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Social Network Analysis and Professional Practice: Exploring New Methods for Researching Technical Communication

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This article provides background on social network analysis, an innovative research paradigm that focuses on the importance of social networks. The article begins by giving background on the development of social network analysis and different methods used by social network analysis researchers. The article then examines how these methods can be used in the field of technical communication by focusing on how technical communicators form social networks and connect diverse audiences.

keywords: method, networks, professional practice, social network analysis, sociology

The profession of technical communication is remarkably diverse. Technical communicators work as writers, editors, user-interface experts, information architects, and designers, to name a few of an even longer list of positions. The variety of tasks that fit under the umbrella of technical communication can make it difficult to define the field or describe the professional roles of technical communicators in organizations. Common among these positions, however, is that they require collaboration. Whether writing technical reports or helping design user interfaces, practitioners' work requires them to work closely with others. These connections may be even more important for technical communicators than other professionals because the technical communicator's role is often that of translating information from one audience to another. Consequently, it is not surprising that Hart and Conklin (2006) found the ''function of technical communication is not usually pictured as the creation of a product, but rather is seen as creating linkages across a complex, networked organization'' (p. 407).

Technical communication researchers have turned to approaches such as activity theory (AT) and actor-network theory (ANT) to understand the roles networks play in knowledge production (Potts & Jones, 2011; Swarts, 2010). These different approaches to understanding networks have proved valuable and influential for understanding that the production of knowledge is always relational, particularly in Spinuzzi's (2008) book, *Network: Theorizing Knowledge Work in Telecommunications*, in which he puts AT and ANT into conversation. AT and ANT are both excellent at conceptualizing the sociotechnical nature of networks and examining the roles that actors—both human and nonhuman—play in the formation and maintenance of knowledge ties. ANT has proved particularly useful in analyzing the role of technologies in the production of knowledge (Graham, 2009; Potts & Jones, 2011), and AT has provided technical communication scholars with a valuable framework for analyzing how people make connections and use objects to shape goal-directed behavior (McNair & Paretti, 2010).

With the adoption of ANT and AT, technical communication researchers have addressed the importance of various networks. As I discuss in more detail, however, there is another approach to understanding networks that will help researchers begin answering a different set of questions focused more on the position of technical communicators in various professional networks: social network analysis (SNA). SNA is focused on the social connections people make and how those connections both enable and constrain behavior. Consequently, by drawing from SNA to map and conceptualize the social networks in which technical communicators operate, researchers will be able to better understand the roles technical communicators play in organizations, the multiple audiences they connect, and how technical communicators' network positions may provide them with opportunities to shape various types of information production.

Similar to AT and ANT, SNA is a theory rather than a method. Certain methodological approaches, however, are closely related to the study of SNA. By shedding light on both the theoretical assumptions and the methodological approaches typically found in SNA and by describing examples of how they can be applied to the study of technical communication, I hope to introduce our research community to an approach that may further our understanding of the importance of technical communicators' positions inside various professional networks.

This article provides background on the development of SNA and explains different approaches. I first compare ANT and AT to SNA to explain how SNA can provide a different type of analysis that will be useful for the study of technical communication. I then offer a brief history of SNA and discuss the epistemological assumptions of SNA researchers. After providing background on SNA, I then discuss methodologies closely associated with SNA and elaborate upon how they can be applied to the study of technical communication. My argument is not that SNA is a better approach than ANT or AT; rather, I hope to show through this comparison that SNA provides a different type of analysis that can help the technical communication research community better understand how information spreads through social networks.

UNDERSTANDING NETWORKS

AT and ANT are both postcognitive theories useful for understanding the formation and maintenance of the social world. They are also influential theories of technology that view human cognition as distributed through heterogeneous networks of both human and nonhumans. AT and ANT contrast with cognitive theories that make the same assumptions as much of Modernist theory, pointing to what Pickering (2010) called the ''Modern self'' and viewing the self as self-contained and locatable within the individual. Instead, AT and ANT view the self as distributed in wider heterogeneous networks. The two theories do differ in some significant ways. For example, key to ANT is the principle of symmetry, arguing that humans and nonhumans play an equal role in the networks that maintain the social world (Latour, 2005). In this way, ANT is similar to object-oriented ontology, which views objects and humans as equal actors (Bogost, 2012). AT, on the other hand, takes a less radical, asymmetrical view of networks. AT retains the subject-object dichotomy and theorizes that human actors exert a unique form of agency that nonhumans do not have; an emphasis on human intentionality is a key part of the theory (Kaptelinin & Nardi, 2006). Although there are obvious differences between these two approaches, both AT and ANT reject the isolated individual as a sufficient unit of analysis and see activity and cognition as distributed throughout a network.

