A Double Take on High Stakes: Exploring the Ethical Conflict of Acquiring Informed Consent in Online Social Network Research

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Abstract—**Informed consent acquisition is often overlooked in Online Social Network (OSN) research. There is an ongoing ethical debate among OSN security researchers which concerns the attempts to balance the goal of keeping the OSN users' privacy versus keeping the value of the OSN research.**

This report attempts to explore the ethical conflict surrounding the process of gathering informed consent, understanding the perspectives of each social goal, exploring how informed consent is acquired, and evaluates these acquisition methods by performing a cost-benefit analysis then suggests some improvements to address the costs.

Finally, the report concludes with some recommendations to help OSN researchers to try to find a reasonable balance between conflicting privacy ethics, and the value of their OSN research.

I. INTRODUCTION

A. MOTIVATION

Online Social Networks (OSNs) have become a melting pot for information exchange wherein massive amounts of data about OSN users have been accumulated, stored, and potentially shared over time across the World Wide Web. They offer a wealth of information about the activity of the network, and details regarding its users. Performing analysis on OSNs may bring about many benefits such as improving the security of OSNs by finding flaws, and quickly applying fixes to protect their large pool of user data. However, OSN research also brings about equally many concerns, particularly in the realm of ethics.

Research without consent is considered to be unethical, especially if it involves human beings [1]. Previous OSN research mentions the problem of such in various similar but somewhat different ways. Despite being aware of informed consent acquisition as somewhat of a "grey area" [2] when it comes to OSN research, previous research has done little to further explore the problem of acquiring informed consent beyond this, and to a lesser extent, how this relates to the needs of both the participants and researchers.

Hence, this report attempts to undertake an exploratory approach in analysing, and justifying why the acquisition of informed consent is worthy of consideration, and should be taken more seriously by researchers who do not bother to do a double take on their approaches to managing ethical conflict in regards to the ways in which their OSN research could impact users' privacy.

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B. BACKGROUND

OSN research, as outlined by Elovici et al. [1], is centred around the two key focuses: firstly, on analyzing the connections between OSN users, otherwise known collectively as the OSN graph [1], and secondly, understanding the trends and behaviours exhibited by OSN users, otherwise known collectively as the OSN user behaviour [1]. This report mainly focuses on informed consent acquisition methods' effects on behaviour-related OSN research.

Informed consent has a flexible, and often at times inconsistent definition in OSN research. Elovici et al. [1] defines user consent as "the consent [given by the user] to participate in the [OSN] experiment" [1], and considers user consent as an important ethical consideration when fake identities are used in OSN research. But how is informed consent any different to regular user consent? As an indirect answer to this, Hutton's work [3] suggests that the difference in consent that is informed requires, not only the user's given permission to freely use their information, but also their additional knowledge of how their information is being used by the researchers who are performing the OSN research. This is the definition for informed consent which will be used, and followed through in this report.

Elovici et al. [1] have identified two social goals:

1) User Privacy - of which is defined to encompass both privacy and security concerns.
2) Research Value - of which is defined as having reliable experimental research.

These goals form the basis of the ethical conflict concerning informed consent, and the methods used to acquire it.

C. OVERVIEW OF REPORT STRUCTURE

The structure of this report will be outlined, and follows a mostly exploratory approach wherein the view of three ethics-based articles are compared and contrasted for their views in relation to the topic of informed consent acquisition. First, the social goal of user privacy will be explored, followed by the social goal of research value, giving examples, and justifying the aims, and expectations of each social goal. Secondly, an overview of existing acquisition methods will be discussed, describing the common research ethic practices that have been employed in past OSN research which concerns the issue of acquiring informed consent. Thirdly, a benefit-cost analysis is undertaken, outlining the benefits first, then the costs of the previously examined informed consent acquisition methods. Fourthly, an evaluation will be undertaken, and suggested improvements to address the costs found within the current methods will be discussed. Finally, some potential work for the future is addressed, and the report ends with the author's final conclusions.

II. USER PRIVACY

User privacy concerns the issue of keeping the user's personal information private, and confidential, meaning that it should only be accessed by those who have been authorized by the user to do so. Often, these authorized entities are the user's friends whom they've established a connection with via a friend request. Being connected enables friends to access each others' private information which

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is only available to the user's friends, whereas public information is accessible to anyone in the OSN [1].

