Interpersonal Informatics: understanding ourselves through our communities

Elizabeth Bales

University of California, San Diego

ebales@cs.ucsd.edu

William Griswold

University of California, San Diego

wgg@cs.ucsd.edu

Abstract

Recent research in social network science has found that that what we do and say flows through our social network, impacting our friends, our friends' friends, and beyond. Conversely, our own personal choices are also the influenced by the social networks we participate in. We introduce the area of *interpersonal informatics*, a class of tools that allows groups of people to collect, aggregate, analyze, and share personally relevant information. The goal of interpersonal informatics is to help people gain awareness of how those around them affect their habits, beliefs, and health.

Keywords

Interpersonal informatics, personal informatics, social networking, sensing.

ACM Classification Keywords

H.5.m Information interfaces and presentation (e.g., HCI): Miscellaneous
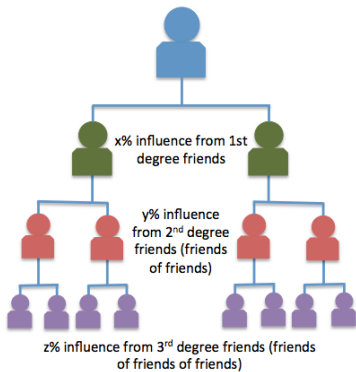
General Terms

Human Factors

Figure 1 Hyperdyadic spread is when influence reaches beyond an individual's immediate network. The effect of influence decreases with each level of indirection, approaching zero beyond three degrees of indirection (or beyond a friend's, friend's, friend).

Introduction

Those around us help define our norms: if your friends smoke, then it is OK to smoke; if your friends are runners then running is normal, etc. Recent research in social networks has found that everything from the likelihood that a person will gain weight, to the likelihood that a person will be happy is significantly influenced by their social network[3]. Even more surprisingly, due to hyperdyadic spread (Figure 1), the phenomenon of social influences spreading beyond our immediate social network, it is possible that many of the influences exerted on an individual come from people they don't even know. Ultimately, as stated by Christakis and Fowler, "to truly know ourselves, we must first understand how and why we are connected"[3].

Despite these influences, it is very hard for an individual to detect those influences, as they are the result of thousands of small impressions left by our friends, family, colleagues, and neighbors. Taking a page from the personal informatics community[7][9], we propose the study of _interpersonal informatics_ (IPI). IPI extends the personal informatics vision to include helping people make sense of their social networks and enabling people to make informed choices about how those networks influence them. The ubiquity of technologies such as mobile smart phones, commodity sensing products and online social networks such as Facebook serve as the foundation on which interpersonal informatics tools are based.

Interpersonal Informatics

As awareness is often the first step to wellbeing, it follows that an understanding the influence of our social networks is an important step to understanding

ourselves, and ultimately in making changes. With such knowledge, we can proactively respond to influences that were previously invisible to us.

Sample Scenario
Judy is a first year student in college. It is her first time away from her family and she is excited to be able to make her own decisions about how she spends her time. Unfortunately, when her first grades come back she notices her scores are not as high as she would like. Judy is invited by one of her friends to use a Facebook application that allows students to share their study habits. After using the application she finds that she and her friends are spending less hours studying than other students at her school. Judy decides to increase her study time to match the time spent by other students, rather than her friends, and is pleased to see an increase in her scores.

Unique Characteristics and Challenges

The preceding scenario and discussion have significant implications for IPI systems design, presenting several research challenges beyond those presented by personal informatics.

Self-censorship
The level to which an online representation of self is an accurate portrayal of reality is debated [1][10]. However, it is likely that people will feel varying levels of comfort when it comes to sharing different kinds of data online. Therefore, there will be some level of self-censorship of data that could be viewed by others as negative. Such self-censorship could hide negative influences in a social network. For example, it may be hard for a user to find out how many of her friends drink a lot of alcohol because sharing such information

could be seen as negative. Some of these issues may be solved by something as simple anonymous sharing, while others may require more creative solutions.

Critical Mass
Few individuals will have their complete social network logging and sharing data. However, to gain statistical confidence from the data collected from one's social network, there will need to be a certain level of adoption in each unique cluster of one's network. In cases of low adoption, it may be possible for users to provide estimates of the missing data based on what they know about their friends. Population-level data harvested from other sources may also be used; though one's friends may be atypical, their age, education level, etc. can be used to identify a representative demographic with known characteristics.

