

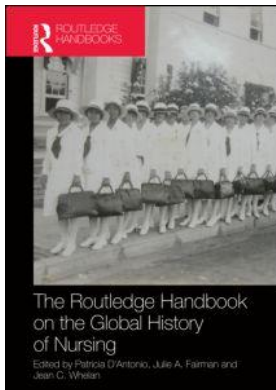
This article was downloaded by: 10.3.97.143

On: 06 Dec 2023

Access details: *subscription number*

Publisher: *Routledge*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: 5 Howick Place, London SW1P 1WG, UK



Routledge Handbook on the Global History of Nursing

Patricia D'Antonio, Julie A. Fairman, Jean C. Whelan

Searching for Connectivity

Publication details

<https://www.routledgehandbooks.com/doi/10.4324/9780203488515.ch5>

J. Margo Brooks Carthon, Katherine Abbott

Published online on: 24 May 2013

How to cite :- J. Margo Brooks Carthon, Katherine Abbott. 24 May 2013, *Searching for Connectivity* from: Routledge Handbook on the Global History of Nursing Routledge

Accessed on: 06 Dec 2023

<https://www.routledgehandbooks.com/doi/10.4324/9780203488515.ch5>

PLEASE SCROLL DOWN FOR DOCUMENT

Full terms and conditions of use: <https://www.routledgehandbooks.com/legal-notices/terms>

This Document PDF may be used for research, teaching and private study purposes. Any substantial or systematic reproductions, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The publisher shall not be liable for an loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

5

SEARCHING FOR CONNECTIVITY

Using historical methods and social network analysis to uncover new discoveries in community organizing

J. Margo Brooks Carthon and Katherine Abbott

The time has come for more social science historians to join the ranks of . . . theory builders, who modify social theory in the laboratory of the past.¹

On January 8, 2011, the American Historical Association (AHA) convened its 125th Annual Meeting in Boston. Among the conference's offerings was a panel entitled, *Historical Social Network Analysis: A Practicum*.² Round table discussants included four university-based international scholars, who each presented on subjects ranging from institutional change in the colonial economy of Buenos Aires to Klan violence in the post-reconstruction American South. For some conference attendees the two-hour practicum served as an initial introduction to Social Network Analysis (SNA); for others it demonstrated the wide range of software and data management tools available to current and nascent users. Social network analysis refers to "a distinctive set of methods used for mapping, measuring and analyzing the social relationship between people, groups, and organizations."³ In recent decades SNA has grown in use and is currently employed across an array of disciplines ranging from sociology to medicine and business.⁴

Advances in technology and widening training opportunities are opening doors for the use of SNA for historical research purposes. Many historians, however, are unfamiliar with SNA, hence the purpose of this chapter is to introduce the SNA method and describe how it might be applied to a historical case study. Drawing on our respective backgrounds in history, social work, sociology, and health services research, we explore what historical data sources are required to employ a network approach, examine whether the applicability of SNA is better suited for large data sets or equally beneficial to smaller localized historical or cultural studies, and discuss how a network analytic approach might enhance the arguments or results of a historical investigation.

The chapter begins with an overview of the theoretical and analytic underpinnings of SNA, followed by a review of examples of studies employing history and SNA. Finally, we present an illustration of this integration with a case study of the Starr Centre, a settlement association with deep civic roots in Philadelphia's early 20th century ethnic immigrant and black communities. The case study was drawn from a historical research study originally conducted by Dr Brooks Carthon. Using the original study we describe how the use of a network perspective facilitated new understandings of how individuals and organizations historically mobilized to disseminate important social and health information in local minority communities. The chapter ends with a discussion of the limitations associated with combining SNA and history and with recommendations to future users.

An introduction to social network analysis

Social network analysis is a term that not only describes a method of analysis, but equally refers to a set of theories which take into account how people are interconnected.⁵ It has developed over the past century as an area of inquiry encompassing a broad range of disciplines including social psychology, business, geography, political science, economics, and physics.⁶ SNA traces its roots in the early 20th century to the fields of anthropology and sociology.⁷ SNA users are interested in understanding how social interactions are patterned by the structure of the network in which individuals are embedded. By helping to understand the patterns of interactions, SNA can elucidate how individuals become susceptible to infectious diseases, obtain information, and influence or are influenced by others.⁸

Early researchers employing SNA include Jacob L. Moreno, who conducted a study at Sing Sing Prison in 1932 and another at the Hudson School for Girls in 1934. In his Hudson School study Moreno sought to understand the reasons behind a rapid increase in runaways among the pupils at the New York school. To answer his question, Moreno graphically represented relationships between students and their social positions with one another.⁹ He concluded that social proximity and influence between pupils determined whether and when a girl ran away rather than the girls' personalities or other motivations. Moreno's findings were published in the *New York Times* and in book form in 1934. His scholarship, along with that of other early SNA pioneers such as researchers at the Group Networks Laboratory at the Massachusetts Institute of Technology (MIT) and that of anthropologist Radcliffe Brown, helped to launch the discipline.¹⁰ Later research conducted in the 1980s and early 1990s affirming that HIV/AIDS was transmitted through a network process added credibility to SNA and attracted research funds for SNA, contributing to its further evolution throughout the 20th century.¹¹

The name "SNA" implies that it is only a method of analysis, but it has a strong foundation in theory as well. Social theorists Emile Durkheim and Georg Simmel were the first to discuss the role of social integration or isolation on a variety of outcomes. Today, SNA theories focus on understanding how ties are formed or dissolved, how actors come to occupy positions, and how networks come to have properties, such as

a core or periphery structure. SNA goes beyond simply identifying how actors are connected to one another, to examining how the structure of relations and the position of actors within a social structure help to determine the opportunities or the constraints that an actor encounters.¹² This represents a shift from solely using attributes of the individual, such as race, gender, and health status, as explanations for social position to a focus on relationships and interactions with others, thereby adding situational and environmental factors to the list of attribute variables that can be studied.

