

# Is Your Social Networking Privacy Reliant on Intuitive Interfaces?

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**Abstract.** A study was conducted to assess the level of awareness that users have with regard to the privacy account settings within Facebook, a popular social networking site. A questionnaire was developed and disseminated. The questionnaire findings are discussed and recommendations for improvement to the interface in terms of creating more awareness of privacy settings were identified. The conclusion section discusses improvements to enhance users' awareness of their privacy settings. Future research was identified in pursuit of increasing intuitive interfaces related to privacy settings.

**Keywords:** Usability, Social Networks, Privacy, Intuitive Interface.

## 1 Introduction

A study was conducted to assess the level of awareness that users have with regard to the privacy account settings within Facebook, social networking site. As Facebook continues to expand and grow, concerns about privacy drive research into user awareness of settings and profile privacy settings intuitiveness. The study consisted of developing and disseminating a questionnaire which was developed through analysis of privacy literature and a careful review of the Facebook privacy account settings. The questionnaire focused on the degree of personal information users share on their profile. The research methodology consisted of developing the questionnaire to assess the intuitiveness of different privacy settings within Facebook, disseminating the questionnaire to survey participants, analyzing the data collected from the questionnaire and summarizing the results for enhancing protection of personal data within social networks. Over 392 participants were surveyed, with 366 of those surveyed having a Facebook account. Recruiting of the participants took place on a University campus offering extra-credit for their participation. The questionnaire findings were gathered and are discussed in the results section. Recommendations for improvement to the interface in terms of potential usability barriers were identified. The conclusion section discusses improvements to enhance users' awareness of their privacy settings. Future research was identified in pursuit of increasing intuitive interfaces specifically related to privacy settings within Facebook.

## 2 Social Networking Privacy

Social network sites (SNSs) such as Facebook are defined by the functions permitted to the users of the community. By creating an individual user profile, the user may establish connections with others in the community and explore these connections as well as connections made by others in the system [1]. As opposed to communities where a user may create a profile and post to a common area such as a message board or a blog, SNSs allow a user to demonstrate the breadth of their social networks through the types of connections that they make with other users. Users do not necessarily seek out strangers with whom to connect; instead, the online interactions tend to reinforce connections that users make offline.

In its inception in 2004, Facebook limited its social network to the Harvard community where it was conceived. Soon afterward, it expanded to include colleges and universities. In 2006, Facebook opened membership to include high schools and businesses; being part of a pre-established network was necessary in order to join. More than six years after its beginnings, Facebook now allows users to join, although they often require approval to list themselves as part of a given network.

In joining Facebook, a user creates a profile that requires a name, email, gender, and birth date. This is the minimum amount of information that a user may provide, but it alone is insufficient in utilizing Facebook as a social network site. SNSs by definition require that the user establish and connect with friends; therefore, the user must designate a list of friends. The user becomes the center of his or her personal network, with the connections often defined by common interests, beliefs, or past experiences. These friends are then able to post comments on a user's personal page and view each other's profiles.

With Facebook, groups of users can come together under a common interest or cause, thereby further establishing connections outside of an offline network. University students, the first group to establish a collective identity on Facebook, have used the SNS to establish and maintain social capital that bridges the offline and online worlds. Ellison, Steinfield, and Lampe examined the role that an individual's Facebook "friends" played in establishing and maintaining a university student's well-being, concluding that individuals use Facebook to solidify already existing relationships [2]. In a time before the inception of Facebook, Bargh, McKenna, and Fitzsimons concluded that for some individuals, the Internet medium facilitated a representation of one's true self [3]. During the process of profile creation, the new user is prompted to voluntarily submit information tied to identity, including religious and political affiliation as well as favorite books, movies, and movies. This information made available through a Facebook connection then allows individuals to maintain weak relationships, such as by sending birthday greetings or commenting on a recently posted photo. For this to take place, however, the user must make such information public and available to members of his or her network.

