

# Privacy Management in a Connected World: Students' Perception of Facebook Privacy Settings

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## ABSTRACT

Millions of people, particular young adults, are active on online social networks. They are sharing content, communicating and passively staying aware of each other. Through a semi-structured interview study of university students we looked into their privacy practices on the online social network Facebook. We found that the students wanted to disclose information but had little awareness about their privacy settings and who can access their information. Overall privacy management was not a common activity but we found that the students considered what was appropriate to share in a public space and relevant to social sties. None of the participants reported any negative episodes caused by their use of Facebook and had no motivation to spend resources on privacy management. Privacy management is more than simply limiting access to information, but also, and more importantly, to disclose information under the right circumstances.

## INTRODUCTION

Social interaction is a primary Internet activity among university students [21]. Particularly online social networks have gained huge popularity and are widely used among undergraduate students [29]. Online social networks are used both to stay in contact with distant and local ties [22] and to arrange offline socialization [2]. These networks provide effective communication tools and link information directly to individuals.

Having personal information open to other people online has several advantages but can also be problematic to the users and makes the discussion about privacy management very important. Especially when considering how complex and contradicting privacy management can be. Dealing with privacy in online social networks is complex as it consists of a mix of technical solutions, legislation, and social norms [27], moreover privacy management is not a strict

discipline but a dynamic process depending on factors such as context and circumstance [26].

In the case of Facebook the millions of users [10] are “befriending” each other through explicit social ties. The center of Facebook is the explicit ties and the social interactions between these ties as well as the awareness users obtain by passively going through the newsfeed and browsing friends’ profiles [20].

On a daily basis more than a 100 million tags are added to photos shared on Facebook [11] and users are also giving out information about their social ties to Facebook applications etc. [19]. Therefore it is not relevant just to discuss the privacy concerns regarding the individual user, but also to discuss the collective privacy concerns related to social interactions and content sharing among primarily explicit ties, as well as ties without explicit relations such as friends of friends. Such actions will often affect several individuals. When sharing content such as photos it is very likely that in some cases individuals have conflicting privacy preferences [31] and requirements [26].

Currently Facebook privacy management is mainly based on the individual’s privacy settings as opposed to group-oriented settings on shared items such as pictures. Users want to communicate and share information but still maintain their privacy by having the ‘right’ information reach only the intended audience. This emphasize the rather contradicting notion of discussing privacy and the sharing of personal information on a public platform.

Users who want to share information will always face a dilemma between potential privacy risks and the desire to share information and content. An online social network such as Facebook makes sharing of information fairly uncomplicated and for example with Facebook Places, Facebook encourages its members to post personal information such as a person’s current location and whom they are with [13].

In this workshop paper we discuss issues regarding users’ sense of privacy and their practices in relation to Facebook use. Our study is based on qualitative data looking at university students’ use and practices of Facebook.

## **PRIVACY MANAGEMENT IN A CONNECTED WORLD**

Despite recognizing privacy risks such as unintended use of information or exposing too many details, users still engage in online social networking [15]. A study concludes that generally the users do not know much about privacy settings and who can access the information they share [1]. Users have high trust in Facebook and find their information safe [1, 15], despite Facebook having a history of leaving default privacy settings at an open stage assuming the user wants to broadly share information [5].

Privacy is not only about managing and protecting information from unintended receivers but also how the information is used and interpreted by social ties. For example, in romantic relationships this enhanced access to a partner's social activities and information can lead to jealousy [25]. Information and activity on a partner's Facebook profile may lead to assumptions and faulty interpretations [32]. Palen and Dourish point out that "*privacy management involves satisfying a number of needs, and balancing a number of tensions.*" [27] An example of a tension is the need and wishes to disclose certain information under specific circumstances while still maintaining privacy. Disclosing the right information under the right circumstances can be beneficial and serve as an advantage to the individual or group. For example, people are engaging in social interaction and information sharing. Using an online social network such as Facebook has shown to provide the users with a variety of gratifications such as communication and content sharing [20].

### **Authentic information**

A characteristic of Facebook is that the user base consists of real identifiable people. Facebook is about sharing information; particular personal authentic information [23] and it has been shown that the personal information provided by individuals here is both personally identifiable and accurate [1], making Facebook a reflection of real-world events and communication, opposite for example game-oriented networks. Online social networks are based on networks of real people and the authenticity is important because the users expect to be able to rely on the posted information [28].