The social network analyst attempts to evaluate the multidimensional aspects of human interactions through the mapping and measurement of social ties. Social ties are defined as the linkages between two or more persons, groups, or institutions and are viewed as the essential unit of analysis. Network analysts focus specifically on the relational or social cohesion aspects of social structures by examining the direct ties or interactions between actors. Depending on the data used, ties can have different strengths, represent asymmetrical relations, and carry values that reflect multiple aspects of relationships.¹³ Network analysts look for relational tie patterns and social cohesion developments such as the formation of very strong, dense, and relatively isolated social networks, which facilitate the formation of subgroups or cliques. Because SNA studies frequently include measures of strength of social ties, the final analysis yields a wealth of information on the relational aspects of social structures.

Sociologist Mark Granovetter examined the implicit meaning of tie strength and posited that while information spreads rapidly through densely knit groups because the actors are strongly connected to one another, they are less apt to gain access to new information since they frequently share the same set of social contacts and are more likely to hold similar views and opinions. This feature of densely knit groups is frequently exemplified in ethnic enclaves or social cliques. Alternatively, Granovetter suggests that weaker ties, defined as contact with extended non-intimate ties, inject innovations and novel ideas into groups that would otherwise be more homogeneous in their views and opinions.¹⁴ Weak ties may be identified as individuals with whom less is shared in common, but who nonetheless may indirectly connect individuals or serve as bridges between isolated social groups (or individuals).

To better understand the influence of tie strength, let us take an example of a nurse working in a Hispanic migrant community. Ties between members of the migrant community may be very strong and dense, with the community itself being ethnically and culturally homogeneous and relatively isolated. The nurse is not of Hispanic origin nor is she a resident of the immediate community. Hence, the affiliation between the nurse and clients could be defined as comprising weaker “ties” due to cultural, socio-economic, residential, and perhaps racial differences. The nurse in this example nonetheless serves as an important link between migrant residents and the healthcare community, providing access not only to health resources but also to social services and perhaps employment opportunities. According to Granovetter’s theory, which specifies the “strength of weak ties,” these seemingly more fragile connections may (in the end) serve as conduits for increased diversity of thought and widening opportunities for social mobility.

Depending on the research question of interest, researchers employing SNA examine a number of key network features about their social ties such as size (number of network

members), density (the extent to which the members are connected to each other), composition (the degree to which they are defined on the basis of traditional group structures such as kin, co-worker, neighbor); and homogeneity (the extent to which individuals are similar to each other in a network, such as age, gender). In addition, they can examine the frequency of contact between ties and determine the content of what is flowing through ties. The extent to which exchanges or transactions are reciprocated is also an example of a network characteristic that can be explored.¹⁵

The three primary approaches to analyzing network data are the whole network (WN), personal/egocentric network (EC), and affiliation network.¹⁶ The WN approach seeks to capture all essential connections among actors in a defined group, such as all patients in a unit of a hospital. Determining who will be studied is fundamental to research employing whole networks. When using the WN approach all members of the network are ideally included and all possible ties are documented and analyzed. In contrast the egocentric (EC) approach seeks to examine an individual and the multiple ties that he or she relies upon for support, such as discussing important matters, borrowing money, or the receipt of emotional support. Networks can also be constructed using affiliation data, such as organizations and the members of their board. This approach will likely be the most applicable approach for historians, who can use archival records to infer relationships among people who serve together as board members. There are a variety of mathematical algorithms and software programs, such as UCINET, that offer comprehensive SNA data analysis capability. In order to generate network models, analysts apply mathematical and graphical techniques to illustrate and understand the complexity of human and organizational relationships.¹⁷

Merging SNA and historical methods

Over the past decade access to SNA software and training has improved, increasing its accessibility to historians.¹⁸ This section provides a number of examples of studies that have simultaneously employed historical and social network research methods. We end it with a discussion of the possibilities and limitations of such endeavors.

One of the best-known examples of SNA use with historical materials is the 1993 work of John Padgett and Christopher Ansell, who analyzed marriage and financial transactions to examine how the Medici family rose to power in early 15th century Florence based on their network position. In their work, Padgett and Ansell employ the concept of structural equivalence to identify “the family, economic, and patronage networks that constituted the Medicean political party” and their rivals, the “oligarchs.”¹⁹ Using archival data such as marital and economic records as well as personal correspondences, the researchers were able to produce an overall relational picture of Florence’s social structure within a 92 family ruling elite. Through their analysis they were able to predict and reveal connections among networks, groups, and party membership. They concluded that “rather than [political] parties being generated by social groups . . . both parties and social groups were induced conjointly by underlying networks.”²⁰ More specifically, the researchers reveal that there was no simple way to map groups into parties simply based on social status, but instead contend that attributes

such as social class are “cognitive categories” that party affiliation, networks, and actions crosscut.²¹ In this application of SNA using archival records, Padgett and Ansell reject categorical affiliation as motivation for political party association, but instead demonstrate how the complex interplay of marriage, finances, residential affiliation, and other social determinants served as precursors and motivators to political allegiances.

