Willingness to participate in passive mobile data collection

Public Opinion Quarterly

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Wave 1 Questionnaire

QA4. Which of the following devices do you have?
Yes
No

    (a) A smartphone (with touchscreen, internet access, and apps)
    (b) A cell phone (with numeric keypad and no apps) that is not a smartphone
    (c) A desktop or laptop computer
    (d) A tablet computer, for example iPad, Samsung Galaxy Tab, Google Nexus, Kindle Fire etc.;
    (e) An ebook reader, for example a Nook or Kindle e-reader

QA6. How often do you use a smartphone for activities other than phone calls or text messaging?
Several times a day
Every day
Several times a week
Several times a month
Once a month or less

QA7. Do you use your smartphone for the following activities?
Yes
No

    (a) Browsing websites
    (b) Reading and/or writing email
    (c) Taking photos
    (d) Looking at content on social media websites/apps (for example looking at text, images, videos on Facebook, Twitter, Instagram)
    (e) Posting content to social media websites/apps (for example posting text, images, videos on Facebook, Twitter, Instagram)
    (f) Making purchases (for example buying books or clothes, booking train tickets, ordering food)
    (g) Online banking (for example checking account balance, transferring money)
    (h) Installing new apps (for example from iTunes, Google Play Store)
    (i) Using GPS/location-aware apps (for example Google Maps, Foursquare, Yelp)
    (j) Connecting to other electronic devices via Bluetooth (for example smartwatches, fitness bracelets, step counter)
    (k) Playing games
    (l) Streaming videos or music

QA8. Generally, how would you rate your skills of using your smartphone?
Beginner
2
3
4
Advanced

QA9.   Please indicate if you agree or disagree with the following statements.
        Strongly disagree
        Disagree
        Neither agree nor disagree
        Agree
        Strongly agree

   (a) Answering questions in surveys and participating in research is in my own best interest
   (b) Answering questions in surveys and participating in research is a waste of time
   (c) The terms 'poll' and 'survey' are often used to disguise a sales pitch
   (d) Answering questions in surveys and participating in research is an interesting experience
   (e) The survey research industry serves a useful purpose.

QA10.   How much do you trust each of the following to not share your personal data with other parties?
        Do not trust at all
        Trust a little
        Trust somewhat
        Trust a lot

   (a) Public opinion research companies and market research companies
   (b) University researchers
   (c) Government agencies, like the German Federal Statistical Office
   (d) Your mobile phone network provider
   (e) Companies that make apps for smartphones
   (f) Credit card companies
   (g) Online retailers
   (h) Social media platforms

QA12.   In general, how worried are you about your personal privacy?
        Not at all concerned
        A little concerned
        Somewhat concerned
        Very concerned

QA13.   Please indicate whether or not you ever feel your privacy is violated by the following.
        Yes
        No

   (a) Banks and credit card companies when they ask about finances
   (b) The government when it collects tax returns
   (c) The federal government, when it conducts surveys
   (d) People who ask questions on public opinion surveys
   (e) Social media platforms that store a lot of information about you
   (f) Apps collecting information about location when they are not used

(g) Web browsers tracking websites you visit

QA14.   Smartphones can collect a variety of data that provide researchers with information of the everyday life of the users. Below you will see a number of activities that you could do with your smartphone. How concerned would you be about the security of providing information in the following ways for research?
Not at all concerned
A little concerned
Somewhat concerned
Very concerned

(a) Complete an online questionnaire on your smartphone
(b) Download a survey app to complete an online questionnaire
(c) Download an app which collects data about how you use your smartphone
(d) Answer a couple of questions sent via text messaging
(e) Use the camera of your smartphone to take photos or scan barcodes (for example photos of receipts, barcodes of purchased products)
(f) Allow built-in features of your smartphone to measure the frequency and speed at which you walk, run or cycle
(g) Share the GPS position of your smartphone (for example to measure time spent in urban vs. green spaces)
(h) Connect your smartphone via Bluetooth to other electronic devices (for example wearables such as Fitbit to measure physical activity)

Wave 2 Questionnaire

General study description

On the following pages we present you **8 different scenarios** which vary in a number of features.
All scenarios will mention a research app that, when downloaded to a smartphone, collects the following data:
•   technical characteristics of the phone (for example, brand, screen size)
•   the telephone network currently used (for example, signal strength)
•   the current location (every 5 minutes)
•   what apps are used and what websites are visited on the phone
•   number of incoming and outgoing phone calls and text messages on the phone
Please note that the research app mentioned in the scenarios would only collect information on when other apps are opened or when a call is made. The **research app cannot** see what happens inside other apps or what is said in a phone call or a text message.
All information collected by the research app described above is confidential. It would only be used by the researchers and they would not share your individual data with anyone else. The described study complies with all German federal regulations about data protection and privacy.

