*Article - 5*
*Global Media Journal-Indian Edition*
*Sponsored by the University of Calcutta/www.caluniv.ac.in*
*ISSN 2249 - 5835*
*Summer Issue/June 2014/Vol. 5/No. 1*

# FACEBOOK PRIVACY MANAGEMENT: AN EMPIRICAL STUDY OF AWARENESS, PERCEPTION AND FEARS

**Anusha Venkat**
Pursuing post graduation in Journalism and Mass Communication
PSG College of Arts and Science, Coimbatore, Tamil Nadu, India.
Email:anusha.venkat91@gmail.com
**Dr. C. Pichandy**
Head, Department of Communication, PSG College of Arts and Science, Coimbatore, Tamil Nadu, India.
Email: cpichaandy@yahoo.co.in
**Francis P. Barclay**
Doctoral scholar, Department of Mass Communication and Journalism,
PSG College of Arts and Science, Coimbatore, Tamil Nadu, India
Email: francisjournalist@gmail.com
**R. Jayaseelan**
Doctoral scholar, PSG College of Arts and Science, Coimbatore, Tamil Nadu, India.
Email:jayaseelan.sr@gmailcom

***Abstract***: Is Facebook safe and secure? In several cases, it has been evident that users hardly ever give safety a thought before feeding the social network with sensitive and personal information. That's exactly why such a question rather rattles an average active user that pays little or no heed to the security concerns revolving the online network. As Facebook becomes increasingly popular in India, as in the other parts of the world, a demand for a scientific investigation has risen. Are users aware of the safety risks that Facebook poses? Are they aware of the privacy settings on the site? If yes, how efficiently they manage privacy? Are they proactive when it comes to privacy management on the social network? To find answers to these critical questions, the researchers adopted a scientific survey method covering parts of North and South India. As many as 406 active Facebook users were chosen for the investigation. While a major chunk of them were unaware of the privacy settings, even part of those who were aware were poor at privacy management on Facebook. Another important revelation of the study was that most users' personal data were open to the public, while they were of the belief that their data weren't. And, a majority of the users weren't aware of the privacy concerns associated with the popular social networking website.

**Key words:** Facebook, hacking, new media, online, privacy management, safety risks, social media

## Introduction

FACEBOOK is gaining good grounds in India. Predictions by media analysts at 2013-end were that India could soon become the largest Facebook market in terms of the volume of people accessing the social network. A media analyst with BTIG named Rich Greenfield tweeted that Nathan Eagle, CEO of mobile phone developer Jana, said that India was going to be the leading Facebook market in a matter of months (Sugandh Dhawan, 2013). According to his

tweet, India had 114.8 million Facebook users, i.e. 32 million users short of the US. In August 2013, there were 160 million Internet users in India. That meant 71% of the total Internet users were on Facebook, against 60% in the US. By October, India had crossed the 200 million mark, said a report released by the Internet and Mobile Association of India (IMAI) and IMRB (Moulishree Srivastava, 2013). The report estimated that the nation will have over 243 million internet users by June 2014, overtaking the US as the world's second largest internet base after China.

The report noted that while Indians primarily used the internet for communication, largely in the form of email, social media was also an important driver of internet use.

Facebook India Country Growth Manager Kevin D'Souza had revealed that the number of monthly active users of Facebook in India had shot up by 5 per cent to 82 million for April-June period of 2013 (PTI, 2013). That meant India was the second largest geographical region for Facebook after the US and Canada. Facebook does not operate in China. Facebook amassed 92 million users in India, making it the second highest after the U.S, revealed Facebook's own data in January 2014 (www.dazeinfo.com).

While the data culled out from media reports reinstated the point that Internet, and Facebook along with it, is fast catching up in India, scientific investigations into the levels of awareness on privacy management and safety risks among Facebook users in India were dismally low.

Facebook, an online social-networking service founded in 2004, had more than 750 million active users globally, including over 23 million in India, in 2010 (Wikipedia, 2014). Facebook allows anyone who claims to be 13 years old or elder to become a member and create a profile using an active email address. Once the profile is created, the user can send requests to other Facebook users to add them in his/her 'friends list'. If the users accept the request, their profiles will appear in the friends list. That's how the user will be able to build a network of friends, relations and acquaintances online using Facebook. Then the user can 'poke' other Facebook users, post messages in the form of status updates, and upload photographs, post videos, links and tag those in his/her friends list to the post. Facebook's interface is user-friendly and doesn't pose much difficulty even to a new user who can read and write English. As Facebook gained popularity, it started promoting online games through its social network, introduced applications and provided value-added services like creating groups and fan pages. It has also introduced advertisements that appear on side panels of the social network. Messages, photographs and videos posted by a user appear on his/her 'timeline' and that are posted by his/her friends appear on the 'newsfeed' of the user that gets updated realtime. Based on the privacy settings executed by the user, the messages and photographs posted will be visible only to the user or to friends in the list or friends of friends or to the public. Privacy settings can be accessed and altered by the user anytime by reaching the settings page, the link of which is available on the 'homepage'. However, not much users are aware of the privacy settings and manage privacy efficiently on Facebook – the assumption that led to this study.

The user also maintains a 'profile page' where s/he can upload personal and contact information. Again, who all can view this page and elements of it can be controlled by the user, by altering the privacy settings. A user can manage privacy on the social network with the options provided in the settings page — it is at least what Facebook claims. Of late, Facebook had raked in a lot of criticism mostly on privacy threats and concerns, and commercial use of personal data. Facebook faced criticism over its treatment of its users and their data, child safety, and its inability to terminate accounts that violate norms and pose threats to other users, without first manually deleting the content.

Sengupta and Rusli (2012) discussed the commercial use of users' personal data and observed that Facebook, the world's largest social network, was a fast-churning data machine that captured and processed every click and interaction on its platform. Every time a person shares a link, listens to a song, clicks on one of Facebook's ubiquitous 'like' buttons, or changes a relationship status to 'engaged', a morsel of data is added to Facebook's vast library. It is a siren to advertisers hoping to leverage that information to match their ads with the right audience. As users post personal and contact information, photographs of self, family and friends — mostly left to public view, with or without knowledge — they face safety risks, including online blackmail and bully. Even if the awareness levels of the user is above average and the user manages privacy settings of his/her profile on the social network efficiently, the user's account still faces threats that include hacking and bugs. If a user loses his/her account information, the fallouts could be highly damaging and dangerous depending on the person to whom it is lost. Despite dangers lurking in the social network, users continue to post sensitive and personal information. Is it

unawareness or deliberate attempts underestimating the safety risks on Facebook? Most of the personal data are open for public view. Why? There are ways to manage personal data on Facebook but why does it remain unused? Is it lack of awareness and knowledge or lethargy? These questions of Facebook privacy management are critical. Hence, the need to study the awareness levels of the users on privacy settings and concerns, fears associated with the social network and privacy management was strongly felt. By investigating the above-said factors in India, the authorities concerned, Facebook management and users could take necessary steps for efficient privacy management on the social network, to make the user experience smoother and more secure, to allay fears, and thwart theft of personal information and crimes like bully and blackmail online.

