

# Creepy but Inevitable? The Evolution of Social Networking

Hui Zhang

University of Washington  
Seattle, Washington  
huizhang@uw.edu

Munmun De Choudhury

Microsoft Research  
Redmond, Washington  
munmund@microsoft.com

Jonathan Grudin

Microsoft Research  
Redmond, Washington  
jgrudin@microsoft.com

## ABSTRACT

This paper focuses on the fifth year of a cross-sectional trend study of enterprise social networking. Several stable patterns are evident—some activities have plateaued, others steadily increase in frequency. The fifth year did see a new development: As social networking companies visibly embraced behavior tracking and targeted advertising, concerns shifted from boundary regulation within personal networks to unsettling evidence of activity monitoring. However, benefits of use continue to outweigh drawbacks.

## Author Keywords

Social networking; Facebook; LinkedIn; Twitter; Boundary

## ACM Classification Keywords

H.5.3 Group and Organization Interfaces

## INTRODUCTION

*At the end of our first interview, we asked a 30-year-old senior program manager, “What haven’t we asked (about her use of social networking) that might be noteworthy.”*

*She replied, “I don’t know how Facebook is using my information. Somehow, whenever I type in something, the marketing ads on Facebook seem to match what I typed in, so that’s creepy...”*

*One of us said, “When I go to the supermarket I have a card and they scan things in and I get these offers that are clearly tuned to me because they’re things I bought before, (sometimes) I get one free, so that doesn’t seem creepy...” She was nodding. “So what’s your feeling as to why it feels creepier with Facebook?”*

*She replied, “When I’m in the grocery store and that happens, I’ve physically purchased something at that specific place. But if I’m in conversation with somebody and said ‘Oh yeah, I’m looking for a house,’ and then some random person back there comes up and says ‘I have five houses in that area,’ it’s super creepy.”*

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [Permissions@acm.org](mailto:Permissions@acm.org).

CSCW '14, February 15–19, 2014, Baltimore, Maryland, USA.

Copyright is held by the owner/author(s). Publication rights licensed to ACM. Copyright 2014 ACM 978-1-4503-2540-0/14/02...\$15.00.

<http://dx.doi.org/10.1145/2531602.2531643>

*A senior software design engineer explained why she has resisted her partner’s constant encouragement to join Facebook. “I do not like how much information they collect about people (and) I don’t need that kind of potential time sink.” But without rancor, she said “Facebook I see as an inevitable thing. One day I will have to have a Facebook account. I am holding out as long as I can.”*

In ten years, social media went from relative obscurity to over a billion active users [14]. LinkedIn, Facebook, and the once-popular MySpace and Orkut were launched in 2003 and 2004; predecessors Friendster and Plaxo in 2002. New users and sites appear and established sites evolve, but as experience accumulates, habits and social conventions form. Where designers cannot or do not address challenges, people find workarounds.

The initial public offerings of LinkedIn and Facebook in 2011 and 2012 indicated that investors believe that the rapid rise and fall of major sites is over. Obligations to shareholders and regulators require a new level of corporate responsibility and oversight. These sites responded to the heightened attention to revenue and profitability by expanding on-site advertising. Their valuations have risen.

For five years, we have studied the use of social networking sites for personal and professional purposes by Microsoft employees. Not a typical company, Microsoft has many early adopters of digital technologies, although fewer than half of the employees are engaged in product development.

Trends within the organization over the first four years were previously published [1]. This paper focuses on two unexpected deviations in 2012. (1) Daily LinkedIn by employees has risen significantly. Daily Twitter use plateaued at a much lower rate, yet occasional Twitter use is rising. To understand these phenomena, we interviewed 46 employees. (2) The interviews revealed that although people expressed the same moderate level of overall concern about social networking sites, the nature of those concerns in our population has shifted dramatically.

In 2008, most Microsoft employees were active on at most one social networking site. Their principal concern was that as their network expanded to include friends, family, and professional contacts, communication was inhibited [34]. Challenges in boundary management may still afflict some populations. Ours, typically thirty-somethings with several years’ social networking experience, described ways that they had reestablished boundaries.

Despite media accounts of risks in social network use, the proportion of people reporting major security concerns leveled off or declined over the years as they gained a sense of control. However, a new concern appeared: Through targeted advertising, people are more aware of how personal conversations and information are monitored and used. The words “creepy,” “weird,” and “unnerving” arose without prompting in many interviews.

Nevertheless, abandonment rates are low. Almost all employees have integrated social networking into their lives and show no sign of giving it up, although some take steps to counter developments that make them uneasy.

This paper has two threads. (1) The five-year cross-sectional trend study, a unique look at organizational aspects of sites that are also used for personal purposes. (2) The shift in concerns, which has broad implications that are primarily in the personal sphere.

## RELATED LITERATURE

The pace of change complicates efforts to interpret the literature. To understand a study conducted in mid-2006 requires keeping in mind that Facebook was then open only to students and that MySpace was dominant, getting more visits than Google. Some studies do not report when data were collected, which impedes efforts to identify shifting patterns of use.

Treem and Leonardi [40] acknowledge the challenge that rapid change creates in pulling together studies from different times and places. Their survey identifies conceptual aspects of social media use in organizations that appear consistently, such as the visibility and persistence of activity and the associations of groups of users.

Studies vary as to whether sites are used at work, by the general population, or by students, and vary as to the aspects of use that are considered. Our study examines workplace use but includes personal uses as well. Many in our population began using social networking sites as students, so our brief review covers all three focuses. We separately review studies of boundary regulation, a topic that is particularly salient to our analysis.

### Workplace studies

*Internal sites.* Most workplace studies are of volunteers using proprietary systems accessible only to employees. Most volunteers are relatively active and positive. IBM prototypes such as Beehive and BlueTwit dominate early research on enterprise behavior. The studies identified the potential of social networking to strengthen ties and develop social capital [8, 10, 14, 16, 18, 19, 36, 39, 48]. The studies guided systems research, development, and deployment, as did similar non-IBM studies [e.g., 4, 49]. The latter examined the use, by 1.5% of an organization, of Yammer, a Twitter-like tool with posts of unlimited length. It was used to broadcast work-related status, questions or directed messages, and links to external information.

*External sites.* Publicly available sites such as Facebook and Twitter are used formally for recruiting and marketing [e.g., 43]. Some enterprises prohibit informal access to external sites from workplace computers, but many including Microsoft do not. With smartphones enabling access, blocking employee use during the day is difficult.

