

Social Networks in Education - Literature Review and Proposed Research Approach

Prepared for Washtenaw Intermediate School District

September 2014



In the following report, Hanover Research presents an overview of social network theory and its application in the field of education. We include an overview of the potential ethical, methodological, and logistical challenges to conducting social network analysis in a school setting. The report also outlines our proposed research projects to conduct social network analysis in Washtenaw Intermediate School District.

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EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

In recent years, social network analysis has become a popular tool in examining how people in organizations relate to one another. Researchers have shown that something as basic as happiness spreads through a network. In fact, someone who has a direct connection to a happy person is 15 percent likely to be happier. Interestingly, this finding holds (although to a lesser degree) out to three degrees of removal (i.e., I'm happier if my friend's friend's friend is happy).¹ If happiness can spread through a network in this way, it stands to reason that other things, especially information, should also be able to spread through a network. Knowing who the most connected people are in a given network, such as a school, can help shed light on how information travels through the network, and conversely can be used to help improve the spread of information through the network.

In this report, we examine the literature on social networks, and enumerate potential projects that Hanover Research can conduct, on behalf of Washtenaw Intermediate School District (Washtenaw), using these methods. This report comprises the following sections:

- **Section I: Social Network Theory.** This section begins with the general approach and assumptions of social network analysis, as well as the key measures we can evaluate and calculate using social network analysis. We also examine some core examples of how social network analysis has been used in the K-12 setting. Finally, we enumerate some important considerations (ethical, logistical, and methodological) in conducting social network analysis in schools.
- **Section II: Annotated Bibliography.** This section presents key articles on the use of social networks analysis in education. The articles Hanover Research includes in this section are the ones with applicable research designs and/or interesting research findings that are particularly relevant to the research we propose to do on behalf of Washtenaw.
- **Section III: Proposed Research Approach.** This section presents an outline of the research methodology and projects Hanover proposes to conduct on behalf of Washtenaw.

¹ Christakis, Nicholas A and James H. Fowler, *Connected: The Surprising Power of Our Social Networks and How They Shape our Lives*, New York: Little Brown, 2009.

KEY FINDINGS

SOCIAL NETWORKS RESEARCH

- **Social network analysis examines both who people are connected to and how they are connected.** At the most basic level social network analysis analyzes who is connected to whom. However, how people are connected also matters. Social network analysis thus also looks at how many ties people have, if those ties are reciprocal, and how strong those ties are.
- **The structure of the social network affects how people interact.** Since individuals are interdependent, how they are connected in the aggregate is also important. For this reason, social network analysis also includes measures of network density and centrality.
- **Teachers have both expressive and instrumental networks.** Teachers connect with their colleagues on a personal (contact outside of work, personal guidance) and professional (collaboration, asking advice) level. The type of connection(s) teachers share affect the type of information transmitted through their network.
- **Social networks can lead to positive externalities.** If one teacher shares what she learned in training with the other teachers she is connected with, the teacher who did not attend the training may still implement the new strategy in her own classroom.

CONDUCTING SOCIAL NETWORK ANALYSIS

- **Conducting social network analysis in schools present ethical and logistical concerns.**
 - Teachers need to be willing to answer social network questionnaires openly and honestly for researchers to be able to accurately analyze the structure of the network. Teachers need reassurance that the findings from this type of survey will not lead to punitive actions by either school or district administrators.
 - Network analysis is sensitive to missing data. Teachers need to be encouraged to complete the survey carefully, while the instrument should minimize the burden on the respondent.
- **Research has shown that social network questionnaires accurately capture the true relationships teachers have with their colleagues.** While the measurement validity of surveys are often of concern, research shows that if teachers are asked about specific types of interaction with their colleagues, they report interaction related to the specified type of interaction and do not report unrelated interaction.

