

Exploring Privacy Aspects of Smartphone Notifications

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QUESTIONNAIRE

(I) INTRODUCTION

We care about the quality of our data. In order for us to get the most accurate measures of your knowledge and opinions, it is important that you thoughtfully provide your best answers to each question in this study.

- **Will you provide your best answers to each question in this study?**
 - I will provide my best answers.
 - I will not provide my best answers.
 - I can not promise either way.

(II) BACKGROUND

Note: Please answer the questions in this questionnaire as they pertain to your **primary smartphone** and your practices during typical (i.e., non-COVID) times.

- **What is the Operating System (OS) of your phone?**
 - Android
 - iOS (iPhone)
 - Other (Please specify: [text box])
- **Does your device use any type of lock (e.g., PIN, password, pattern, fingerprint, faceID, etc.)?**
 - Yes
 - No
 - I don't know
- If 'Yes' is selected for the question "Does your device use any type of lock (e.g., PIN, password, pattern, fingerprint, faceID, etc.)?" then ask:
Who other than you can unlock your device? (Select all that apply.)
 - Parents
 - Spouse
 - Siblings
 - Friends
 - Children older than 13
 - Other family members
 - Colleagues
 - Strangers
 - No one [Selecting this option disables all others.]
 - Others (Please specify: [text box])

(III) NOTIFICATIONS AND SMARTPHONE MECHANISMS

- **How many notifications have you received in the last hour?** *NOTE: Include all types of notifications (i.e., app icon badges, notification center, lock screen, and banners).*
 - 0
 - 1 to 9
 - 10 to 19
 - 20 to 29
 - 30 or more
- **On a typical day, how frequently do you pick up your phone to check, clear, or address notifications?**
 - Once in about 5 minutes
 - Once in about 15 minutes
 - Once in about 30 minutes
 - Once in about 1 hour
 - Once in about 3 hours
 - Once in about 6 hours
 - Once in about 12 hours
 - Once in about 24 hours
 - Whenever a notification is delivered
 - Something else (Please specify: [text box])
- **Does your screen wake up when a notification is delivered?**
 - Never
 - Sometimes
 - About half the time
 - Most of the time
 - Always
 - I don't know
- **For each of the following actions, mention how many hours in a typical day (from 0 to 24) you use it.**
 - Use **Do Not Disturb (DND)** Mode [a list of numbers from 0 to 24]
 - Use **Silent** mode [a list of numbers from 0 to 24]
 - Turn the device **off** [a list of numbers from 0 to 24]
 - Use **Airplane** mode [a list of numbers from 0 to 24]
 - Use notification management apps [a list of numbers from 0 to 24]
- **Please explain your reasons for the answers to the previous question.** *(Optional)*
[essay-type text box]

(IV) DEVICE SHARING BEHAVIOR

- **How frequently can someone else view notifications on your phone in any of the following places?** (Choose one from the scale: Never, Few times a month, Few times a week, Once a day, and Few times a day.)
 - Home
 - Meetings
 - Classes

- Seminars and presentations
 - Cafeterias and restaurants
 - Social gatherings
 - Stores and markets
 - Public Transport
 - Others (Please specify: [text box])
- **How frequently do you share your phone with the following people?** (Choose one from the scale: Never, Less than once a week, Few times a week, Multiple times a week, Once a day, Few times a day, Multiple times a day, and N/A.)
 - Spouse
 - Siblings
 - Parents
 - Children older than 13
 - Friends
 - Colleagues
 - Strangers
 - **Please explain your reasons for the answers to the previous question.** (*Optional*)
[essay-type text box]
 - **When you hand your phone over to someone else, which of the following actions do you take?** (*Select all that apply.*)
 - I don't allow anyone else to use my phone [Selecting this option disables all others.]
 - Nothing [Selecting this option disables all others.]
 - Close running applications
 - Clear notifications
 - Enable guest mode or second space
 - Enable app locks
 - Change accessibility settings
 - Watch the person's use of the phone
 - Check all the applications used by the person
 - Other (Please specify: [text box])
 - If 'Clear notifications' is selected for the question "When you hand your phone over to someone else, which of the following actions do you take?" then ask:
Do you clear notifications from screen before handing your phone over to the following people? (Choose one from the scale: Never, Rarely, Sometimes, Always, and N/A.)
 - Spouse
 - Siblings
 - Parents
 - Children older than 13
 - Friends
 - Colleagues
 - Strangers

(V) LAST NOTIFICATION

Think about the **latest notification** that you received on your phone. Please answer the following questions with respect to that notification.