Vignette

Imagine that a **#sponsor#** invites you to participate in a research study that includes downloading a special research app to your smartphone.
The data the research app collects from your smartphone will help the researchers to learn more about **#topic#** on their smartphones.
The study will last for **#duration#** and you should leave the research app installed on your smartphone until the end of the study.
There is **#option to switch off app#** during the course of the study.
#Incentive#
#additional short questions#

QB1.   How likely is it that you would download the app to participate in this research study?
0 Definitely would not participate
1
2
3
4
5
6
7
8
9
10 Definitely would participate

QB2.   Why would you [IF QB1=0-5: not participate/IF QB1=6-10: participate] in this research study?

QB3-9.   REPEAT QB1. AFTER NEW VIGNETTE.

QB10.   Did you notice any differences among the 8 different research study descriptions?
          Yes
          No

IF QB10=YES -> ASK QB11, ELSE -> QB12

QB11.   What differences did you notice between the scenarios?

QB13.   Aside from this study today, were you ever invited to download a research app to
          your smartphone that automatically collects data such as about your location, the
          apps you are using, and the websites you are visiting, for research purpose?
          Yes
          No

IF QB13=YES -> ASK QB14, ELSE -> QB15

QB14.   Did you actually download the research app to your smartphone?
          Yes
          No

QB15.   Are you male or female?
          Male
          Female

QB16.   How old are you?
          17 years or younger
          18 to 19 years
          20 to 29 years
          30 to 39 years
          40 to 49 years
          50 to 59 years
          60 years or older

QB18.   What is your highest school degree?
          Still in school
          Left school without a degree
          Degree from "Volksschule," "Hauptschule," or "Polytechnische Oberschule" after 8
          or 9 years
          Degree from "Realschule," "Polytechnische Oberschule," or "Mittlere Reife" after
          10 years
          Degree from "Fachoberschule" or similar ("Fachhochschulreife")

High school degree ("Abitur," "Hochschulreife," "Erweiterte Oberschule" with degree after 12 years)
Other degree, please specify: _____

Descriptive statistics for variables used in the analysis

Attitudes toward surveys and research (H1.6) were measured based on a five-item battery (QA9a-e). Factor analysis confirmed that all five items load on one factor. We reverse-coded the negatively worded items and summed up the responses into an index. To facilitate comparison of the different measures used in our analysis, we converted all scales and indexes to a common scale ranging from 0 to 10. Higher values on the survey and research attitude index mean more positive attitudes toward surveys and research.

We used several indicators to measure privacy and security concerns (H2.1). First, *security concern when using a passive mobile research app* was operationalized as responses to a question on concern with providing information via a smartphone app that collects data on how the smartphone is used (QA14c). Second, *general privacy concern* was measured based on question QA12: "In general, how worried are you about your personal privacy?". For the analysis, we converted both measures to the common scale ranging from 0 to 10 with higher values meaning more concern. Third, a battery of questions (QA13a-g) asked respondents about perceived privacy violations for seven situations (e.g., banks and credit card companies asking about finances, public opinion surveys, apps collecting information about location). Factor analysis showed a two-factor solution with four items (a-d) loading highly on the first factor and three items (e-g) loading highly on the second factor. We thus summed up the number of *perceived privacy violations offline* (range: 0 to 4) and *perceived privacy violation online* (range 0 to 3). For both indexes higher values mean that respondents felt that their privacy was violated in more situations.

Next, we measured respondents' trust that organizations collect data in confidentiality (H2.2) by asking how much respondents trust eight different organizations to not share their personal data with other parties (QA10a-h). After dropping item (f), factor analysis showed a two factor solution with three items (a-c) loading highly on one factor and four items (d, e, g, and h) loading highly on a second factor. We summed up the answers into an index of *trust data will not be shared by research organizations* and an index of *trust data will not be shared by other organizations* and converted both indexes to the common scale ranging from 0 to 10. For both indexes, higher values indicate higher trust in organizations to not share data with third parties. The correlation between the two indexes is 0.32.

To measure *smartphone skills* (H2.3), respondents rated themselves on a scale from 1 "Beginner" to 5 "Advanced" (QA8). For the analysis, this measure was also converted to the common scale ranging from 0 to 10.