Online social networks are not just representing living people but also an increasing amount of deceased people [6]. This opens up for several ethical privacy concerns regarding both the deceased and friends and family. On Facebook post-mortem profiles can be memorialized meaning that they no longer will show up in searches, being suggested as a potential friend to other users and also most profile information is removed [14]. This problematic will without doubt be an increased issue as online profiles become more and more integrated into the lives of many people. Information in online social networks is very well organized making it easily accessible for included parties. Particularly the options to list all public interactions between two specific people ("See Friendship") [8] and passively getting information through the newsfeed that

push information directly to the users making information "*...accessible and visible.*" [4]. Detailed accessible personal information has both high commercial value [18] and can be of interest to researchers challenging researchers with ethical dilemmas [33]. In recent years it has become more and more common to use information from online social networks in a court of law. This trend is increasing and now is not only publicly available information that may be used, also restricted information (i.e. profile information only available to 'friends'). Examples of content used are pictures and status updates but also interpretations of emotional aspects from a profile such as smileys to argue for a certain emotional state of a person. An argument is that such information, despite being restricted, not necessarily is confidentially [16]. When it becomes more common to use information from online social networks a person's social ties can directly or indirectly become involved in court cases since their social interactions or content sharing with the person potentially can be used as evidence and publically restricted information can be made public.

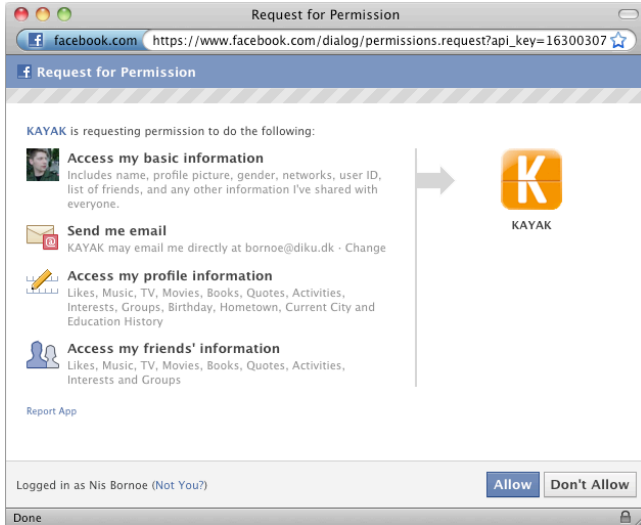
### **Privacy Management Awareness**

A recent survey of Facebook privacy habits among undergraduate students at a US university found that almost all participants at some point had changed their privacy settings [5]. Not surprisingly it was found that more engaged and experienced Facebook users and general highly skilled Internet users were more likely to change the privacy settings on a regular basis. No significant gender difference differences were found. The authors argue that some users might want to change privacy settings but simply do not know how to do it. Despite users changing privacy settings it is not clear if the users are aware of the changes they make. As pointed out the frequent changes of privacy settings and options on Facebook can potentially make it challenging to stay updated on current privacy settings.

### **Privacy Management in a Collective Environment**

Content posted on online social networks such as photos often include several people and currently more than 100 million tags in photos are added daily [11]. As Squicciarini et al. [31] point out these people can be considered stakeholders that all have an interest in the privacy management of a given photo or other shared item. For a given shared item such as a photo it can be complicated if not impossible to decide on a shared privacy setting that accompaniments all stakeholders privacy preferences. For example, always using the most strict privacy preference among the stakeholders is most likely rarely optimal. Clearly this approach would often result in very strict settings only allowing small sets of users access to the shared content. The authors propose an approach based on game theory that considers the privacy preferences of all stakeholders. Based on the individual preferences a privacy setting benefiting the group as a whole is chosen. However such an approach results in tradeoffs, as it will be impossible to satisfy all uses [31].

Facebook Apps, the small third party applications that operate with the context of Facebook, will often request access to a user's personal information and sometimes even request friends' information (see Figure 1.). Several apps, even some of the most prominent, have been found to transmit personal identifiable information to third parties [30]. Yet an example of how 'friends' can affect each other.



