

User Perceptions of Security and Privacy for Group Chat

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Motivation

- Secure messaging is integral to modern society
 - 3 billion WhatsApp, Facebook Messenger, and WeChat users
- Prior work has examined one-to-one secure chat, identifying substantial security and usability concerns
- We wanted to see if there were similar issues for group chat

Research Goals

1. Understand users' security and privacy perceptions regarding group chat
2. Identify potential improvements that could be made to existing tools to make them better meet users' needs
3. Understand whether cultural differences impact users' perceptions and requirements for group chat

Methodology

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- 44-question survey
 - Explored tool usage, group dynamics, privacy, and security
 - Survey was enhanced via 10 cognitive interviews, as well as feedback from researchers and our IRB consultant
- 1001 participants in the UK and US
 - Known differences in privacy attitudes between US and Europe
 - 5 respondents excluded due to a mostly blank survey or responses that did not answer the questions
 - 996 valid responses

Analysis

- Pair-coding of open-ended questions by two researchers
- Discussed results as a team to identify themes in the data
- Analyzed data to find correlations between answers

Demographics

- 58% female
- 62% under 34
- 58% completed education beyond high school
- 16% used group chat tools rarely
 - This indicates there may be a need to consider infrequent users when designing security and privacy features in group chat

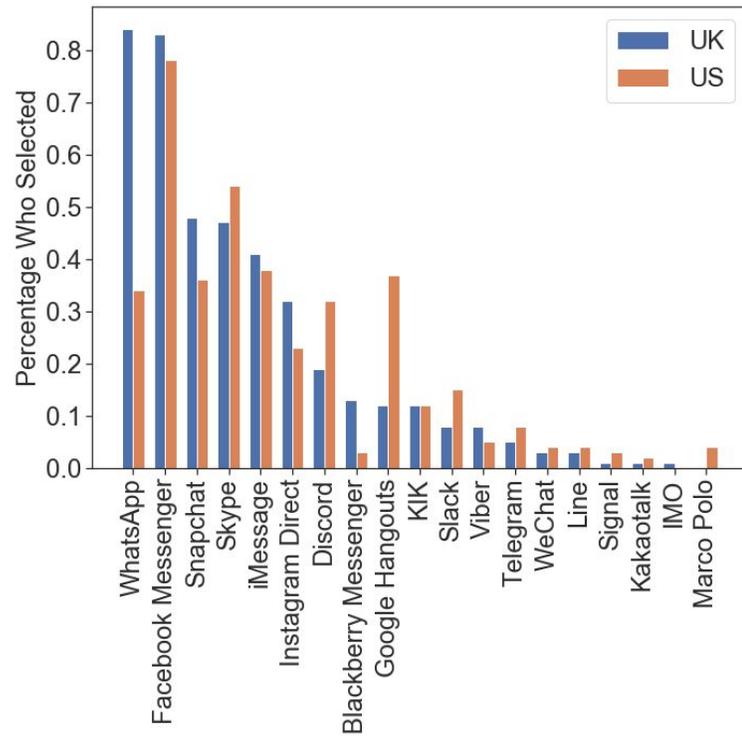
Limitations

- Users may have misrepresented their attitudes or behaviors. Future work should build on our results via diary studies, interviews, and/or direct observation.
- In examining cross-cultural differences, we focused on the US and UK. Future work should broaden this analysis.