**Review of the Related Literature**

Facebook has been a fascinating field of study, especially for communication research—thanks to its immense and growing popularity among the younger generation. To analyze how far and deep this particular area of communication research has been studied, a wide range of papers were reviewed by the researcher and presented below. Social networking sites such as Facebook have become increasingly popular and many organizations have been quick to grasp the potential they offer for marketing, recruitment and economic activities (Ben Light, et al., 2008).

Sharing of personal data has emerged as a popular activity over online social networking sites like Facebook (Yabing Liu, et al., 2011) and users are revealing a large amount of personal information on social networks (Johann Schrammel, et al., 2009) that poses threats, including identify theft, stalking, embarrassment, and blackmail (HR Lipford, et al., 2008). Bernhard Debatin, et al., (2009) investigated Facebook users' awareness of privacy issues and perceived benefits and risks of utilizing the social network. Their research found that Facebook was deeply integrated in users' daily lives through specific routines and rituals. Users claimed to understand privacy issues, yet reported uploading large amounts of personal information, which is the main focus of the present study. Their research also found that risks to privacy invasion were ascribed more to others than to the self. However, users reporting privacy invasion were more likely to change privacy settings than those merely hearing about others' privacy invasions. This lax attitude, the researchers observed, may be based on a combination of high gratification, usage patterns, and a psychological mechanism similar to third-person effect. Safer use of social network services would thus require changes in user attitude, the research concluded.

As participation in online communities increases, so does the necessity for flexible privacy mechanisms to protect user data (HR Lipford, et al., 2008). A need for mechanisms for socially appropriate privacy management in online social networking communities was felt in their study.

Nothing that the issue of online social network privacy has received significant attention in both the research literature and the mainstream media, Yabing Liu, et al., (2011) attempted to improve defaults and provide better tools for managing privacy. However, they lamented that the full extent of privacy problem remained unknown and there was little quantification of the incidence of incorrect privacy settings or the difficulties users face when managing their privacy.

Internet was not completely private. By creating a profile on Facebook or MySpace, a person is naturally volunteering to show some of their identity and information to others (M. J. Hodge, 2006). João Pesce, et al., (2012) conducted an interesting study on tagging that is popular on Facebook and came to the conclusion that social-networking users unknowingly reveal certain kinds of personal information that malicious attackers could profit from to perpetrate significant privacy breaches. The paper quantitatively demonstrated how the simple act of tagging pictures on Facebook could reveal private user attributes that are extremely sensitive. Their results suggested that photo tags can be used to help predicting some, but not all, of the analyzed attributes. Christopher Hoadley (2010) studied public outcry after the introduction of the features of News Feed. To investigate the privacy controversy, they conducted a survey research to explore their usage behaviors and privacy attitudes toward the introduction of the controversial News Feed. They examined the degree to which users were upset by the changes.

Govani and Pashley (2005) investigated students' awareness levels of privacy issues. The study results pointed to considerable amounts of awareness on privacy among the users of Facebook, but it also found that the users, despite

the knowledge that their personal and sensitive information could be exposed and misused, comfortably fed the social network with them. Despite the overwhelming majority of survey participants knowing that they were able to limit who viewed their personal information, the participants did not take the initiative to protect their information, the study concluded.

Various aspects of privacy management on Facebook were dealt with in research studies. Of them, one was the disparity between the desired and actual privacy settings, quantifying the magnitude of the problem of managing privacy (Yabing Liu, et al., 2011s). Important revelations of the study were that 36% of content remained shared with the default privacy settings on Facebook; privacy settings matched users' expectations only 37% of the time, and when incorrect, almost always exposed content to more users than expected. Finally, the research explored how the results had the potential to assist users in selecting appropriate privacy settings by examining the user-created friend lists and suggested that information from the social network may be helpful in implementing new tools for managing privacy.

While Jaakko Stenros, et al., (2011) found Facebook to be mostly a playful context where (semi) public utterances were consumed privately, 'friends' were managed as an audience and a public 'face' was performed; Yang Wang, et al., (2013) focused on regrets that Facebook users experience after undesirable posts. Their study of Facebook regrets showed that people have various cognitive and behavioral biases that affect their decision-making and they make posts that they later regret. These regretted disclosures sometimes carried substantial consequences, such as loss of a relationship or a job. Mahmood and Desmedt (2012) introduced the ‘zero day privacy loophole’ in Facebook that they called the deactivated friend attack. The concept of the attack is similar to cloaking in Star Trek while its seriousness could be estimated from the fact that once the attacker is a friend of the victim, it is highly probable the attacker has indefinite access to the victims’ private information in a cloaked way.

They demonstrated the impact of the attack by showing the ease of gaining trust of Facebook users and being befriended online. With targeted friend requests they were able to add over 4,300 users and maintain access to their Facebook profile information for at least 261 days.

No user was able to unfriend them during this time due to cloaking and short de-cloaking sessions. The short de-cloaking sessions were enough to get updates about the victims.

Acquisti and Gross (2006) studied management of privacy on Facebook and a few other online social networking websites and came to the conclusion that users, who were also concerned about their privacy online, tended to reveal a considerable amounts of personal information on the social network. In their study, they also found that some of the users managed their privacy concerns by trusting their ability to control the information they provide on the website. Users were also found to hold misconceptions about the online community’s actual size and composition, and about the visibility of the members’ profiles. Hence, it can be seen that assorted studies blame both the users and the system (Jones and Soltren, 2005) for flaws in privacy management. Besides, there are third parties applications that pose privacy threats (Leitch and Warren, 2009). Na Wang, et al., (2011) pointed out that privacy threats associated with the use of third-party apps on Facebook were not probed deeply enough. To address this gap, they provided new interface designs for third-party apps’ authentication dialogs. This research provided both conceptual and empirical insights in terms of design recommendations to address privacy concerns toward third-party apps on Facebook. Stutzman and Kramer-Duffield (2010) spotted a paradox in online social networking. They observed that content-sharing behavior stood in conflict with the need to reduce disclosure-related harms. In their study, they explored privacy in social network sites as a contextual information practice, managed by a process of boundary regulation. They examined a particular privacy-enhancing practice: having a friends-only Facebook profile and found that increased levels of interpersonal privacy management were positively associated with having a friends-only profile.

Though most online social networks offered fine-grained controls of information sharing and privacy controls, these were rarely used (Gross and Acquisti, 2005), both because their use imposed additional burden on the user and because there were too many control settings for an average user to handle (J. M. Moler, et al., 2011). B. Krishnamurthy and C. E. Wills (2008) explored on privacy leakage and found users shared personal identifying information about themselves, but did not have a clear idea of who accessed their private information or what portion of it really needed to be accessed.

Jones and Soltren (2005) observed that privacy on Facebook was undermined by three principal factors: users disclose too much, Facebook does not take adequate steps to protect user privacy, and third parties are actively seeking out end-user information using Facebook.

Hendry and Goodall (2010) sought to highlight some of the more subtle privacy issues of the 'Facebook debate' in terms of two main considerations: the access to and the control of personal information on the part of the provider. Most of the debate about online social networking sites, such as Facebook, had revolved around questions of privacy and access to personal information. Users of such services, should they choose to exercise them, had a myriad of privacy options that allowed them to restrict access to their own personal information posted online, and the privacy policies of such sites were abundantly clear that the making of such choices was the responsibility of the users themselves.