PROPOSED RESEARCH

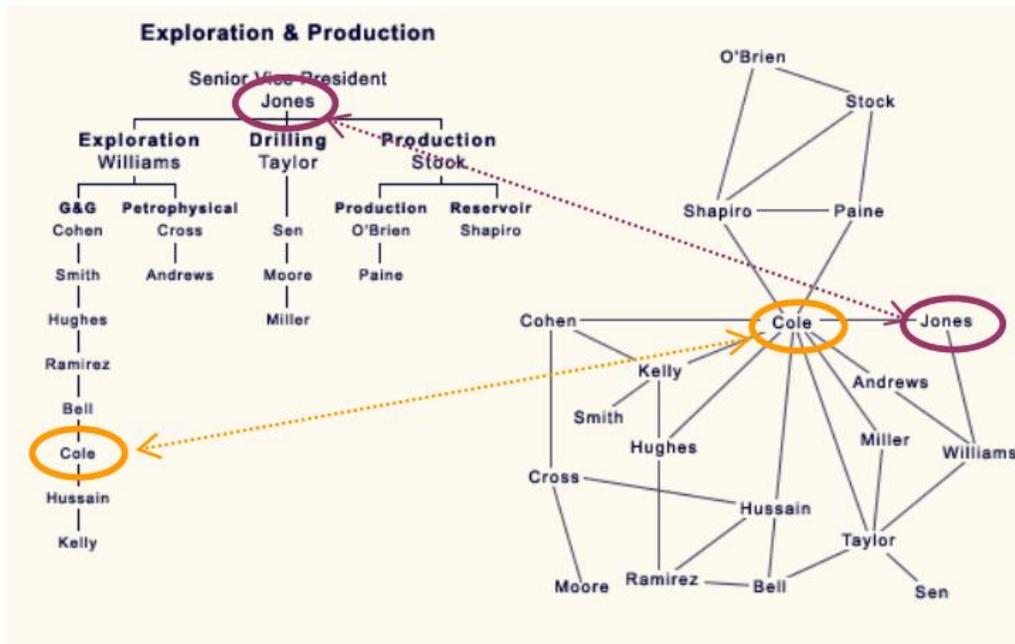
- **Hanover proposes to design a School Staff Social Network Questionnaire (SSSNQ) and pilot the survey in a single school in Washtenaw.** Carefully designed SSSNQs have been shown to accurately capture network data in a school setting. By piloting the survey, any potential issues can be address and corrected before a large number of teachers have completed the survey.
- **Hanover proposes a district by district roll out of the SSSNQ and to conduct two separate data analysis projects for each district.**
 - The first analysis will identify characteristics of the network structure within each school using common social network data analysis methods. Hanover will be able to produce a basic analysis of the data, summarizing the staff members with the greatest number of connections as well as the average number of connections within each school (as well as within subsets of the school such as grade levels or departments).
 - Hanover will also investigate the possibility of conducting a second analysis, which will compare network structures between schools. By conducting the social network analysis in one district at a time, overarching patterns of network structures in the district will emerge. This data can also be used to identify differences in network structures at schools within the district. This phase of the research will entail using advanced social network data analysis methods to compare the structure of networks. *Hanover is continuing to investigate the possibility of conducting this type of analysis.*

SECTION I: SOCIAL NETWORK THEORY

AN OVERVIEW

Social network theory rests on the assumption that individuals are connected to one another and that resources flow through these connections. Access to information, knowledge, and innovation are the most common types of resources that flow through these connections.² Organizations usually have formal structures; e.g., in a school district there are the district administrators, school principals, vice-principals, department heads, etc. However, individuals do not always access information and resources (solely) through these formalized structures. By analyzing the social network within an organization, we can determine how people are connected in actuality. Figure 1.1., below, displays the results from a social network analysis that a company undertook to understand who was sharing pertinent information. The chart on the left of the image presents the formal organization structure of the company, while the social network on the right indicates the additional connections outside of the formal organization reporting/management structure. Notice specifically that “Cole”, although a relatively junior employee in the official organization structure, is actually centrally connected and serves as the only link between those working in production and the rest of the company.³

Figure 1.1: Organization Chart vs Social Network⁴



² Daly, Alan J and Kara S Finnigan. “The Ebb and Flow of Social Network Ties between District Leaders Under High-Stakes Accountability.” *American Education Research Journal* 48:1, February 2011, pp 39-79.

