Social Learning and Technical Capital on the Social Web

by Sarita Yardi

The social Web is a set of ties that enable people to socialize online, a phenomenon that has existed since the early days of the Internet in environments like IRC, MUDs, and Usenet (e.g. 4, 12). People used these media in much the same way they do now: to communicate with existing friends and to meet new ones. The fundamental difference was the scale, scope, and diversity of participation.

For social Web users, this has implications for broadening participation among emerging populations, increasing access to information and resources, and promoting more diverse interactions. For social Web researchers, this opens doors for conducting analyses of large datasets on the Web, but also challenges us to contextualize these datasets in rich, detailed descriptions about what people are doing and why.

My own interest is in social networks and the science of networks in general. These are two emerging fields that are typically disciplinarily split between the School of Interactive Computing and the School of Computer Science at Georgia Tech. Network science includes large-scale analyses of network data while social computing research involves implementing design interventions and employing a variety of methods, often ethnographic, to analyze them. Combined, we can understand what people are doing online and why with unprecedented scale and depth.

One focus of my research has been on teen participation online, measured as a function of teens' relationships with parents, siblings, extended family, friends, teachers, and community members. The integration of the social Web into teens' everyday lives echoes the growing pains of every new media that has come before it. In the 1960s, teens' communication through the home telephone disrupted family routines and rituals. In 2009, teens' communication through the social Web displaces earlier forms of teen-parent communication. Teens are living out their social lives online but they are still adolescents in the physical world, living at home and being raised by their parents. There is very little research to date on the role of parents and parenting in teens' use of social media and how teens' behavior and attitudes are influenced by their parents.

We are building a set of Web-based tools and running a series of longitudinal design studies in which teens build their own social networks for an audience of parents, siblings, peers, and community members. The goal of this research is to understand how teens' attitudes toward technical competency are formed and to encourage them to develop more positive attitudes. Many teens enjoy spending time on the Internet, but they often don't connect these activities with skills they can learn and careers they can pursue. We are exploring how network models that have been shown to exist in many real-world large-scale networks can be mapped to real-world peer social status' to determine which participants and social groups are influential and why. The challenge in this research is in mapping quantitative measurements of interactions based on network traffic to qualitative analyses of social relations; it is easy to know what people are doing in the networks, but it is harder to know why.

A Theory of Technical Capital

This research is focused on a particular dimension in teens' relationships, which we call *technical capital*. Technical capital is a variation on social capital which is a measurement of access an individual may have to resources embedded in relationships with network members [3, 5, 10]. We are measuring technical capital as a function of teens' relationships with not only parents, but also siblings, extended family, friends, teachers, and community members. Technical capital refers to *availability* of technical resources in a network, and the *mobilization* of these resources in ways that can positively impact access to information and upward mobility. This definition builds on Pierre Bourdieu's notion of technical capital as a subset of cultural capital, based on any broad skill or educational level reached [3]. (Paul Resnick's SocioTechnical capital refers to a framework for evaluating technology-*mediated* social relations.)

The process of measuring technical capital draws on an approach from the social sciences called ego-network analysis. "Ego" refers to the person being studied, "alter" refers to the people he or she knows, and "tie" refers to the relationship between them. A resource generator is an instrument for generating names and ties to alters and contains questions about the people that ego knows and the strength of ego's tie with those people. Questions in a technical capital instrument might include:

- If you have a problem with computers or technology, whom do you go to for help?

- How is it the other way around? Are there also people who come to you for advice regarding problems they have with computers or technology?

- Suppose you had to borrow some small piece of technology, like a cell phone or an mp3 player. Whom would you ask?

- Suppose someone asked to borrow a large item from you, like a laptop. Whom would you trust the most to lend it to?

Participants are asked to list names of people they know for each question and then to articulate their relationship to each person and how close they are to the person. From this set of data points, a network of ego's technical ties can be drawn.

Ties act as information transmission lines in a social network; access to novel and diverse information varies with the level of homophily—the tendency to associate with people who are similar—in the network. For many issues, access to just one strong tie may be sufficient, rather than relying on an additive effect through access to

multiple ties that contain overlapping information [14]. This distinction is theoretically grounded but has strong practical applications: when measuring technical capital, is there a difference in effect between having one tech-savvy parent or two? Does it matter if the parents offer a diverse range of skill sets? And how do other alters like siblings, aunts and uncles, or friends' parents factor into the equation? Volume, heterogeneity, and upward reach among network ties—especially local family ties—are important indexes into technical capital in a teen's social network [10].

Parents and Local Community

Amidst the media perpetuated images of teen deviance and helicopter parenting, much time has been spent discussing sites where teens and parents can't coexist, but little time has been spent investigating sites where they can.

There is a curious dualism between teens' social life and family life online. Offline, they are physically grounded and geographically constrained by their home and family, but they have no such fixed space online. There are few contexts in which parents and teens are encouraged, or even allowed, to interact online. In fact, most popular press perpetuates and exacerbates parent-teen disparities, with headlines like: "The Helicopter Parents Are Hovering on Facebook" (*Wall Street Journal*, Sep. 8, 2009); "Teens to parents: It's our Facebook" (*USA Today*, Oct. 4, 2007); "Facebook teens try to stop parents intruding" (*Sydney Morning Herald*, Aug. 8, 2009); "Worlds Colliding: My Mom's on Facebook!" (*Business Week*, Sep. 4, 2007).