**Figure 1. Screenshot of a Facebook application requesting not only access to the user's information but also friends' information.**

Several other recent Facebook initiatives are also going to blur the border between individual users and their network of social ties. One feature is Facebook Places [13], a build-in location-based service giving users the opportunity to post their current location by "checking-in" to a location and tag the people they are together with. With "sponsored stories" Facebook is introducing a new advertising concept where the users indirectly endorse certain advertisers. A scenario would be a user "checking in" on "Facebook Places" from a coffee shop or a user clicking "Likes" on a certain advertiser's "Facebook Page". This action can automatically be turned into a "Sponsored Story" that shows up as an advertisement on a friend's page together with the advertiser's logo. Friends tagged in the given update will also be included in the ad [7]. For example, when Jack checks-in at Starbucks and also tags Melissa, an ad showing up on a Friends page could say: "*Jack is relaxing with a hot cup of coffee - at Starbucks with Melissa*". In this example two people are indirectly making an endorsement of an advertiser and "Melissa" might not even be aware she is part of an advertisement. Another recent introduced concept is "Facebook Messages" [12], a messaging system providing a full conversation history with each friend. The conversation history is platform independent and will include conversations from instant messaging, e-mail and text messages. Overall these examples shows that social ties are becoming more and more linked together and this is encouraged through the system design.

## METHOD

During 2010 we completed 52 semi-structured interviews with a mix of predominately undergraduate and a few graduate students at a large public university in the Midwest of the US. The participants were recruited through different means including flyers handed out at campus, by word of mouth, through a mailing list, and through Facebook. Of the people that showed interest in the study we specifically chose the ones being most active on Facebook. All participants received compensation for their time. The use of semi-structured interviews resulted in comparable data, while still allowing a dynamic conversation.

The interviews were centered around the students' use of Facebook, both from computers and mobile phones. During the interviews we asked the participants to log into their Facebook profile and show us some of their recent status updates. This as well allowed the participants to show us pictures, and other content they found interesting and relevant to the discussion. The interviews were video recorded for later analysis using a Grounded Theory approach, which has shown to be very useful when taking a qualitative research approach to how information technology is used [17].

It has been pointed out that investigating privacy can be quite complex and the most reliable results will require a mixed of methods such as interviews and user observations [24]. This study is based on interviews and the results reflect the participant's attitudes, awareness, and thoughts about privacy management and settings but not their actual behavior.

## Participants

Of the 52 students 20 were males and 32 were females. Participants' ages ranged between 18 and 29 (mean age: 21, SD: 2.27). 48 were undergraduate students and 4 were graduate students. They studied a variety of fields including biology, business, informatics, journalism, and psychology. All participants connected to Facebook from both a computer and a mobile phone. In general our participants can be considered heavy Facebook users with a large majority having Facebook incorporated as part of the daily routine. On average the participants had 841 friends (SD: 519). The one with the fewest friends had 187 friends and the one with the most had 2939. In comparison an average Facebook user has 130 friends [10], which also confirmed that our student sample were more high-level users. To our participants Facebook was about staying in touch, communicating, and not least staying aware of social ties. They looked particularly at the newsfeed, sent private messages, posted status updates, wall posts, and comments. Photo sharing and browsing profiles were reported as common and popular activities. Participating in interest groups, playing games and using other sorts of applications were rare activities. In essence, the use of online social networks functioned as both a 'time-filler' and entertainment.

## FINDINGS

Our findings in this study clearly indicate that Facebook use is centered around the social ties and personal interactions as opposed to, for example, applications, games, interest groups, also available through Facebook. When the participants logged onto Facebook the purpose were rarely to accomplish specific goals but out of pleasure and to be entertained and have enjoyment between activities. A 27 year-old male described Facebook as: *"Small talk you can turn on and turn off."*

### Communicating, Sharing, and 'Stalking'

Facebook was a social platform used both for actively and passively socializing. Besides explicit communication through primarily wall posts and photo sharing the participants would were also heavily engaged in passive activities. Particularly using Facebook to passively browse through profiles, popularly refereed to as *'Facebook stalking'*, and browse photos were a very common activities. Profile browsing has been presented as *'social surveillance'* and coupled with unfavorable activity such as spying on a romantic partner [25][32]. A 19 year-old male mentioned that Facebook sometimes could lead to *'social trouble'*. For example, a 19 year-old female explained about her long distance relationship: *"...there have been a few incidents were like he will be tagged in a picture with another girl and I will ask 'what was that?' and it is nothing that has been too problematic..."*

Overall we did find that profile browsing mainly was correlated with positive aspects. The browsing of profiles was used to passively stay aware of social ties and was done both for pure entertainment but also as a way to get to learn more about new contacts. For example, Facebook was seen as neutral platform to get introduced to classmates. Passively browsing profiles was somewhat a taboo. Despite everyone being engaged in *'Facebook stalking'*, it was considered *"creepy"* to let people know.