There is a shared assumption by researchers who study OSNs that if the data is considered to be publicly available, as both Alim [2] and Hutton [3] have suggested, that publicly available data is considered "fair game" for researchers to freely use, and extract OSN data from for their research. Looking from the user's point of view, their concerns are taken into account.

A summary of the key elements to be met when regarding the goal of protecting users' privacy is given as follows:

- Choice - users tend to be fickle, as was found in Hutton's work [3] which explored contextual integrity, i.e. the agreement between parties to exchange knowledge in circumstances under which both ends have some understanding based on social norms which deems the exchange to be considered respectful of the disclosing entity's privacy. Hutton gives an example via the analogy that for a doctor to give a patient a medical diagnosis, the patient must first disclose personal information regarding their status of health [3]. Hence, Hutton suggests an inference of consent based on considerably universally known conventions which deem sharing of such should not be seen as a problem, but that this is circumstantial, and can change over time. Alim [2] further supports this notion by citing the Belmont report in their related work, of which one of the core ethical principles mentioned is the respect

for persons, for which can be interpreted as giving them a choice to withdraw from the study, providing further evidence of the general unpredictability of users which warrants a need for such autonomy.

- Usability - users wish to go about their regular OSN activities with minimal disruption which could cause frustration among OSN users. This belief in minimising the burden of the consent process is supported by Alim [2] in which they identify OSN practice to incorporate user privacy controls which are quick, and easy-to-find to opt in and out of OSN research which they do not wish to be apart of. For example, being presented with tailored advertisements would rely on OSN user profile information to learn about the user's interests, and preferences which some would prefer not to disclose to advertisers and/or investors [1] [2].

- Anonymisation - identity, as Alim [2] states, is considered to be a core building block of any OSN, consisting of personal details which uniquely identify a real world user. It is of great importance to OSN users that they are not being singled out as targets for a malicious user who would want to cause them harm. Thus the ability to anonymise datasets is a crucial part of protecting user privacy, since it is possible to de-anonymise anonymised data. This has been done before as Alim [2] refers to an incident wherein a group of college students whose personal data had been de-anonymised by using a publicly-available code book

which was used to match the personal details of the students' information due to the data set being publicly released by the researchers. Hence, anonymity, and careful disclosure are important sub-goals under the social goal of user privacy.

III. RESEARCH VALUE

Research value can be described as the level of usefulness of the information which you gain out of doing your research. In other words, it signifies the possible gains towards a potentially beneficial outcome which comes from acquiring the outputs of that research. For example, Elovici et al. [1] states that value that comes out of doing OSN research is done to overall benefit the general population, as they bring up examples of previous OSN research which have been able to identify harmful user behaviours such as users who partake in illegal criminal activities such as hacking, and fraud.

A summary of the key elements to be met when regarding the goal of ensuring research value is given as follows:

- Reliability - a main concern highlighted by Elovici et al. [1] is that if users were too aware of being monitored for their behaviour, they would act differently from how they would if they did not know that their data was being sampled. This is deemed as the user-awareness problem, which is also similarly brought up in Hutton's [3] conclusion in which their study primarily concerned user consent rather than informed consent. However, the fact remains that the users were aware of that their data was being used. The problem in Hutton's work [3] which Elovici et al. [1]

heavily stresses is that users' behaviour will be influenced, hence can misrepresent the actual OSN user behaviour. In order for OSN research to have value, Elovici et al. [1] states that it must be based on realistic data, which indicates that studies such as Hutton's [3] may be unrepresentative of actual OSN user behaviour.

- Social Good - another further refined goal under the hood of the overarching research value is emphasizing the social value of the OSN research [1]. For research to have value, it should provide some benefits to society as a whole, and this is mentioned by the principle of beneficence which is stated as another core principle of the Belmont report mentioned in Alim's work [2]. Examples of social good are helping users be more careful with what they share online, and who they communicate with.