Most of the studies found that personal information of the users were at stake, users were revealing a lot about themselves, but failed to answer why it is all happening. The present study chose some of the variables that haven't been studied earlier, at least in the investigations reviewed, and attempts to find a possible answer for the query why. Privacy settings are there on Facebook but there could be lack of awareness. Disparity between perceived and actual privacy settings could be a reason why the privacy settings remain unused, a factor untouched in the studies reviewed.

**Research Methodology**

Privacy management on Facebook poses to be a critical issue with many a facet and factors affecting it. Several factors of privacy management on Facebook have been examined and found that investigating the disparity between perceived privacy settings and the actual privacy settings on Facebook was necessary. The aim of the present study is to examine how users manage privacy on Facebook and what are the issues associated with it. For that, the following factors (dependent variables) were examined in the study:

--Extent and modes of Facebook use
--Knowledge and awareness on privacy settings
--Fear factor
--Perceived privacy settings
--Actual privacy settings
--Privacy management

Disparity between perceived and actual privacy settings has disastrous implications, and needs to be examined. An instrument was developed based on the above factors with numerous items related to them and the item pool along with the structured questionnaire was placed before a panel of jurors consisting renowned Indian scholars, media professionals and security analysts for content validity and instrument finalization. Thus the final instrument adopted for the study had 39 items under the six factors. Then a pilot study was conducted using the instrument. A sample of 90 respondents across North and South India was collected and the researchers performed a split of correlation using the Spearman-Brown prophecy formula. The high correlation of .698 tested positive for the reliability of the instrument.

In India, a wide range of people belonging to different social and economic strata log on to the website. So, the researchers, using a convenient random sampling, chose parts of North and South India to give equal representation to either of them. Of the 406 respondents surveyed, as many as 202 were from various parts of North India and the rest from South India. The demographic variables — age, gender, educational qualification and occupational status of the respondents — were chosen to be the independent variables, as they represent the diverse cultural settings of the respondents. Except the questions under the factor 'actual settings'— that were filled in by the researchers by visiting the Facebook profile of the respondents and reviewing the privacy settings—the rest were answered by the respondents.

On the data gathered through the survey method, statistical analyses were performed to find the relationships between the independent and dependent variables.

**Findings and Discussions**

The data gathered were fed into IBM SPSS Statistics software and the following statistical methods were applied for desired results. Here is the sample characteristics derived based on the demographic variables chosen for the study—age, gender, educational qualification and occupational status.

*A. Sample characteristics: Age vs. gender cross-tabulation*

| Age group | Male | Female | Total |
|---|---|---|---|
| Below 20 years | 9 | 52 | 61 |
| 20-25 years | 46 | 124 | 170 |
| 26-30 years | 49 | 42 | 91 |
| Above 30 years | 52 | 32 | 84 |
| Total | 156 | 250 | 406 |

Of the 406 respondents chosen for the study, as many as 156 (38.4%) were males and 250, females (61.6%). 61 of them belonged to the age group of below 20 years (15%), while there were 170 people (41.9%) in the age group of 20-25 years holding a majority and 91 respondents (22.4%) in the age group of 26-30 years and 84 (20.7%) above 30 years.

*B. Age vs. educational qualification cross-tabulation*

| Age group | Std10 or below | +2 | UG | PG and above | Total |
|---|---|---|---|---|---|
| Below 20 years | 35 | 13 | 12 | 1 | 61 |
| 20-25 years | 0 | 3 | 62 | 105 | 170 |
| 26-30 years | 0 | 0 | 11 | 80 | 91 |
| Above 30 years | 0 | 0 | 29 | 55 | 84 |
| Total | 35 | 16 | 114 | 241 | 406 |

Of the 406 respondents chosen for the study, 35 (8.6%) had studied Standard 10 or below, while there were 16 people (3.9%) who had only completed +2, 114 people (28.1%) who had completed their under-graduation and 241 (59.4%) were holding a Master's degree or a qualification above that.

*C. Age vs. occupational status cross-tabulation*

| Age group | Student | Professional | Retired | Unemployed | Total |
|---|---|---|---|---|---|
| Below 20 years | 61 | 0 | 0 | 0 | 61 |
| 20-25 years | 74 | 89 | 2 | 5 | 170 |
| 26-30 years | 3 | 84 | 0 | 4 | 91 |
| Above 30 years | 0 | 53 | 2 | 29 | 84 |

| | | | | | |
|---|---|---|---|---|---|
| Total | 138 | 226 | 4 | 38 | 406 |

Of the 406 respondents, 138 (34%) were students, while there were 226 professionals (55.7%), four retired people (1%) and 38 (9.4%) unemployed. A majority of the active Facebook users chosen for the study were professionals. To find out if there are associations between the independent and dependent variables chosen in the study, Chi-square tests were performed and the results are presented:

*D. Chi-Square test results*

| Independent variables | Use | Knowledge | Fear |
|---|---|---|---|
| Age | Value = 40.215 | Value = 67.199 | Value = 13.625 |
| | Sig. = .000 | Sig. = .000 | Sig. = .034 |
| Gender | Value = 20.399 | Value = 9.840 | Value = 20.882 |
| | Sig. = .000 | Sig. = .007 | Sig. = .000 |
| Education | Value = 53.552 | Value = 46.606 | Value = 16.093 |
| | Sig. = .000 | Sig. = .000 | Sig. = .013 |
| Occupation | Value = 43.965 | Value = 38.654 | Value = 15.466 |
| | Sig. = .000 | Sig. = .000 | Sig. = .017 |

Use = Extent and modes of Facebook use
Knowledge = Knowledge and awareness on privacy settings
Fear = Fear factor
Perceived = Perceived privacy settings
Actual = Actual privacy settings
Management = Privacy management

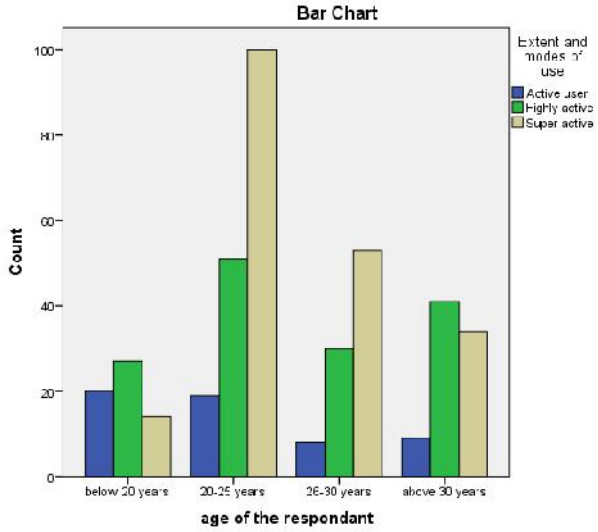
*E. Chi-Square test results*

| Independent variables | Perceived | Actual | Management |
|---|---|---|---|
| Age | Value = 20.183 | Value = 10.494 | Value = 44.982 |
| | Sig. = .003 | Sig. = .015 | Sig. = .000 |
| Gender | Value = 16.595 | Value = 16.595 | Value = 60.963 |
| | Sig. = .000 | Sig. = .000 | Sig. = .000 |
| Education | Value = 6.151 | Value = 6.151 | Value = 4.925 |
| | Sig. = .105 | Sig. = .105 | Sig. = .553 |
| Occupation | Value = 4.293 | Value = 4.293 | Value = 23.045 |

Sig. = .232 Sig. = .232 Sig. = .001

Barring the combinations highlighted in yellow, the others had statistically significant associations. Chi-Square tests reveal there is a statistically significant association between age of the respondents and the extent and modes of Facebook use [$\chi(6) = 40.215$, $p < 0.001$]. Those belonging to the age groups 20-25 and 26-30 years have more super-active users (see Fig. 1).