SNA has some commonalities with both AT and ANT and is also primarily concerned with networks and how agency is distributed beyond the individual. SNA, however, does not share AT's cultural/historical focus nor ANT's focus on machinic agency and symmetrical networks. Instead, SNA views social relationships through the lens of network theory, identifying individual actors as a set of nodes that are tied to other nodes. Unlike traditional cognitive theories, agency in SNA is not found in the individual (the node); instead, agency is found in the ties the nodes are able to enact in ways that are similar though not identical to AT and ANT. SNA also draws from significantly different epistemological assumptions and tends to draw heavily from structuralism (Scott & Carrington, 2011), whereas AT and ANT share more with postcognitive theory (Kaptelinin & Nardi, 2006). In SNA, structures (the ties among nodes) are seen as the major determinant of action rather than the goal-directed behavior of AT or the constantly in flux assemblages of ANT. SNA is also primarily focused on social networks, which are most typically individuals or corporations, although SNA can be used to study other objects as well.

I next briefly discuss two articles published in technical communication journals to better detail how SNA can provide a different type of analysis than ANT and AT. The first article is Potts and Jones' (2011) discussion of networks of social media sites such as Twitter. The authors use ANT to analyze the sociotechnical networks of the social web, focusing on the relationships among human actors and technological actors and the prescriptions of the technologies they analyze. They also draw from an AT approach to actions and operations to discuss design implications for understanding how to improve the sociotechnical networks of the social web. The second article is Spinuzzi's (2012) discussion of ''coworking'' sites in Austin, Texas, which are locations at which people who do not work in traditional offices go to work with other professionals. Spinuzzi drew from fourth-generation AT to analyze the practices of people who cowork. He specifically focuses ''on how these professionals collaboratively construct coworking through their talk and texts'' (p. 400). He used AT to describe the activity systems at these coworking sites by analyzing the material site, the actors present in a coworking environment, and the outcomes of coworking.

Researchers approaching the same objects of study (the social web, coworking sites) from an SNA perspective would likely be interested in addressing significantly different research questions that could also be valuable to the study of technical communication. An SNA approach would typically focus more on mapping and visualizing the human connections necessary to spread information through a network. Potts and Jones (2011) analyzed how human actors and technical actors form a network of relations on the social web that enables different types of knowledge production. Using the methods typical to SNA approaches detailed in this article, researchers would instead likely map how tweets travel through multiple social networks as they are retweeted again and again, each time reaching a different audience (Bakshy, Hofman, Mason, & Watts, 2011). This form of network mapping focuses on elements different from an ANT approach and emphasizes network nodes that have more power in facilitating how information moves through a site such as Twitter. An SNA approach would yield different results if it focused on Spinuzzi's (2012) object of study as well. Rather than focusing on the material site of the coworking office or the goal-directed behaviors of the site's actors, an SNA approach would instead likely map the social networks of the individuals working at the site. Through the mapping of their social networks, SNA could reveal whether off-site workers have fewer connections than do people in their organization who work in a more traditional office. The mapping of the

individual social networks could then be used to examine whether the act of coworking constrains or enables different types of professional connections necessary to succeed in organizational life.

Comparing AT, ANT, and SNA shows that these approaches are all valuable for answering different research questions. SNA is primarily concerned with mapping individuals' network positions, which will be a useful addition to technical communication research. To better understand how we can use SNA to understand technical communicators' positions in various organizational networks, I now turn to a discussion of the history and epistemological assumptions of SNA.

SOCIAL NETWORK ANALYSIS

With the recent growth of Facebook and similar sites, the term *social network* has entered the popular imagination. Sites such as LinkedIn encourage people to build their professional networks; Academia.edu focuses on the public display of personal academic networks; Technical Writing World is a social networking site devoted solely to technical communicators. Social networks have also gained increased attention from researchers in disciplines ranging from computer science to cultural studies. However, the study of social networks has a history that long predates the rise of Internet-based social network sites. This interest can be seen in the development of SNA, which has long been concerned with the mapping of social networks, defined as ''a set of socially relevant nodes connected by one or more relations'' (Marin & Wellman, 2011, p. 11).