Yet, parents, and other local support systems like siblings, peers, teachers, and community members can have strong positive influences on teens.

Assumptions of normative family relationships are deeply rooted on both local and personal levels. When I asked a group of girls in an Oakland, California program to identify their role models, they responded almost unanimously, "My mom." One asked me, unceremoniously, "Do you like your momma's boyfriend?" Yet, broader themes characterize the non-normative family unit. My lab-mate, Betsy DiSalvo, described the same mom-heroism in her work in Pittsburgh, Pennsylvania, with girls from different socioeconomic, ethnic, and family backgrounds than the Oakland-based kids.

We are interested in designing around teens' local community for several reasons. First, people living in close geographic proximity may be likely to share common characteristics, like age, ethnicity, and socioeconomic status [2]. This is particularly the case for teens living at home and attending schools in local neighborhoods. Connecting them online can help them form ties, access information and resources, and build a support network [6, 11]. Second, connecting people who live in the same neighborhoods, towns, and regions may foster community

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interest and participation [15, 16]. Last, much of Internet research in the past two decades has focused on the potential for connecting people across long distances. We are interested in returning to the local.

Practical Applications: Designing for Positive Social Change

This research is part of a broader agenda toward designing for social change based on how people are influenced by one another online. Bandura's social learning theory describes how people learn through observation and imitation of others' behavior [1]. Social learning theory has been used to explain why people join gangs, or become alcoholics or drug addicts. In each of these situations, people are influenced by observing external social forces around them that lead them to do things they otherwise might not have done.

People learn from one another in school hallways, community neighborhoods, and public parks; however, it is difficult, if not impossible, to measure and evaluate learning as a social process in these offline contexts. The social Web offers new opportunities for measuring and designing for positive social learning online.

In one study, we are focusing on the role of parents and parenting in teens' lives. Parents as Partners 2016 is a social network for parents at a local Atlanta school. The site was designed to inform and engage parents about the kinds of things their children are doing with technology by having them actually participate in their own online social networked community centered around their 6th grade children. Our goals are to learn about parents' attitudes toward technology and their children's use of technology, and critically, to identify points where parents can influence and encourage their children to be informed consumers on the Web.

In a second study, with Erika Shehan Poole and Jill Dimond, we examined ways that life disruptions influence help-seeking and technological support. We analyzed posts contributed to an online technology support board to show how life disruptions fundamentally impact technology practices and routines. We found that life disruptions usually thought of as separate from technology—such as birth, death, or divorce—present situations in which families must take on new roles, not only as social support providers, but also as technical support providers. That is, people's need for help might be better supported online by communities based on social similarity [17] and shared life disruptions like death, divorce, or unemployment, rather than around technical topics.

Future of the Social Web

During summer 2009, I worked at Microsoft Research New England, and in 2008, I worked at HP's Social Computing Lab. Both labs contained a mix of social media researchers, computer scientists, and physicists.

At both of those positions, I had great conversations and debates about how to balance the abstract nature of network models and measurements with the richness and detail of socially-oriented research. I believe these conversations are worthwhile. A theory of social networks and network science has real-world applications that can have meaningful impact in the world around us.

Some immediate and timely examples of real problems include topics like detecting disease outbreaks through social media sites like Twitter, connecting marginalized groups like rural communities, homeless people, or elderly individuals with one another and with

access to resources and information they need, or empowering children to critically navigate through their social spaces online.

Future research on the social Web should involve designing for positive social outcomes. It is possible, though not always easy, to understand what people are doing online; it is more difficult to impact or alter their behavior. This challenge is grounded in decades of research about how people learn, social psychology and group behavior, and behavioral economics.

The first question I would ask in designing an online intervention is, would anyone really use this? The question is complex. In an age of Twitter, Wikipedia, and Facebook, popular Web sites seem to have arisen through a triumvirate of good timing, luck, and providing a service that people want even though they didn't know they wanted it. More problematically, participation on these sites can be intensely imbalanced [6, 7]. Participation is privileged.

Technology is not neutral, and neither are teen-family relations. Differences in family members' schedules, power relations, and technical skills, and balancing awareness with privacy and trust are all factors that need to be considered in study design [13]. We don't assume that teens and parents necessarily want to connect online. We know a lot about spaces where teens don't want parents around, but we don't know about spaces where they do.

While parent and teen relations online are central to my work, my research is guided by a broader agenda of how to help people access resources and information on the social Web. This is important for diversity and equality [6, 7], especially with growing groups of home Internet users like baby boomers, seniors, and rural users [8]. Stanley Milgram's oft-cited small world study suggested that people are separated by just six degrees; however, subsequent studies showed that degrees of separation were deeply divided by social barriers of race and class [9].

We have rich information about who is coming online and how, particularly in developed countries. In the U.S. in 2009, a majority of adults have broadband internet access at home, and highest growth rates are among senior citizens, baby boomers, rural Americans, and low-income Americans [8]. Research on the social Web should not hinge upon the whims of the Web. We should be able to design for emergent populations.

Biography

Sarita Yardi is a PhD candidate in the College of Computing at The Georgia Institute of Technology, studying how teens in the Atlanta area use technology in their lives. Her area of specialization is in social computing, focused on social networks and the science of networks.

Acknowledgements

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