### Facebook 'Friends'

The Facebook friends were for all participants a mix of all sort of social ties. The social ties would include family members, strong ties and a large amount of weak ties, typical fellow-students, high school ties, friends of friends, and occasionally co-workers. Especially the type of friend requests the participants accepted had changed over time. From accepting almost everyone requesting friendship, many participants reported having changed habits into being more restrictive about who they would accepted. A 20 year-old female explained: *"I was more open in the past [... if] I have no idea who they are I look at the mutual friends and then I will add them. Normally they will be: 'Ohh I met you here' and I will be like: 'Ohh yeah'. [...] If they are like: 'Hey I thought you were cute!' I will be like 'delete'!"*

By default all social ties are treated the same meaning there is only one type of friendship. This made social interaction with anyone easy but often not all information on a profile was intended for all ties but rather a limited group.

### Perception of Privacy Settings

We found that the participants had little knowledge about the privacy settings and the consequences of making adjustments. For example, when asked if the participants used "Limited Profile" (a list of 'friends' that have limited access to a profile and might be restricted from reading wall posts or browse a user's pictures.) only a minority used this setting and knew how it was used. Almost all had changed the openness of their profile so only friends or in some cases friends of friends had access. This seemed to be the only privacy setting most were aware of and actively adjusted. In fact they were often even aware of their own ignorance. A 20 year-old female explained: *"...I read about the privacy settings on Facebook but I didn't realize all of exactly what was going on and why..."*

Despite have adjusted the openness of their profiles, the descriptions of their privacy settings was often unclear. This was illustrated by the following comment by a 21 year-old female when asked how open her profile was to non-friends: *"I think... I don't even really know... I think it is just private..."* and a 27 year-old male explained: *"...what do I let people see? I feel there is something I let everyone see but I can't remember. It might be my photos but maybe not... I can't remember. I might have turned that off..."*

This was the general "trend" we found among our participants. All had at some point changed their settings away from the default, but they were not aware about who could access what. Further, regularly managing privacy settings was not a common activity. We found only little motivation and interest in managing privacy settings.

### Sex, Drugs, and Alcohol a "no-go"

The participants were in general quite *nonchalant* about their privacy, what they posted, and what social ties posted about them. When asked if he was concerned and cared about his privacy a 25 year-old male answered: *"I don't but I am concessions of what I put up there..."*

When considering what to post the participants heavily relied on *'commonsense'* and on social norms from the offline world. An explicit concern was the impression they would make on future employers. This was one of the only specific concerns that were mentioned. This concern made the participants consider not only what they posted but also what friends posted on their wall and which pictures they were tagged in. Posting pictures and status updates including revealing pictures, illegal substances, and alcohol was in general for all participants a *"no-go"*; however alcohol related updates were in a somewhat *'grey area'* and depended very much on the specific context. A 20 year-old female explained her practices when taking party pictures: *"That one is iffy... I usually try to avoid that in general by when I take the picture ask the person to put there cup down or just like not let the alcohol be in the picture when I take it or if it does get in the picture it is my judgment if I feel it is okay I will post it if I feel it is really bad I will like Photoshop it and just like blur it out."*

Mainly the participants started to consider privacy management on Facebook after hearing about incidents reported in the media, through stories of friends or friends of friends that had gotten into trouble and through urban legends. Participants reported different practices such as completely blocking access to their pictures, use limited profile by blocking certain 'friends' from accessing specific profile parts to not considering privacy management at all.

Rather than trying to protect information it was common to only post information the participants felt was appropriate for the public space. This practice mixed with occasionally deleting information seemed to cover the need for privacy. Mainly they removed wall posts posted by friends or untagged themselves from photos. Often because of vanity as explained by 19 year-old female: *"If there is a picture where I don't look my best I don't want to be tagged and I will untag it."*

Interestingly a 20 year-old female explained that members of her sorority had to follow sorority regulations.