Zhao and Rosson [50] studied 11 heavy users of Twitter. Heavy users are by definition atypical, but they can identify useful features. Their uses were similar to those noted above for Yammer. Ehrlich and Shami [12] compared use of Twitter and BlueTwit by 34 employees who used both. With BlueTwit there was less status posting and more information and comments directed to specific individuals. Thom and Millen [38] described a Twitter-based event organized to capture organizational culture. The effort was deemed a success although less than one-fifth of 1% of employees posted.

Surveys of communication practices at a small company in May 2008 and May 2009 found Facebook, LinkedIn and Twitter use increasing, with weekly use the norm for Facebook and Twitter [42]. The authors forecast that Twitter would thrive. We found a similar pattern in 2008-2009, but daily Twitter use plateaued in 2011 at around 10%.

Rooksby & Sommerville [33] identified problems with the use of internal and public sites to support productivity in a large government agency. Lampe et al. [26] surveyed Facebook use by university staff. Although diverse networks are reportedly effective for getting questions answered, they found little use of social networks for Q&A.

### General population

Much of the research literature and media attention is focused on Facebook and Twitter use by the general population. Wilson et al. [46] surveyed 412 articles on Facebook research, grouping them into user characterizations, user motivation, presentation of self, privacy and disclosure, and Facebook’s role in interactions.

Most Facebook research is through surveys and interviews, although researchers at Facebook publish server log studies [e.g., 5, 6]. The Twitter API provides streams from users who do not opt out, enabling collection and analysis of large-scale samples [e.g., 27, 30].

The general population differs in makeup from most workplaces. A higher proportion of Twitter users are black and Hispanic than the general population [35]. Teens are heavily represented and may have less complex social networks than older users—acquiring professional colleagues can change social network composition [34].

Nevertheless, such studies can provide indicators. Naaman et al. [30] found that Twitter users clustered into those who post about themselves and those who relay information. Wang et al. [45] describe regrets over Facebook posts. This is a possible step toward more mature use, just as early concerns with email flaming receded over time.

### **Student use**

Students are a significant segment of the general user population. Students differ in important respects from our career- and family-engaged population, few of whom are younger than 25. Nevertheless, all employees were once students and many began using social networking sites as students, arriving at Microsoft with habits and expectations.

Studies published before 2009 [2, 21] noted that students generally opted either for MySpace or for Facebook based on their career aspirations. We also found a tendency to use a single site in 2008, but this changed over time.

In a 2007 survey of undergraduates [17], women expressed more concerns about privacy. We did not find this in our samples surveyed later. In surveys conducted from 2005 to 2008, many undergraduates' Facebook networks resembled IM or SMS buddy lists [24, 25]; they then slowly added family members and past classmates. We found that networks often expanded significantly after employment.

Surveying college students from 2006 to 2010, Tufekci [41] charted a decline in allowing open access to Facebook profiles. Attitudes toward privacy depended on whether the goal was primarily to communicate with existing friends or to find people with common interests. Twenty percent of those surveyed had dropped Facebook once, but most resumed using it. Non-use was considered "resistance" or a "faux pas." Limiting access was considered a better approach. Women reported more use of access controls.

### **Boundary regulation**

"By proper scheduling of one's performances, it is possible not only to keep one's audiences separated from each other (by appearing before them in different front regions or sequentially in the same region) but also to allow a few moments in between performances so as to extricate oneself psychologically and physically from one personal front, while taking on another." – Erving Goffman, quoted in Hogan [22]

Goffman's observation pinpoints a dilemma posed by social media. Conversations are persistent, so we cannot use temporal sequencing to address the different audiences that he identified as integral to social life. When we access our audience through the same device or devices, separation does not occur, or occurs in distinct digital spaces.

A good review of issues in boundary regulation appears in Stutzman and Herzog [37]. It is sometimes called context collapse, although the process is typically gradual. An employee with a network of friends adds co-workers who are also friends, then gets requests from other colleagues, customers, and so on. Posting becomes more awkward, but a moment calling for radical reorganization may not present itself.

Studies of boundary regulation issues arising in social media use date back to at least early 2007 [11]. In 2008, it was the primary concern found in the first year of this cross-sectional trend study: Skeels and Grudin [34] focused

on the many problems created as Facebook users added, sometimes under pressure, 'friends' who were family members, managers, customers, and others.

Issues found in enterprises can surface in other populations. Two studies used advertising to recruit Facebook [15] and Google+ users [23]. The former reported that individual sites do not support people's faceted lives; the latter explored how friend circles can address these tensions. Ellison et al. [13] conclude that suboptimal use of access control features could prevent Facebook users from maximizing social capital. Woelfer & Hendry [47] describe homeless users who resolve tremendous disparities across their contacts through multiple online identities on one site. Stutzman and Hartzog [37] recruited 20 adults aged 25 to 60 who also created multiple identities on a single site. Our sample did not create multiple identities on one site, but their observations of why and how their participants differentiated groups is consistent with our observations below of why and how our participants use multiple sites.

### **SURVEY AND INTERVIEW METHODS**

The two direct ways to identify change over time are with longitudinal studies of a fixed population or with a cross-sectional trend study, in which different members of the same group are studied at regular intervals. We chose the latter approach out of concern that taking a survey or being interviewed would alter behavior, especially in the early years when many people had not heard of these sites. In addition, employee turnover or annoyance with repeated solicitation could diminish the sample size.

Starting in mid-2008 we sent a survey invitation annually to 1000 employees randomly selected from the Microsoft address book. The survey covered attitudes and behaviors around the use of social networking for work and personal purposes. Demographic information was collected, including age, gender, geographic location, level, role, and years of use. Previous respondents were excluded to avoid influence from exposure to the survey. As an incentive, participants were entered in drawings for digital appliances.

Key survey questions are whether social networking is considered useful for fun, personal networking, external professional networking, and networking within the company. We ask the frequency of visiting different sites and engaging in diverse activities. We inquire into the use of access control mechanisms and their level of concern, with optional open-ended opportunities to elaborate.

The 2012 survey analysis revealed departures from past surveys. To understand these, we conducted 46 semi-structured interviews of respondents who indicated that they were open to follow-up. Interview selection criteria are discussed below. Most interviews were 45 to 60 minutes. Thirty were conducted in or near the informant's office, 16 by teleconference. Each was attended by at least two researchers who took notes and recorded with permission.