SNA has a long tradition in the social sciences but did not gain significant popular attention until physicist Duncan Watts' (2003) work on ''small world'' networks in the early 2000s. Watts, and Barabási (2003)—another physicist—applied advanced mathematical models to human connections and found that the way we form networks tends to follow a ''scale-free'' distribution similar to the distribution of other phenomena such as Internet links and high temperature superconductors. A scale-free network at its most basic follows a power distribution and includes ''hubs'' that feature significantly higher numbers of connections than other nodes (Barabási & Albert, 1999). Watts and Barabási's findings showed that social networking connections are not randomly distributed; rather, certain nodes are far better connected.

Although Watts and Barabási's work in experimental physics popularized SNA, their work ignored a long tradition of sociological approaches to studying social networks (Freeman, 2011). SNA actually goes back to the Chicago School of Sociology in the early 20th century, and arguably even further back to some of Simmel's (1950) early work on urban life (Scott & Carrington, 2011). Earlier approaches focused mostly on the qualitative tracing of social connections, but quantitative approaches have gained the majority of SNA attention over the past few decades. There have been important analyses, such as Granovetter's (1973) work on the importance of weak ties for job hunters, that have made valuable contributions to what we know about the social world. Other researchers, such as Wellman (1988, 2001; Wellman, Quan Haase, Witte, & Hampton, 2001) and Hampton (Hampton, Sessions, & Her, 2011; Hampton & Wellman, 2001) have also made valuable contributions using SNA approaches that focus on how people use new technologies to make and maintain social connections.

SNA is a structuralist paradigm that decenters the human in interesting ways by focusing mainly on how social networks shape behaviors and achievement. Unlike ANT and AT

approaches, SNA focuses on social structure rather than the sociotechnical mixing of humans and nonhumans. The focus on social structure raises questions about individual agency, and many SNA researchers believe that ''causation is not located in the individual, but rather the social structure'' (Marin & Wellman, 2011, p. 13). Put differently, ''Structured social relationships are a more powerful source of sociological explanation than personal attributes of system members'' (Wellman, 1988, p. 31). Consequently, rather than looking for the influence of variables that are attributes of the individual, SNA studies focus on how people are influenced by their social network, decentering individuals in ways that contrast with typical variable-analytical approaches. With SNA, the network is the variable that matters. Whereas a traditional sociological approach may use low socioeconomic status or race as variables to explain a lack of access to employment opportunities, SNA approaches study how a group's social network lacks connections with the nodes necessary for adequate employment opportunities, positioning individual outcomes as the result of a mediating network function. Rather than argue that people act the same way because they are similar, SNA looks at how people act on one another to shape each other's actions (Marin & Wellman, 2011, p. 13). This is an obviously simplified description of a research tradition that goes back decades, but it identifies that the network as mediator is the core concept of SNA.

SNA's conceptualization of agency as the result of network structure shares some similarities with contemporary agency scholarship in technical communication research. Recent technical communication scholarship has moved away from the humanist view of rhetor as self-contained agent. Instead, technical communication scholars have pushed towards a more networked view of agency, though the ways they conceptualize those networks are different. For example, Graham (2009) analyzed the disease fibromyalgia to show how positron emission tomography was an important agent in the network that helped establish fibromyalgia as a ''real'' disease. Herndl and Licona (2007) also viewed agency as networked, arguing that agency exists at ''the intersection of a network of semiotic, material, and, yes, intentional elements and relational practices'' (p. 151). Koerber (2006) discussed how women negotiate agency when dealing with the discourses surrounding breast feeding. She acknowledges that the networks of these discourses often force women into predefined subject positions that reduce their ability to resist, but she also argues that agency can be found in the ways women negotiate among competing messages and refuse to be fully constrained by preexisting subject positions. Winsor (2006), in a longitudinal study of four engineers, found that agency could be located in the actors' connections and was not a contained attribute of the individuals. She indicated that ''rhetorical agency, the authorship of one's rhetorical actions, is not an individual attribute but rather the result of a conjunction of opportunities'' (p. 427).

Although these analyses of agency do have differences, they all share the view that agency is networked and relational. As I explained earlier, SNA also argues that agency is a networked function not contained within individual actors. SNA, however, approaches agency from a more structuralist position and views agency as the result of one's position inside a social network rather than a discursive or sociotechnical network. Consequently, SNA can be used to approach the roles of technical communicators and how they wield power differently than other approaches to agency, yet does not represent a complete break from the development of agency theory in technical communication. To better understand how SNA seeks to map individual actors' position inside a network, it helps to delve more deeply into the methods most closely associated with the approach.