We used four measures for familiarity with mobile device tasks (H2.4). First, we asked respondents whether they owned each of five digital devices (QA4a-e), and we summed up the *number of devices* (range: 1 to 5). Second, we asked respondents about their *frequency of smartphone use* for activities other than phone calls or text messaging (QA6). This measure was again converted to the common 11-point scale. Next we asked respondents whether they used their smartphones for 12 different activities such as browsing websites, reading and/or writing email, posting content to social media, making purchases, and installing new apps (QA7a-l). We summed up the answers into a *number of smartphone activities* (range: 0 to 12). Finally, in Wave 2, we asked whether participants were ever invited to download a research app to their smartphone that automatically collects data for research purpose (QB13) and, if so, whether they actually did download the research app to their smartphone (QB14). Using these two questions, we coded respondents based on their *experience with smartphone research apps* as whether they were never invited to download a research app, were invited to but did not download the app (reference category), and downloaded the app.
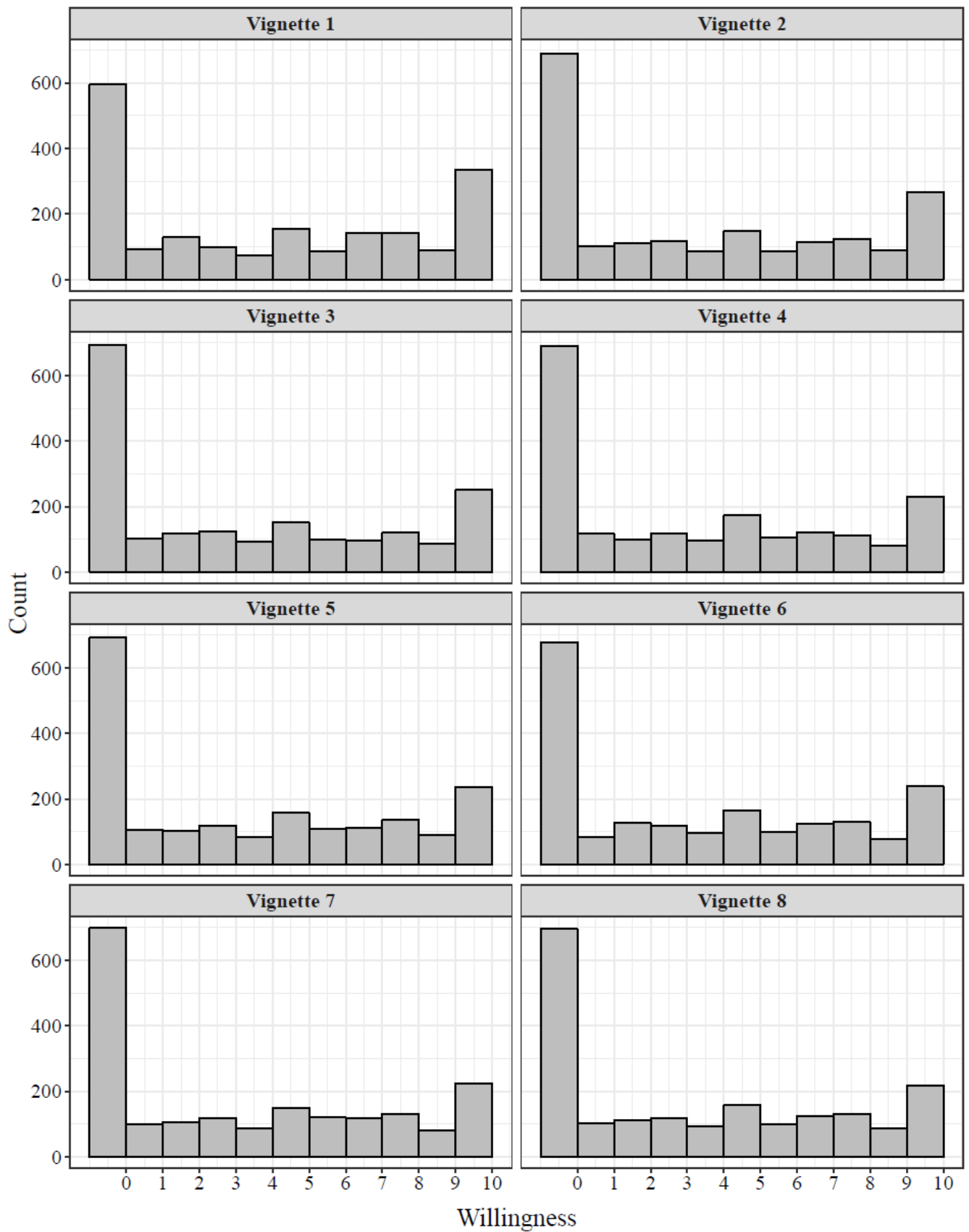
Figure A. Histogram for original willingness ratings