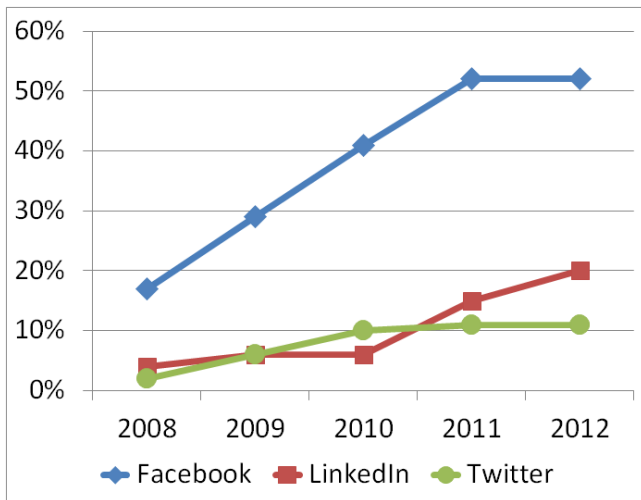


Figure 1. Daily use of sites as percentage of all employees.

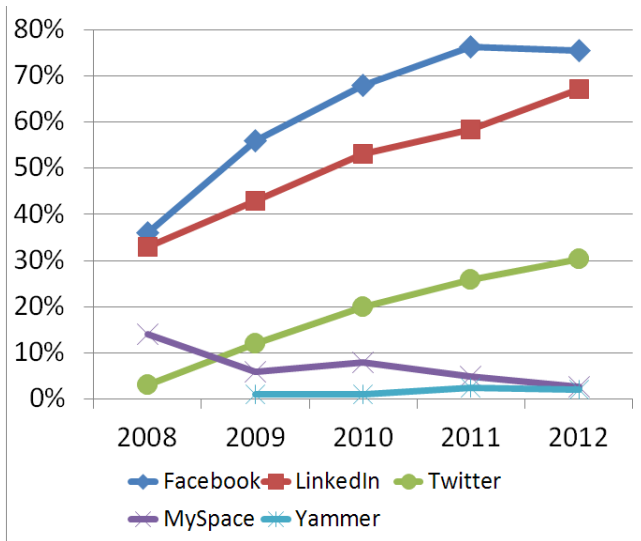


Figure 2. Occasional or more frequent use. Not shown: In 2012, Foursquare 10%, Pinterest and Google+ 7.5%, Instagram 2%.

Our approach to interviews was grounded—we had no hypotheses, we were there to listen. However, as a result of the survey results discussed below, we included employees who use Facebook or LinkedIn several times a day, occasional Twitter users, and a few employees who do not use social networking at all. We selected employees in Asia, Europe, Latin America, and various parts of North America to look for indications of differences based on culture or distance from headquarters. We included people sceptical of the usefulness of social sites for internal networking and some who had indicated that they had major concerns. Included were a few executives, some managers, and many individual contributors (non-managers), covering a range of ages and lengths of time with the company.

After each interview, a researcher used the notes and a full re-audit of the recording to compose a detailed summary. Quotations were transcribed and checked by two authors.

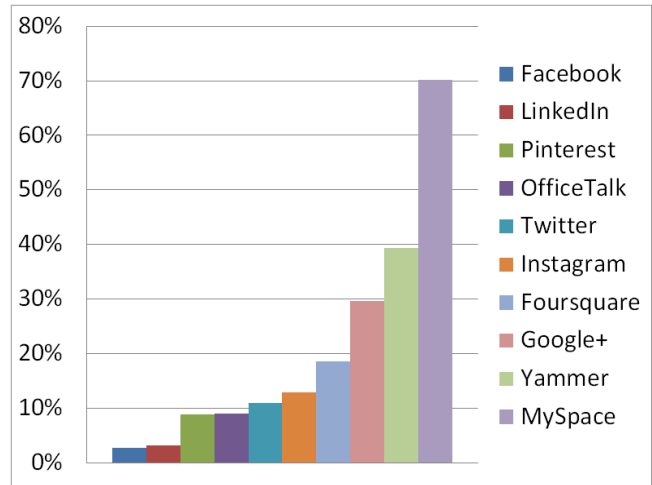


Figure 3. Churn (abandonment) rate.

An open-ended question, “If you have concerns (or know others who do) please describe them,” drew 1232 comments over five years. We used a variant of the Miles and Huberman [29] coding method to tag each with a label identical or close to what was written, then grouped the resulting subcategories into higher-level categories. Any that did not cover 2% of the respondents in a year were dropped from the analysis, yielding 18 categories.

As discussed in the results section, the overall level of employee concern about social networking has never been high. Responses to the open-ended comment on concerns vary in detail. Some type “privacy,” with no subcategory; others are more specific. This is discussed further when we cover the shift in concerns expressed over the years.

## RESULTS

Survey response rates were over 40% every year, high for a long survey. Respondent demographics (ages, gender, and roles) were within 1% to 2% of those published for the company. In general, 95% confidence intervals for the results reported in this paper range from  $\pm 2\%$  to  $\pm 4\%$ .

Over half of all employees now report daily use of Facebook (Figure 1), although it appears to have leveled off (as has ‘several times a day,’ at 22%). Daily Twitter use plateaued at 11%. A surprise was that *daily* use of LinkedIn is twice as high as Twitter: one-fifth of employees in a company that is not experiencing high turnover.

Figure 2 shows that ‘occasional’ use of Twitter continues to climb and occasional LinkedIn use is very high. New social networking entries attracted attention (see caption). Figures 1 and 2 apply to the overall employee population: 50,000 are daily Facebook users, around 65,000 are at least occasional LinkedIn users, and so on.

Figure 3 shows the percentage of people who report once having had a profile but no longer using a site. In light of mass media articles describing Facebook burn-out, it is striking that fewer than 3% of its many users reported

abandoning it. Twitter churn is almost four times as high. Pinterest is the ‘stickiest’ newcomer. The internal social networking platform Yammer has low adoption and high abandonment, but it competed the last two years with an internally-developed prototype system. (Yammer was bought by Microsoft soon after this survey.)

These analyses raised questions: What are heavy LinkedIn users doing? What are occasional Twitter users using it for? Why aren’t they progressing to daily use as Facebook and LinkedIn users did? Why is Facebook so sticky? What could explain Foursquare’s relatively high adoption—and abandonment—rates? Qualitative findings from interviews and open-ended survey questions that address these questions are covered in the next two sections.

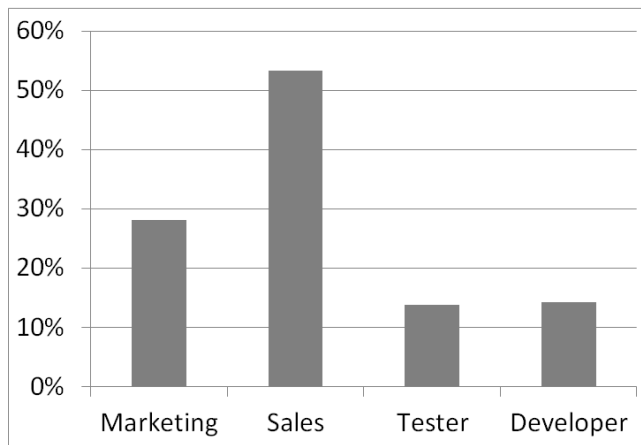


Figure 4. Daily LinkedIn use over major job roles.