Another example of the use of SNA and historical archival data is the work of Naomi Rosenthal et al., whose research examined women’s social reform activities in New York State between 1840 and 1914.²² Through their use of organizational records, Rosenthal and her associates mapped out the organizational affiliations of 202 prominent women reformers and developed a detailed portrait of the multiorganizational field of social movement activity during this period. Using measures of centrality they were able to detect the role and functions of particular groups that were more important to the network of reform activities. In addition, using a “directional flow” analysis they were able to detect the movement of individuals across organizations. The results of this study aided researchers in mapping the interorganizational networks operating in women reform efforts and revealed the complex interplay between reform movements and civic association affiliation.

An additional example of the combined application of historical sources and SNA includes research conducted by historians Michael Alexander and James Danowski in 1990.²³ The aim of the study involved the content textual analysis of 280 letters written by Cicero, to study the personal communication and social structure of the Late Roman Republic (68–50 BC). Central to their research were questions about frequency and distance between knights and senators, two groups who functioned as social and political elites within ancient Roman society. To answer these questions, Alexander and Danowski completed a network analysis of all actors, including their ranks, in order to generate a complete representation of the network structure and how individual position or status within the network influenced network role.

To examine the role of “centrality,” the researchers performed cross-tabulations of seven categories of social status in Roman society (including citizen, freedman, slave, knight) by network role. Centrality reflects relational power and control over information in a network. Results from the analysis revealed that individuals on the periphery of the network were somewhat more likely to be of lower status and that information within a group tended to flow through more central figures. However, the study also revealed that while status frequently served as a barrier to group entry, once accepted within the central group position, the individual was no longer defined by formal status. This finding suggested that while centrality reflected a type of relational power *between* “in-group” and “out-group” members, once accepted into the in-group all members were viewed as socially equivalent. Hence, social structure of Cicero’s ancient Roman society was much like that of a club, fraternity, or sorority; all outsiders were viewed as social subordinates, until they were formally accepted into the organization.

When used alongside traditional historical methods, SNA allows users to reconstruct the structure and properties of social networks and examine relational interactions within and between individuals, groups, and organizations. While historians have always

recognized that social interactions have influenced the development of institutions and communities, few have quantified frequency of interactions between individuals or measured the influence of people within networks and systems as the central feature of their work. Moreover, the chronological order that generally gives structure to historical narratives and the dependence on words rather than (graphic) images emphasizes temporal over spatial and structural patterns.²⁴

To better understand the importance of spatial and structural patterns, let's return to our example of the nurse working in the Hispanic migrant community. As noted, the analysis of spatial and structural patterns relies in part on the measurement of relational ties and proximity. A straightforward assessment of this case study might focus on the cultural discordance existing between the nurse and community and the importance for the nurse to understand the specific beliefs and values of community residents in order for health promotion to occur. The application of SNA, however, prompts us to examine not only the individual nurse–client interactions but also the nurse in relationship to her contacts *outside* of the migrant community. If for instance this nurse is connected socially to individuals from a local parish, and is a neighbor of a city council board member, and sits on a board for her professional nursing organization, then we are able to visualize how she is uniquely positioned to serve as a bridge to the migrant community from a public health, social, political, and advocacy perspective. Analyses that focus solely on direct individual–individual interactions, without taking into consideration the full social network and all possible connections, may miss the important impact of these simultaneous relations. Hence the application of SNA principles may allow us to view relational patterns in unexpected and more complex ways.

A social network approach also provides a means to test theories and may enhance the arguments or results of a historical investigation by helping to either support or challenge conclusions made through historical inquiry alone. As an example, one of the primary archival sources used in Alexander and Dankowski's work was Cicero's personal letters. While Cicero's letters are recognized as the best evidence for ancient Roman society during that period, it is undeniable that they are from his vantage-point only. Hence, a reliance on this body of evidence alone may render the results flawed due to the limited representativeness of the source.²⁵ However, Alexander and Dankowski's use of the content analysis of Cicero's letter in addition to quantitative methods helps to substantiate their final conclusions.

Using a database management system, each of Cicero's letters was compiled and an entry was recorded for each personal contact that Cicero mentioned. This resulted in 1914 observations involving 524 individuals with four items recorded for each entry, namely the name and rank of the two individuals involved. The database records recorded each mention of a contact named in a Cicero letter.²⁶ The researcher's use of quantitative methods helped to create a multidimensional picture of organizational or relational patterns. The use of textual analysis retained rich qualitative information about human interactions, while the use of SNA methods allowed the researchers to quantify the position and status of actors in the network and statistically test hypotheses.

SNA limitations

As with all methods, SNA has its limitations. While SNA may do well to determine structural components of networks such as frequency of interactions and the distance between individuals, this method alone is unable to determine the texture and quality of these relationships. While SNA illuminates structural patterns, it cannot explain why such patterns occur and how social processes change over time. For instance, in the historical SNA study conducted by Rosenthal et al., the researchers were able to delineate early 19th century women's reform activities. While the analysis did well to reveal these activities, the study culminates in the reproduction of static map configurations and relational snapshots of network patterns.²⁷ Missing from the analysis is a full explanation of the social and political processes underlying such reform involvement; instead these processes are viewed as exogenous variables and are not fully explored or explained by the researchers.

