

Libby Hemphill, School of Information, University of Michigan Research Statement

When we talk about getting things done, whether it's finding a job or getting a project finished at work, we often say, "It's not what you know but who you know." I believe there's at least one other component to the story: how you engage the people you know. I study collaboration, and my research shows that the people we work with and the ways in which we manage and coordinate those relationships have big impacts on the work we are able to accomplish. The term "collaboration" refers to many, large intellectual spaces, and I focus on projects where participants are oriented toward a common goal such as developing a new software application. I'm interested in collaboration because when we collaborate with others we have opportunities to learn what they know and to complement our expertise with their abilities; by working together we can learn and accomplish things that we cannot do on our own. For instance, I've studied biomedical researchers developing vaccines for infectious diseases (Teasley, Schleyer, Hemphill, & Cook, 2008) and international software teams creating new applications (Hemphill & Begel, under review). Theories of social capital, practice, and interaction can help explain some of the relationships among who we know and what we can accomplish; I aim to advance those theories and to enable new kinds of collaborative work. My goals in this statement are to explain my current research by describing interesting aspects of my recent projects and to briefly discuss my plans for future work.

Social capital theories explain how resources such as wealth, status, and power are embedded in social networks, and how those resources can be used to increase information flow, to establish credentials, and to accomplish cooperative work. Many of these theories focus on individuals and what they stand to gain or lose from their position in social networks. For instance, some studies ask how job seekers benefit from their social networks (e.g. Granovetter, 1973). Structural holes theory (Burt, 2001) formalizes the notion of social capital and argues that individuals who connect otherwise unconnected networks have advantages in autonomy and opportunity. I focus on the collaboration or project level, and instead of asking, "How does this network influence what an individual can do?" I ask, "How does this network influence what the network can do?"

For instance, in my dissertation, I study a collaborative construction project that produced a highway bridge. The bridge contains sections made from a novel kind of concrete that was invented by a university materials research lab. Part of my dissertation describes the structure of the social network of the bridge project and uses that structure to explain how the bridge project collaboration was able to leverage its network in order to build the bridge. For instance, one individual is a concrete plant owner who graduated from the university that invented the new concrete. He explained that he was willing to try out the new concrete because it came from his alma mater; he felt a sense of loyalty and pride and offered his help. While he fills a role that structural hole theory already explains – he connects the university and concrete production networks where they were previously disconnected – what I find interesting about the resulting network is not that this one man can do something different, but that the university network and the concrete production network have the potential to do something they couldn't do before the connection was made. In my dissertation, I explain how those two networks capitalized on their networks' potential by testing a new concrete material in a city bridge. Without that connection, without that one man and his school pride and concrete plant, they may not have been able to test the material at production scale or to bring the material to market.

The concrete plant owner is just one interesting piece of the social structure story in my dissertation. He sits at the intersection between two social networks whose concerns, motivations, daily routines, and tools are very different. By bringing those groups together, the bridge project increases the potential that information from the university will reach the concrete producers and that knowledge the concrete producers possess will reach the university. Materials researchers in academia may be considered a community of practice (Wenger, 1999) who focus on understanding and developing new materials. Similarly, the concrete producers have their own community of practice where the focus is on the production and use of concrete in physical structures. Because these two communities of practice emphasize and engage in different activities and are independent, they have few opportunities to encounter people outside their community. Collaborations like the bridge project that bring people from different communities of practice together increase the opportunities those people have to interact with and learn from one another. Such projects create the network ties that enable information to move through networks.

Connecting those communities increased the “who you know” quotient for all the actors involved in the bridge project. But, just knowing new people from other communities does not enable innovative work. Data from my interviews with bridge project members shows that the ways in which those actors engaged and interacted with one another had profound effects on the bridge’s success. For instance, when asked for his thoughts on the project one of the construction contractors said, “You should probably talk to the concrete supplier. Get their thoughts as to how it was handled in their plant, their trucks, did they have a problem washing their trucks out.” His comments demonstrate awareness and concern for other opinions; when asked for his opinion he offered one and then suggested a group who might have another. He acknowledges that other perspectives may exist and may provide different information than he can. This kind of social thinking, an attention to and recognition of multiple perspectives, enables people to leverage their social networks effectively. Social thinking shows a concern for others that eases coordination in social interaction.

Other studies of collaboration have found that coordination is one of the biggest challenges for collaborations (Sonnenwald, 2007), especially those that happen over distance (Cummings & Kiesler, 2005). I argue that social thinking can ease the coordination burden, freeing collaborators to focus on their work. For example, I spent a summer at Microsoft Research studying distributed software teams, and while there, my mentor Dr. Andrew Begel and I found that teams who recognized that their distant members had different experiences, and adjusted their teamwork to those experiences, were able to work together more effectively (Hemphill & Begel, under review). For instance, one team manager tried to participate in team meeting remotely so that she could understand what that experience was like for her distant team members. After she participated remotely, she made changes to the structure of team meetings so that remote members could be more involved in discussions. She recognized that her remote team members had a different perspective (Hemphill & Begel, 2008), did what she could to understand that perspective, and then changed the way her team worked in order to adapt to a distributed setting with multiple perspectives. Her software team demonstrates that it’s not just what her employees know, or even who they know, but how they interact with one another that influences what work they are able to do together.

In studying collaborations such as the bridge project and software teams at Microsoft, I am able to investigate how collaborations can be successful. I focus on the opportunities social networks afford teams and how their connections to one another enable teams to accomplish work they could not do on their own. I have experience studying distributed teams (Teasley et al., 2008) and developing organizational and technical tools to enable collaborations that bring new groups together (Hemphill & Yew, 2007; Hemphill & Begel, under review; Wash, Hemphill, & Resnick, 2005). I study different groups with many divergent goals, and yet they all have an element of collaboration and rely on technologies to make their work possible. Effective leveraging of a social network allowed a materials researcher to test his invention in a real bridge. Social thinking and adapting work for multiple perspectives enabled a software team to employ a talented engineer without requiring that he and his coworkers work in the same place. The bridge I study in my dissertation may be the first step to developing buildings that can withstand earthquakes. The software teams I studied at Microsoft enable global collaboration. I study collaboration so that I can be a part of those kinds of innovative work; my goal is to understand successful collaboration so that we may better design and manage game-changing projects in the future and that we may advance theories of social capital, practice, and interaction.

My immediate future work will further explore how we can leverage social networks and coordination mechanisms to enable new scientific research. Dr. Stephanie Teasley (Michigan), Dr. Erik Johnston (Arizona State) and I recently received funding from the NSF to explore post-doctoral researchers' experiences joining existing distributed teams (NSF Award #0838295). I am also in discussions with a large consulting company to study their employees' use of an enterprise wiki system and its impact on internal communication. Communication technology and manager behavior emerged as important concepts during our study at Microsoft, and I'd like the opportunity to conduct further research with managers of distributed teams. How they struggle with communication technology, how they adapt their team's work to accommodate distribution, and how they assess work in such a setting are open and interesting questions. I'm excited to continue research that advances social theories and enables new kinds of work. By enabling and improving collaborations that join communities of practice, that connect globally-distributed teams of experts, that emphasize social thinking and coordination, we increase our opportunities to learn and accomplish new things.

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