- Ease of Access - the value gained from partaking in OSN research is often constrained by the effort that has to be undergone by researchers to acquire the OSN user data. Some studies such as Elovici et al. [1] often resort to using fake identities to acquire more in-depth OSN data, and meta-data such as time-stamps of photo uploads, by way of web crawlers, and Application Programming Interfaces (APIs) used by third-party applications. Similarly, Alim [2] focuses on automated data extraction, and involved an online questionnaire to gather the opinons of researchers on ethical considerations they take into consideration, and employ in their work. Methods of acquisition must

be able to scale, especially since OSNs hold such large amounts of user data.

IV. EXISTING INFORMED CONSENT ACQUISITION METHODS

Existing acquisition methods will be described, and discussed with reference to techniques used to acquire informed consent as identified and used by researchers on previously conducted OSN research.

As of present, OSN research have performed the following methods, and can be listed as follows:

1) Long-Term Research - as identified in Elovici et al.'s work [1], this involves acquiring informed consent at the onset of the OSN research, but is said to be for some "other" research purpose, i.e. the researchers do not specify the true hypotheses, and research questions. Informed consent is given in that the OSN users agree to be part of the study, but for a purpose which differs from the true intentions of the OSN research. Hence, enabling research to run over an extended time-span such that the OSN users may become less aware of the OSN research which they had initially given consent to partaking in. This has been adopted by some large OSNs, such as Facebook, included within their 'Terms of Service' which states that user data may be collected and used for research purposes [3].

2) Post-Research Informing/Compensating - involves acquiring informed consent after data collection, and measurements have taken place [1]. In contrast to the previous method of Long-Term Research, the informing takes place after the research as opposed to before, hence it is only deemed as informed consent once the participant is informed. However, this method is similar in the sense to the previously discussed method of running research over the long-term in that consent is not directly noticeable during the course of the OSN research.

3) Consent-Gathering Policies - is a direct consent collection process to acquire some level of informed consent. Hutton [3] explores this further by testing out three consent-gathering policies: 1) secured consent, which uses an all-or-nothing approach similar to Alim [2] whom specified in their research that informed consent could be gathered by the OSN user giving permission to use their profile data to log in to third-party applications, a technique which is currently employed by Facebook in order to log in, using one's Facebook account, to other apps [1] [2] [3], 2) sustained consent, which continually requests direct consent for all data, and 3) contextual integrity, where consent is assumed for the same types of data based on the norm inferred from the larger proportion of data types of which the data the OSN user had given consent for the researchers to use, i.e. willingness to share similar previously-consented data.

V. BENEFIT VS. COST ANALYSIS

Now we look at the positives, and then the negatives, considered from the perspectives

of the previously-defined social goals: user privacy, and research value.

A. BENEFITS

The benefits are identified for each of the methods as follows:

1) Long-Term Research - adheres favourably to the social goal of improving research value by minimising influence to OSN user behaviour. Over time, the users become less aware that their data is being recorded, and eventually, resume OSN activities as they would normally. This benefit is acknowledged by Elocivi et al. [1] in that research over long periods provide more realistic representations of OSN user behaviour to capture fluctuations and trends, providing better insights in capturing any suspicious behaviours.

2) Post-Research Informing/Compensating - is, like lengthening research over a longer period, beneficial for keeping research value. By withholding informing until after all data is gathered, this gives time for the researchers to perform analysis on the gathered OSN data. This method also seems to scale better for OSNs with a large user base, as mentioned by Alim [2] in that acquisition of informed consent beforehand could take away time that could have otherwise been used for the analyses.

3) Consent-Gathering Policies - provide benefits to user privacy by constantly asking for consent directly. This ensures that users know exactly what information they are sharing in detail thus giving

them plenty of choices in terms of the granularity of data they wish to share for research. Hence, unlike the others, this method is more favourable towards user privacy rather than research value.

B. COSTS

The following section elaborates on some of the downsides of the existing informed consent acquisition techniques:

1) Long-Term Research - the main cost of eroding awareness over the long-term, as mentioned by Elovici et al. [1] is that users may give more access to information than what they had signed up for. Although users may have consented to have some information shared for OSN research purposes, they may reconsider when they realise they no longer want to share what they had initially consented to. As Hutton [3] acknowledges that considering a single instance of acquired informed consent does not always equate to the long-term, and this could make users turn against the researchers if they gather more information than they said they would.