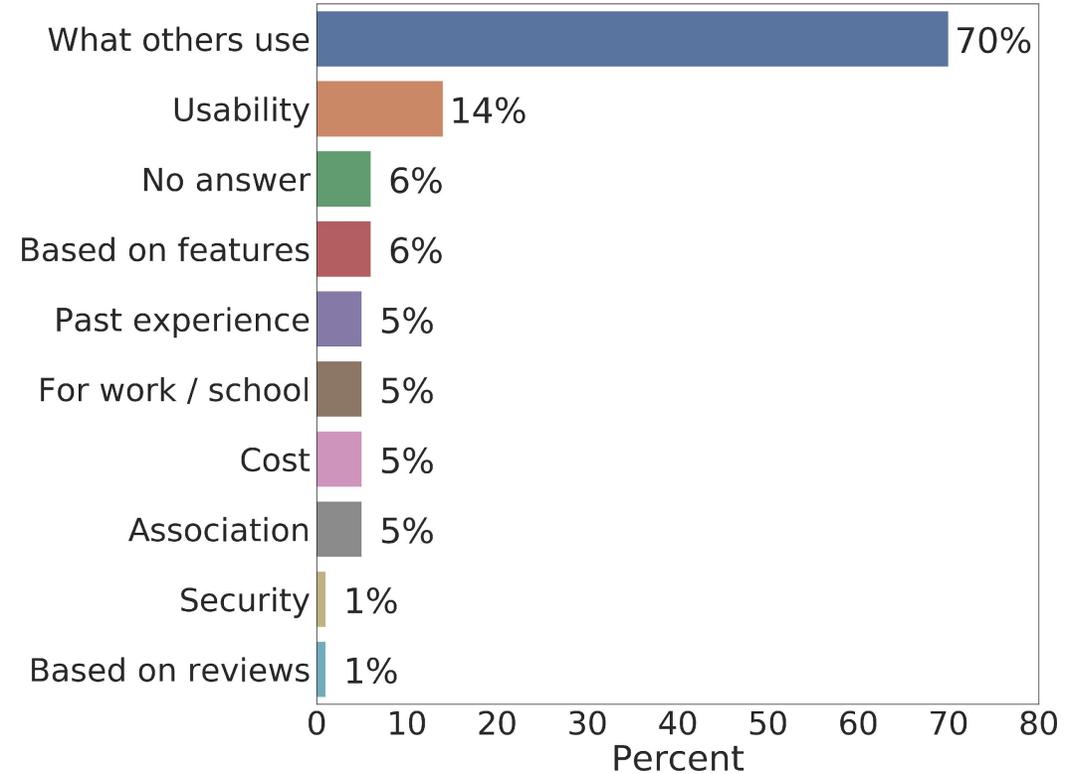
Results

Tool Usage

Tools Used

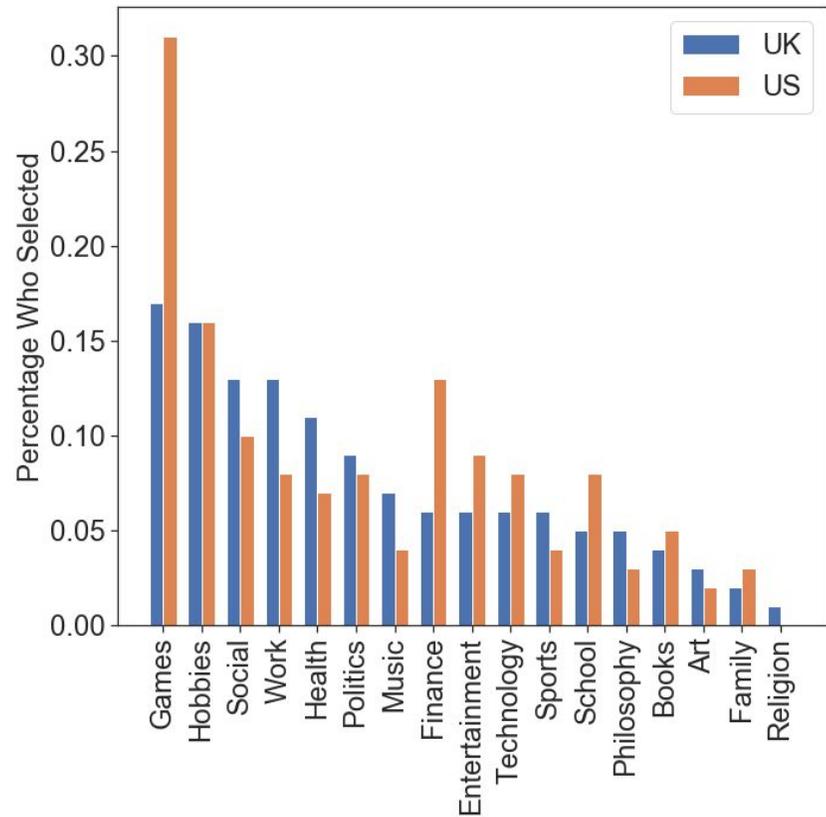


Reason for Adoption

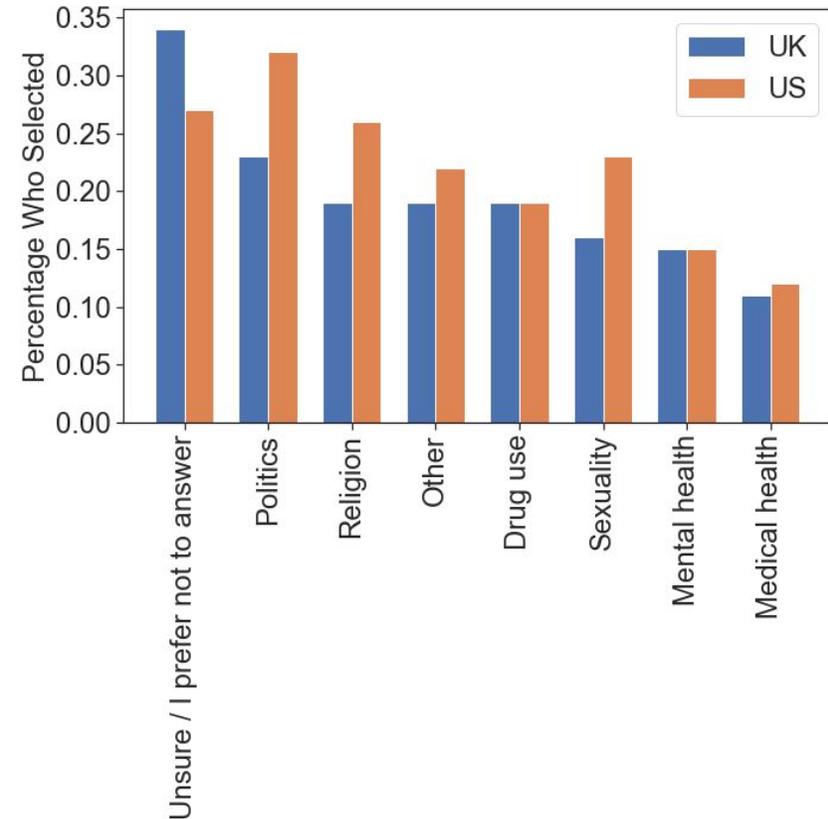


Group Chat Topics

Topics Discussed

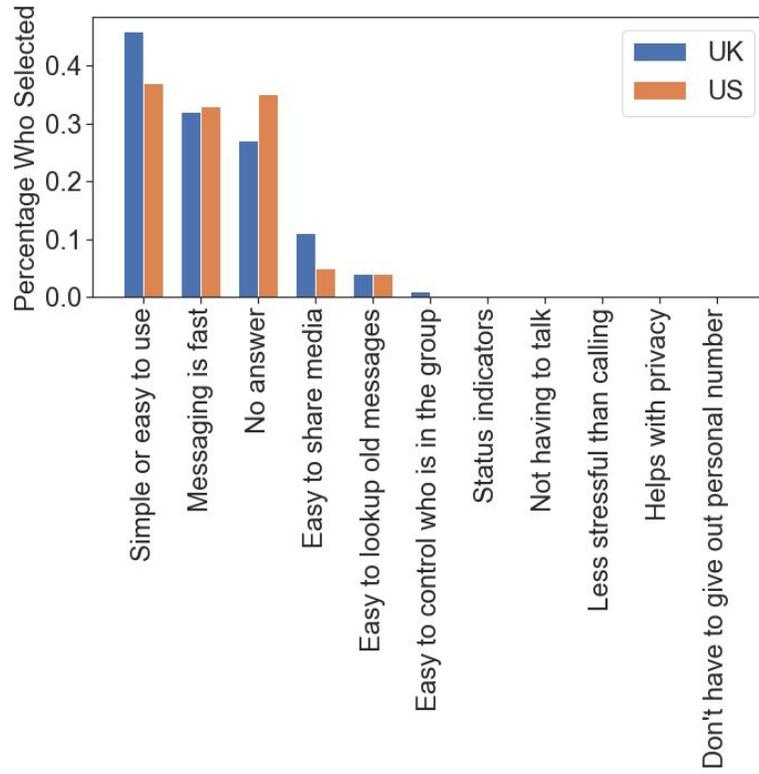


Uncomfortable Topics

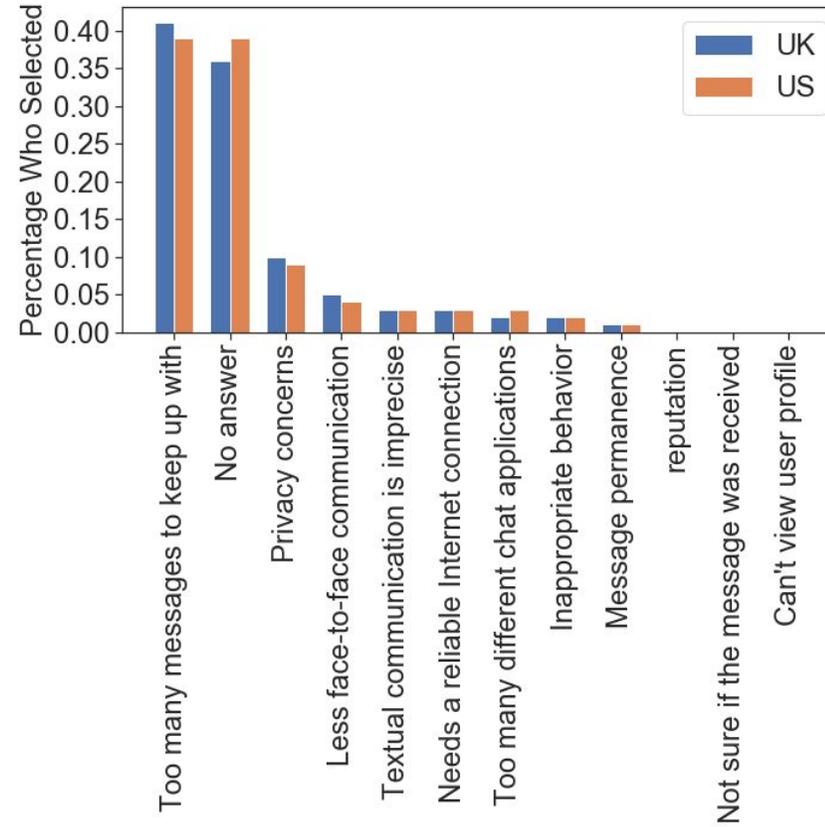


Likes and Dislikes

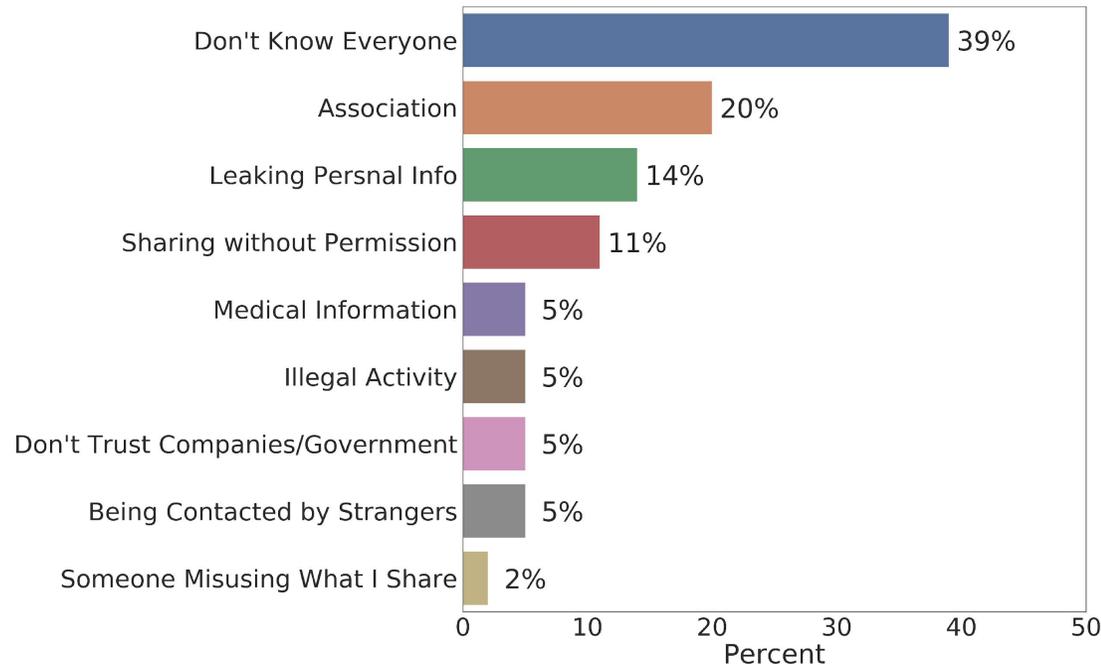
Likes



Dislikes



Privacy Concerns



“I have been involved in anime fanfiction circles and was fearful of my writing being associated with my real name/identity.” (R803)

“A member of a discord was screenshotting sensitive discussions and sharing them on social media.” (R735)

“Things I might have said to my friends (secrets) regarding home issues.” (R584)

Perceptions of Security

Security = Confidentiality

“If it is secure there is no way that someone outside can access the messages being sent or the list of group members without the permission of a group admin.” (R535)

Popularity + Reputation

“If there are a lot of positive reviews from users of the instant messaging tool, it leads me to believe that it is secure for group communications. In addition, I look for what my friends and family use because I trust their opinions in what is safe. However, I understand that full security is unlikely and I must make efforts to maintain security in group chats.” (R719)