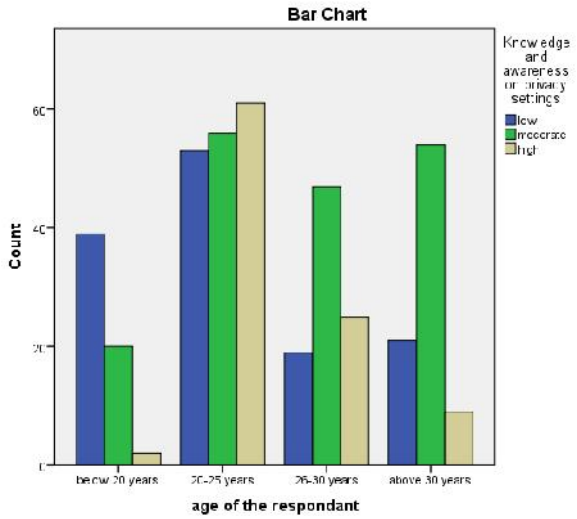
*Figure 1: Age vs. Extent and modes of use*




There is a significant association between gender of the respondents and the extent and modes of Facebook use [$\chi(2) = 20.399$, $p < 0.001$]. Among the female respondents, there was more number of active and highly active users. Among both male and female, there were large numbers of super active users. There is a statistically significant association between educational qualification of the respondents and the extent and modes of Facebook use [$\chi(6) = 53.552$, $p < 0.001$]. Post-graduates had the highest number of super-active Facebook users.

Similarly, there is a statistically significant association between occupational status of the respondents and the extent and modes of Facebook use [$\chi(6) = 43.965$, $p < 0.001$]. Professionals had the highest number of super-active users, the test results revealed. There is a statistically significant association between age of the respondents and the knowledge and awareness of Facebook privacy settings [$\chi(6) = 40.215$, $p < 0.001$]. Those belonging to the age groups 20-25 years and 26-30 years have more super-active users (see Fig. 2).

*Figure 2: Age vs. Knowledge and awareness on privacy settings*

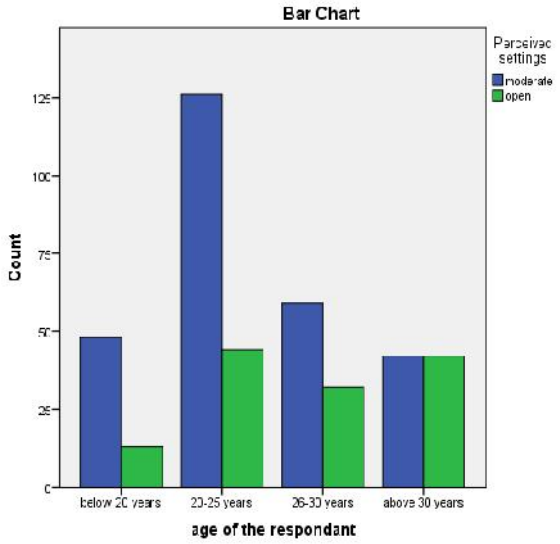



Among the female respondents, there was more number of users with low and moderate levels of awareness on privacy settings on Facebook. Among the males, most of the users had moderate levels of awareness. Post-graduates and under-graduates had the highest number of users with moderate knowledge and awareness among them. There is a statistically significant association between occupational status of the respondents and the knowledge and awareness of Facebook privacy settings [$\chi(6) = 38.654$, $p < 0.001$].

Professionals had the highest number of users with moderate knowledge. Among the unemployed respondents, a majority of users had moderate levels of awareness, while the students exhibited the lowest levels of knowledge and awareness about privacy settings. Users belonging to the various age groups mostly had moderate to high levels of fear.

Among the 250 female respondents included in the present study, 145 users had moderate levels of fear, while 102 had high levels of fear. Among the 156 male respondents, 107 users had moderate levels of fear, while 37 had high levels of fear. Chi-Square tests reveal that there is a statistically significant association between educational qualification of the respondents and the fear factor [$\chi(6) = 16.093$, $p = 0.013$]. All groups had moderate levels of fear as a majority. Among 241 postgraduates, 161 users had moderate levels of fear. Professionals had the highest number of users with moderate level of fear. Among the 38 unemployed users, 23 had moderate levels of fear about Facebook. There is a statistically significant association between age of the respondents and the perceived settings [$\chi(6) = 20.183$, $p = 0.003$]. Users belonging to various age groups had an open or moderate perception about their privacy settings (Fig 3).

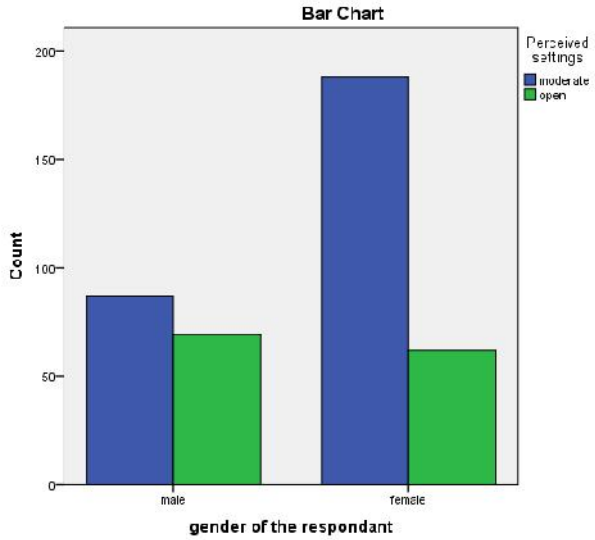
*Figure 3: Age vs. Perceived settings*




Chi-Square tests reveal that there is a statistically significant association between gender of the respondents and the fear factor [$\chi(1) = 16.595$, $p < 0.001$]. The bar chart shows that among the 250 female respondents, 188 users had moderate levels of openness with regard to perceived privacy settings on Facebook, while 62 had open perceptions.

Among the 156 male respondents, 87 users had moderate levels of openness with regard to perceived privacy settings on Facebook, while 69 had open perceptions.

*Figure 4: Gender vs. Perceived settings*




There is no significant association between educational qualification of the respondents and the perceived settings [$\chi(3) = 6.151$, $p = 0.105$]. Users belonging to the various educational groups had moderate to open perceptions about their privacy settings on Facebook. Of the 241 postgraduates, 164 users had moderate levels of openness with regard

to perceived privacy settings on Facebook, while 77 had open perceptions. There is no significant association between occupational status of the respondents and the perceived settings [$\chi(3) = 4.293$, $p = 0.232$]. Users belonging to the various occupational groups had moderate to open perceptions about privacy settings. There is a statistically significant association between age of the respondents and the actual settings [$\chi(3) = 10.494$, $p = 0.015$]. All the users belonging to the various age groups were predominantly open with regard to their actual privacy settings on Facebook.

Among the 250 female respondents, 188 users had moderate levels of openness with regard to perceived privacy settings on Facebook, while 62 had open perceptions.