2) Post-Research Informing/Compensating - a cost to only informing users of their data being used afterwards is the possible outrage and backlash researchers may receive from OSN users. The infamous Emotional Contagion study demonstrates this great discomfort users may feel wherein Facebook user feeds were manipulated to cater posts to how users may feel based on their recent interactions, and activities, is brought up by Hutton

[3]. Furthermore, if users were to request their collected data to be destroyed, this would greatly compromise research value.

3) Consent-Gathering Policies - can be considered the most disruptive method if consent gathering must be repeated constantly, especially for users who do not conform to social norms as discovered by Hutton [3]. For example, users who are more privacy-conscious, and would rather keep all their data private. Furthermore, consent-gathering policies may not always explicitly state what the research is for, as Hutton [3] admits that although they gathered users' consent, it was not necessarily informed, as participants were not given exact reasons or hints to researchers' intentions.

VI. POTENTIAL IMPROVEMENTS

Now that we have analyzed the costs and benefits of the previous methods, we suggest ways to address, and minimise identified costs for each method as follows:

1) Long-Term Research - costs could be addressed by informing OSN users of what information could be gathered, and used for the OSN research at certain intervals during the course of the OSN study. This would have to be chosen carefully, and suitable for the research goal. For example, in Hutton's work [3], they acknowledge the temporal dynamism of users who change their mind when it comes to willingness to share certain types of data. A suggestion is to provide a regular but not too often reminder policy, which could perhaps notify the OSN user that they are a part of wider OSN behaviour-related research. In turn, researchers could work with the OSN operators to provide opportunities for the OSN users to opt in and out of OSN research to better fulfill the choice aspect of user privacy, and inform of the social good of the research. Additionally, this would minimise extra lure effort to gain consent initially such as with fake identities in Elovici et al.'s work [1].

2) Post-Research Informing/Compensating - costs could be addressed by providing compensation in the form of updates to the research, and also informing OSN users of any policy changes made. This could help researchers avoid any legal disputes in violating the OSN's terms of service such as when fake identities [1], or automated data extraction is concerned [2], as well as preventing user outrage.

3) Consent-Gathering Policies - one could try to counteract constantly changing user consent by creating adaptive tools to analyse trends within consent-based activity of the OSN. Or to perhaps resort to an all-or-nothing approach, but enable more refined options to specify the type of data users would rather not share. In addition, perhaps general hints can be given as to what the research will output that would socially benefit the OSN users, to provide reassurance that their data is used on their terms.

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VII. FUTURE WORK

After looking through past research, and what they have to say, this is what the work recommends for addressing this problem of acquiring informed consent without compromising too much of either of the social goals. Recommendations follow on from what has been suggested as improvements, particularly the idea of combining the benefits of each methods, such as investigating appropriate time intervals to keep users informed but without too much disruption to cause any major behavioural changes that could compromise research value. By investigating better ways to balance the conflicting ethics, research practices can improve, and users could receive benefits without compromising privacy.

VIII. CONCLUSION

Informed consent, and how it is acquired, is often brushed aside when it comes to conducting OSN research experiments. This work aims to show why informed consent is a problem which should be given more attention to in the future as it can cause much trouble between the OSN users and researchers which could escalate into legal intervention if harm is caused to the OSN users. Starting from the root of concerns, the two social goals: 1) User Privacy, and 2) Research Value, were examined for their underlying sub-goals of enabling freedom of choice, usability, and providing anonymity for the social goal of User Privacy, and capturing realistic reliable OSN data, emphasizing social benefits, and accessibility to the OSN data for the social goal of Research Value.

The informed consent acquisition techniques of Long-Term Research, Post-Research Informing/Compensating, and Consent-Gathering Policies, were introduced, and an ethical analysis was undertaken to highlight the advantages, and disadvantages of each of the proposed acquisition methods, before providing suggestions to address these disadvantages. Lastly, future work is encouraged to further explore how benefits of each method could be leveraged to address the costs, and look into better ways to balance the social goals of user privacy and research value when it comes to gathering informed consent.

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