The majority of SNA researchers rely on quantitative methods to visualize networks, and as Scott and Carrington (2011) stated, ''At the heart of social network analysis is the branch of mathematics called graph theory'' (p. 4). Graph theory in SNA maps how nodes are connected through ''edges'' (defined as ties between nodes). By mapping the edges connecting nodes, SNA researchers are able to visualize who is connected to whom and to better understand how certain actors inside networks connect high numbers of other nodes. SNA applications of graph theory can range from the macro level of mapping how information travels through huge networks like Twitter (Bakshy, Hofman, Mason, & Watts, 2011) to smaller scale analyses of the social networks in a single community (Hampton & Wellman, 2003).

Larger scale SNA studies typically involve mapping whole networks (see Figure 1), and there are two broad possible models that social ties in large networks can follow. The first model is the egalitarian network in which ''most nodes (people or organizations) possess fairly similar numbers of links on a normal distribution'' (Urry, 2004, p. 115). The other model is the aristocratic network. Aristocratic networks are characterized by a few large nodes that have disproportionately large numbers of ties. These nodes then typically hold significant power in the network because they are better able to shape how information travels. An example of an aristocratic network is the contemporary configuration of the World Wide Web in which a few nodes contain the large majority of Web traffic.

Full network analyses are useful for understanding who or what wields influence in a network. By mapping the nodes connecting large numbers of other nodes, researchers are able to identify people (or organizations or web pages) that become points of passage through which information must move. These analyses are also able to identify the nodes that have higher ''bridging'' social

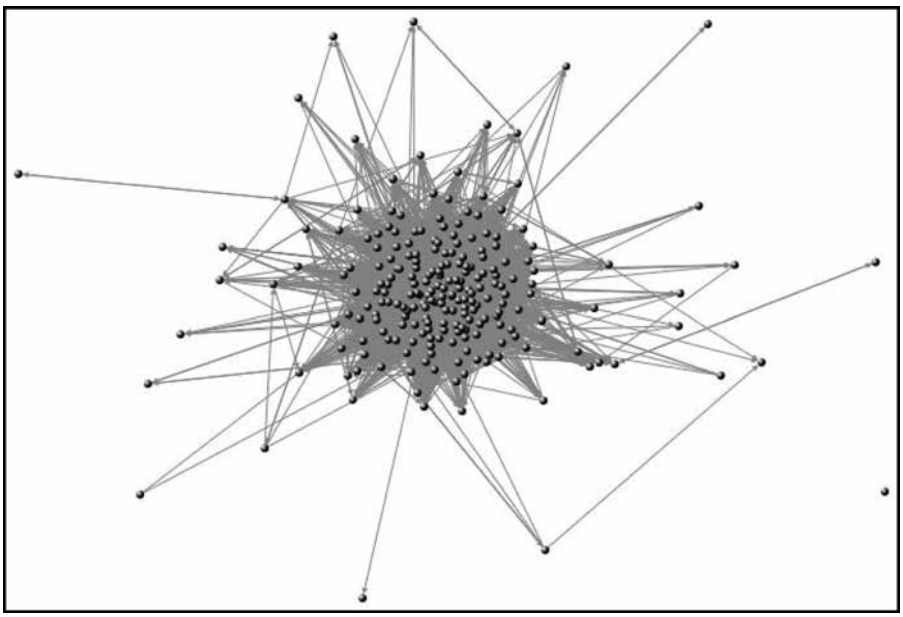

FIGURE 1 Visualization of who follows whom on @jmswisher's ''technical communication'' Twitter list.

capital (Putnam, 2000). Bridging capital is the ability to act as a go-between for two relatively insular groups. For example, in a high school filled with social cliques, the person who is friends with the cheerleaders as well as the drama club can serve as a bridge between these two groups. This person also can play a role in the information each group receives because information does not simply ''flow'' from node to node in an outdated form of Shannon and Weaver's (1949) transmission model of communication; information is instead shaped by the nodes through which it passes. To understand where bridging social capital is located, full network analyses are necessary to identify the nodes that link groups. In the next section, I return to how these full network analyses can be useful in studying technical communication.