Critics of SNA also contend that SNA does not concern itself with "ideals" or "discursive frameworks" although such abstractions are indeed generally difficult to quantify in "concrete" ways.²⁸ In their critique of social network analysis, Mustafa Emirbayer and Jeff Goodwin assert that SNA's tendency to objectify social relations through its use of technical tools drains relations "of their active, subjective dimensions and their cultural elements and meanings."²⁹ Finally, due to its focus on the structure of networks, the motivations behind individual human behavior may not fully be examined or explained using an SNA only model. However, if other aspects of human agency, choice, and volition are measured using historical methods then the two may be used together effectively.

SNA applied to the early history of the Starr Centre

Our own attempt to bring together historical and SNA methods utilized a whole network analytic approach and was drawn from a case study of the Starr Centre, a Philadelphia-based civic association founded in the late 19th century. The primary historical sources used for this analysis were extracted from research conducted previously by Brooks Carthon for a study that examined community and health organizing among blacks living in Philadelphia during the early 20th century.³⁰ During this period the Starr Centre launched an ambitious campaign to address social inequities and illness among poor blacks and ethnic immigrants living in South Philadelphia, an impoverished area of the city.

The primary aim of the project was to integrate SNA and historical methods in an effort to explore how the theoretical and methodological tools of SNA might help to augment or extend conclusions revealed during the original historical process. The SNA methodology used for this study included three main stages: (1) describing the set of actors and members of the network; (2) characterizing the relationships between and across members of the network; and (3) analyzing the structure of the civic association. The historical sources used for this case study included Starr Centre annual reports, pamphlets, and meeting minutes. SNA tools allowed us to measure and quantify the

structural relationships operating across a range of Starr Centre constituents, while our historical records helped to establish the organization's goals, missions, and programmatic changes over time.

Starr Centre: Historical background

Our case study begins in late 19th century Philadelphia, which at the time was in the midst of cataclysmic changes due to mass industrialization and migration.³¹ Brooks Carthon captures the transformation in Philadelphia, noting that "the population of Philadelphia was in particular flux as huge swells of immigrants from Eastern Europe and rural Southern migrants entered the city during the opening decades of the twentieth century."³² Between 1890 and 1910, the city's black population increased more than 100 percent to 84,000 in a city with a total population of 1.5 million, and by 1920 it had expanded to 134,000 in a population of 1.7 million.³³ In search of jobs and increased social freedoms, the city's newest residents packed into cramped dwellings, which resulted in rapidly deteriorating housing conditions and the spread of infectious diseases.³⁴ To address the growing threat of infectious illness and urban decay, progressive reformers waged a battle through settlement houses and other charities.³⁵ During this turbulent time, Theodore Starr, a white businessman and philanthropist with deep roots in Philadelphia's black community, established the Starr Centre to address concerns of residents living in some of the poorest and most segregated neighborhoods in the city.³⁶

During his lifetime, Theodore Starr's concern for the social welfare of local residents led to the development of a number of initiatives, including building public playgrounds and gardening centers for neighborhood children. By the time of his death in 1884, Starr's social-welfare initiatives were well entrenched within Philadelphia's black community. After his death, Susan P. Wharton, a well-to-do white social progressive, took over management of Theodore Starr's collective philanthropic interest and served as the Centre's first chairperson and president. In addition to Wharton, the Starr Centre comprised a broad constituency of ethnically and culturally diverse individuals. The association's organizational structure included a Board of Directors, donors, various committees, trained visitors, and neighborhood residents.³⁷

Local blacks became Starr Centre "members" and gained access to the association's programs by contributing one dollar annually.³⁸ White well-to-do civic workers served as organizers or trained paid visitors, who made house calls to Centre members to assess housing and health conditions.³⁹ The heterogeneous nature of the Starr Centre Association's social network fostered connections between people from diverse backgrounds and made concrete the association's desire to come into intimate contact with those they were attempting to help in the local community. The Starr Centre's first charter and bylaws document the association's mission as one that would: "provide for and promote by practical methods, the educational and social improvement of those poor neighborhoods; primarily in the vicinity of the Starr Garden."⁴⁰ Starr Centre organizers put this vision into practice by organizing a range of widely attended programs, including classes on housekeeping, carpentry, and health.

Brooks Carthon describes the efforts of the Starr Centre in her account of early 20th century urban community health efforts:

Starr Centre leaders were particularly interested in health promotion and disease prevention. In 1905, the Starr Centre created a medical department and contracted the services of the Visiting Nurses Association of Philadelphia to provide care to sick children and adults in clinics and homes. Despite the excessive illness present in the black community, many families were forced to juggle their participation in health programs and visits to local clinics with more quotidian domestic concerns, such as finding coal to warm their homes or food to fill their children's hungry stomachs. Even as infectious disease rates spiked among blacks, poor families were frequently obliged to work long hours instead of seeking medical care. Starr Centre board members saw this dilemma and realized that any efforts to curtail excess sickness had to address the limited material resources of community members first.⁴¹