³ [1] Ehrlich, Kate and Inga Carboni. “Inside Social Network Analysis.” *Collaborative User Experience Technical Report*. IBM Corporation, 2005. [2] Cross, R et al. “Knowing What We Know: Supporting Knowledge Creation and Sharing in Social Networks.” *Organizational Dynamics* 30:2, 2001, pp 100-120.

⁴ [1] Ehrlich and Carboni, Op. cit. [2] Cross et al., Op. cit.

In examining the ties (connections) between people, social network theory relies on key factors that describe the network and the members of that network. In its most basic form, social network analysis simply examines who is connected to whom. But *how* individuals are connected also matters. For example, respondents share different information with someone they view as a personal friend than with someone they view purely as a colleague.

Ties can be *reciprocal*, meaning that the connection goes in both directions, or unidirectional. Some relationships and interactions are by definition reciprocal (two people who regularly meet have a reciprocal relationship) while others are not (Adams can ask Brown for advice, but if Brown never asks Adams for advice the relationship is not reciprocal). Reciprocal ties tend to be stronger than unidirectional ties.⁵

The *strength* of ties also matter. Two individuals have a strong tie when they have high quality and/or frequent interaction. Strong ties often entail multiple types of connections, such as personal, career-related, or emotional. These are also the people who form an individual's support system. While strong ties are important for transferring complex knowledge, weak ties help individuals to access new information.⁶ This is the same reason that you are, for example, more likely to learn about a new job opportunity from a casual acquaintance (a weak tie) than a good friend (a strong tie).⁷

However, since social network theory assumes that individuals are interdependent, it also takes into account two specific features of the structure of the network to understand how the members of that network interact; centrality and density.⁸

Centrality: Centrality looks at the connectedness of individuals in the network. Centralized individuals (like "Cole" in Figure 1.1) exert more control over resources, have increased influence over the network and are more innovative.⁹ Centrality can be measured in terms of *degree*, which is a simple count of the number of connections each individual has to another individual in the network. Centrality can also be measured in terms of *closeness*, which looks at how many people a person must go through to reach all others in the network. A person with many close connections can exert power through bargaining and the exchange of information. The person also acts as a "reference point" by which other actors judge themselves, and by being a center of attention [whose] views are heard by

⁵ Ehrlich, Kate and Inga Carboni. "Inside Social Network Analysis." *Collaborative User Experience Technical Report*. IBM Corporation, 2005.

⁶ Hansen, M. T. "The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge Across Organization Subunits." *Administrative Science Quarterly*, 44(1), pp 82 -111.

⁷ Sundarajan, Arun. "Your Casual Acquaintances on Twitter are Better Than Your Close Friends on Facebook." *Wired.com*, September 2013. <http://www.wired.com/2013/09/your-friends-have-informational-deficit-which-is-why-we-need-weak-ties/>

⁸ Marsden, Peter V. "Recent Developments in Network Measurement." *Models and Methods in Social Network Analysis*. Ed. Peter J. Carrington, John Scott, and Stanley Wasserman. Cambridge University Press, 2005, pp 8

⁹ [1] Daly, Alan J and Kara S Finnigan. "The Ebb and Flow of Social Network Ties between District Leaders Under High-Stakes Accountability." *American Education Research Journal* 48:1, February 2011, pp 39-79. [2] Tsai, Wenpin. "Knowledge Transfer in Intraorganizational Networks: Effects of Network Position and Absorptive Capacity on Business Unit Innovation and Performance." *Academy of Management Journal* 44:5, pp 996-1004.

