

APPS AGAINST THE SPREAD – PRIVACY IMPLICATIONS AND USER ACCEPTANCE OF COVID-19-RELATED SMARTPHONE APPS ON THREE CONTINENTS



Christine Utz^{2*}, Steffen Becker^{1,3}, Theodor Schnitzler¹, Florian M. Farke¹, Franziska Herbert¹, Leonie Schaewitz¹, Martin Degeling¹, Markus Dürmuth^{4*}

¹Ruhr University Bochum ²CISPA Helmholtz Center for Information Security ³Max Planck Institute for Security and Privacy ⁴Leibniz University Hannover

*The work for this paper was conducted while these authors were affiliated with Ruhr University Bochum.

MOTIVATION

- Spring 2020: Intense public debates in multiple countries about **digital contact tracing** and possible architectures / data processing practices
- Increasing availability of mobile apps with **COVID-19-related functionality** for different purposes in fighting the pandemic

Research Questions

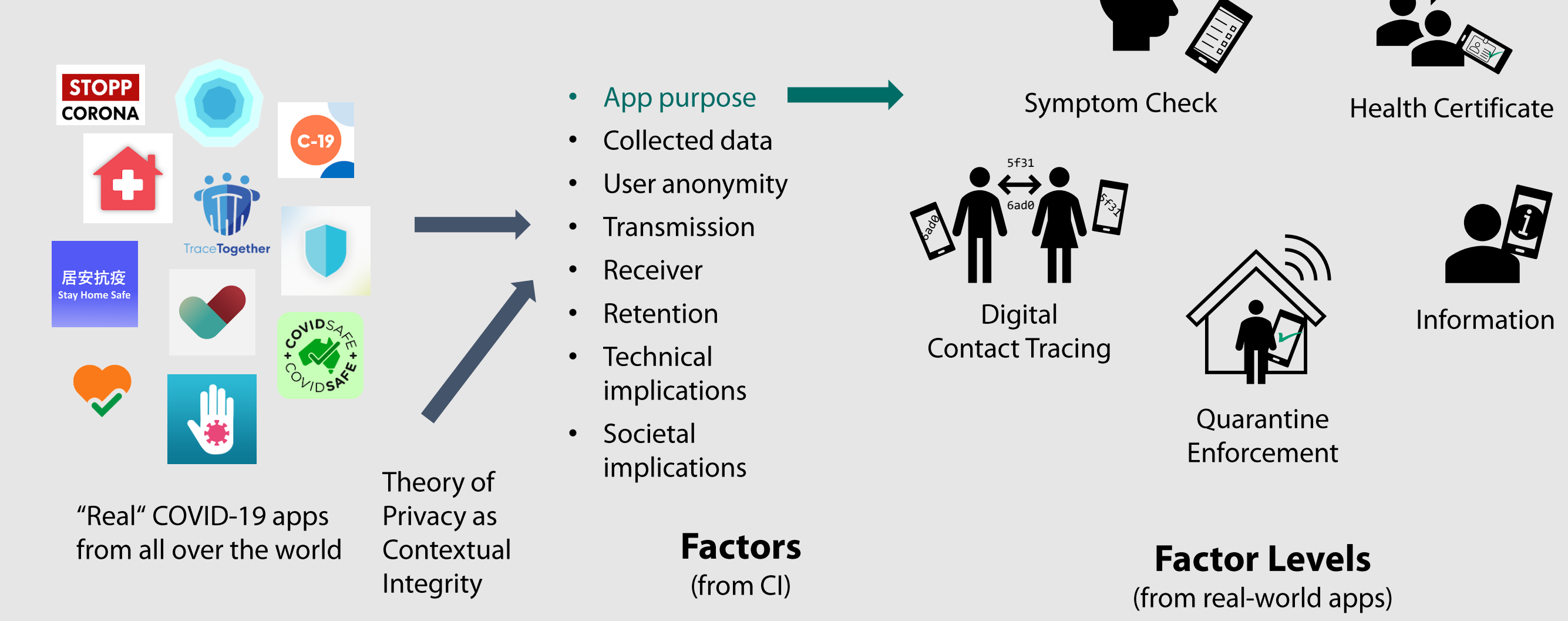
How do different **data processing factors** of COVID-19 apps influence people's willingness to use them?

General **perception** of COVID-19 apps?

Apps for different **purposes**?

Differences across **cultures**?

METHOD: VIGNETTE DESIGN



Example Vignette

Imagine an app that provides information about your health and needs to be shown if you want to visit a certain place. **App purpose**

- The app uses health or activity data, your COVID-19 infection status, and your current or past location(s). **Collected data**
- In addition, the app collects data that could be used to uniquely identify you. **Anonymity**
- This data is sent to research institutions when you request your health report and it will be stored until the current coronavirus regulations end. **Retention**
- The app decreases your phone's battery life. **Technical implication**
- Using this app may increase your personal freedom of movement or travel. **Societal implication**

Survey

- Survey conducted in in summer 2020
- Representative, ~1000 participants per country
- Participants saw 10 app scenarios (2 per purpose) and rated them how likely they were to use the presented fictitious app

RESULTS

General willingness to use a COVID-19 app

(7-point Likert scales, numbers increase with likelihood of use)

| | mean | sd | mean | sd | mean | sd |
|--------------------|------|------|------|------|------|------|
| Willingness to use | 3.25 | 2.04 | 3.12 | 2.10 | 5.27 | 1.55 |

Willingness to use a COVID-19 app by app purpose

(percentage of responses in positive range of 7-point Likert scales)

| Contact tracing | 37 % | 32 % | 80 % |
|------------------------|------|------|------|
| Quarantine enforcement | 27 % | 25 % | 72 % |
| Symptom check | 32 % | 29 % | 74 % |
| Health certificate | 26 % | 27 % | 76 % |
| Information | 30 % | 26 % | 77 % |

Influence of factor levels on the willingness to use an app

(CLMM – cumulative link mixed model; significant **positive** / **negative** influence; no significant influence of a factor level)

| Purpose | Contact tracing | CT, SC, HC | QE, SC |
|------------------------|--|------------|------------------------|
| Data | Encounter data | | Unspecified data |
| Anonymity | Unique identifiability Demographic data | | Unique identifiability |
| Recipient | Private companies | | |
| | Law enforcement | | |
| | The public | | |
| Technical implications | Technical malfunctions | | |
| | Battery drain | | |
| Societal implications | Faster adjustment of measures for pandemic control | | |

Perception of COVID-19 apps

(Most frequently named **positive** / **negative** aspects by country)

| | None | None | Information |
|--|------------------|-----------------|----------------------------|
| | Contact tracing | Contact tracing | Generic positive sentiment |
| | Pandemic control | Information | Movement control |
| | Privacy | Privacy | None |
| | Surveillance | None | Privacy |
| | None | Surveillance | Anxiety |

TAKEAWAYS

- **Willingness to use** COVID-19 apps high in China, more ambiguous in Germany / US
- People prefer COVID-19 apps for **purposes** familiar through media coverage / actual use
- Base percentage of people who do not want to use a COVID-19 app under any circumstances
- **Key concerns** in DE, US: fear of surveillance beyond the pandemic; CN: anxiety due to looming warnings
- For future government-backed apps requiring **widespread adoption**, privacy-friendly implementation can increase acceptance

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