### Daily LinkedIn use

Many people assume that a steep rise in LinkedIn use signals that employees are considering new jobs. However, low employee turnover and our data tell a different story.

Although Microsoft develops technology, 45% of the employees are in product development groups, 45% are in sales and marketing divisions, and 10% support operations. Four major roles are Developer, Tester, Marketing, and Sales. Most sales and marketing staff are located in the field. LinkedIn use varies with role (Figure 4).

In sales and marketing, LinkedIn is used for customer contact, to recruit, to participate in professional LinkedIn groups, to stay in touch with past colleagues and alumni, and to follow technical news. For some, LinkedIn is a primary communication medium as well as the first place to check out a new contact.

What of testers, developers, and others who have little customer contact? Peak use for some coincided with past job searches, but many continue to use it regularly, exploiting advantages that LinkedIn has over business card exchange [1, 34]. They also use LinkedIn alumni groups and other groups. Developers and testers scan job openings that arrive via LinkedIn because it is nice to feel sought and

useful to see the job skills that are listed. One tester takes training courses to acquire skills that are sought in LinkedIn job descriptions, figuring it could prove useful some day.

### Occasional Twitter use

On a typical day, 8% of adult Americans use Twitter [35]; therefore, even fewer are daily users. Twitter use is not representative [27] and may skew toward demographic groups that are underrepresented in technology companies, so why do we find ‘occasional’ Twitter use increasing? Several interviewees reported rarely or never posting to Twitter, yet valuing it as a news source. They occasionally follow celebrities, Olympics, CNN headlines, and so on. An Egyptian tester considered its coverage of demonstrations in Cairo faster and more trustworthy than official media. Some people follow or post about local events or product launches. A developer who said he has only posted about 25 times in 3 years said:

“(Twitter) is very useful for finding out local news... Near our house some guy barricaded himself in his house and said he had a bomb or something and we were like ‘what’s going on?’ There were cops all around the place. (We) started looking on Twitter and searching for Wallingford and were able to figure out fairly quickly what was going on. I was even able to contribute! I saw a little bomb robot going down the road! So I posted that.

“I’ve done that a number of times. There was a fire down in Renton one time and we saw smoke and tried ‘smoke, Renton.’ We were able to figure out what’s going on before the news stations were even getting that information.”

A marketing executive, finding the Disneyland parking lot closed, used Twitter to quickly learn that the theme park was open and to locate nearby free parking.

For our population, tweeting about self is rarer than using Twitter for information consumption or information seeking [30]. Whether as a source of news or to publicize one’s work, most use is occasional.

### Internal uses of social networking

The question of most interest to enterprises is whether internal use of sites that also include non-employees will benefit an organization by improving social capital and work productivity. We explored this issue in depth for 2008-2011 in [1]. In 2012 there was little change: 20% of the employees are negative and close to 30% are undecided about internal utility.

Men are more often negative about internal use than women. Workers around the company headquarters are more negative than those in the field, many of whom use LinkedIn. Only 15% of employees in sales are negative about internal utility, versus 25% of developers. In 2008, managers were more negative than individual contributors. Although both groups are now less sceptical, more managers shifted; on average they are now more positive. Individual contributors who communicate in person with collocated peers may find internal networking less useful.

Partially collocated group members are the most positive. Not surprisingly, employees with major concerns about social networking are less optimistic about internal use.

**New social networking sites**

The rise of new social sites shows that existing sites do not meet all needs. However, the challenge facing a new site was summed up by a designer who said, “(Facebook) seems like a monopoly. I can’t post to five different things.” Some people liked the design of a new site but said it never attracted enough of their friends to be useful. Internal sites suffered from a perception of low signal-to-noise ratio or insufficient ease of access: People want to browse all their sites quickly; for example, when they have a few free minutes and a smartphone in hand.

Foursquare’s game element may contribute to its substantial adoption—and its high churn. After working hard to become ‘mayor’ of a sushi restaurant, one informant could either work to defend his title, watch himself lose it, or drop Foursquare, which is what he did. Pinterest had less adoption but very low churn: People whose use had declined spoke of it fondly and some expected to resume.

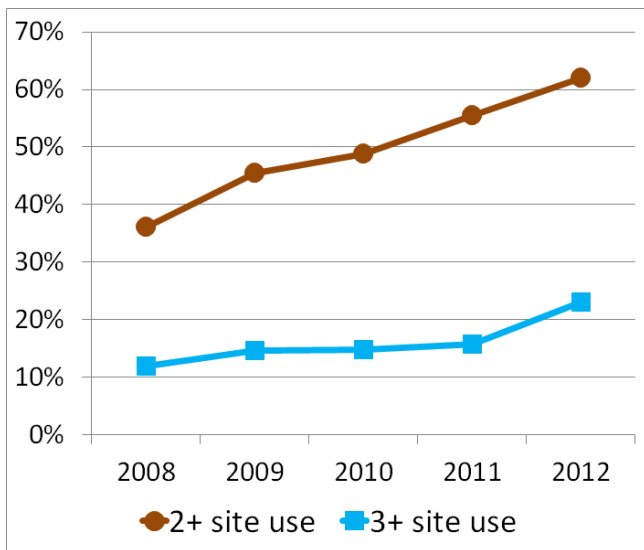


Figure 5. Occasional or more frequent use over time.

**The use of multiple sites**

Figure 5 shows increasing use of multiple sites. Facebook for personal networking and LinkedIn for professional networking is common, but people described a variety of ways to segment audiences. People differ as to which sites they are more selective about. Figure 5 misses the use of LinkedIn or Facebook groups and pages to segment audiences. Interfaces that support quick scanning of sites are popular; sites that are not covered can be overlooked.

These approaches to boundary regulation, to restoring Goffman’s sequential ‘performances,’ came as experience with social networking increased. In 2008, 1-2 years was the median and mode; only 9% reported 5+ years. In 2012,

44% reported 5+ years of use and only 9% fewer than three years. People found conventions and solutions that worked for them—usually using multiple sites, sometimes using grouping features that sites provide. A technology that is deeply integrated into the lives of many people is reaching maturity on some dimensions even as it evolves and provokes new responses. Implications of this, and new challenges, are considered in the Discussion.

