

# When Friend Becomes Abuser: Evidence of Friend Abuse in Facebook

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## ABSTRACT

We show through 2 user studies ( $n = 80$ ), that a high number of participants have at least 1 Facebook friend whom they believe is likely to abuse their posted photos or status updates, or post offensive, false or malicious content, or with whom they never interact in Facebook and in real life. Our results reveal the importance of developing tools that automatically detect and defend against friend abuse in social networks.

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## 1 INTRODUCTION

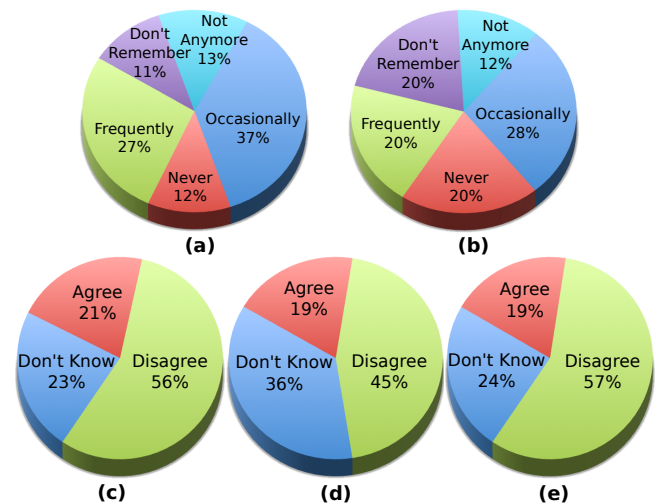
Social network abuse includes not only the passive collection of sensitive user information, but also active attacks, such as cyberbullying [4, 5, 7], trolling and distribution of fake news, malware and propaganda [1, 3, 6]. For instance, Singh et al. [7] showed that emerging online features, including the prevalence of images and videos, anonymity and hyperlocal communications influence cyberbullying, and generate negative socio-psychological effects. Yang et al. [8] have introduced techniques to translate surveys into surveillance strategies on social media. i.e., that find a the posts of a user that can be interpreted as valid survey responses. Brown et al. [2] found that in Facebook, attackers could send sophisticated context-aware email to approximately 85% of users, including to people with private profiles.

We study abusive friend behaviors in Facebook, the most popular social network. We briefly describe Facebook's most relevant features: the friends, timeline and news feed. Facebook users form *friend* relationships through friend invites. Each user has a global *friend list* of other users with whom she has formed friend relationships. The *timeline* (a.k.a wall, or profile) is Facebook's central feature, the place where the user can share her updates, photos, check-ins, and other activities (e.g., posting comments on a status or picture of a friend, confirming a new friend, etc). Users can control with whom they share each story, i.e., through the *audience selector*. A user's *news feed* shows, stories created by her friends, groups, and subscribed events.

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**Figure 1: Distribution of responses for questionnaire over 1,600 Facebook friend relationships, from 80 participants. (a) Q1: frequency of Facebook interaction, (b) Q2: frequency of real world interaction, (c) Q3: friend would abuse posted sensitive picture, (d) Q4: friend would abuse status update post, and (e) Q5: friend would post offensive, misleading, false or potentially malicious content. The red sections correspond to potential strangers or abusive friends.**

Despite the progress made by Facebook in raising user awareness to the dangers of making information public and to the importance of deciding who can access it, many users still allow all their friends to access their information. Friends can then leverage social networking features such as walls and news feeds to easily collect sensitive information from users and to actively abuse them.

## 2 CONTRIBUTIONS

In this work we have explored the perception of Facebook users on their exposure to abusive behaviors perpetrated by friends. To evaluate the user perceived exposure to such friend abuse, we have developed a mobile friend abuse questionnaire whose responses can help pinpoint Facebook friends who (1) form unverified relationships with the user, (2) publish abusive responses to pictures and status updates posted by the user, and (3) publish and distribute fake, malicious or abusive posts.

Specifically, our questionnaire consists of 5 questions for each friend of the user. The first question seeks to capture the user's frequency of interaction with the friend on Facebook with possible responses being "Frequently", "Occasionally", "Not Anymore", "Never" and "Don't Remember". The second question asks the user

about her frequency of interaction with the friend in real life, and has the same response options as the first question. For both questions, we are particularly interested in the “Never” responses: a friend with whom the user has never interacted in real life and in Facebook may be a fake, “trojan” friend who secretly monitors the user. We note that the “Not Anymore” option covers the case of friends with whom the user no longer interacts, e.g., due to moving away.

The third and fourth questions seek to identify friends that are perceived by the user as capable to abuse or misuse photos or status updates posted by the user. Such friends could be cyberbullies. The fifth question seeks to identify trolls, as friends that are perceived by the user to post offensive, misleading, false or potentially malicious content on their timelines. This content can later propagate to the user through her newsfeed. The possible responses for questions 3-5 are “Agree”, “Disagree” and “Don’t Know”. A choice of “Agree” signals abuse.

### 3 RESULTS

We performed two user studies ( $n = 20$  and  $60$  respectively) to collect questionnaire responses for 1,600 friend relationships (20 from each participant). Figure 1 shows the distribution of the responses for each of the 5 questions.

Figure 1(a) shows that in 12% of the 1,600 friend relationships, the participants stated that they have never interacted with that friend in Facebook. However, 64 (80%) of the 80 participants have at least one such friend. Figure 1(b) shows that in 20% of the 1,600 friend relationships, the participants stated that they have never interacted with the corresponding friend in real life. 73 (91%) of the participants had at least one such friend.

In 21% of the 1,600 friend relationships, participants stated that the queried friend would abuse a photo they post (Figure 1(c)), in 19% of the cases they admit the friend would abuse their status updates (Figure 1(d)), while in 19% of the cases, they admit that the friend would post offensive, misleading, false or potentially malicious content (Figure 1(e)).

However, 68 (85%) of the participants have at least 1 friend who would abuse their photos, 62 (77%) of the participants have at least 1 friend who would abuse their status updates, and 62 (77%) of the participants have at least 1 friend who would post offensive, misleading, false or potentially malicious content.

Furthermore, 55 (68.75%) of the 80 participants have at least 1 friend with whom they have never interacted in real life and in Facebook. 71 participants (88.75%) have a friend whom they believe is either a potential trojan, a cyberbully or troll.

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### 4 LIMITATIONS

In our user studies we have only recruited remote participants. Further user studies would need to be performed to validate our findings with local participants. Further studies are also needed to investigate the impact of the number of friends that participants are required to evaluate (20-30 in our studies), on the accuracy of the responses. Relevant dimensions to investigate include the impact of fatigue and the scalability of the findings to the entire friend population.

### 5 CONCLUSIONS

The high number of Facebook users who are exposed to friend abuse reveals the importance of developing tools to automatically identify potentially abusive friends, and take defensive actions against them. Example of defensive actions include unfriending, unfollowing, restricting the access and blocking the friend. This problem is made complex by the conflicting requirements of seeking user approval when taking such defensive actions, while minimizing user involvement.

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