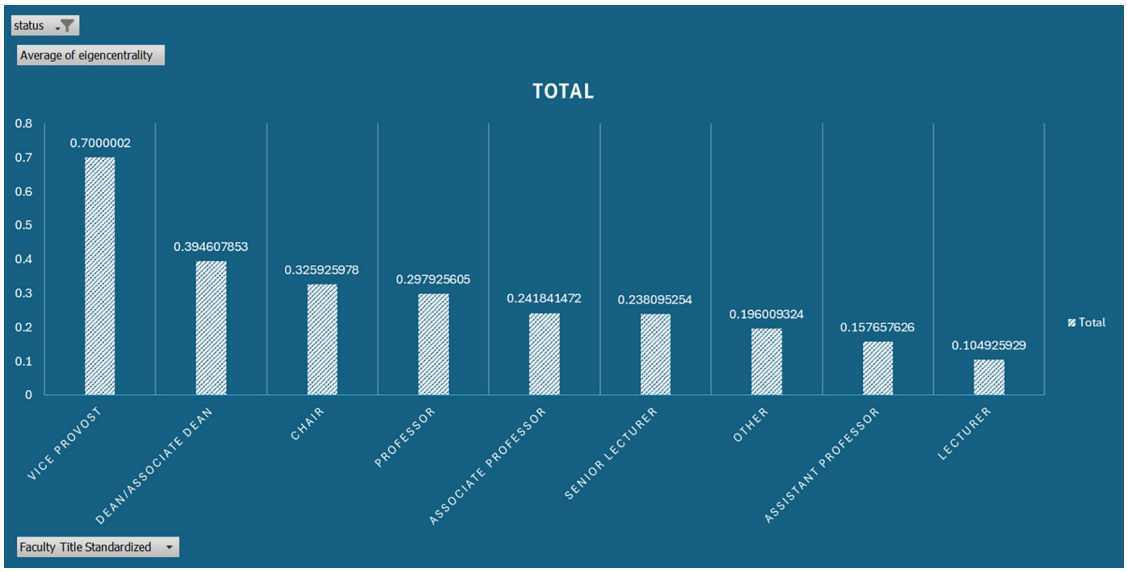


FIGURE 10

Average Eigenvector Centrality Score, from Highest to Lowest, for All Faculty Titles. This Visualization Demonstrates that Eigenvector Centrality Scores Generally Decrease as Faculty Rank Decreases, with Vice Provosts and Associate Deans Having the Highest Scores and Lecturers Having the Lowest.



Our network was also directed, which means the relationship strength was only measured one way. To gain a more comprehensive understanding of the network between liaisons and departmental faculty, we would need to include the faculty's measurements of the relationships as well. Further studies could be done with an undirected network approach, either of one liaison and their constituents in their liaison areas or of a liaison program and an entire campus. Collecting the data on the former scenario would be a little less complicated and could provide the "assessment of emerging models of liaison librarianship" suggested by Bracke (2016, p. 139).

Future social network explorations of liaison librarian relationships can uncover a variety of dynamics within academic libraries and their broader institutional environments. SNA can map how information flows between librarians, faculty and students, identifying central nodes and potential bottlenecks. SNA can also be used to investigate whether librarians help or hinder cross-disciplinary collaborations among departments. In addition, SNA can be used to determine whether liaison librarians are aligned with institutional priorities; are their networks connected to key researchers or decision-makers? Comparative studies could also be illuminating, such as comparing networks across institutions to highlight differences in network structures or communication patterns or contrasting the networks of liaison librarians who exhibit collaborative behaviors with those who are more territorial. A longitudinal study could observe network changes in response to technological change or institutional priorities.

Conclusion

Our study has visualized the network of relationships between liaison librarians and the faculty they serve. The network we uncovered shows that the length of time either a liaison or a faculty member spends at an institution reflects a greater connectivity of relationships. It also shows that departments or individuals with ties to more than one liaison are more strongly and centrally connected. Another significant finding is that liaisons who participate in campus activities outside of their direct liaison work create relationships that strengthen their connectivity across the network. These findings suggest that fostering long-term institutional ties and encouraging broader campus involvement can enhance the effectiveness of liaison programs. Understanding these dynamics is crucial for optimizing liaison librarian roles and fostering stronger academic communities.

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