Among the 156 male respondents, 87 users had moderate levels of openness with regard to perceived privacy settings on Facebook, while 69 had open perceptions.

Chi-Square tests reveal that there is no statistically significant association between educational qualification of the respondents and the perceived settings [$\chi(3) = 6.151$, $p = 0.105$]. Users belonging to the various educational groups had moderate to open perceptions about their privacy settings. Of the 241 postgraduates, 164 users had moderate levels of openness with regard to perceived privacy settings on Facebook, while 77 had open perceptions. Users belonging to the various occupational groups had moderate to open perceptions about privacy settings. All the users belonging to the age groups below 20 years, 20-25 years and 26-30 years were mostly poor in privacy management. Those in the age group above 30 years were predominantly moderate and poor in privacy management on Facebook.

Among the 250 female respondents, 178 users were poor in managing their privacy settings on Facebook, while 65 users were moderate in their privacy management. Among the 156 male respondents, 54 users were poor and 74 were moderate in managing their privacy settings on Facebook.

Users belonging to the various educational groups were poor to moderate in managing their privacy settings on Facebook. Of the 241 postgraduates chosen for the study, 130 users were poor while, 88 respondents were moderate in privacy management on Facebook. Students and professionals were predominantly poor in managing privacy.

To find out if there are differences among the various groups of independent variables with respect to the dependent variables, one-way Anova tests were perfomed.

*F. One-way Anova results*

| Independent variables | Use | Knowledge | Fear |
|---|---|---|---|
| Age | F = 10.44 | F = 11.342 | F = 3.503 |
| | Sig. = .000 | Sig. = .000 | Sig. = .016 |
| Education | F = 12.966 | F = 10.232 | F = 2.276 |
| | Sig. = .000 | Sig. = .000 | Sig. = .079 |
| Occupation | F = 24.260 | F = 4.512 | F = 6.764 |
| | Sig. = .000 | Sig. = .004 | Sig. = .000 |

*G. One-way Anova results*

| Independent variables | Perceived | Actual | Management |
|---|---|---|---|
| Age | F = 9.510 | F = 12.627 | F = 3.503 |
| | Sig. = .000 | Sig. = .000 | Sig. = .016 |
| Education | F = 7.856 | F = 6.696 | F = 2.238 |

| | | | |
|---|---|---|---|
| | Sig. = .000 | Sig. = .000 | Sig. = .083 |
| Occupation | F = 2.756 | F = 15.476 | F = 4.318 |
| | Sig. = .042 | Sig. = .000 | Sig. = .005 |

The study revealed that the extent of Facebook use was higher among those in the age group of 20-25 years (11.3 ± 3.2 points, $p$ = .000); 26-30 years (11.3 ± 3.1 points, $p$ = .000) and above 30 years (11.2 ± 3.7 points, $p$ = .000) compared to those in the age group of below 20 years (8.8 ± 2.3 points). There were no statistically significant differences among the age groups 20-25 years, 26-30 years and above 30 years ($p$ = 1.000 or .999). Those who had secured 5-7 points were categorized as active users, while those who scored 8-10 were termed highly active and the others, super active users of Facebook. The study results showed that the teens were active but the others super-active. About 90% users were either highly-active or super-active on Facebook. Of the 406 respondents surveyed, 213 (52.5%) had 101-500 Facebook friends and 97 (23.95%) had 501-1,000 friends on their list. Also, 32 percent of the total number of respondents spent at least two hours a day on Facebook showing clear signs of addiction to the social network.

The investigation revealed that the extent of Facebook use was statistically significant and higher among the under-graduates (10.9 ± 3.7 points, $p$ = .001) and post-graduates (11.4 ± 3.0 points, $p$ = .000) compared to those who have passed only Standard 10 or below (8.7 ± 2.3 points). Similarly, the extent of use was significantly higher among the under-graduates (10.9 ± 3.7 points, $p$ = .001) and post-graduates (11.4 ± 3.0 points, $p$ = .000) compared to those who have passed only plus-two (7.7 ± 1.6 points).

There were no statistically significant differences between the educational groups Standard 10 or below and plus-two, as was in the case of under-graduates and post-graduates ($p$ = .681 or .707). While the under- and post-graduates were found to be mostly super active on Facebook, the rest were either active or highly active as shown in the descriptive table above. The study revealed that the extent of Facebook use was statistically significantly higher among the professionals (11.9 ± 3.4 points, $p$ = .000) and retired persons (13.5 ± 2.9 points, p = .029) compared to students (9.2 ± 2.5 points). Similarly, the extent of Facebook use was significantly higher among the professionals surveyed (11.9 ± 3.4 points, $p$ = .022) compared to the respondents who were unemployed (10.42 ± 2.0 points).

There were no statistically significant differences in usage between students and the unemployed ($p$ = .140); between professionals and the retired ($p$ = .737); and the retired and unemployed ($p$ = .214). While the students were highly active on Facebook, the professionals were super-active and the unemployed almost super-active. Only four retired people were spotted among the active users surveyed. However, those people expressed high levels of indulgence in Facebook.

Knowledge and awareness levels were statistically significantly higher among those in the age group of 20-25 years (4.5 ± 1.6 points, $p$ = .000); 26-30 years (4.6 ± 1.5 points, $p$ = .000) and above 30 years (4.1 ± 1.6 points, $p$ = .019) compared to those in the age group of below 20 years (3.3 ± 1.1 points). There were no statistically significant differences between the age groups 20-25 years and 26-30 years ($p$ = .866); and 20-25 years and above 30 years ($p$ =.160). Similarly, there was no statistically significant difference between the age groups 26-30 years and above 30 years ($p$ = .061). Those who had secured 0-3 points were categorized as users with low levels of knowledge and awareness, while those who scored more than 3 and within 5 were termed to have moderate awareness levels and the others, users with high awareness levels. The study results showed that all the users had moderate awareness levels as average, some close to low and others close to high. Of the 406 respondents surveyed, 32.9% users had low levels of awareness as average. About 87% users were aware of the Facebook privacy settings, 75% thought they were managing privacy efficiently, about 56% believed that Facebook can't be hacked, about 70% users thought their photos posted on Facebook can't be saved by others, while 63% believed that Facebook does not use their personal data for commercial purposes, over 50% users were of the opinion that their public posts would not be visible to strangers but almost 67% users knew Facebook stores their personal data and monitors their activities on the social network. The study results showed that all the users had average moderate awareness

levels—the average of those who had studied plus-two or less was near low and the average of others close to high. A Tukey post-hoc test revealed that awareness levels were higher among the professionals (4.4 ± 1.6 points, $p$ = .032) and the unemployed (4.7 ± 1.1 points, $p$ = .038) compared to students (3.9 ± 1.6 points). There were no statistically significant differences in average awareness levels between students and the retired; between professionals and the retired; professionals and the unemployed and the retired and the unemployed. The study results showed that all the users had moderate awareness levels in average—the retired and students at the bottom.