*"I was the risk manager and I had like a fake Facebook, her name was like Rose [...] which related to me and I was only friends with our sisters and I had to go through everyone like... go through all their pictures and if it was inappropriate I left a comment that like... the comment was 'I love you sister' but they knew that means the picture was inappropriate and had to come down."*

#### **The "Mom" Test**

Most participants were friends with family members and felt that if posted content was appropriate for family to see it was appropriate for everyone. For example, a 20 year-old female described: *"I am friends with my mom on Facebook so I guess I am okay with my mom seeing it."*

#### **CONCLUSION**

This study evokes two questions worth considering: Why at all discuss privacy when online social networks are all about exposing information? And why does privacy matter at all? We have found that the participants in this study received different forms of gratifications from using online social networks. They wanted to expose information and engage in social interactions. This is not the same as giving up privacy, rather exposing leads to a need for privacy management or as Palen and Dourish write: *"...privacy management is a dynamic response to circumstances rather than a strict enforcement of rules."* [26]. Privacy management is about balancing between several considerations and is an activity filled with nuances.

All participants had at least been active on Facebook for a couple of years previously to the study. During which they had gone through a process correlated with social changes and maturing, especially marked by the change from high school to college. Their use of online social networks had changed towards more intensive considerations of what to make public and posting information they felt comfortable with. They were also more selective when accepting new

'friends'. Privacy management was a mix of adjusting privacy settings and usage practices. Particularly social norms from the offline world seemed to be reflected when using online social networks. Overall we conclude that the participants had gotten to know the media better, how it was useable to their stage in life and which benefits and gratifications they got. We received almost only positive feedback about using online social networks and despite missing awareness of privacy settings we found that this was compensated for through usage practices.

Recent new Facebook features such as Facebook Places and Facebook Messages integrate user interactions more closely than before so groups of users take part in joint stories. Most likely the stories told through online social networks will move towards being attached to a group rather than an individual.

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#### **REFERENCES**

1. Acquisti, A. and R. Gross. "Imagined Communities: Awareness, Information Sharing and Privacy on The Facebook." Proceedings of the 6th Workshop on Privacy Enhancing Technologies, Cambridge, UK (2006).
2. Barkhuus, L. and Tashiro, J. Student Socialization in the Age of Facebook. In Proc. CHI '10, ACM, New York, NY, USA (2010), 133-142.
3. boyd, d. "Why Youth (Heart) Social Network Sites: The Role of Networked Publics in Teenage Social Life." MacArthur Foundation Series on Digital Learning – Youth, Identity, and Digital Media Volume (ed. David Buckingham). (2007) Cambridge, MA: MIT Press.
4. boyd d. Facebook's Privacy Trainwreck: Exposure, Invasion, and Social Convergence. *Convergence: The International Journal of Research into New Media Technologies* 14, 1 (2008), 13-20.
5. boyd, d. and Hargittai, E. Facebook privacy settings: Who cares? *First Monday* 15, 8 (2010).
6. Brubaker, J. R. and Hayes, G. R. "We will never forget you [online]": An empirical investigation of post-mortem MySpace comments. In Proc. CSCW 2011, ACM, New York, NY, USA (2011).
7. Constine, J. Inside Facebook: Facebook's Sponsored Stories Turns News Feed Posts Into Home Page Ads <http://www.insidefacebook.com/2011/01/24/sponsored-stories-feed-ads/> (January 24, 2011).
8. Davis, L. S. The Trouble with Facebook's 'See Friendship' Feature. *TIME*. <http://time.com/time/business/article/0,8599,2032030,00.html> (November 18, 2010).
9. Ehrmann, E. From Facebook To Casebook... Privacy Violations Spark Legal Action. *Huffington Post*. <http://www.huffingtonpost.com/eric-ehrmann/from->