Around the same time that Facebook expanded to include users beyond colleges and universities, studies emerged that focused on users' familiarity and comfort with issues related online privacy. Facebook offers its users the ability to share a wealth of itemized information about themselves; hometown and present locations, academic affiliations from high school and beyond, religious and political affiliations, and employment status can all be listed in carefully controlled fields in their profiles. In

these earlier years, Facebook users often joined the SNS in spite of personal privacy concerns; those users who were aware of the potential privacy threats on a large social network relied upon Facebook's privacy controls to fine-tune the availability of the information, as opposed to simply not listing the information at all [4].

Facebook users have been shown to reveal more information about themselves in profiles when compared to users of another popular SNS, MySpace [5, 6]. These connections are further maintained and segregated through the ability of control that a user can have over the wealth of information that can exist in a given user profile; however, the new Facebook user encounters a default privacy setting that is public. Only by deliberately changing settings can the user opt out of searches among networks and friends as well as larger search engines.

Privacy on a large social network site such as Facebook is relative; simply by joining the community, the user already provides a real name, gender, and birthday [7]. Users agree to the Statement of Rights and Responsibilities which includes granting Facebook the "non-exclusive, transferable, sub-licensable, royalty-free, worldwide license to use any IP content" that a user may post on or in connection with Facebook [8]. The permissions granted are subject to the user's privacy and application settings; at the same time, the Statement of Rights and Responsibilities reminds users that posting and publishing content under the 'everyone' setting permits everyone, including persons who may not use Facebook, to view and utilize the information and associate it with the user's name and likeness. In studying privacy settings of college students on Facebook, Lewis, Kaufman, and Christakis considered a profile to be private if a student altered the default settings to restrict a personal profile so that only a partial profile is available to a nonfriend, same network users or so that no part of the profile may be searched by a nonfriend, same network user [9]. In either case, the user must have taken deliberate action to ensure some measure of privacy within the Facebook community. Results from this study indicated that a student's utilization of privacy settings was influenced by the number of friends who also maintained private profiles as well as how frequently a user updated his or her profile.

As Facebook continued to expand and grow, concerns about privacy drive research into user awareness of settings and profile availability. Less than two years after Facebook's push onto college campuses, studies showed that while three-quarters of users were aware of privacy settings, between one-third and one-half of users actually used those privacy settings [8, 10]. As recently as 2009, research into privacy issue awareness and the risks versus benefits of using Facebook demonstrated that the majority of users who report restricting their profile still provides a wide range of detailed personal information to friends they may or may not know from offline encounters [11]. This same study indicated that users were more likely to alter privacy settings if they had experienced a negative encounter with Facebook, such as having a profile hacked or an unwanted posting on a profile wall, and concluded that concerns about user privacy should be countered with a drive toward technical, sociocultural, and ethical education about social network site privacy.

### 3 Methodology

A study was conducted to assess the usability of privacy account settings within Facebook, the social networking site. The study consisted of the following steps in planning, conducting, and assessing the interface affiliated with the privacy settings. The form of assessment was through development and dissemination of a questionnaire during the fall of 2010.

*Step 1: Develop the questionnaire to assess the intuitiveness of different privacy settings within Facebook.* The questions were developed through two means. First, a review of literature affiliated with concerns of privacy on social networks provided insight into areas of privacy that can be problematic for users. Furthermore, the researchers went through the Facebook account settings to identify all settings that fall under the category of privacy settings. From the review of the literature and of the privacy settings, the questions for the questionnaire were identified. The first part of the questionnaire focused on the degree of personal information users share on their profile such as posting a picture of themselves as their profile picture, address, birthday, home phone number, work phone number, email address and other pictures of themselves in photo albums. The second part of the questionnaire focused on the type of setting that users have selected when posting their personal information such as selecting which audiences can view their personal information. The different audience settings are everyone, friends of friends, friends only, and other (user has customized their setting so that different friends have different permissions in terms of viewing a user's personal information including the option to not allow anyone to view personal information).