larger numbers of actors.”¹⁰ Finally, centrality is measured in terms of *betweenness*. Someone with high betweenness, lies on the path to many other individuals, which gives them the opportunity to act as brokers of information and contact to other individuals.¹¹

Density: Density is a measurement of the share of actual ties present in the network as a share of all possible ties. This measure captures how closely members of a group are to one another, and can be an indicator of the speed with which information will travel through the network.¹² Networks with high density have been associated with higher levels of performance and increased flow of information, although it may reduce the amount of new ideas and/or novel information introduced to the network and primarily foster the movement of commonly known or redundant information.¹³

SOCIAL NETWORK ANALYSIS IN EDUCATION

Social Network Analysis has been used to identify how individuals in a school (or district) setting relate to, and engage with, one another. Researchers have used social network analysis to determine how knowledge, advice, and innovation related to district wide reform policies flow through the network, and how the institution of these reforms change the structure of the network and how people interact.¹⁴

Social network analysis has also been used to shed light on the variety of ways in which teachers interact and relate. The relationships between teachers can be divided into expressive (contact outside of work, personal guidance) and instrumental (collaboration, asking advice) relationships, with an underlying differentiation between how independent or interdependent each relationship structure makes teachers.¹⁵

Understanding the structure of teachers’ social networks, and thus how they relate to other teachers and administrators, can have important implications for how school districts and schools approach implementing new programs. Teachers’ decisions on how to implement new policies or navigate the demands of multiple competing policies are shaped by both their formal and informal networks at school.¹⁶

While much of social network analysis focuses on informal relationships and de facto leaders, it can also shed light on how teachers interact with formal leaders. While we normally think of formal leaders as educators holding full-time leadership roles, such as principals or vice-principals, we should also take into account the role that part-time leaders

¹⁰ Hanneman, Robert A and Mark Riddle. *Introduction to Social Network Methods*. Riverside, CA: University of California, Riverside, 2005. Published in digital form at <http://faculty.ucr.edu/~hanneman/>

¹¹ Ibid.

¹² [1] Hanneman and Riddle, Op. cit. [2] Daly and Finnigan, Op cit.

¹³ Daly and Finnigan, Op cit.

¹⁴ Ibid.

¹⁵ Moolenaar et al. “The Social Fabric of Elementary Schools: A Network Typology of Social Interaction Among Teachers.” *Educational Studies* 38:4, 2012, pp 344-371.

¹⁶ Coburn, Cynthia E. “Collective Sensemaking about Reading: How Teachers Mediate Reading Policy in Their Professional Communities.” *Educational Evaluation and Policy Analysis* 23:2, 2001, pp 145-170.

play. Teachers who also serve as department leads or mentors in addition to their teaching duties may play central roles in schools' advice and information networks, acting as brokers in helping teachers form connections with other teachers and serving as experts on subject-related topics.¹⁷

Interaction in a social network can also have positive externalities when information gained in professional development training and seminars are diffused through the network to teachers who did not attend the training. Teachers who did not attend training personally, but who interact with colleagues who went to the training and receive help on the topic covered in the training may be more likely to incorporate the new teaching methods in their own teaching.¹⁸

IMPORTANT CONSIDERATIONS IN CONDUCTING SOCIAL NETWORK ANALYSIS

ETHICAL CONSIDERATIONS

The type of data collected through social networks surveys may be potentially sensitive. While these questionnaires shed valuable light on teacher relationships and interactions, they cannot provide the same level of anonymity, or even confidentiality, as other types of surveys can. First of all, both participants and their identified connections must be identified by name. Second, even if a teacher opts out of participating in the survey, he or she may still be identified by other teachers participating in the survey.¹⁹

Additionally, even in results where teachers are not identified by name, but just by grade level and school, they may still fear that the administration will react to patterns observed in the data. This is of particular concern if those actions are punitive in nature.²⁰

LOGISTICAL CONSIDERATIONS

To be able to get a clear sense of what the social network looks like, and how people are connected, the researcher must gather network information on the largest share of members possible. Missing data in social network studies can severely bias the results and give an incomplete, or worse, incorrect, picture of the structure of the network.²¹

By using an online survey instrument which relies on logic and piping to customize questions based on respondents' previous answers, the survey can be made less cumbersome than a

¹⁷ Spillane, James P and Chong Min Kim. "An Exploratory Analysis of Formal School Leaders' Positioning in Instructional Advice and Information Networks in Elementary Schools." *American Journal of Education* 119:1, November 2012, pp 73-102.