Fear was lower among those in the age group of 20-25 years (12.7 ± 1.4 points, $p$ = .020) and above 30 years (12.6 ± 1.3 points, $p$ = .016) compared to those in the age group of below 20 years (13.3 ± 1.1 points). Those who had secured 8-10 points were categorized as users with low levels of fear about Facebook, while those who scored more than 10 and within 13 were termed to have moderate fear levels and the others, users with high fear levels. The study results showed that the teens had high levels of fear as their average and the others, moderate. Of the 406 respondents surveyed, 70% users thought Facebook was not safe; about 9% users share passwords; 50% users said they do not post personal pictures on Facebook, about 4% were threatened or blackmailed on Facebook; about 59% users do not post their opinions freely without fear of future issues; while 63% have not uploaded their contact information; over 62% users do not share family information but almost 20% users felt they were addicted to Facebook. There was no evidence of a difference between the educational groups as determined by one-way Anova ($F$ [3,402] = 2.276, $p$ = .079). The averages of fear factor for the various educational groups were close to the border between moderate and high levels as shown in the table.

A Tukey post-hoc test revealed that fear levels were lower among the professionals (12.6 ± 1.5 points, $p$ = .000) and the unemployed (12.5 ± 1.4 points, $p$ = .037) compared to students (13.2 ± 1.3 points). There were no statistically significant differences in average fear levels between students and the retired; between professionals and the retired; professionals and the unemployed and the retired and the unemployed.

The averages of fear factor for the various occupational groups were close to the border between moderate and high levels as shown in the table—moderate for professionals and the unemployed, high for students and the retired respondents.

Perceived privacy settings were more open among those in the age group of 26-30 years (20.1 ± 2.3 points, $p$ = .012); and above 30 years (20.7 ± 2.2 points, $p$ = .000) compared to those in the age group of below 20 years (18.8 ± 2.2 points). Similarly, the perceived privacy settings on Facebook were more open among those in the age group of above 30 years (20.7 ± 2.2 points, $p$ = .000) compared to those in the age group of 20-25 years (19.2 ± 2.7 points). There were no statistical differences between the age groups below 20 years and 20-25 years ($p$ = .635); and 20-25 years and 26-30 years ($p$ =.056). Similarly, there was no statistically significant difference between the age groups 26-30 years and above 30 years ($p$ = .359). Those who had secured 5-10 points were categorized as closed users with regard to perceived privacy settings, while those who scored more than 10 and within 20 were termed as users with moderate openness and the others, open. The study results showed that users belonging to the age groups of below 20 years and 20-25 years were moderately open and the others open.

A major chunk of the users perceived that only friends can view their contact information, status updates and other important information posted on Facebook. The study results showed that the under-graduates sported an open outlook in their perception about privacy settings, while the others moderately open. There was a weak statistical difference among the occupational groups as determined by one-way Anova ($F$ [3,402] = 2.756, $p$ = .042). The levels of openness were around the border between moderate and open.

The study revealed that the actual Facebook privacy settings of the users were more open among those in the age group of below 20 years (27.9 ± 1.9 points, $p$ = .000); 20-25 years (26.3 ± 3.4 points, $p$ = .031) and above 30 years (27.6 ± 2.7 points, $p$ = .000) compared to those in the age group of 26-30 years (25.2 ± 3.4 points). There was no statistically significant difference between the age groups below 20 years and above 30 years ($p$ = .933). Those who had secured 5-10 points were categorized as closed users with regard to actual privacy settings, while those who scored more than 10 and within 20 were termed as users with moderate openness and the others, open. All the users had open as their average, signaling danger. Of the 406 respondents surveyed, about 70% users didn't bother much about segregating photographs to different friend lists. About 75% users left their profile page for public view, 68% left their photo albums for public view, 23% for friends of friends, about 85% left their status updates for public

watch or friends of friends; about 88% users left their friends list and contact information for public view or friends of friends, and about 99% let others share their photographs. The study revealed that the actual settings were more open among the plus-two passed, under-graduates and post-graduates compared to those who have passed only Standard 10 or below. There were no statistically significant differences among the educational groups—plus-two, under-graduates, and post-graduates. The study results showed that all the users had open as their average, signaling danger. The investigation revealed that professionals maintained lower levels of openness compared to others. The study results showed that all the users had open as their average, signaling danger. The test revealed that those belonging to the age group of above 30 years had the lowest levels of privacy management. Those who had secured 7-9 points were categorized as users efficient in privacy management; while those who scored more than 9 and within 11 as users with moderate management levels and the others, poor. The study results showed that all the users were poor in privacy management on Facebook. Of the 406 respondents surveyed, about 60% users had friends whom they haven't met. About 55% users allow indiscriminate tagging, 87% accept friend requests from strangers, about 70% do not restrict public view of sensitive posts, 80% thought friends cannot post on their timelines, and 75% thought they did not keep their pictures open for the public.

About 85% users do not block friends even after they receive derogatory messages from them. There was no evidence of a difference between the educational groups ($F$ [3,402] = 2.238, $p$ = .083). The study results showed that all the user groups had poor levels of privacy management as their average. There was no difference between the occupational groups as determined by one-way Anova ($F$ [3,402] = 4.318, $p$ = .005). All the user groups had poor levels of privacy management as their average.

*H. Table of means*

| Groups | Use | Knowledge | Fear |
|---|---|---|---|
| Below 20 years | 8.8033 | 3.3390 | 13.3115 |
| 20-25 years | 11.2588 | 4.5176 | 12.6882 |
| 26-30 years | 11.2967 | 4.6703 | 12.8022 |
| Above 30 years | 11.2381 | 4.0952 | 12.5952 |
| Male | 11.9000 | 4.3000 | 12.3000 |
| Female | 10.2000 | 4.2000 | 13.0000 |
| Students | 9.2319 | 3.9706 | 13.2246 |
| Professionals | 11.9425 | 4.4336 | 12.5619 |
| Unemployed | 10.421 | 4.7368 | 13.0000 |
| Retired | 13.500 | 3.0000 | 12.5263 |
| Std 10 or below | 8.7429 | 3.1714 | 13.1429 |
| +2 | 7.6875 | 3.1429 | 13.5000 |
| Graduates | 10.9912 | 4.4912 | 12.7105 |
| Postgraduates | 11.3734 | 4.4274 | 12.7261 |

*I. Table of means*

| Groups | Perceived | Actual | Management |
|---|---|---|---|
| Below 20 years | 18.8033 | 27.8689 | 11.6885 |
| 20-25 years | 19.2412 | 26.3294 | 11.8412 |
| 26-30 years | 20.0549 | 25.2308 | 11.3407 |
| Above 30 years | 20.6667 | 27.5595 | 11.0119 |
| Male | 20.3000 | 26.7000 | 10.8000 |
| Female | 19.1000 | 26.4000 | 11.9000 |
| Students | 19.2246 | 27.6957 | 11.6812 |
| Professionals | 19.8009 | 25.6504 | 11.5664 |
| Unemployed | 20.3947 | 27.7895 | 10.9737 |
| Retired | 19.0000 | 28.0000 | 10.0000 |
| Std 10 | 17.8286 | 27.4857 | 11.9143 |
| +2 | 19.5000 | 28.6250 | 11.4375 |
| Graduates | 20.1499 | 27.1140 | 11.7105 |
| Postgradutes | 19.6929 | 26.0415 | 11.4025 |

Use: 000 Low 000 Moderate 000 High

Knowledge: 000 Low 000 Moderate 000 High

Fear: 000 Low 000 Moderate 000 High

Perceived: 000 Closed 000 Moderate 000 Open

Actual: 000 Closed 000 Moderate 000 Open

Management: 000 Efficient 000 Moderate 000 Poor

Individual samples T-Tests were performed for the various factors, with gender (male and female) being the independent grouping variable. Here are the results presented:

*1) Extent and modes of Facebook use:*

The T-Test results showed that there was a significant difference between the gender groups ($p$<.001), where the mean score for males was 11.9, while for the females, it was 10.2; both super-active with regard to Facebook use.