Security Strategies: Group Management

“In some groups, the members share private and sensitive information. In groups with this sort of trust, it’s important to get permission for the whole group before adding new members so the atmosphere of security can be maintained.” (R283)

“I don’t feel that I can control them but I do take into account who is a member of the group and what I feel comfortable sharing with them.” (R288)

“Dependent on the group members and my trust of them rather than technology.” (R802)

Security Strategies: Self-filtering

“I realize that I can’t trust that my communication is 100% secure at this point so I am just careful in what I say. Especially with the way the creators of internet apps, social media platforms etc. are constantly breaching or violating the privacy of users and selling information.” (R271)

“I never say anything I couldn’t say in front of my grandmother.” (R155)

Security Strategies: Establishing Identity

“I didn’t know the person and so I felt uncomfortable that they could be anyone - and I wasn’t quite sure how they were invited to the group chat in the first place.” (R218)

“If you know the person in real life then you could ask them questions that only that person would know. Also if you have another way of contacting the person, you could contact them and ask them to verify that it is in fact them.” (R625)

Dimensions of Privacy (Mulligan et al.)

- Dimension of provision
 - Respondents relied on themselves, rather than their tool, to protect their privacy
- Dimension of harm
 - Respondents mainly concerned about untrustworthy users or association
 - Only a few respondents concerned with government surveillance
- Dimension of scope
 - Respondents wanted their group chat data to remain private to their group indefinitely

Similarities Between the US and UK

- Respondents in the US and UK defined privacy and security in group chat similarly
- This result does not mean that their broader views on security and privacy are the same

Discussion

Snapshot of Main Findings

1. Users rely on self-filtering and careful group management to protect themselves
2. Users biggest concerns are that untrusted group members or third parties being able to read their private messages
3. Users want to know who they are talking to, but also occasionally need pseudo-anonymous communication

Bridging the Gap: How Group Chat Fails

Users

- Missing Functionality
 - Methods for managing group membership
 - Methods for intelligently filtering what you share
- Parity of Functionality
 - Blocking user in one-to-one chat does not block them in group chat (WhatsApp, GroupMe, Facebook Messenger)
 - Default end-to-end encryption for one-to-one, but not group chat (Snapchat)
 - Key verification more burdensome in group context

Bridging the Gap: Identifying Sensitive Information for Users

- Use key words to notify users before they share potentially sensitive information
- Users could mark which group chats the tool should watch
- Data from this textual analysis would need to be stored locally to protect privacy
- More research needed to help users avoid sharing sensitive information in the wrong contexts

Bridging the Gap: Group Management

- Easy to miss when a new member is added to the group (just a message in the group chat)
 - Persistent notifications or annotations may help address
- Difficult to establish trust
 - Annotations based on a web-of-trust model may prove effective because group chat communication is both closed and instantaneous

Wrap-Up

Questions?

- Check out the paper for our complete analysis
- Contact: toesch1@vols.utk.edu
- Thanks for joining!