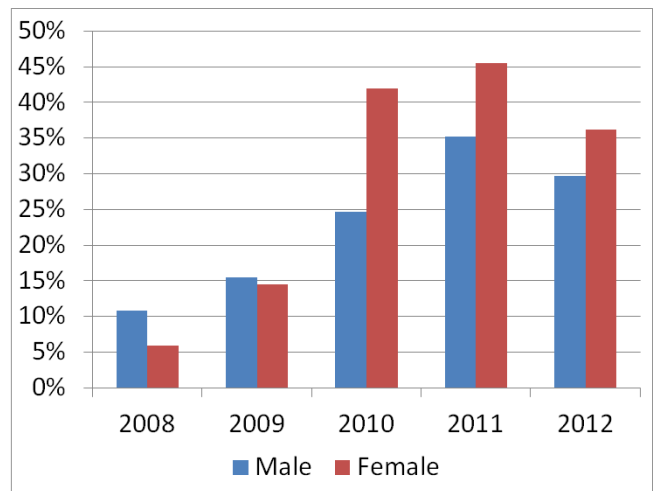
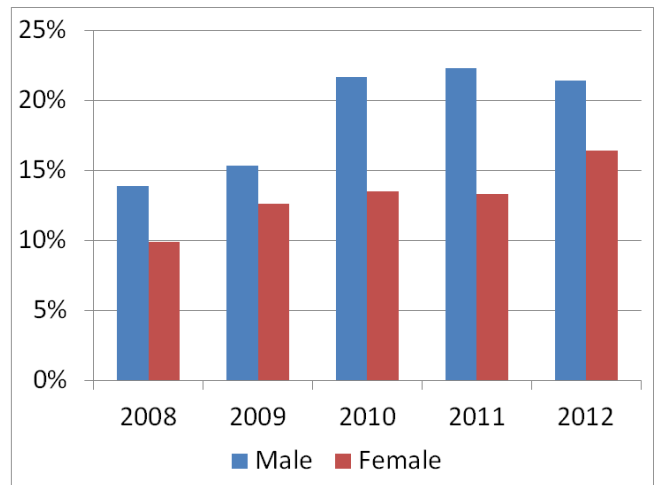


Figure 6. Major concerns (top). Heavy access control (bottom).

**Concerns**

The survey asked whether people had major concerns about social networking sites, minor concerns, or no concerns. Most reported minor concerns, but as seen in Figure 6, reports of major concerns rose until 2010, then leveled off. Reported use of access controls also jumped in 2010, continued to rise in 2011, and declined in 2012. Gender differences were initially minor, but by 2010 more women used access controls heavily and fewer expressed major concerns.

For those expressing concerns, the nature of the concerns shifted sharply. The open-ended survey comments revealed transitions in 2010 and 2012. Boundary maintenance

problems were the greatest concern in 2008. In 2010, perhaps influenced by media stories, general privacy and security concerns leaped from 40% to 59% of all concerns, and the first concerns were reported about content ownership, the permanence of information on sites, and reduced off-line interaction with friends. 2012 brought the first explicit mention of targeted advertising, which together with the related topics of 3<sup>rd</sup> party access to personal information, misuse of data, and profiling outnumbered concerns about improper content, access by children, usage, safety, and wasted time.

Concerns about mixing personal and professional information declined over the past two years. Early concerns over unwanted contacts, spam, and insufficient access control have disappeared. People explicitly noted that they had found ways to cope. One summarized his response to spam: "Hide all Farmville."

### **Creepiness**

People did not object to targeted advertisements in principle. They are familiar with ads placed in search results. Their comments focused on visible reminders that private conversations are being mined. The person quoted at the beginning of the paper is one of several using the words 'creepy,' 'weird,' or 'unnerving.' A few more examples that revealed uneasiness:

"Why is that pair of shoes following me around the web? That's creepy."

"I don't mind being advertised to, but there's ways that are uncomfortable... I want to say that I 'like' stuff, like Batman... So I 'like' Breaking Bad, but I didn't realize that I was instantly going to start getting a feed from the show... I might like going to Target every once in a while, but if I 'like' Target on Facebook all of a sudden I'm clogging my feed... There are some smaller businesses and smaller websites that I don't mind 'liking' because I want to help their business."

"You get this very clear evidence that they are mining the things you're posting, mining your data... Ads targeted at my age... like, get ripped now, exercise at..., or if I post something on biking then I started getting all kinds of bike ads... Some targeted ads are better but then they start pigeon-holing you. So 'You're clearly a 40-year old white guy, you probably need to lose weight...' Stuff for knee surgery and spinal surgery... I guess my age group and my cohort talking about their injuries... And a lot of dating stuff, meet local women... (I just changed my marital status.) You'd get these kind of weird things, not really offensive or anything, just unnerving."

"Creepy, but kind of cool."

After interacting with French colleagues, one informant encountered ads in French, a language he doesn't speak.

People were uncomfortable, but not angry. No one reported dropping a site because of evidence that they were targeted. However, several said that they dropped apps and games altogether, or that they refuse to download anything that asks to access information such as location, photos, or

contacts when they do not see why such information is needed for the app or game to work.

### **Other concerns**

Another form of behavior tracking is users tracking one another. The complexity of this issue is seen in the comments of a recent hire. He spoke of the "immorality" of letting people see who had viewed one's site. He joked about funny possible misunderstandings. He knew that Facebook does not allow you to see who has viewed your profile, but that LinkedIn does:

"The thing I don't like about LinkedIn is that I'm always afraid to look at people's pages, because then they can see that I looked at it, and I might just be looking for some inane reason... One of my friends said 'you're stalking me!' because I went and looked at his page."

Then, without noting a contradiction or qualifying his long diatribe on this topic, he said, "When I was looking for a job it was helpful. I could see who was looking at my page. I could see if a recruiter was. I could contact people."

Potential risk in revealing your location to online friends (or 'friends of friends') through posts or check-ins is a non-issue for some people and a huge issue for others. Some parents express concerns about the safety of their children. More often the concern was for property. For example,

"I don't want 'Hey, I'm going on vacation' messages or 'I'm in Virginia at this place,' going out to the world... I don't want someone coming to my house and stealing my stuff... I trust my friends, I don't trust everybody. I know that people will see your driveway has newspapers in it and they'll target your house... I don't want Facebook to be another way for someone to see that, because we have someone pick up our newspaper."

### **Inevitability**

The overall rise in frequency of use and low rates of abandonment speaks to the stickiness of social networking. For now, it is woven into people's lives. Markedly fewer younger employees express major concerns (Figure 7).