- facebook-to-casebook\_b\_278888.html (February 17, 2011).
10. Facebook | Statistics. Retrieved January 14, 2011, from <http://facebook.com/press/info.php?statistics>
  11. The Facebook Blog | Making Photo Tagging Easier. <http://blog.facebook.com/blog.php?post=467145887130> (December 15, 2010, updated February 11, 2011).
  12. The Facebook Blog | See the Messages that Matter. <http://blog.facebook.com/blog.php?post=452288242130> (November 15, 2010).
  13. The Facebook Blog | Who, What, When, and Now... Where. <http://blog.facebook.com/blog.php?post=418175202130> (August 18, 2010).
  14. The Facebook Blog | Memories of Friends Departed Endure on Facebook. <http://blog.facebook.com/blog.php?post=163091042130> (October 26, 2009).
  15. Fogel, J. and Nehmad, E. Internet social network communities: Risk taking, trust, and privacy concerns, *Computers in Human Behavior* 25, 1 (2009), 153-160.
  16. Grow, B. In litigation, private Facebook posts are suddenly less private. *Westlaw News & Insight*. [http://westlawnews.thomson.com/National\\_Litigation/News/2011/01\\_-\\_January/In\\_litigation,\\_private\\_Facebook\\_posts\\_are\\_suddenly\\_less\\_private/](http://westlawnews.thomson.com/National_Litigation/News/2011/01_-_January/In_litigation,_private_Facebook_posts_are_suddenly_less_private/) (January 28, 2011).
  17. Hansen, B H. and Kautz, K. Grounded Theory Applied - Studying Information Systems Development Methodologies in Practice. In *Proc. HICSS '05*. IEEE Computer Society, Washington, DC, USA (2005).
  18. Hughes, A. *Strategic Database Marketing*, 3rd ed. New York: McGraw-Hill, 2005.
  19. Hull, G., Lipford H. R., and Latulipe, C. Contextual gaps: privacy issues on Facebook. *Ethics and Information Technology*. Springer (2010).
  20. Joinson, A. N. Looking at, looking up or keeping up with people?: motives and use of facebook. In *Proc. CHI '08*. ACM, New York, NY, USA (2008), 1027-1036.
  21. Jones, S., Johnson-Yale, C., Millermaier, S., and Pérez, F. S. Everyday life, online: U.S. college students' use of the Internet. *First Monday* 14, 10 (2009).
  22. Lampe, C., Ellison, N., Steinfield, C. A Face(book) in the Crowd: Social Searching vs. Social Browsing. In *Proc. CSCW '06*, ACM, New York, NY, USA (2006), 435-444.
  23. Lewis, K., Kaufman, J., and Christakis, N. The Taste for Privacy: An Analysis of College Student Privacy Settings in an Online Social Network. *Journal of Computer-Mediated Communication* 14, 1 (2008), 79-100.
  24. Mancini, C., Thomas, K., Rogers, Y., Price, A. B., Jedrzejczyk, L., Bandara, A. K., Joinson, A. N., and Nuseibeh, B. From spaces to places: emerging contexts in mobile privacy. In *Proc. Ubicomp '09*. ACM, New York, NY, USA (2009), 1-10.
  25. Muise A., Christofides, E., and Desmarais, S. More information than you ever wanted: does Facebook bring out the green-eyed monster of jealousy? *Cyberpsychology & Behaviour* 12, 4 (2009), 441-444.
  26. Palen, L. and Dourish, P. Unpacking "privacy" for a networked world. In *Proc. of CHI '03*. ACM, New York, NY, USA (2003), 129-136.
  27. Pekárek, M. and Pötzsch, S. A comparison of privacy issues in collaborative workspaces and social networks. *Identity in the Information Society* 2, 1 (2009), 81-93.
  28. Ryberg, T. and Larsen, M. C. Networked identities: Understanding relationships between strong and weak ties in networked environments. *Journal of Computer Assisted Learning* 24, 2 (2008), 103-115.
  29. Smith, S. D. and Caruso, J. B., with an introduction by Kim, J. *The ECAR Study of Undergraduate Students and Information Technology, 2010 (Research Study, Vol. 6)*. Boulder, CO: EDUCAUSE Center for Applied Research (2010).
  30. Steel, E. and Fowler, G. A. Facebook in Privacy Breach. *Wall Street Journal*. <http://online.wsj.com/article/SB10001424052702304772804575558484075236968.html> (October 18, 2010)
  31. Squicciarini, A. C., Shehab, M., and Wede, J. Privacy policies for shared content in social network sites. *The VLDB Journal* 19, 6 (2010).
  32. Tokunaga, R. S. Social networking site or social surveillance site? Understanding the use of interpersonal electronic surveillance in romantic relationships. *Computers in Human Behavior* (2010). In press.
  33. Zimmer, M. "But the data is already public": on the ethics of research in Facebook. *Ethics and Information Technology* 12, 4 (2010), 313-325.