*Step 2: Disseminate the questionnaire to survey participants.* Extra-credit was given to students enrolled in a freshman level university course. An email was sent out to these students informing them of the opportunity to participate in the survey if they desired resulting in extra-credit being provided. The link to the survey was also provided so that the survey was taken online through the university learning management system.

*Step 3: Analyze the data collected from the questionnaire.* From the analysis of the survey data, the responses for each question were calculated as well as the mean, standard deviation, standard error and 95% Confidence Interval data. The questionnaire findings were gathered and are discussed in the results section. Recommendations for improvement to the interface in terms of potential usability barriers were identified.

*Step 4: Summarize the results for enhancing protection of personal data within social networks.* The conclusion section discusses usability improvements in pursuit of increasing intuitive interfaces specifically related to privacy settings within Facebook. Future areas of research were also identified.

### 4 Results

The results for each question listed in the questionnaire to assess the usability of the Facebook interface in terms of how intuitive is the privacy account settings for users

are presented. The range in age of the 392 participants surveyed was between 18-25 years of age. All participants surveyed are college students.

*Do you have a Facebook account?* Of the 392 participants surveyed, 366 or 93.4% of those surveyed, have Facebook accounts.

*Do you use a picture of yourself as an identifying profile picture?* Of the 366 participants surveyed that have a Facebook account, 94.54% use a picture of themselves as their profile picture.

*Do you post pictures on your Facebook account?* Of the 366 participants surveyed that have a Facebook account, 90.16% post pictures such as posting pictures in a picture album or wall photos.

*Do you post information regarding the address where you live?* Of the 366 participants surveyed that have a Facebook account, 19.95% identify their address on their profile.

*What are your settings for your birthday?* Table 1 displays the results broken out by response category.

**Table 1.** Birthday Setting

<b>Birthday Setting Response</b>	<b>%</b>
My birthday shows the month, day and year.	55.19
My birthday shows the month and day, but not the year.	37.16
I do not show my birthday.	7.65

*Do you post your phone number (home or cell)?* Of the 366 participants surveyed that have a Facebook account, 26.23% post their home or cell phone number on their profile.

*Do you post your work phone number?* Of the 366 participants surveyed that have a Facebook account, 3.83% post their work phone number on their profile.

*Do you post your email address?* Of the 366 participants surveyed that have a Facebook account, 59.56% post their email address on their profile.

*Has your Facebook account ever been hacked?* Of the 366 participants surveyed that have a Facebook account, 9.29% have experienced their account being hacked.

*Keeping in mind the Privacy Settings available in Facebook, what permissions have you set for your own profile for the following nine areas?* The nine areas that Facebook allows users to set privacy settings for as well as the responses in terms of percentages of the 366 participants surveyed that have a Facebook account is displayed in Table 2.

*Keeping in mind the Basic Directory Information setting in Facebook, what permissions have you set for your own profile in Facebook?* The seven areas that Facebook allows users to set privacy settings for their basic directory information as well as the responses in terms of percentages of the 366 participants surveyed that have a Facebook account is displayed in Table 3.

**Table 2.** Privacy Settings Permissions

<b>Privacy Settings Permissions exactly as shown in Facebook</b>	<b>Everyone %</b>	<b>Friends of Friends %</b>	<b>Friends Only %</b>	<b>Other %</b>
My status, photos and posts.	20.77%	11.20%	61.20%	6.83%
Bio and favorite quotations.	25.68%	11.75%	56.28%	6.29%
Family and relationships.	21.31%	10.38%	59.56%	8.75%
Photos and videos I'm tagged in.	12.30%	17.76%	59.02%	10.92%
Religious and political views.	20.22%	15.85%	54.37%	9.56%
Birthday.	18.31%	17.21%	56.28%	8.2%
Can comment on posts.	13.11%	10.11%	69.40%	7.38%
Places I check in to.	10.11%	7.92%	67.49%	14.48%
Contact Information.	10.93%	7.10%	63.11%	18.86%