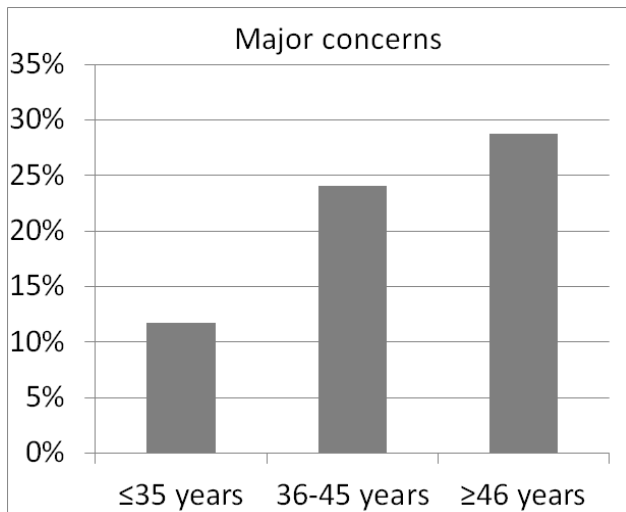
"These ecosystems, they kind of suck you in, like gmail... Then you think about leaving, and you're just stuck. Facebook's kind of the same way. It's hard to break out of it, which is great for them but it makes me feel a little fenced in."

"Any time that I try to organize a dinner party with more than say five guests, logistically it starts getting complicated (without Facebook). I know there are things like Evite, but most of my friends would use Facebook..."

### **DISCUSSION**

"There is no big brother, we're all big brother, we're all spying on each other... We're entering an age where privacy is going away in a lot of ways anyway, so I might as well embrace some of this. There will be so much noise out there, how will they be able to pinpoint me? If everybody's not private, then everybody's private. No privacy leads to all privacy. How are they going to be able to pinpoint?" – Software engineer





**Figure 7. Major concerns by age.**

Facebook was largely unknown prior to its public release in late 2006. In 2012 it reported having a billion active users. Features changed steadily—Facebook added access control mechanisms, became an application platform, introduced advertisements, and so on. People using social networking sites develop personal and social conventions. Given this unparalleled dynamism, consideration of dates and user populations is critical to understanding studies.

Insights can be gleaned by carefully merging the results of independent studies. A cross-sectional trend study such as ours can identify phenomena with greater confidence, bearing in mind that it may not generalize to other populations. By identifying significant shifts over five years, we know that past findings may not hold today. In some respects there is a pattern of maturing use, yet we also see experimentation and new behaviors. With millions of new young users each year, innovation is inevitable.

Given that there is a finite number of people on the planet and only 24 hours in the day, activity will level off. With years of experience, people discover what they find useful and comfortable. New features and sites appear, but there is more behavioral inertia.

In 2008, we set out to understand the impact of social networking sites on one workplace. The first survey revealed a range of attitudes and identified how some employees used public sites in ways that they felt helped them work better [34]. Their major concern was the difficulty of boundary regulation on sites that increasingly included work colleagues, personal friends, and family members. In 2012 we published a paper that details workplace trends over four years, 2008 to 2011 [1]. Most did not change appreciably in 2012, so readers interested in more depth on these issues can refer to it.

The following discussion focuses on concerns expressed by a significant minority. Concern with boundary regulation receded in our population as people became active on

multiple sites and in different groups on some sites. Concerns over monitoring revealed by targeted advertising are significant although not an enterprise issue. We conclude with discussion of location tracking, one form of monitoring, and gender differences.

### **Boundary regulation**

A decade ago, most users had few online friends and experienced few conflicts. Boundary regulation was less an issue for Friendster, MySpace and other early sites. Facebook was initially used by students who saw it as an enhanced space to interact with IM buddies [24]. By 2008, students were often adding family members [25], but Facebook had few access controls. Subsequently, as adults (faculty, corporate users, etc.) joined in growing numbers, boundary issues became significant. What should a student do when a teacher asked to be a friend, and vice versa? Could I refuse my manager, vice president, or customer? Probably not, but it affected what I posted about.

At Microsoft in 2008, this was the problem most often cited by the minority of employees then active on social networking sites. Virtually all had past schoolmates, family members, and friends in their networks, and were now adding colleagues. Few were active on more than one site. Several people interviewed in 2008-2009 remarked that they *should* use Facebook's new access control features to create multiple groups, but only one had done so.

Site designers did little to solve the problem. Interest groups are used, but there is little segmentation of 'friends.' Some people tried but now report only posting to 'All.'

Our workforce primarily coped by adopting different sites for different social groups. There was no single pattern in how Facebook, LinkedIn, Twitter, restricted Facebook pages, LinkedIn groups, and specialized sites are used. No one used multiple identities on one site as did Stutzman and Harzog's [37] carefully recruited sample, but motives for using multiple sites were similar, albeit with little use of pseudonyms to shield identity. The focus was on directing different kinds of messages to appropriate audiences.

Many of our participants explicitly said that they have things under control. Some noted that other people, people who do not make adequate arrangements, could get in trouble. Incidents arise—one person discovered to his horror that LinkedIn was displaying his Twitter feed. But he quickly fixed it. Another said of unwanted intrusions, "It's easier to turn off now, so I feel more protected."

Given the drumbeat of negative media stories about social media, our 2012 decrease in 'many concerns' might be a surprise. Tufekci [41] reported reduced concerns among long-time site users. Every day more of us are long-time users. We find solutions that work for us.

Even if these concerns fade over time, designers have reasons to improve our options. They may prefer that users spend more time on their site, rather than skip off to other



sites. Also, every year, millions of people use their first social networking site or take their first job. Teenagers, who were absent from our sample, will likely encounter the boundary challenges that our population did five years ago.

### **Targeted advertising: A new concern**

People may have known that tracking was possible, but it was not among the concerns expressed in our early surveys or in other studies. In 2009, Raynes-Goldie [32] examined privacy concerns among “twenty-somethings,” focusing on control of who saw what—boundary regulation—and explicitly reported *not* finding concerns about the use of personal information. Interviews conducted in 2009 into location-tracking Google Latitudes found concern with maintaining social boundaries, but even when the experimenters asked directly they found that use of personal information was not a concern [31].

What changed for some people is that the hypothetical became the reality. It is in your face. “Why are these shoes following me around the web?” As public companies, LinkedIn and Facebook are under pressure to show profitability and expand uses of targeted advertising. Public awareness is amplified by Google, as it partners with other site owners to place targeted ads. Facebook is also placing targeted ads on third-party mobile applications [7].

Why are people who are familiar with targeted ads in search engine results uncomfortable? A person approaches a search engine with a question. An ad that is related to the current query is like a friend who makes a relevant suggestion in the course of a conversation. On a social networking site, one discovers that a discussion with friends is being listened to, resulting in an advertisement that is often only loosely tied to the conversation. It is different.