The Starr Centre coordinated its services with local blacks through frequent visits to the homes of club members. While in the home, Starr Centre visitors were charged with collecting dues, learning about members' living conditions, and offering assistance or referrals when needed. By building relationships and offering "constant sympathy and care," trained visitors hoped "to help, to advise, to inspire."⁴² In 1911, the black membership in the Starr Centre totaled more than 900 paid members, and visitors that year made more than 41,000 home visits.⁴³ Members frequently asked visitors to "please call on my aunt, who wants to join" or "my cousin or friend."⁴⁴ The Starr Centre's philosophy of "active touch" between the trained visitors and black Starr Centre members helped to foster a "mutual understanding and confidence," resulting in an "inspiring" partnership that would endure.⁴⁵

The results of the historical study revealed that the establishment of these trusting relationships served as prerequisites for the later success of the Centre's health promotion initiatives. Our application of SNA helped to make these relationships and the roles of stakeholders within the Starr Centre organization more concrete, and revealed potential alternative pathways for resource and informational flow.

Defining organizational ties and determining meaning

The initial application of SNA using historical sources began with understanding the organizational features of the Starr Centre and learning which members of the civic association were likely to engage or form "ties" with one another. Individual affiliates from the Starr Centre used in this example include Theodore Starr, Susan Wharton, two Starr Centre employed visitors and Annie (a black member of the local community and Starr Centre member). To do this with the historical data we constructed a matrix where zeros (0) and ones (1) are used to show the presence or absence of a relationship between a set of actors (see Table 5.1). Thus, there are two sets of items: the rows correspond to individuals who were affiliates of the Starr Centre and the columns reveal if individual affiliates had known interactions with one another.

Table 5.1 Relational data matrix

ID	Starr	Wharton	Visitor 1	Visitor 2	Ms Annie
Starr	0	1	0	0	0
Wharton	1	0	1	1	0
Visitor 1	0	1	0	1	1
Visitor 2	0	1	1	0	1
Annie	0	0	1	1	0

The data in this matrix can also be used to determine the “direction” of the relationships between organization members. Directional ties are oriented ties such as charities giving money to recipients, but recipients not giving money to the charity. Nondirectional ties are not oriented and a tie is either present or absent. In the Starr Centre example we created a nondirectional matrix based on the historical documents that inferred a relationship between Theodore Starr and Susan Wharton. As seen in Table 5.1, there is a tie indicated in the cell from Theodore Starr to Wharton and also from Wharton to Starr. On the other hand, there are no ties linking Annie to Wharton or to Starr, which suggests that elites within the organization had more interactions with one another. Annie’s most frequent contacts came through interactions with Starr Centre visitors. At first glance this may appear to suggest that Annie had little interaction with elites within the Starr Centre organization. Given their intermediary roles, however, Starr Centre visitors represented an important feature of the network, providing Annie with potential access to powerful members of the Starr Centre executive board with very few degrees of separation.

To answer our question related to how the members of the Starr Centre were positioned in relation to one another, we created a network visual based on the data presented in Table 5.1. It is through visualizing the network that the structure of the Starr Centre network is revealed. Figure 5.1 presents a visual representation of the Starr Centre social network computed from data in Table 5.1 and integrating attribute data such as gender and race found in Starr Centre records.

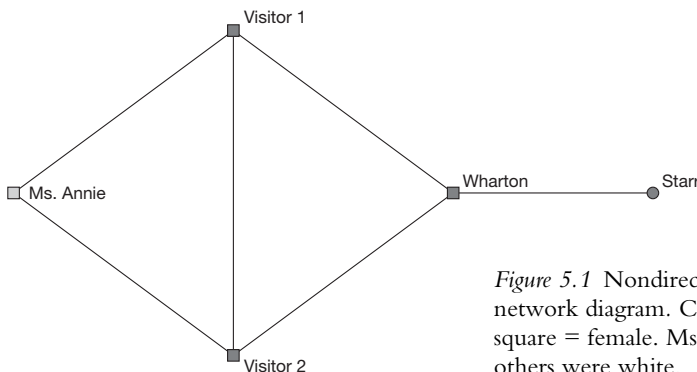


Figure 5.1 Nondirected Starr Centre network diagram. Circle = male; square = female. Ms Annie was black; all others were white.

In viewing the structure of the diagram we can see the various roles and groupings in the Starr Centre network. Wharton plays a classic bridging role between Starr and the Centre staff (Visitors 1 and 2) given her position between two important constituencies in this network. In this capacity Wharton also had great influence over what flowed or did not flow through the network. Remove Wharton and the network falls apart. This is not to suggest that another person could not fill Wharton's role. However, SNA's focus on organizational structure demonstrates Wharton's strategic position and function as the transmitter of upstream and downstream information between association benefactors and members. In this example we were able to capture Annie's interactions with the Starr Centre Visitors, but we know little about Annie's social network outside of those interactions. If, for instance, we had data linking Annie to a local church or sorority, then she too would represent a bridge between the Starr Centre and other facets of the black community.