**Table 3.** Privacy Settings for Basic Directory Information Permissions

<b>Privacy Settings for Basic Directory Information Permissions exactly as shown in Facebook</b>	<b>Everyone %</b>	<b>Friends of Friends %</b>	<b>Friends Only %</b>	<b>Other %</b>
Search for me on Facebook.	66.94%	10.11%	17.49%	5.46%
Send me friend requests.	69.95%	9.56%	16.67%	3.82%
Send me messages.	58.74%	12.84%	25.68%	2.74%
See my friend list.	42.35%	16.67%	36.07%	4.91%
See my education and work.	34.70%	14.75%	45.63%	4.92%
See my current city and hometown.	34.97%	12.84%	46.72%	5.47%
See my interests and Pages.	32.24%	12.84%	46.72%	5.47%

*Do you use the “Places” application in Facebook that allows users to see where you have ‘checked in,’ such as local restaurants, airports or entertainment venues?* Of the 366 participants surveyed that have a Facebook account, 11.20% utilize this application.

*Do you use security questions to help retrieve passwords?* Of the 366 participants surveyed that have a Facebook account, 81.42% set up a security question such as the name of a childhood teacher to help these users retrieve a forgotten password.

*Please select the questions that you commonly use for password retrieval (select all that apply).* Table 4 displays the percentages of responses based on the 366 participants surveyed that have a Facebook account.

*Do you display information that could be linked to a security question (name of pets, mother’s maiden name, hometown, etc.)?* Of the 366 participants surveyed that have a Facebook account, 12.57% display information on their profile which could be used to hack into their Facebook (or other) account.

*After completing this survey, do you plan to alter your Facebook profile settings?* Of the 366 participants surveyed that have a Facebook account, 24.86% plan to change some aspect of their Facebook profile settings.

**Table 4.** Questions the 366 Participants Commonly Use for Password Retrieval

Use of the below Questions Commonly Used for Password Retrieval	%
Mother's maiden name.	40.16%
Name of first pet.	40.44%
Name of childhood teacher.	9.84%
Favorite Sports Team.	14.21%
Name of town where you born.	39.89%
I do not use any of these questions.	36.07%

## 5 Conclusion

The objective of evaluating users' privacy account settings was to determine if users adjust their privacy account settings within Facebook with the overall objective being to gain insight on whether users find the interface for privacy account settings to be intuitive enough to be making adjustments to their privacy controls. The questions relating to the permissions set for different information on individual profiles varied. The permission settings consist of "everyone" where everyone on Facebook can view particular information about a user. The setting "friends of friends" signifies that all of your friends' friends can have full access to information where this setting is utilized. The setting "friends only" refers to only those friends of a particular Facebook user can view information where this setting is utilized. Lastly, there is a custom setting where a Facebook user can block certain friends or even nonfriends from seeing any or all aspects of their profile. The custom setting also has the option of posting information for personal viewing only as there is an option where a user can set information to only be viewable only to their self. With regard to birthday settings, over 55% of participants allow for the default setting of showing their birthday month, day and year to be displayed on their profile. Furthermore, over 18% of the survey participants utilize the default setting of "everyone" for viewing the birthday information that user's display on their profile. Over 20% of survey participants utilize the default setting of "everyone" for viewing their profile status, photos and posts. Over 25% of the survey participants utilize the default setting of "everyone" for viewing their profile biography and favorite quotations. Over 21% of the survey participants utilize the default setting of "everyone" for viewing their family (displays information such as names of your siblings, cousins, etc. on Facebook) and relationship status (married, single, etc.). Over 12% of the survey participants utilize the default setting of "everyone" for viewing their photos and videos where they are tagged which could include those photos or videos posted by a Facebook friend. Over 20% of the survey participants utilize the default setting of "everyone" for viewing their religious and political views. Over 13% of the survey participants utilize the default setting of "everyone" for allowing everyone on