How people and sites will adjust to this in the long term remains to be seen. For now, in our sample, those who are uncomfortable are not outraged. “Not offensive, just unnerving,” one said. Frequency of daily Facebook and Twitter use has plateaued, and we read reports of similar retrenchment more broadly, but the rate of abandonment is remarkably low.

However, several respondents now draw a line at apps and games that demand access to personal information that does not seem necessary. Some said emphatically that they removed or refused to download them, a trend echoed in a September 2012 Pew report on smartphone use [3].

On the other hand, a game designer observed that he did not understand why some games asked for so much information, but added, “I think people are becoming really desensitized to it... I wouldn’t be surprised if people became really desensitized to it really quickly.”

He may be right, but some people are sensitive now. A 2005 study that quaintly called this now-ubiquitous information collection “spyware” reported that people do not read application EULAs (end user license agreements) that

reveal such data collection [20]. Another study showed that people are surprised when they are told what is collected [28]. Targeting advertisements reveal what is collected and push some people to pay closer attention to EULAs.

Will more people look closely? Will those who do so relay their findings, perhaps on social networking sites, to inform a larger community? We don’t know, but app developers might be advised to ask only for what they need and let prospective users know why the app needs it.<sup>1</sup>

### **Location tracking**

The safety of location information is an area of heightened concern. Although this is a topic dear to privacy experts and the mass media, early studies reported that users are wholly unconcerned about it [31, 32]. Many people tweet their location or check in on Facebook or Foursquare, and some of our informants reported positive experiences. Others abandoned location tracking only because it led to no encounters for them. However, others described robbery and stalking concerns. Fear of “a friend of a friend” can motivate people to set access controls: Restricting messages to a closer circle to increase the sense of security.

### **Gender**

A finding that surprised some is that men expressed greater concern about social networking than women. Female students expressed significantly more concerns in mid-2007 [17]. But later surveys found women using access controls more heavily [41], a trend seen also in our study. This was correlated with women having fewer concerns. Women may organize their online worlds in ways that make them comfortable. It is also possible that women working for a 75% male technology company are not easily intimidated.

### **CONCLUSION**

“Before Facebook, how did we know what people were listening to on Spotify?” – A joke recounted in an interview.

With change so rapid, it is difficult to remember how life used to be and anticipate with confidence what is coming. Site designers and frequent site visitors accumulate experience, learn to avoid pitfalls, and bend a new medium to their purposes.

Facebook, LinkedIn, Twitter, Pinterest, Instagram and so on are not just places we visit, they house spaces we shape and spend time in. In 2008, most site users had one large room that was growing crowded. Many resolved this by finding or creating different spaces in which to hold different conversations. Now some are unsettled to discover that

---

<sup>1</sup> At an abstract level, the monitoring of conversations by site owners or intelligence agencies are forms of boundary regulation, differing in that these ‘friends’ are uninvited. Coping strategies seem limited. Sites could let people pay to opt out. People could shift to highly encrypted channels.

their conversations are being listened to by the architects, who strive to balance helpfulness and intrusiveness as they put up billboards or interject comments. To find a comfort level that supports these free services requires ongoing, delicate negotiations.

We surveyed and interviewed a diverse but not fully representative set of people. There were no teenagers. Most are over thirty, economically secure, and relatively well-informed about technology. They have a wide range of jobs and are drawn from around the world. In general, they seemed uninhibited in their responses.

Even savvy people are feeling their way forward in this new world. Recall the developer who said, "How will they be able to pinpoint me? If everybody's not private, then everybody's private. No privacy leads to all privacy. How are they going to be able to pinpoint?" There is an answer: "With computers." Research can guide the developers and the users of these helpful and intrusive technologies.

#### ACKNOWLEDGMENTS

Anne Archambault worked on this for three years, Meredith Skeels worked on the first year, and Gina Venolia assisted throughout. We thank Cliff Lampe for comments and the CSCW 2014 coordinator/shepherd who saw value that mostly eluded the previous 15 conference reviewers.

#### REFERENCES

1. Archambault, A. & Grudin, J. 2012. A longitudinal study of Facebook, LinkedIn, & Twitter use. *Proc. CHI 2012*, 2741-2750. ACM.
2. boyd, d. 2008. Taken out of context: American teen sociality in networked publics. PhD Dissertation, University of California-Berkeley.
3. Boyles, J.L., Smith, A. & Madden, M. 2012. Privacy and data management on mobile devices. Pew Internet. <http://www.pewinternet.org/Reports/2012/Mobile-Privacy.aspx>
4. Brzozowski, M.J., Sandholm, T. & Hogg, T. 2009. Effects of feedback and peer pressure on contributions to enterprise social media. *Proc. GROUP 2009*, 61-70.
5. Burke, M. & Kraut, R. 2013. Using facebook after losing a job: Differential benefits of strong and weak ties. *Proc. CSCW 2013*, 1419-1430. ACM.
6. Burke, M., Kraut, R. & Marlow, C. 2011. Social capital on Facebook: Differentiating uses and users. *Proc. CHI 2011*, 571-580. ACM.
7. Constine, J. 2012. Facebook beta launches new mobile ad network using your data to target you with banner ads in other apps. TechCrunch, September 18th. <http://techcrunch.com/2012/09/18/facebook-mobile-ad-network/>
8. DiMicco, J., Geyer, W., Millen, D.R., Dugan, C. & Brownholtz, B. 2009. People sensemaking and relationship building on an enterprise social networking site. *Proc. HICSS 2009*. IEEE.
9. DiMicco, J.M. & Millen, D.R. 2007. Identity management: Multiple presentations of self in Facebook. *Proc. Group 2007*, 383-386. ACM.
10. DiMicco, J., Millen, D.R., Geyer, W., Dugan, C., Brownholtz, B. & Muller, M. 2008. Motivations for social networking at work. *Proc. CSCW 2008*. 711-720.
11. Efimova, L. & Grudin, J. 2007. Crossing boundaries: A case study of employee blogging. *Proc. HICSS'07*.
12. Ehrlich, K. & Shami, N. S. 2010. Microblogging inside and outside the workplace. *Proc. ICWSM 2010*. AAAI.
13. Ellison, N., Vitak, J., Steinfield, C., Gray, R., & Lampe, C. 2011. Negotiating privacy concerns and social capital needs in a social media environment. In S. Trepte and L. Reinecke (Eds.), *Privacy online*, 19-32. Springer.
14. Facebook Inc. 2013. First Quarter 2013 Results. <http://investor.fb.com/releasedetail.cfm?ReleaseID=761090>
15. Farnham, S. & Churchill, E. 2011. Faceted identity, faceted lives: Social and technical issues with being yourself online. *Proc. CSCW 2012*, 359-368. ACM.
16. Farzan, R., DiMicco, J.M., Millen, D.R., Brownholtz, B., Geyer, W. & Dugan, C. 2008. Results from deploying a participation incentive mechanism within the enterprise. *Proc. CHI 2008*, 563-572. ACM.
17. Fogel, J. & Neman, E. 2009. Internet social network communities: Risk taking, trust, and privacy concerns. *Computers in Human Behavior*, 25, 1, 153-160.
18. Geyer, W., Dugan, C., Brownholtz, B., Masli, M., Daly, E. & Millen, D.R. 2011. An open, social microcalendar for the enterprise: Timely? *Proc. CHI 2011*, 247-256.
19. Geyer, W., Dugan, C., DiMicco, J., Millen, D.R., Brownholtz, B. & Muller, M. 2008. Use and reuse of shared lists as a social content type. *Proc. CHI 2008*, 1545-1554. ACM.
20. Good, N., Dhamija, R., Grossklags, J., Thaw, D., Aronowitz, S., Mulligan, D. & Konstan, J. 2005. Stopping spyware at the gate: A user study of privacy, notice, and spyware. *Proc. SOUPS 2005*, 43-53. ACM.
21. Hargittai, E. 2007. Whose space? Differences among users and non-users of social network sites. *Journal of Computer-Mediated Communication*, 13, 1, article 14.
22. Hogan, B. 2010. The presentation of self in the age of social media: Distinguishing performances and exhibitions online. *Sci Technol Soc*, 30, 377-386.
23. Kairam, S., Brzozowski, M., Huffaker, D. & Chi. E. 2012. Talking in circles: Selective sharing in Google+. *Proc. CHI 2012*, 1065-1074. ACM.
24. Lampe, C., Ellison, N. & Steinfield. 2006. A Face(book) in the crowd: Social searching vs. social browsing. *Proc. CSCW 2006*, 167-170. ACM.
25. Lampe, C., Ellison, N. & Steinfield. 2008. Changes in use and perception of Facebook. *Proc. CSCW 2008*, 721-730. ACM.