Visitor 1 and Visitor 2 also appear to hold important, structurally equivalent roles within the network. The Starr Centre visitors are viewed as structurally equivalent because they are connected in the same ways to other structurally related points such as to Annie and Susan Wharton. As structurally equivalent actors in the network, the visitor's roles are viewed as substitutable, meaning if Visitor 1 was unavailable, then Visitor 2 could assume her responsibilities. The presence of structurally equivalent network actors would have been particularly important when serving large numbers of Starr Centre members as, for example, visitors could help to support one another with caseloads and could also provide enhanced coordination of services. SNA visualization also helps to reveal alternatives to traditional organizational flow diagrams. If Figure 5.1 were to be shifted 90 degrees the visualization structure would be a traditional top-down organizational structure, where information flows in one direction (top to bottom). Our representation, which incorporates attribute and relational data from the historical record, introduces a competing explanation where the role and function of a variety of stakeholders influence the flow of information within the Starr Centre network.

Analyzing the structure of the Starr Centre

Centrality is another core concept in SNA that answers critical questions about which individuals occupy positions of power, prestige, and visibility. Highly central individuals can be influential in the spread of diseases, ideas, or behaviors. Three of the most widely used measures of centrality are degree, closeness, and betweenness centrality. Degree centrality is a measure of individual or local network activity and is calculated by the total number of ties to and from an individual. A person who has a high degree centrality is connected to many people in the group.

Both closeness and betweenness centrality are measures of centrality that take account of the pattern of ties of the overall network. Closeness centrality is a measure of a person's communication role, or how reachable an individual is to all other people in the network, and is calculated by measuring the average distance (or paths) an individual is from all other individuals (or "nodes"). This measure of social distance would be useful

Table 5.2 Centrality measures for the Starr Centre members

	<i>Degree centrality (total no. of ties)</i>	<i>Closeness centrality (average distance between members)</i>	<i>Betweenness centrality (information control)</i>
Starr	1	0.125	0.000
Wharton	3	0.200	3.000
Visitor 1	3	0.200	1.000
Visitor 2	3	0.200	1.000
Annie	2	0.143	0.000

if you needed to know who could rapidly communicate information through a network because you would want to start with the person who can reach all other ties through the fewest number of people. For example, a person with high closeness centrality would be the ideal person to discuss important health information with Starr Centre members. The final centrality measure, betweenness centrality, measures information control. A person with a high betweenness centrality is strategically located with ties to other people who have high centrality values, but may not necessarily have a large number of ties. The person with high betweenness centrality can function as a gate-keeper by allowing or not allowing information to flow to ties with lower betweenness centrality. Centrality for the five individuals in the Starr Centre example is derived from the data provided from Table 5.1 and is shown in Table 5.2. Here we illustrate how each individual captures slightly different aspects of centrality. As can be seen from Table 5.2, Wharton, Visitor 1, and Visitor 2 have the highest degree and closeness centrality. However, Wharton stands out when we examine betweenness centrality values. Wharton occupies a strategic position in the network connecting the visitors, executive Board members and black members of the Starr Centre.

Measures such as centrality often serve as proxies for social distance and may illuminate class structure and power dynamics between and among group members. While our records do not permit a nuanced exploration of class within and between Starr Centre members, the application of SNA using historical sources reveals a clear pattern of power and prestige evidenced through Wharton’s role as the “gate-keeper” and central organizer for Starr Centre mission, vision, and programming. In this capacity she was a central figure for the control of critical information and resources. Our results also reveal the equally critical roles of Visitors 1 and 2. Due to their high degree of centrality evidenced through their frequent contact with a range of members across the Centre’s network, they were highly visible and more apt to interact with Starr Centre members at different levels of the organization.

Discussion

Our application of SNA to historical sources helped to support many of the findings of the Brooks Carthon original historical research. Relational and structural patterns that were evident in the historical record were made more explicit through the application of a network perspective. In particular, SNA helped to reveal how the structure and composition of Starr Centre membership networks influenced the flow of resources and how an individual's receipt of information shifted depending on their position in the Centre. Our use of historical methods and SNA also helped us to affirm who the most central person(s) working in the Starr Centre were, which aided in facilitating our understandings of the role of stakeholders and provided insight into the paths that information may have traveled in order to reach constituents. In addition, we were able to challenge a top-down narrative related to the flow of information within the Starr Centre network through visualization techniques to demonstrate how the structurally equivalent roles of some actors served as support mechanisms, thereby enhancing coordination of care, increasing communication, and reducing social distance between Starr Centre affiliates.

This endeavor was not without its challenges. We did not for instance have access to data about all individuals in the Starr Centre network, which in some cases prevented comprehensive analysis of all actors. The absence of these records limited our ability to draw conclusions about potential interactions between Starr Centre constituents and may have particularly silenced the voices of black members of the Starr Centre, who were often mentioned only briefly in annual reports. Since the application of SNA was completed retrospectively, we were restricted to data that was previously collected, hence our ability to formulate questions might have been altered had the methods been applied simultaneously at the outset of the original project.

Data limitations also prevented us from examining the formation of subgroups and cliques within the Starr Centre network. While the historical records indicated that Starr Centre visitors made over 41,000 visits to the homes of black Starr Centre members in 1911, the individual records for each of these visits were not present in the archive. If we had all relationships between all Starr Centre affiliates accounted for we could have also looked to see where cliques existed and who was in them, the number of bridges (individuals who, if removed, would break the single network into two unconnected networks), how many people individuals had to go through to reach other individuals (geodesic distance), who was in the core or center of the network, and who was on the edges or periphery. Notwithstanding these limitations, a number of interesting findings emerged from the given data, which reinforced results revealed in the original historical evaluation.