*2) Knowledge and awareness of privacy settings:*

The T-Test results showed that there was no difference between the gender groups (*p=0.481*), where the mean score for males was 4.3, while for the females, it was 4.2;the mean of both the groups were moderate in nature.

*J. T-test results with gender as the independent variable*

| Variable | T | df | Sig. (2-tailed) |
|---|---|---|---|
| Use | 5.400 | 404 | .000 |
| Knowledge | 0.706 | 404 | 0.481 |
| Fear | -5.089 | 404 | .000 |
| Perceived | 4.781 | 404 | .000 |
| Actual | 0.963 | 404 | 0.336 |
| Management | -9.001 | 404 | .000 |

*3) Fear Factor:*

There was a significant difference between the gender groups (*p*<.001), where the mean score for males was 12.3, while for the females, it was 13.0; the average fear level for males were moderate, while for females it was just high.

*4) Perceived Settings:*

The T-Test results showed that there was a significant difference between the gender groups (*p*<.001), where the mean score for males was 20.3, while for the females, it was 19.1. While the mean score for females was moderate, that for males sported an open outlook.

*5) Actual Settings:*

The T-Test results showed that there was no difference between the gender groups (*p*=0.336), where the mean score for males was 26.7, while for the females, it was 26.4. Both for males and females, the actual settings were open.

*6) Privacy Management:*

The T-Test results showed that there was a significant difference between the gender groups (*p*<.001), where the mean score for males was 10.8, while for the females, it was 11.9. Males were moderate in privacy management, while the females were poor in average.

Taking the research a tad more forward, correlation tests were performed on the dependent factors to find prevalent associations among the variables. Those that had considerable levels of negative correlations are displayed below. The other factor couples had mild positive correlations.

*K. Extent of use vs. fear factor*

| | | use | fear |
|---|---|---|---|
| Extent and modes of use | Pearson Correlation | 1 | -.503** |
| | Sig. (2-tailed) | | .000 |

| | | | |
|---|---|---|---|
| | N | 406 | 406 |
| Fear factor | Pearson Correlation | -.503** | 1 |
| | Sig. (2-tailed) | .000 | |

The results showed that the fear lessened with increase in Facebook use.

*L. Use vs. actual settings*

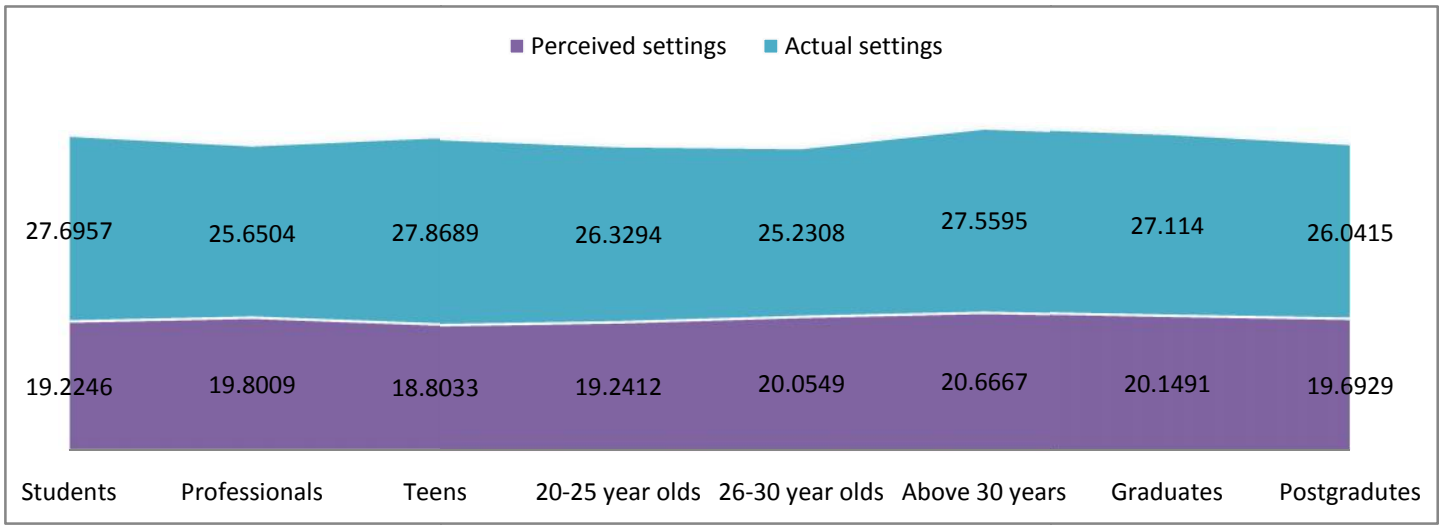
| | | Extent and modes of use | Actual settings |
|---|---|---|---|
| Extent and modes of use | Pearson Correlation | 1 | -.224** |
| | Sig. (2-tailed) | | .000 |
| | N | 406 | 406 |
| Actual settings | Pearson Correlation | -.224** | 1 |
| | Sig. (2-tailed) | .000 | |

Use also had a negative effect on the actual settings, that is, the more the users used the social network, the more closed was their actual privacy settings. Interestingly, the more open the user's actual privacy settings were, the poorer was his/her level of privacy management on Facebook.

*M. Perceived settings vs. privacy management*

| | | Perceived settings | Privacy management |
|---|---|---|---|
| Perceived settings | Pearson Correlation | 1 | -.305** |
| | Sig. (2-tailed) | | .000 |
| | N | 406 | 406 |
| Privacy management | Pearson Correlation | -.305** | 1 |
| | Sig. (2-tailed) | .000 | |

*Figure 5: Perceived settings vs. Actual settings*




**Conclusion**

This study reveals that the average score for Facebook use of all the users was 10.8, which is categorized as super-active in this study. While the average user had moderate awareness levels about privacy settings (score = 4.3), the amount of fear was moderate (12.8), as was the perceived privacy settings (19.6). But the actual settings were, alarmingly, open (26.6), and privacy management poor (11.5).

These findings postulate a critical theory that due to inadequate levels of knowledge and awareness about privacy and the settings on Facebook, there is a marked difference between the perceived and actual privacy settings (as shown in Fig. 5), due to which privacy management is poorly maintained by the users. Difference between the perceived and actual privacy settings here means that the users' personal data is exposed to a wider section of people, while the users think that only those on their friend lists can view their posts, updates and photographs. This, despite the prevalence of considerable levels of fear among the users about dangers dealing with Facebook.

Despite fears, misconceptions about privacy settings are preventing the users from taking proactive measures to ensure safety of their personal information uploaded on Facebook. Hence, the present study recommends adequate steps to increase awareness about privacy settings for those who blindly believe that their personal data is in safe custody on Facebook, even while their privacy settings were open in actuality. This study also lays a foundation for future research in this critical area of online social networks.