In-the-moment sharing
Personal informatics applications relating to health and safety can support real-time notification, for example an alert to a diabetic of low blood sugar. IPI expands on this requirement to include detecting interesting or important real-time events in your social network, such as the moment when more than half your local network has gone to bed for the night – signaling perhaps that you might benefit from going to bed as well. Due to the scale characteristics of IPI, this presents unique computational challenges. Also, such alerts could become too disruptive if there are many of them and the alerts are overt.

Privacy and Safety
Now that we are involving multiple users it is important that each user be able to easily select both what types of information they would like to share. With IPI

extending many personal informatics pursuits, such as health management, people may desire to track more information about themselves than they might be comfortable sharing. For example, a user may want to track both her weight and daily activity, but may only be comfortable sharing their activity. Others may be willing to go farther and share *changes* in weight. It will be important to design applications that (a) clearly distinguish and label private and shared data, and (b) depend on data that people are generally willing to share (e.g. changes in weight rather than total weight).

Additionally, with large-scale social applications it is important to consider how malicious individuals could misuse such a system. It is possible that with large amounts of personal information being shared, the data could be used by one user to exert control over another, especially in existing unhealthy relationships. Thus, it will be important to keep these possibilities in mind when designing IPI systems to minimize possible negative consequences.

Related Work

Beyond the obvious relationship to personal informatics there are a couple of areas with some complementary connections to interpersonal informatics. In contrast to how interpersonal informatics is concerned with understanding how your social network influences you, *Community Informatics* is "the application of information and communications technology to enable and empower community process"[5]. *Participatory Sensing* is the idea that private and professional individuals can share and analyze data that they collect about their environment using every-day mobile devices[2]. Although the focus of participatory sensing

contrasts with IPI's, the underlying technologies can be quite similar.

Many research groups are exploring how to use online social networks to effect health behavior changes[6]. These projects are in essence trying to *enhance* the social network effects that IPI is aiming to make visible and understand, often by providing new mechanisms for social support, competition, etc.

The online web community PatientsLikeMe[1] has features of interpersonal informatics. Patients with various diseases track their health and treatments while sharing their progress with the rest of the community. Members of the community can then compare their progress with others who have been diagnosed with the same illness, which can help them decide which treatments they would like to pursue. There are a few ways that PatientsLikeMe differs from the goals of IPI, the most important being that the social network is emergent around a patient's illness, rather than defined by preexisting social bonds.

Conclusion

Interpersonal informatics is the next step in personal informatics: whereas personal informatics can reveal *who we are*, IPI can reveal *why we are who we are*. By creating systems that aggregate, distill, and display the data that friends gather about themselves, a person will be able to learn more about the influences they are exposed to, and in turn make more informed choices about how they choose to live their lives.

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[1] http://www.patientslikeme.com/

References

[1] Back, M., et al. "Facebook Profiles Reflect Actual Personality, Not Self-Idealization" *Psychological Science, 21, Pages 372-374*

[2] Burke, J., et al. "Participatory Sensing". *ACM Sensys World Sensor Web Workshop*, Boulder, CO, USA, Oct 2006.

[3] Christakis, N., Fowler, J. Connected: The Surprising Power of our Social Networks and How they Shape Our Lives. Little, Brown and Company, Sept 28, 2009

[4] Fowler, J., Christakis, N. "Dynamic spread of happiness in a large social network: longitudinal analysis over 20 years in the Framingham Heart Study" British Medical Journal 2008. Dec 4, 2008. Vol. 338. Pages 23-37.

[5] Gurstein, M. What is Community Informatics and Why Does it Matter? 2007. Milano: Pilometrica.

[6] Kamal, N., Fels, S., Ho, K., "Online Social Networks for Personal Informatics to Promote Positive Health Behavior" Workshop on Social Media 2010, Firenze, Italy, October 25-29.

[7] Li, I., Dey, A., Forlizzi, J. "Grafitter: leveraging social media for self reflection." *Crossroads* 16, 2 (December 2009), 12-13.

[8] Li, I., Dey, A., Forlizzi, J. "A Stage-Based Model of Personal Informatics Systems" CHI 2010, Atlanta Georgia, USA. April 10-15, 2010.

[9] Li, I., Forlizzi, J., Dey, A. "Know thyself: monitoring and reflecting on facets of one's life." In *Proceedings of the 28th of the international conference extended abstracts on Human factors in computing systems* (CHI EA '10). ACM, New York, NY, USA, 4489-4492.

[10] Manago, A., Graham, M., Greenfield, P., Salimkhan, G. "Self-presentation and gender on MySpace" Journal of Applied Developmental Psychology, Volume 29, Issue 6, pages 446-458. Nov-Dec 2008