A different approach to SNA is the egocentric approach. In egocentric approaches to SNA, the individual is the center of the visualization and the nodes mapped are the ones that relate to the individual (see Figure 2). These approaches work with a large number of participants to compare personal networks and look for patterns, differences, and reoccurrences. Egocentric networks consist of the *ego*—the center of the network—and *alters*—the nodes the ego is connected to (Chua, Madej, & Wellman, 2011). Visualizations of egocentric networks center on the ego and the alters radiate outwards, their positions depending upon their relationship to the ego. Although egocentric analyses take the individual as a starting point, the goal of the research is to move past individual-focused models and to understand the role one's network plays in shaping behavior. Ultimately, whereas whole network analyses seek to map entire organizations, egocentric analyses seek to map different social networks from the starting place of individual actors to better understand how ties limit or enable access to certain resources.

The two most common approaches to collecting egocentric data are the name generator and the position generator (Chua et al., 2011, p. 106). Name generator approaches ask participants to

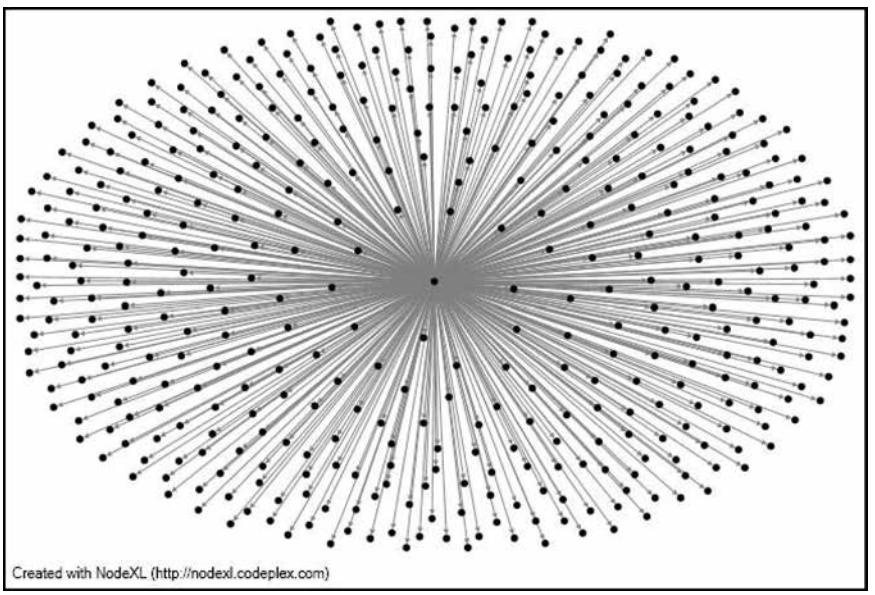

FIGURE 2 Visualization of the author's Twitter network created using NodeXL.

list names of people who meet criteria defined by the researchers. Typically, there are two approaches to compiling name generator data. One is to ask participants who their ''best friends'' are, and another is to ask participants to identify alters ''with whom they exchange specific resources'' (Chua et al., 2011, p. 106). An influential example of the second approach is the question ''who would you borrow a large sum of money from?'' (Fischer, 1982). But researchers could also ask work-specific questions as a way to map where the ego turns to accomplish specific work tasks. The name generator step is sometimes followed by a name interpretation step in which the ego is asked to give details about the alters. These details likely should be limited to a few core areas because, as Gaag (2005) warned, ''there is a practical reason to limit the number of relationship attributes and alter attributes in the name interpretation part of the interview'' (p. 82).

Position generator approaches also focus on the ego, but rather than asking participants to volunteer information about ties, researchers ask individuals if they have connections with alters in other positions in the social structure. For example, researchers may ask participants if they know lawyers, janitors, doctors, teachers, and financial advisors. These types of broad status-marking positions have traditionally been used in position generator approaches, but researchers could also apply these methods to gauge someone's connections within an organization by instead including a list of positions that pertain to the organization. Position generators are a good way of teasing out connections across levels of society (or an organization), and Chua and colleagues (2011) argued they are better at determining an ego's weak ties because participants are forced to think about linkages that might not arise in name generator approaches.