**References**

[1] Heather Richter Lipford, Andrew Besmer, Jason Watson, "Understanding Privacy Settings in Facebook with an Audience View," published in the UPSEC'08 Proceedings of the 1st Conference on Usability, Psychology, and Security, Article No. 2, 2008, http://static.usenix.org/events/upsec08/tech/full_papers/lipford/lipford_html/

[2] Yabing Liu, Krishna P. Gummadi, Balachander Krishnamurthy, Alan Mislove, "Analyzing Facebook privacy settings: user expectations vs. reality," IMC '11 Proceedings of the 2011 ACM SIGCOMM conference on Internet measurement conference, Pages 61-70, http://dl.acm.org/citation.cfm?id=2068823

[3] Bernhard Debatin, Jennette P. Lovejoy, Ann-Kathrin Horn M.A, Brittany N. Hughes, "Facebook and Online Privacy: Attitudes, Behaviors, and Unintended Consequences," Journal of Computer-Mediated Communication, 2009, pages 83–108, http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.2009.01494.x/full

[4] Jaakko Stenros, Janne Paavilainen and Jani Kinnunen, "Giving good 'face': playful performances of self in Facebook," MindTrek '11 Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, Pages 153-160, 2011, http://dl.acm.org/citation.cfm?id=2181062

[5] Yang Wang, Pedro Giovanni Leony, Kevin Scotty, Xiaoxuan Chenz, Alessandro Acquistiy and Lorrie Faith Cranory, "From Facebook Regrets to Facebook Privacy Nudges," Ohio State Law Journal;2013, Vol. 74 Issue 6, p1307, November 2013, http://precog.iiitd.edu.in/events/psosm2013/9psosm6-wang.pdf

[6] Shah Mahmood and Yvo Desmedt, "Your Facebook Deactivated Friend or a Cloaked Spy (Extended Abstract)," 2013, IEEE International Workshop on Security and Social Networking SESOC 2012, Lugano, Switzerland, http://arxiv.org/abs/1203.4043

[7] Somini Sengupta and Evelyn M. Rusli, "Personal Data's Value? Facebook is Set to Find Out," 2012, The New York Times

[8] Acquisti, A. and Gross, R., "Imagined communities: awareness, information sharing, and privacy on the Facebook," In PET, Heidelberg, 2006. Springer-Verlag.

[9] Frederic Stutzman and Jacob Kramer-Duffield, "Friends only: examining a privacy-enhancing behavior in Facebook," 2010, CHI '10 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Pages 1553-1562, http://dl.acm.org/citation.cfm?id=1753559

[10] Ralph Gross and Alessandro Acquisti, "Information revelation and privacy in online social networks," 2005, WPES '05 Proceedings of the 2005 ACM workshop on Privacy in the electronic society, Pages 71 – 80, http://dl.acm.org/citation.cfm?id=1102214

[11] Jakob, M., Moler, Z., Pechoucek, Michal and Vaculin, R., "Intelligent Content-based Privacy Assistant for Facebook," in Web Intelligence and Intelligent Agent Technology (WI-IAT), 2011 IEEE/WIC/ACM International Conference on (Volume:1 ), https://agents.felk.cvut.cz/publications/download/368

[12] Balachander Krishnamurthy and Craig E. Wills, "Characterizing Privacy in Online Social Networks," WOSN '08 Proceedings of the first workshop on Online social networks, Pages 37-42, 2008, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.145.4305&rep=rep1&type=pdf

[13] Harvey Jones and Jos´e Hiram Soltren, "Facebook: Threats to Privacy," 2005, http://groups.csail.mit.edu/mac/classes/6.805/student-papers/fall05-papers/facebook.pdf

[14] Jennifer Hendry and Kay Goodall, "Facebook and the Commercialisation of Personal Information: Some Questions of Provider-to-User Privacy," Wolf Legal Publishing, 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1550821

[15] Nicole S. Cohen and Leslie Regan Shade, "Gendering Facebook: Privacy and commodification," Feminist Media Studies, 2008, http://www.media-action-media.com/wp-content/uploads/2011/12/genderingfb.pdf

[16] Susan Freiwald, "A Comment on James Grimmelmann's Saving Facebook," Iowa Law Review, Vol. 94, p. 1137, 2009, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1616373

[17] Ben Light, Kathy McGrath and Marie Griffiths, "More Than Just Friends? Facebook, Disclosive Ethics and the Morality of Technology," International Conference on Information Systems (ICIS) 2008 Proceedings, http://usir.salford.ac.uk/17266/1/LIght.pdf

[18] Johann Schrammel, Christina Köffel and Manfred Tscheligi, "How Much do You Tell? Information Disclosure Behaviour in Different Types of Online Communities," C&T '09 Proceedings of the fourth international conference on Communities and technologies, Pages 275-284, 2009, http://www.sozio-informatik.org/fileadmin/IISI/upload/2009/p275.pdf

[19] Matthew J. Hodge, "The Fourth Amendment and Privacy Issues on the "New" Internet: Facebook.com and MySpace.com," Southern Illinois University Law Journal, 2006, https://litigation-essentials.lexisnexis.com/webcd/app?action=DocumentDisplay&crawlid=1&srctype=smi&srcid=3B15&doctype=cite&docid=31+S.+Ill.+U.+L.+J.+95&key=565175060a0dfffc5ae88b5650ce98b1

[20] João Paulo Pesce, Diego Las Casas, Gustavo Rauber and Virgílio Almeida, "Privacy Attacks in Social Media Using Photo Tagging Networks: A Case Study with Facebook," PSOSM '12 Proceedings of the 1st Workshop on Privacy and Security in Online Social Media Article No. 4, 2012, http://dl.acm.org/citation.cfm?id=2185358

[21] Christopher M. Hoadley, Heng Xu, Joey J. Lee and Mary Beth Rosson, "Privacy as information access and illusory control: The case of the Facebook News Feed privacy outcry," Electronic Commerce Research and Applications, Volume 9, Issue 1, January–February 2010, Pages 50–60, http://www.sciencedirect.com/science/article/pii/S1567422309000271

[22] S Leitch and M Warren, "Security Issues Challenging Facebook," Australian Information Security Management Conference, 2009, http://ro.ecu.edu.au/cgi/viewcontent.cgi?article=1017&context=ism

[23] Tabreez Govani and Harriet Pashley, "Student Awareness of the Privacy Implications When Using Facebook," 2005, http://lorrie.cranor.org/courses/fa05/tubzhlp.pdf

[24] Na Wang, Heng Xu and Jens Grossklags, "Third-Party Apps on Facebook: Privacy and the Illusion of Control," CHIMIT '11 Proceedings of the 5th ACM Symposium on Computer Human Interaction for Management of Information Technology, Article No. 4, 2011, http://personal.psu.edu/nzw109/papers/Wang_chimit_2011.pdf

[25] Sugandh Dhawan, India will be the number one Facebook market in a few months- Nathan Eagle, 2013, http://www.iamwire.com/

[26] Moulishree Srivastava, Internet base in India crosses 200 million mark, 2013, http://www.livemint.com/

[27] PTI, Facebook users in India up 5% at 82 million in April-June, 2013, http://articles.economictimes.indiatimes.com/2013-08-13/news/41375370_1_facebook-users-active-users-78-million-users

Wikipedia on Facebook, page was last modified on 26 February 2014 at 12:20., http://en.wikipedia.org/wiki/Facebook