Consideration for future users

Successful application of historical SNA hinges on the researcher's ability to access archival data that can infer relationships among a group of individuals or larger entities, such as hospitals or organizations. The use of a variety of archival records such as newspapers, court records, membership rosters, patterns of citations among scholars,

and other publicly available information is needed to create data matrices for SNA. The extent to which one can collect information such as the types of ties, similarity or difference of those ties, quality of tie (strong/weak), what is transmitted across ties (information/beliefs), and how it is transmitted (talking/sexual activity) are important aspects to explore in archival materials. However, the historical record is often incomplete, hence gaining access to complete sources and inferring network specific information may be difficult unless one is working with data from multiple sources.

Further limiting the integration of SNA with historical methods is the lack of researcher knowledge in using SNA software programs, such as UCINET and NetDraw. Most graduate-level history students receive limited course work in quantitative methods. Schools with quantitative courses rarely include historical research within the coursework, hence students often do not see how such an integration might work and are subsequently forced to seek training outside their university.⁴⁶ However, many sources of training are now being offered, including free online materials (see Node XL and <http://faculty.ucr.edu/~hanneman/nettext>). We also highly recommend collaborating with colleagues who perform SNA in other disciplines.

Conclusion

This chapter examined both the benefits and the limitations of an integration of historical and SNA methods and theories. Our exploration of the early decades of the Starr Centre offers an illustration of this merger in action. While data limitations present a challenge to broad usage of SNA by many historians, it presents an innovative method, which may add interesting and provocative insights to the historical research and analytic process.

Notes

- 1 C. Wetherell, 1999, "Theory, method, and social reproduction in social science history: A short Jeremiad," *Social Science History*, vol. 24, no. 4, p. 494.
- 2 American Historical Association, 2011, *Historical social network analysis: A practicum*. American Historical Association Annual Meeting. Boston: American Historical Association, 86.
- 3 K. Blanchet and P. James, 2012, "How to do (or not to do) . . . a social network analysis in health systems research." *Health Policy and Planning*, vol. 27, no. 5, p. 439.
- 4 M. Emirbayer and J. Goodwin, 1994, "Network analysis, culture, and the problem of agency," *American Journal of Sociology*, vol. 99, no. 6, pp. 1411–1454.
- 5 S. Wasserman and K. Faust, 1994, *Social network analysis: Methods and application*, Cambridge University Press, New York.
- 6 L. Freeman, 2004, *The development of social network analysis: A study in the sociology of science*, Empirical Press, Vancouver, p. 244.
- 7 L. Freeman, 2004, *The development of social network analysis*, p. 244; J. Moreno, 1934, *Who will survive?*, Nervous and Mental Disease Publishing Company, Washington, DC; S. Wasserman and K. Faust, 1994, *Social network analysis*; C. Wetherell, 1994, "Network analysis comes of age," *Journal of Interdisciplinary History*, vol. 19, no. 4, pp. 645–651.
- 8 S. P. Borgatti, A. Mehra, D. J. Brass, and G. Labianca, 2011, "Network analysis in the social sciences," *Science*, vol. 323, pp. 892–895.

- 9 L. Freeman, 2004, *The development of social network analysis*, p. 244; J. Moreno, 1934, *Who will survive?*
- 10 S. P. Borgatti et al., 2011, "Network analysis in the social sciences."
- 11 A. A. Adimora and V. J. Schoenbach, 2005, "Social context, sexual networks, and racial disparities in rates of sexually transmitted infections," *Journal of Infectious Diseases*, vol. 191, no. 1, pp. S115–S122.
- 12 D. Knoke and J. H. Kuklinski, 1982, *Network analysis*, Sage, Beverly Hills, CA.
- 13 C. Wetherell, 1999, "Theory, method, and social reproduction in social science history." See also M. S. Granovetter, 1973, "The strength of weak ties," *American Journal of Sociology*, vol. 78, no. 6, pp. 1360–1380. C. Wetherell, A. Plakans, and B. Wellman, 1995, "Social networks, kinship, and community in Eastern Europe," *Journal of Interdisciplinary History*, vol. 24, no. 4, pp. 639–663.
- 14 M. S. Granovetter, 1973, "The strength of weak ties," pp. 1360–1380.
- 15 L. F. Berkman, T. Glass, I. Brissette, and T. E. Seeman, 2000, "From social integration to health: Durkheim in the new millennium," *Social Science & Medicine*, vol. 51, no. 6, pp. 843–857. For other readings on the relationship between social networks and health see: L. F. Berkman, 1986, "Social networks, support and health: Taking the next step forward," 1986, *American Journal of Epidemiology*, vol. 123, no. 4, pp. 559–562; S. Cohen, 1989, "Psychosocial models of the role of social support in the etiology of physical disease," *Health Psychology*, vol. 7, no. 3, pp. 269–297; J. Holt-Lundstad, T. B. Smith, and J. B. Layton, 2010, "Social relationships and mortality risk: A meta-analytic review," *PLOS Medicine*, vol. 7, no. 7, p. e316; D. A. Luke and J. K. Harris, 2007, "Network analysis in public health: history, methods, and applications," *Annual Review of Public Health*, vol. 28, pp. 69–93; T. W. Valente, 2010, *Social networks and health: Models, methods, and application*, Oxford University Press, New York.
- 16 B. H. Erickson, 1997, "Social networks and history: A review essay," *Historical Methods*, vol. 30, no. 3, pp. 149–157.
- 17 K. Blanchet and P. James, 2012, "How to do (or not to do) . . . a social network analysis in health systems research," pp. 438–446.
- 18 C. Lipp, 2005, "Kinship networks, local government, and elections in a town in southwest Germany, 1800–1850," *Journal of Family History*, vol. 30, no. 4, pp. 347–365.
- 19 J. F. Padgett and C.K. Ansell, 1993, "Robust action and the rise of the Medici, 1400–1434," *American Journal of Sociology*, vol. 98, no. 6, pp. 1259–1619, quote on page 1260.
- 20 *Ibid.*, p. 1277.
- 21 *Ibid.*, p. 1278.
- 22 N. Rosenthal, M. Fingrutd, and M. Ethier, 1985, "Social movements and network analysis: A case study of nineteenth-century women's reform in New York State," *American Journal of Sociology*, vol. 90, no. 5, pp. 1022–1054.
- 23 M. C. Alexander and J. A. Danowski, 1990, "Analysis of an ancient network: Personal communication and the study of social structure in a past society," *Social Networks*, vol. 12, no. 4, pp. 313–335.
- 24 A. Hillier, 2010, "Invitation to mapping: How GIS can facilitate new discoveries in urban and planning history," *Journal of Planning History*, vol. 9, no. 2, pp. 122–134.
- 25 M. C. Alexander and J. A. Danowski, 1990, "Analysis of an ancient network," pp. 313–335.
- 26 *Ibid.*
- 27 M. Emirbayer and J. Goodwin, 1994, "Network analysis, culture and the problem of agency," pp. 1411–1454.
- 28 *Ibid.*, p. 1428.
- 29 M. Emirbayer, and J. Goodwin, 1994, "Network analysis, culture and the problem of agency," pp. 1411–1454.
- 30 M. B. Carthon, 2011, "Making ends meet: Community networks and health promotion among Blacks in the city of Brotherly Love," *American Journal of Public Health*, vol. 101, no. 8, pp. 1392–1401.