- **Which app sent the notification?** [text box]
- If 'Android' is selected for the question "What Operating System (OS) is used by your phone?" then ask:
How do you receive notifications from this app? (*Select all that apply.*)
 - Lock Screen
 - Notification drawer
 - Floating notification
 - App Badge
 - I don't know [Selecting this option disables all others.]
 - Other (Please specify: [text box])
- If 'iOS' is selected for the question "What Operating System (OS) is used by your phone?" then ask:
How do you receive notifications from this app? (*Select all that apply.*)
 - Lock Screen
 - Notification center
 - Banner (permanently)
 - Banner (temporarily)
 - App Badge
 - I don't know [Selecting this option disables all others.]
 - Other (Please specify: [text box])
- **How quickly did you address the notification after you first saw it?**
 - Within a minute
 - Within 5 minutes
 - Within 30 minutes
 - Within an hour
 - Within 6 hours
 - Within 12 hours
 - Within 24 hours
 - Other (Please specify: [text box])
- **What action did you take when you first became aware that you had received this notification?** (*Select all that apply.*)
 - Read the notification preview (title)
 - Read the notification content
 - Cleared it from the phone lock screen
 - Cleared it from the notification center/drawer
 - Opened the relevant app to address the notification
 - Did not do anything [Selecting this option disables all others.]
 - Prevented further notifications from the app (Please tell us how: [text box])
 - Other (Please specify: [text box])

- **How concerned would you be if someone else viewed this notification?** [Choose from a five-point Likert Scale ranging from Extremely concerned to Completely unconcerned.]
- **Please explain your reasons for the answers to the previous question.** (*Optional*)
[essay-type text box]
- **Did this notification include information pertaining to another person?**
 - Yes
 - No
 - Other (Please specify: [text box])
- If 'Yes' is selected for the question "Did this notification include information pertaining to another person?" then ask:
How concerned do you think the person would be if the content of the notification was seen by someone other than you? [Choose from a five-point Likert Scale ranging from Extremely concerned to Completely unconcerned.]

(VI) NEGATIVE EXPERIENCES

- **How many times have you encountered negative experiences related to notifications?**
 - 0
 - 1-2
 - 3-5
 - 6-10
 - 11-20
 - More than 20
- **Of the negative experiences related to notifications that you have encountered, please tell us a bit about the most negative experience.**
[essay-type text box]
- If '0' is NOT selected for the question "How many times have you experienced negative experiences related to notifications?" then ask:
What caused the negative experience?
 - I had given my phone to another person when the notification arrived.
 - I left the phone screen unlocked.
 - I forgot to take appropriate actions to silence the notification.
 - I was screen casting/projecting the device display to others (e.g., in a presentation) when the notification popped up on the screen.
 - The notification included sensitive content. (Please specify: [text box])
 - Other (Please specify: [text box])

(VII) NOTIFICATIONS FROM VARIOUS CATEGORIES OF APPS

Reminder: Please answer the questions in this questionnaire as they pertain to your **primary smartphone** and your practices during typical (i.e., non-COVID) times.

- **How concerned would you be if a family member reads the content of a notification from each of the app categories listed below?** [Choose from a five-point Likert Scale ranging from Extremely concerned to Completely unconcerned or N/A.]
 - Instant messaging
 - Social media
 - Calendar
 - E-mail
 - Banking and payments
 - Health and fitness
 - Dating
- **Please explain your reasons for the answers to the previous question.** (*Optional*)
[essay-type text box]
- **How concerned would you be if a colleague reads the content of a notification from each of the app categories listed below?** [Choose from a five-point Likert Scale ranging from Extremely concerned to Completely unconcerned or N/A.]
 - Instant messaging
 - Social media
 - Calendar
 - E-mail
 - Banking and payments
 - Health and fitness
 - Dating
- **Please explain your reasons for the answers to the previous question.** (*Optional*)
[essay-type text box]
- **Mention the most frequently used Google service or product on your primary phone. To ensure that you are participating attentively, please select the ‘Translate’ option.** [Attention Check Question]
 - Docs
 - Hangouts
 - Maps
 - Photos
 - Scholar
 - Sheets
 - Slides
 - Translate
 - Other (Please specify: [text box])
- **Have you enabled additional locking (e.g., PIN, password, etc.) for any of the following categories of apps? (Select all that apply.)** NOTE: We are asking about locking that you enabled on your own, separate from the screen lock for the device or a mandatory lock/login forced by the app.
 - Instant messaging
 - Social media
 - Calendar
 - E-mail
 - Banking and payments

- Health and fitness
- Dating
- Apps for work
- Travel and navigation
- None [Selecting this option disables all others.]

(VIII) OS-SPECIFIC MECHANISMS

- If ‘Android’ is selected for the question “What is the Operating System (OS) of your phone?” then ask:
What settings have you enabled for lock screen notifications?
 - Show All
 - Hide Sensitive
 - Hide All
 - I don’t know
- If ‘iOS’ is selected for the question “What is the Operating System (OS) of your phone?” then ask:
What option have you enabled for notification previews?
 - Always
 - When unlocked
 - Never
 - I don’t know
- If ‘iOS’ is selected for the question “What is the Operating System (OS) of your phone?” then ask:
For the most frequently used app in each of the following categories, what option have you enabled for ‘Show Previews’? [Choose one from the options: Always, When unlocked, Never, Notification disabled, I don’t know, and N/A]
 - Instant messaging
 - Social media
 - Calendar
 - E-mail
 - Banking and payments
 - Work based or professional purposes
 - Travel and navigation
 - Health and fitness
 - Dating

(IX) PERCEIVED INTRUSION AND PERCEIVED SURVEILLANCE

Subscales of the Mobile Users’ Information Privacy Concerns (MUIPC) Scale by Xu et al. (Heng Xu, Sumeet Gupta, Mary Beth Rosson, and John M. Carroll. 2012. Measuring Mobile Users’ Concerns for Information Privacy. In *Thirty Third International Conference on Information Systems (ICIS 2012, Vol. 3)*. Association for Information Systems, Orlando, FL, USA, 2278–2293.)