¹⁸ Penuel, William R et al. "Using Social Network Analysis to Study How Collegial Interactions Can Augment Teacher Learning from External Professional Development." *American Journal of Education* 119:1, November 2012, pp 103-136.

¹⁹ Penuel, William R et al. "Investigating the Potential of Using Social Network Analysis in Educational Evaluation." *American Journal of Education* 27:4, December 2006, pp 437-451.

²⁰ Ibid.

²¹ Huisman, Mark. "Imputation of Missing Network Data: Some Simple Procedures." *Journal of Social Structure* 10:1, 2009.

paper version of the same instrument would be. By providing a list of all staff members in a school, we also decrease the likelihood that someone omits a connection to another person. However, teachers and staff at schools implementing these surveys will need to be encouraged to complete the survey honestly and completely.

METHODOLOGICAL CONSIDERATIONS

Researchers have shown that social network questionnaires are valid measurement tools to identify relationships between school faculty and administrators. Using social network questionnaires in a school setting accurately identifies informal leadership structures when teachers are prompted about interactions related to specific subjects (e.g. math; reading, writing and language arts; and the teacher's main subject).²²

²² Pitts, Virginia M. and James P Spillane. "Using Social Network Methods to Study School Leadership." *International Journal of Research & Methods in Education* 32:2, July 2009, pp 185-207.

SECTION II: ANNOTATED BIBLIOGRAPHY

This section presents key articles on the use of social networks analysis in education. The articles included here are those with applicable research designs and/or interesting research findings that are particularly relevant to the research we propose to do on behalf of Washtenaw.

Daly, Alan J and Kara S Finnigan. “The Ebb and Flow of Social Network Ties between District Leaders Under High-Stakes Accountability.” *American Education Research Journal* 48:1, February 2011, pp 39-79.

- <http://aer.sagepub.com/content/48/1/39>

Daly and Finnigan’s research examines the role of social networks in under-performing schools that are engaged in district-wide reforms. They use a longitudinal study, looking at social networks related to knowledge, advice, and innovation at two periods in time in La Estasis School District in the Los Angeles, California area. They also supplement the network data with informational interview data.

Daly and Finnigan find differences in the structure of the network between the two different time periods. In particular they find that “over time, network structures resulted in closed, reciprocated relations within work locations (school vs. central office) but little interaction across these groups.” In particular, they find that over time, the knowledge network closed, indicating that leaders were more likely to interact with individuals they already knew and interacted with previously, rather than seeking out new contacts to share the reform knowledge with. These findings suggest that instead of increasing district-wide communication and reforms, networks became closed and location specific, hampering the transmission of knowledge, advice, and innovation.

Moolenaar, Nienke M et al. “The Social Fabric of Elementary Schools: A Network Typology of Social Interaction Among Teachers.” *Educational Studies* 38:4, 2012, pp 344-371.

- http://www.tandfonline.com/doi/abs/10.1080/03055698.2011.643101#.U_3N9fldVD
B (Abstract only)

Moolenaar et al. analyze seven types of social networks that reflect the social interactions between teachers in elementary schools in the Netherlands, to determine how different social networks are structured and function. They base their selection of the seven social networks to examine on interviews with teachers on how they interact with other teachers.