- 31 A. F. Davis, 1973, *The peoples of Philadelphia: A history of ethnic groups and lower class life, 1790–1940*, Temple University Press, Philadelphia.
- 32 M. B. Carthon, 2011, “Making ends meet.”
- 33 U.S. Bureau of the Census, 1968, *Negro population in the United States, 1790–1915*. Government Printing Office, Washington, DC, pp. 350–351.
- 34 S. T. Mossell, 1921, The standard of living among one hundred negro migrant families in Philadelphia,” *Annals of the American Academy of Political and Social Science*, vol. 98, pp. 174–175.
- 35 W. E. B. Dubois, 1899, *The Philadelphia negro: A social study*. University of Pennsylvania Press, Philadelphia, pp. 147–163; V. P. Franklin, 1979, *The education of black Philadelphia: The social and educational history of a minority community, 1900–1950*, University of Pennsylvania Press, Philadelphia.
- 36 Starr Centre Association, Charter and Bylaws of the Starr Centre Association, 1905, Starr Centre Collection, Box 9, Folder 105, p. 4, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania; Starr Centre Association, Constitution, by-laws, and minutes of Annual and Board of Directors, 1900–1906, Starr Center Collection, Box 1, Folder 1, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania.
- 37 E. J. G. Beardsley, 1911, “The value of the intelligent direction of the sick poor – A story of the Starr Centre Association of Philadelphia,” *Therapeutic Gazette*, vol. 3, no. 27, pp. 400–403.
- 38 S. P. Wharton, 1903, Starr Centre First Annual Report, Starr Centre Collection, Box 4, Folder 41, pp. 2–4, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania.
- 39 Starr Centre Association, *A Few Facts about the Starr Centre*, nd, Starr Centre Collection, Box 6, Folder 109, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania; Starr Centre Association, untitled pamphlet, 1907, Starr Centre Collection, Box 9, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania.
- 40 Starr Centre Association, Charter and Bylaws of the Starr Centre Association, 1905, p. 4; Starr Center Association, Annual Board of Directors Meeting Minutes, 1900, Box 1, Folder 5.
- 41 M. B. Carthon, 2011, “Making ends meet,” pp. 1392, 1394. See also S. P. Wharton, 1903, Starr Centre First Annual Report, Starr Centre Collection, Box 4, Folder 41, pp. 2–4.
- 42 S. P. Wharton, 1909, “Negro Branch of the Starr Centre,” Starr Centre Collection, Box 6, Folder 104, p. 4, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania.
- 43 Starr Centre Association, 1911, “Annual Report,” Starr Centre Collection, Box 4, Folder 42, p. 7, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania.
- 44 Starr Centre Association, 1909, “Annual Report,” Starr Centre Collection, Box 4, Folder 41, pp. 4–5, The Barbara Bates Center for the Study of the History of Nursing Archives, University of Pennsylvania.
- 45 M. B. Carthon, 2011, “Making ends meet,” p. 1392. See also Starr Centre Association, 1909, “Annual Report.”
- 46 Ibid.; A. Hillier, 2010, “Invitation to mapping: How GIS can facilitate new discoveries in urban and planning history,” *Journal of Planning History*, vol. 9, no. 2, pp. 122–134.

This page intentionally left blank