- **Please indicate your level of agreement with the following statements:** [Choose one option from seven-point Likert-Scale ranging from Strongly disagree to Strongly agree.]
 - I believe that the location of my mobile device is monitored at least part of the time.
 - I am concerned that mobile apps are collecting too much information about me.
 - I am concerned that mobile apps may monitor my activities on my mobile device.
 - I feel that, as a result of my using mobile apps, others know about me more than I am comfortable with.
 - I should select somewhat agree for this question. [Attention Check Question]
 - I believe that, as a result of my using mobile apps, information about me that I consider private is now more readily available to others than I would want.
 - I feel that, as a result of my using mobile apps, information about me is out there that, if used, will invade my privacy.

(X) GENERAL DIGITAL DIFFICULTIES

Subscale of the Digital Difficulties Scale (DDS) by Anrijs et al. (Sarah Anrijs, Koen Ponnet, and Lieven De Marez. 2020. Development and Psychometric Properties of the Digital Difficulties Scale (DDS): An Instrument to Measure who is Disadvantaged to Fulfill Basic Needs by Experiencing Difficulties in Using a Smartphone or Computer. *PLOS ONE* 15, 5 (2020), e0233891. <https://doi.org/10.1371/journal.pone.0233891>)

- **Please indicate your level of agreement with the following statements:** [Choose one option from: Disagree, Rather disagree, Neither disagree, neither agree, Rather agree, and Agree.]
 - In general, I often have difficulty when using my smartphone, apps, websites, or computer programs.
 - In general, I am not able to solve questions or problems on my own when using my smartphone, apps, websites, or computer programs.
 - In general, I need support when trying out something new on my smartphone or computer.
 - In general, I find it hard to adjust settings of my smartphone, apps, websites, or computer programs (for example, privacy or safety settings).
 - In general, I often have questions or problems when using my smartphone, apps, websites or computer programs after an update has been done.

(XI) DEMOGRAPHICS

Finally, please tell us a bit about yourself:

- **What is your year of birth?**
[dropdown of years from 2010 to 1920]
- **What is your gender?**
 - Male
 - Female
 - Non-binary
 - Prefer to self-describe: [text box]

- Prefer not to disclose
- **What is your ethnic background?** (*Select all that apply.*)
 - American Indian or Native American
 - Asian
 - Black or African American
 - Native Hawaiian or Pacific Islander
 - White
 - Hispanic
 - Other (Please specify: [text box])
 - Prefer not to say [Selecting this option disables all others.]
- **What is the highest level of education you have completed?**
 - Less than high school
 - High school diploma
 - Vocational training
 - Some college
 - College graduate (B.S., B.A., or other 4 year degree)
 - Master’s degree
 - Doctoral degree
 - Professional degree after college (e.g., law or medical school)
 - Other (Please specify: [text box])
 - Prefer not to say
- **What is your current employment status?** (*Select all that apply.*)
 - Employed full-time
 - Employed part-time
 - Unemployed looking for work
 - Unemployed not looking for work
 - Homemaker
 - Student
 - Retired
 - Disabled
 - Other (Please specify: [text box])
 - Prefer not to say [Selecting this option disables all others.]
- If ‘Employed full-time’ or ‘Employed part-time’ or ‘Unemployed looking for work’ is selected for the question “What is your current employment status?” then ask:
What is your profession?
 [text box]
- If ‘Student’ is selected for the question “What is your current employment status?” then ask:
What is your field of study?
 [text box]

- **What is your current annual household income before taxes?**
 - Less than \$10,000
 - \$10,000 to \$19,999
 - \$20,000 to \$29,999
 - \$30,000 to \$39,999
 - \$40,000 to \$49,999
 - \$50,000 to \$59,999
 - \$60,000 to \$69,999
 - \$70,000 to \$79,999
 - \$80,000 to \$89,999
 - \$90,000 to \$99,999
 - More than \$100,000
 - Prefer not to disclose
- **How many years have you lived in the United States of America?**
[List of numbers from 1 to 10 and the option 'More than 10 or All my life']
- **Including yourself, how many people live in your household?**
[List of numbers from 1 to 10 and the option 'More than 10']
- **What is your current marital status?**
 - Married
 - Widowed
 - Divorced
 - Separated
 - Never Married
 - Prefer not to disclose
 - Other (Please specify: [text box])

(XII) CLOSING

- **Is there anything else you would like to tell us?**
[essay-type text box]