Figure 2.1: Seven Social Networks Examined²³

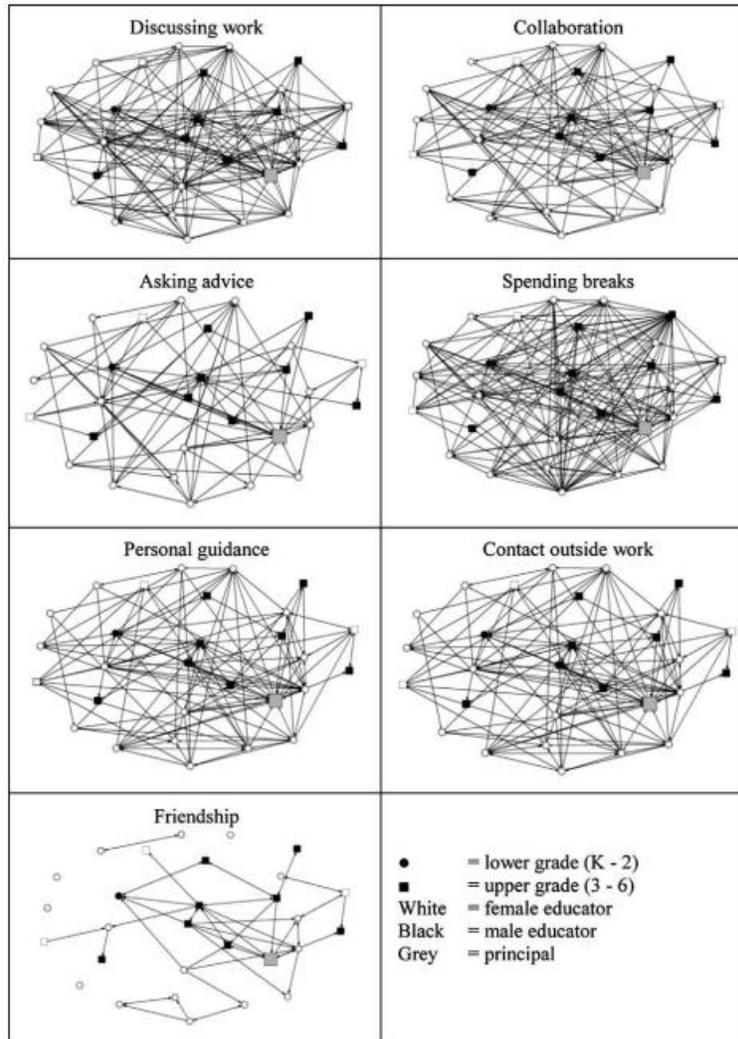
Network	
Discussing work	Whom do you turn to in order to discuss your work?
Collaboration	With whom do you like to collaborate the most?
Asking advice	Whom do you go to for work related advice?
Spending breaks	With whom do you like to spend your breaks?
Personal guidance	Whom do you go to for guidance on more personal matters?
Contact outside work	Who do you sometimes speak outside work?
Friendship	Who do you regard as a friend?

Moolenaar et al. find that there is a clear distinction between networks. Relationships that relate to personal guidance, contact outside work, and friendship can be thought of as expressive networks, while those related to discussing work, collaboration, and asking advice can be group together and thought of as instrumental networks. Additionally, they find that there is a second dimension along which social relationships may fall, namely the level of independence/interdependence. For example, spending breaks with another teacher does not increase teacher interdependence, whereas asking for advice does.

They find that the density of these networks differ substantially, with the friendship network being the sparsest. There is also a notable difference between the level of social connectedness indicated by male teachers and female teachers. Figure 2.2 presents the observed social networks in one of the schools in which Moolenaar et al. conducted the social network analysis.

²³ Moolenaar et al., Op. cit.

Figure 2.2: Visualization of Observed Network Connections²⁴



Penuel, William R et al. “Investigating the Potential of Using Social Network Analysis in Educational Evaluation.” *American Journal of Education* 27:4, December 2006, pp 437-451.