Egocentric approaches can operate on both a large and small scales and can either focus on the aggregation of personal networks or closely examine a smaller number of networks. On the smaller scale, they can also become part of a broader qualitative approach to SNA that may be beneficial to technical communication researchers. Although qualitative research plays a role in many SNA approaches, it is often relegated to the position of testing out ideas as a first step in larger scale quantitative analyses; however, some researchers focus on the importance of qualitative research as a stand-alone method in understanding meaning in social networks. As Fuhse and Mützel (2011) stated, ''qualitative research is indispensable for an 'understanding' of the meaning inextricably intertwined with any structure of social networks'' (p. 1068). Using the concepts of SNA to understand qualitative data has a long history that traces back to early Chicago School analyses and studies in Symbolic Interactionism. Mapping structure is still important in qualitative approaches, but the focus is more on understanding how the structure works than on quantifying it. Quantitative SNA has been criticized for ignoring meaning in its attempt to map social realities. By reifying networks without exploring how they operate on the micro-level, SNA work can fail to account for ''the linguistic forms, narratives, cultural practices, and expectations embodied in networks'' (Fuhse & Mützel, 2011, p. 1078).

Qualitative SNA researchers conduct in-depth interviews with the goal of understanding egocentric networks and revealing how individual actors construct meaning and are constrained inside those networks. The goal is not to perfectly represent participants' ties, but rather to delve into how the ties operate. A combination of interviewing and ethnographic approaches have been used to study entrepreneurial firms (Uzzi, 1997), social movements (Mische, 2008), and how the urban poor use their networks to find employment (Smith, 2005). These qualitative approaches can also be primarily textual, using an archive of texts to map connections between

actors, as in Mclean's (1998) account of the patronage system in 15th-century Florence or Crossley's (2008) account of the Manchester music scene in the 1970s.

Qualitative approaches involve their own methodological assumptions. The first, and most important, is openness. Whereas quantitative approaches choose a field before analysis and map it, one of the strengths of qualitative research is the ability to redefine the network as the researcher gathers more data. With an open ethnographic approach, ''as much data as possible are collected from multiple sources to shed light on the phenomenon from different angles: observation data, documents, interviews, diaries, and questionnaires'' (Hollstein, 2011, p. 410). Researchers must draw from the sources available to them and use their skills to determine the best path forward. Although this approach—as with much qualitative research—can be a messy process, it can also lead to nuanced understandings of the meanings of network formations that are not available from more generalizable quantitative approaches.

Before concluding this section, it is important to note that none of these methods are exclusive to SNA approaches, nor are these the only methods available to SNA researchers. As I stated earlier in this article, SNA is ultimately a structuralist paradigm that believes agency can be found more accurately in social relations than individual actors. Consequently, SNA is a paradigm through which data are interpreted, not an a priori set of methods. Although graph theory is most closely related to SNA, a researcher operating from another theoretical perspective (e.g., ANT) could also map networks using graph theory and analyze data using a different theoretical toolkit that examines different factors than the roles social ties play in determining power and agency. Recognizing the difference between SNA as a research theory and SNA as a method is even more important in understanding qualitative approaches to SNA. Researchers operating in various theoretical frameworks perform ethnographies and interviews. The research questions they seek to answer from their qualitative work are shaped by the paradigm they operate under, and they ideally pick the best method to answer their research questions. As a paradigm interested in the role social networks play in shaping information and power, SNA researchers would begin with the goal of mapping social relationships and then use their structuralist assumptions to understand their interview data, field notes, or textual analyses. Whether the research is quantitative or qualitative, researchers choose particular theories to interpret their data, and SNA, rather than providing only a defined set of methods, provides a theoretical lens through which researchers can understand the importance of social networks.

TECHNICAL COMMUNICATION AND SNA

Returning to the introduction of this article, the areas of technical communication practice SNA can help study are technical communicators' webs of connections and collaborative practices. The roles of technical communicators in organizations often involve communicating information to multiple audiences, including groups of subject-matter experts and the public. Freelance technical communicators also work in dense webs of connections that often can be the key to success or failure in their profession. Yet, the approaches to understanding networks taken in technical communication research, despite their many strengths, tend not to focus on mapping and visualizing the larger social networks in which technical communicators operate. AT and ANT are much better at analyzing the heterogeneous nature of networks and ways networks can guide goal-directed behavior; however, as I noted earlier, researchers who take an SNA approach will

likely be guided by research questions that focus more specifically on how technical communicators connect diverse groups of nodes inside organizations.