Facebook to comment on posts on their profile. The “everyone” setting means that a stranger can post a comment on an individual’s profile. Over 11% of survey participants utilize the “places application” and over 10% of the survey participants allow for the “places application” to be viewable to everyone on Facebook. Therefore, any person with a Facebook account can view profiles set to “everyone” resulting in a stranger being able to view exactly where a person is throughout the day because the “places application” alerts on a user’s profile that the particular user has checked into a particular airport, restaurant, store or even showing that a particular user has checked into their home. Over 10% of survey participants utilize the default setting of “everyone” for allowing everyone on Facebook to view their contact information which could include any combination of information such as their home address, email address and/or phone number (work, home and/or cell). Therefore, depending on the type of information (photos, contact information, etc.), anywhere from 10% to 25% of the participants surveyed utilize the default setting for information sharing. Taking the lower range of 10% of survey participants suggest that of the 366 participants that approximately 36 of those participants either are not concerned about their information privacy or that these participants are not comfortable in exploring the interface where a user can control their privacy settings.

A similar question asked participants about their permission settings with regard to basic directory settings. The results showed that over 66% of survey participants utilize the default setting of “everyone” for being able to be found or rather searched on by other Facebook users. Over 69% of survey participants utilize the default setting of “everyone” for being able to be sent “friend requests” by any person with a Facebook account. Over 58% of survey participants have the default setting of “everyone” for allowing any person on Facebook to send a message. Over 42% of survey participants have the default setting of “everyone” on Facebook to be permitted to view their entire list of friends. Over 34% of survey participants have the default setting of “everyone” to view their education and work information provided. The amount of information users’ list can vary from the name of their school or company, name of degree(s), etc. Over 34% of survey participants utilize the default setting of “everyone” to view their current city and hometown. This could also be an area of concern since some password reset options on email accounts and online marketplaces utilize a question regarding a person’s hometown for password reset options. Over 32% of survey participants utilize the default setting of “everyone” for viewing their interests and pages consisting of fan pages possibly to their favorite restaurants or organizations/clubs. The directory setting information doesn’t reveal home addresses but can also reveal private information such as where a person works.

The topic of security questions to help retrieve passwords within Facebook was covered on the questionnaire. Over 81% of survey participants utilize the option to set a security question to retrieve their password. The options for a user is to be asked for their mother’s maiden name, name of their first pet, name of a childhood teacher, name of their favorite sports team, town where they were born, etc. Over 40% of survey participants use their mother’s maiden name as the security question. However, a person might utilize the capability to list out family members on their profile. If their mother uses their maiden name as part of their name display on Facebook, then a person’s mother’s maiden name is no longer private. Over 40% of survey participants also use the name of their first pet as the security question.

Individuals on Facebook can post old pictures of their old pets and reveal the name of their first pet which would make that information no longer private. The same holds true for any of the security questions as users may accidentally reveal the information needed to answer their security question which could grant a person access to their profile and ultimately their personal data. Over 12% of the survey participants revealed that they have displayed information on their profile which is directly linked to their security question.

As Facebook continues to expand and grow, concerns about privacy drive research into user awareness of settings and profile privacy settings intuitiveness. An interesting response from the questionnaire was that 24.86% of the participants plan to change some aspect of their Facebook profile setting after completing the questionnaire suggesting that the questionnaire itself provided awareness on privacy settings possibly outside of the survey participants' existing knowledge base. Perhaps a short video clip could be put together so that users when signing up for an account can be provided with information pertaining to the importance of fully utilizing the privacy settings within Facebook. The video clip could also utilize a quick demonstration/tutorial so assist a user with adjusting their privacy setting. Another idea could be the use of a wizard to assist a user as they adjust their privacy settings. Also, an alert of some kind could be given to users when setting their security question regarding the importance of not displaying the answer to their security question on their profile. Future research will be conducted to explore different interface displays where usability testing will be conducted to determine which interface features are the most intuitive for Facebook users. An additional questionnaire will be developed also to gain further insight into the perceived ease of use that users have when exploring the privacy account settings within Facebook. Acquiring more information on the reason users do not utilize the privacy account settings would be useful in driving the design of privacy account settings not only for Facebook but also for other social networking sites.

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