▪ <http://aje.sagepub.com/content/27/4/437.short>

Penuel et al. examine teacher views (and concerns) related to the collection and sharing of social network data. They argue that the data collected through social network surveys may be sensitive or political, may include people who have not consented to participate in the study (since respondents name others who they interact with by name), and does not obscure individually identifiable survey answers in aggregate presentations.

²⁴ Moolenaar et al., Op. cit.

They interviewed 141 school staff members from schools that had at least one school-wide reform effort. Interviewers spoke with both teachers who were perceived to be on the periphery of the reform effort and those who were centrally involved, in order to get a diverse perspective. The interviews focused on “teacher interactions and school-level communications, concerns about collecting data about teachers’ ties to colleagues, and concerns about sharing social network data with the school community.”

Penuel et al. find that 32 percent of respondents thought that asking social network questions in schools would not be problematic, while 62 percent thought it was problematic but feasible with the right modifications. Respondents raised concerns about privacy and undermining the collaborative nature present in the school. Sixty percent of respondents thought that it would be problematic to share social network data with the school. Respondents were concerned about increased isolation, negative repercussions, competition among teachers, negative impacts on friendships among teachers, and using the data as an accountability tool to hold teacher accountable for collaboration goals.

Pitts, Virginia M. and James P Spillane. “Using Social Network Methods to Study School Leadership.” *International Journal of Research & Methods in Education* 32:2, July 2009, pp 185-207.

- <http://bit.ly/1tagwhb>

Pitts and Spillane undertake a research study to verify the instrument validity of School Staff Social Network Questionnaires (SSSNQ). In part, this research aims to help identify alternate leaders in school settings. Research has shown that while principals are the designated school leaders, others (including teachers with no formal leadership designations) will also take leadership roles in the school.

They conducted both a social network analysis using an SSSNQ and interviews in which respondents were observed and asked to think aloud while completing a modified version of the SSSNQ. They find that the SSSNQ accurately identifies individuals who are central to the network but are not identified as leaders in the organizational structure of the organization, and that SSSNQ is thus a valid measurement tool to learn more about leadership structures (and the flow of information and knowledge) in schools.

By using interviews to verify the results from the SSSNQ, Pitts and Spillane show that teachers are accurately identifying the types of interactions the survey intended to ask about. However, they show that SSSNQ may be underreporting teachers observing other teachers in the classroom, unsolicited advice-giving, and informal discussions (bouncing around ideas in passing). They also find that respondents are more likely to recall recent or on-going interactions (known as the recency effect) and less likely to report interactions that happen infrequently. Pitts and Spillane make suggestions for possible rewording of survey prompts to minimize the underreporting effects noticed in their analysis.

Spillane, James P and Chong Min Kim. "An Exploratory Analysis of Formal School Leaders' Positioning in Instructional Advice and Information Networks in Elementary Schools." *American Journal of Education* 119:1, November 2012, pp 73-102.

▪ <http://www.jstor.org/stable/10.1086/667755> (Abstract only)

Spillane and Kim examine social networks in 30 elementary schools in an urban school district to determine what similarities and difference exists in how formally designated school leaders fit into their schools' social networks. For the purposes of this study, they include both full-time and part-time leaders. Thus, a teacher who is, for example, both a mentor to a junior teacher and a full-time teacher himself would be considered a part-time leader, and a full-time principal or vice-principal would be considered full-time leaders.

Overall, Spillane and Kim find that principals are not central figures in their schools' social networks, and that they are relatively rarely approached by teachers seeking advice in math and language arts. Interestingly, they found that in schools where the principal was a central figure, both the mathematics and language arts networks were denser.

In general, they find that formal leaders (regardless of whether they were full- or part-time leaders) were centrally located in the schools' social networks on advice and information. They find that formal leaders have more connections with colleagues than teachers with no leadership role, and that part-time leaders were especially central in the mathematics networks. Formal leaders are also more likely to broker relationships among other staff members (e.g. introducing a new teacher to a teacher who can help her with math lessons), although this is more likely to be a part-time leader in the math network and a full-time leader in the language arts network.