26. Lampe, C., Vitak, J., Gray, R. & Ellison, N. 2012. Perceptions of facebook's value as an information source. *Proc. CHI 2012*, 3195-3204. ACM.
27. Laporte, N. 2013. Why TV execs are still skeptical of Twitter's power to attract eyeballs. *Fast Company*. <http://www.fastcompany.com/3019669/>
28. Lin, J., Amini, S., Hong, J.I., Sadeh, N., Lindqvist, J. & Zhang, J. 2012. Expectation and purpose: understanding users' mental models of mobile app privacy through crowdsourcing. *Proc. Ubicomp 2012*, 501-510. ACM.
29. Miles, M. B. & Huberman, A. M. 1999. *Qualitative data analysis*. New York: Sage.
30. Naaman, M., Boase, J. & Lai, C.H. 2010. Is it really all about me? Message content in social awareness streams. *Proc. CSCW 2010*, 189-192. ACM.
31. Page, X., Kobsa, A. & Knijnenburg, B.P. 2012. Don't disturb my circles! Boundary preservation is at the center of location-sharing concerns. *Proc. ICWSM 2012*, 266-273. AAAI.
32. Raynes-Goldie, K. 2010. Aliases, creeping, and wall cleaning: Understanding privacy in the age of Facebook. *First Monday*, 15, 1.
33. Rooksby, J. & Sommerville, I. 2012. The management and use of social network sites in a government department. *Computer Supported Cooperative Work*, 21, 4-5, 397-415.
34. Skeels, M. & Grudin, J. 2009. When social networks cross boundaries: A case study of workplace use of Facebook and LinkedIn. *Proc. Group 2009*, 95-104.
35. Smith, A. & Brenner, J. 2012. Twitter use 2012. Pew Internet. <http://www.pewinternet.org/Reports/2012/Twitter-Use-2012/Findings.aspx>
36. Steinfield, C., DiMicco, J.M., Ellison, N.B. & Lampe, C. 2009. Bowling online: Social networking and social capital within the organization. *Proc. Communities and Technology 2009*.
37. Stutzman, F. & Hartzog, W. 2012. Boundary regulation in social media. *Proc. CSCW 2012*, 769-778. ACM.
38. Thom, J. & Millen, D.R. 2012. Stuff IBMers say: Microblogs as an expression of organizational culture. *Proc. ICWSM 2012*. AAAI.
39. Thom-Santelli, J. & Millen, D. 2009. Learning by seeing: Photo-viewing in the workplace. *Proc. CHI 2009*, 2081-2090. ACM.
40. Treem, J. & Leonardi, P. 2012. Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Communication yearbook*, 36, 143-189.
41. Tufekci, Z. 2012. Youth and privacy in public networks. *Proc. ICWSM 2012*, 338-345. AAAI.
42. Turner, T., Qvarfordt, P., Biehl, J.Y., Golovchinsky, G., & Back, M. 2010. Exploring the workplace communication ecology. *Proc. CHI 2010*, 841-850.
43. Volda, A., Harmon, E. & Al-Ani, B. 2012. Bridging between organizations and the public: Volunteer coordinators' uneasy relationship with social computing. *Proc. CHI 2012*, 1967-1976. ACM.
44. Wang, Y. & Kobsa, A. 2009. Privacy in online social networking at the workplace. *Proc. CSE 2009*, 975-978.
45. Wang, Y., Norcie, G., Komandura, S., Acquisti, A. Leon, P.G. & Cranor, L. 2011. "I regretted the minute I pressed share": A qualitative study of regrets on Facebook. *Proc. SOUPS 2011*.
46. Wilson, R. E., Gosling, S. D. & Graham, L. T. 2012. A review of Facebook research in the social sciences. *Perspectives on Psychological Science*, 7, 3, 203-220.
47. Woelfel, J. & Hendry, D. 2012. Homeless young people on social network sites. *Proc. CHI 2012*. 2825-2834.
48. Wu, A., DiMicco, J. & Millen, D.R. 2010. Detecting professional versus personal closeness using an enterprise social network site. *Proc. CHI 2010*, 1955-1964.
49. Zhang, J., Qu, Y., Cody, J. & Wu, Y. 2010. A case study of micro-blogging in the enterprise: Use, value, and related issues. *Proc. CHI 2010*, 123-132. ACM.
50. Zhao, D. & Rosson, M.B. 2009. How and why people Twitter: The role that micro-blogging plays in informal communication at work. *Proc. GROUP 2009*, 243-252.