The ability to better understand social networks is beneficial because technical communication research is filled with accounts of technical communicators working with others (Thompson, 2001). For example, Conklin (2007) showed through qualitative work with professionals that ''the practice of technical communication is becoming more interactive and collaborative and less solitary and textual'' (p. 210). Existing research has examined how collaboration plays out in practice, but there are still gaps in our knowledge. Namely, much of the research on collaborative practices tends to either theorize technical communicators' organizational roles or qualitatively examine their collaborative practices. For example, Harrison and Debs (1998) drew from systems theory to conceptualize how technical communicators operate in organizations, and they argue that we should think of practitioners as ''boundary spanners'' who ''bridge social and physical distances between groups of individuals within and outside the organization'' (p. 6). As a qualitative example, Jones (2005) showed through ethnographic work how the adoption of new digital technologies altered professional writers' organizational roles. These approaches are valuable, but they can benefit from research that takes an SNA approach. Harrison and Debs' (1998) concept of ''boundary spanners'' could be aided by SNA research seeking to confirm their theory. Qualitative examinations of how new media affect technical communicators' roles could also benefit from SNA approaches that show how the adoption of company intranets or content management systems may alter the connections technical communicators must make in their professional organizations. Consequently, to better understand how social networks shape the ways technical communicators do their jobs, it will be beneficial for technical communication scholars to explore some of the approaches used in SNA, though as with any interdisciplinary project, researchers should do so carefully and familiarize themselves with the epistemological underpinnings of SNA.

Understanding these epistemological underpinnings is crucial because SNA should not be viewed simply as a set of methods for investigating social networks; SNA is a theory in its own right that espouses an updated form of structuralism. To many SNA researchers, it is the structure that matters, not the individual. Agency is found in the larger network, arguably leaving little room for individual agency (Emirbayer & Goodwin, 1994), an epistemological position that may sit uneasily with decades of detailed research that examines the creative roles technical communicators play in information production (Bekins & Williams, 2006). I argue, however, that there is much value to be found in various SNA approaches if applied carefully, especially in the ways these approaches can be used to map the positions of technical communicators in organizations and possibly to explore the interplay between structure and individual agency.

The recognition of the importance of social position provides a valuable framework from which to analyze how information spreads through social relations. As Fuhse and Mützel (2011) wrote, ''Social relations in this regard are understood as channels through which particular resources, such as information, friendship, goods, or money flow'' (p. 1072). The connections (or edges) in an SNA analysis map how certain actors become important nodes that facilitate multiple connections and information flows. These connections can reveal the key actors who connect nodes, especially in scale-free visualizations of information hubs that are connected to a disproportionately high number of other nodes. In many workplaces, technical communicators serve as the information hubs and become a point of passage that connects multiple audiences that may otherwise be separate. The tasks they perform are both enabled

and constrained by their access to resources inside an organization, and the ways in which SNA provides a theoretical framework for understanding social networks and methods for mapping those networks can provide a different conceptualization of how these networks operate from AT and ANT approaches that do not focus specifically on mapping human actors.

There are multiple ways SNA could be approached with technical communicators, such as the whole network approaches described previously. These approaches can be exploratory, in the sense that they may set out to map an unknown network, or they can define a network beforehand to view how documents and other information travel among different nodes. Each employee (or branch of an organization) would become a node, and researchers would map the edges connecting the nodes. In this way, a whole network analysis could be used to understand how different groups relate to each other and to identify hubs that connect different groups of experts.

A whole network approach would be ideal for understanding the role technical communicators play in connecting groups because researchers would be able to visualize how technical communicators become passage points for information that travels between different groups of subject matter experts and the public. For example, different parts of organizations likely would be represented as clusters of nodes. A group of engineers probably would be densely tied together, and the same goes for design teams, legal teams, public relations groups, and so on. In many of these networks, technical communicators are the sources of bridging capital that link these relatively dense clusters, such as those described in Rude and Eaton's (2011) discussion of the role technical editors play in document production (pp. 3–10). Rude and Eaton explained how technical editors are often in contact with writers, instructional designers, programmers, and graphic artists, serving as a link among those diverse groups. In the authors' hypothetical example, the technical editor ''is the one person on the team with whom all the other team members interacted'' (p. 3). Technical editors also often become hubs that connect multiple clusters to the public. Similarly, a full network analysis may reveal technical communicators as vital nodes in the aristocratic networks of different organizations and shed light on the bridging roles of technical communication practitioners. These approaches can also show how certain technical communicators may be constrained in networks by their lack of connections to certain groups inside an organization. In these ways, SNA can be used as an approach to establish the role technical communicators play in organizational networks while also revealing how the lack of access to certain node clusters may limit professionals' reach inside an organization.