Spillane and Kim conclude that their research suggests that part-time leaders are in a unique position in that they are viewed as experts due to their formal leadership role, but remain relatable to other teachers, since they are seen as peers.

SECTION III: PROPOSED RESEARCH APPROACH

PROPOSED PROJECT #1: PILOT A SOCIAL NETWORK SURVEY IN ONE SCHOOL

The first step in conducting social network analysis is collecting data on how individuals relate to one another in the network. The standard way to get at this data in a school setting is to design and implement a School Staff Social Network Questionnaire (SSSNQ). Since SSSNQs are complicated tools, and there are a few legitimate concerns in conducting social network analysis in a school setting, **Hanover strongly recommends beginning this project as a pilot study.**

Together with Washtenaw, Hanover will work to identify the key social networks of interest. Since individuals relate to one another in a multitude of ways, it is important to define the relationships that we are interested in. Additionally, logistically speaking, teachers will only be able to respond to a finite number of social network questions with any accuracy. We thus want to limit the number of networks we examine to ensure that the data we gather is high quality data.

Beyond specifying the particular questions the analysis need to address, and determining the ideal networks to ask about, Hanover will need a complete list of faculty and staff at the pilot school as well as at the district office. Hanover will also rely heavily on Washtenaw to encourage and support teachers and staff to participate in the survey and answer all questions openly and honestly.

Once the data has been gathered, Hanover will be able to look at the distribution in the number of connections teachers have, the number of those connections that are reciprocal, and the strength of those connections, as well as highlighting the teachers with the most connections. Hanover will also investigate the possibility of using social network data analysis techniques to calculate the various measures associated with network analysis. In particular, Hanover will look at calculating overall measures of the network, such as density and centrality, and producing graphs illustrating the network at the school.

PROPOSED PROJECT #2: DISTRICTWIDE SOCIAL NETWORK SURVEYS IN A SINGLE DISTRICT

Once Hanover has successfully concluded the pilot study, the survey can be rolled out to other schools in the district. Together with Washtenaw, Hanover will make changes/updates to the survey instrument based on the results and findings from the pilot survey.

The data needs for this survey will be the same as the pilot study. Again, Hanover will hopefully be able to use the data to calculate various measures of network structure overall and more specific measures of the number and types of connections teachers have, while also potentially producing graphs illustrating the network structure. As in the first project, the exact scope of the analysis may vary somewhat.

PROPOSED PROJECT #3: COMPARATIVE NETWORK STRUCTURE ANALYSIS IN A SINGLE DISTRICT

Once an entire school district has been surveyed and Hanover has conducted the initial analysis to lay out the structure of the network, we can use the data to compare schools within the same district. Given that people's interactions vary depending on who they are interacting with, it is reasonable to expect that we will see variation in the structure and functioning of the social networks at different schools.

This type of analysis can shed light on the overall patterns observed throughout the district under examination, as well as any schools that have network patterns that look substantially different from those observed in other schools in the district. As with projects 1 and 2, the scope of this study may change somewhat as Hanover investigates its capability to conduct this analysis.

ADDITIONAL PROJECTS: CONDUCTING PROJECTS 2 AND 3 IN ALL DISTRICTS

Hanover will be able to extend this analysis to the other school districts in the Washtenaw Intermediate School District. The extension to each new district will happen in two phases: first Hanover will field the SSSNQ in schools throughout the district and calculate network structure and relationship measures within each school, second Hanover will conduct a comparative analysis of the social network at schools within each district.

PROJECT EVALUATION FORM

Hanover Research is committed to providing a work product that meets or exceeds partner expectations. In keeping with that goal, we would like to hear your opinions regarding our reports. Feedback is critically important and serves as the strongest mechanism by which we tailor our research to your organization. When you have had a chance to evaluate this report, please take a moment to fill out the following questionnaire.

<http://www.hanoverresearch.com/evaluation/index.php>

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