Other approaches include name and position generator egocentric methods. These two approaches are often applied to studying social structure in general, but they can also be tailored to technical communication research. For example, rather than asking people to generate a list of their friends, researchers could use the name generation method to ask technical communicators to list the people they communicate with inside an organization. They could also use an even more tailored approach to map the connections technical communicators make to complete different projects and then use the concentric circle visualizations to gauge the frequency with which egos (in this case, technical communicators) communicate with each alter. A position generator approach would be used to compare how technical communicators are positioned differently inside organizations and to visualize how different areas of the profession (e.g., technical editors vs. technical writers vs. user-interface experts) interact with different groups while also exploring how lack of connections in some cases may impact practitioners.

The second approach to name generation also can be beneficial to technical communication research. In this approach, participants are asked to name people they would turn to for specific resources. Researchers could customize this approach to examine work-based resources that are specific to technical communication (e.g., where would you turn for software documentation information?). Position generator approaches would work in much the same way, though they may require researchers to possess knowledge of organizational structure before beginning the field work. Researchers would ask technical communicators about different subject matter experts and to indicate whether they knew anyone at different positions within the organization. By aggregating this information, it would be possible to observe variations in the roles of different technical communicators and to note patterns that emerge in the data. These different egocentric approaches can take a less structural approach than macro-level analyses because they center on how individuals view their own networks.

Qualitative approaches that view relations through an SNA lens address the problem of structure even more obviously and allow researchers to explore how individuals conceptualize their networks. Qualitative SNA has a long history, but as Chua and colleagues (2011) noted, much of this older research focused on the spatially bound neighborhood and neglected ''other important bases of community such as workplaces, voluntary organizations and online worlds'' (p. 103). Through ethnographic work, researchers will be able to examine how technical communicators manage and use workplace connections while also possibly being constrained by the reach of their networks. Ethnographic work may not be able to capture as full an account of a practitioner's network as name and position generator approaches, but a more qualitative approach that uses SNA as a framework will be able to examine these ties in more detail than the visualized connections of name and position generators. SNA also provides a paradigm through which researchers can analyze ethnographic data, focusing on the mediating power of the network and how the connections one makes influence behavior and access rather than focusing solely on specific attributes of the individual.

Similar to other qualitative research, technical communication researchers who utilize a qualitative approach to SNA will likely draw from multiple data gathering methods. These may include a cursory name generation approach (although on a smaller scale than a strictly egocentric approach), in-depth interviews, ethnographic observations, questionnaires, diaries, and textual analysis. For example, researchers may begin by observing technical communicators in the workplace and compiling field notes about their interactions. They may then ask participants questions about those interactions and request that they keep a running diary of whom they interact with on a daily basis. These sources of data may then be supplemented by online logs of chat records or email correspondence to give researchers an even fuller understanding of who participants communicate with on a daily basis, an approach that shares some similarities with Hine's (2007) work on ''connective ethnography.'' Unlike with other SNA approaches that are more about representing a network, qualitative methods are about understanding the network, an approach that could open up new avenues for technical communication research.

CONCLUSION

Technical communication research has a long tradition in of adapting approaches first explored in other disciplines. For example, grounded theory first gained popularity in studies of nursing

(Charmaz, 2006; Glaser, 1978; Glaser & Strauss, 1967) and ethnography arose in early anthropology (Lindlof & Taylor, 2002). The goal of this article is to bring attention to an approach that has been developed in other disciplines to study the structure and importance of social networks. As I argue, SNA can be adapted to fit the needs of the technical communication research community to better understand the professional networks in which technical communicators operate.

As professionals who translate information among audiences, it is important to understand ways in which technical communicators are positioned within networks of discourse and production. I show in this article that SNA provides a valuable framework for understanding how technical communicators interact with and link multiple audiences in order to translate technical information among stakeholders. By understanding the tenets of SNA, technical communication researchers will be able to adapt these approaches to their research and also work collaboratively with people in other disciplines who are also interested in understanding the role of social networks. Although these approaches are certainly not replacements to the variety of methods researchers have developed to study technical communication, they provide a new avenue for understanding the technical communicator's role in connecting diverse audiences in the 21st-century workplace.

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