Vulnerability & Blame: Making Sense of Unauthorized Access to Smartphones
"In the past 12 months, I've looked through someone else's cell phone without their permission."

Estimates from indirect survey (list experiment), N = 1,381 MTurk sample

- Yes
- No

31%

69%

What are incidents of unauthorized access like?
What are incidents of unauthorized physical *access* to smartphones involving people known to each other like?
Approach

Collect accounts of incidents:

- experienced either as smartphone owner or person accessing smartphone
- written as stories

Data: 102 open-text stories collected from Prolific
Ash and Val had been dating for about two years, and things were rocky.

Ash seemed distant and uninterested in Val most of the time, which became a large problem in their relationship. Ash progressively became more distant and absent, and Val could hardly stand it.

One night while Ash was fast asleep in their bed, Val decided to look through Ash's phone on the bedside table. Signs of infidelity, possibly from the beginning of their relationship were on the phone. There were text messages with sexually explicit photos and pet names.

Val waited until the morning to mention what was found to Ash. When Ash woke up, the phone was displaying one of the photos and the jig was up. It was obvious that Val had found out what had been going on.

Val had already packed up everything and was ready to leave. Ash never saw Val again.
Analysis

1. Unpacking incidents
   - What happens in incidents of unauthorized access to smartphones?

2. Making sense of incidents
   - How did participants represent incidents, and what does that tell us?
Unpacking incidents

- Coding of stories from explicit evidence in the text
- Two raters coded subset of 10 stories, with 95% agreement

Outcome: 61 codes, in 8 categories

<table>
<thead>
<tr>
<th>Type of relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
</tr>
<tr>
<td>Opportunity</td>
</tr>
<tr>
<td>Use of locks</td>
</tr>
<tr>
<td>Val’s actions</td>
</tr>
<tr>
<td>Awareness</td>
</tr>
<tr>
<td>Aftermath</td>
</tr>
<tr>
<td>Relationship termination</td>
</tr>
</tbody>
</table>
Convention: Val accessed Ash’s smartphone without permission
What was the relationship between Ash and Val?

- Ash and Val were **intimate partners**, former intimate partners, or one of them aspired to an intimate relationship with the other.
- Ash and Val were **friends**, including people from work or school who are considered friends.
- Ash and Val were **family members** other than intimate partners.
- Ash and Val were **acquaintances**.
- Ash and Val were **co-workers** who were not considered to be friends.
- None of the aforementioned, or not enough information to decide.
What was the primary motivation for unauthorized access?

Control - Val wanted to learn about, or influence, Ash's relationships with third parties

Val wanted to play a prank on Ash

Val wanted to use some of the device's functionality out of convenience

Exploit - Val wanted to steal something from Ash

None of the aforementioned, or not enough information to decide.
How did the opportunity for unauthorized access came about?

Val accessed Ash's device while it was unattended.

Val accessed a device that was not Ash's current smartphone.

Val deceived or misrepresented to create an opportunity for unauthorized access.

None of the above, or not enough information to decide.
How did the opportunity for unauthorized access came about?

Val accessed Ash's device while it was **unattended**

Val accessed a device that was not Ash's current smartphone

Val deceived or misrepresented to create an opportunity for unauthorized access.

None of the above, or not enough information to decide.

Device was unattended while Ash went to the **bathroom**

Device was unattended while Ash was **asleep**

Device was unattended at home while Ash went **outside** to do something

Device was unattended while Ash went to a **meeting**

Device was unattended in some other circumstances, or not enough information to decide.
Did the device have a lock set up?

- ** Device had a lock set up, but Val overcame it
- ** Device did not have a lock set up
- None of the above, or not enough information to decide.
Did the device have a lock set up?

- **Device had a lock set up, but Val overcame it**
  - Val passively knew the lock code beforehand, for instance because it had been **shared**
  - Val actively discovered the lock code through **observation**
  - Val found that the lock code was **easy to guess**
  - Device had a lock, but was **temporarily unlocked**

- **Device did not have a lock set up**
  - None of the above, or not enough information to decide.

- **Val**
  - Ash had an Android smartphone which was password protected. However, they disabled the password protection at some point, because the screen kept timing out when using a GPS program while driving.

- **Ash**
  - Val knew the passcode to Ash's phone since Ash was trusting and believed they had nothing to hide
  - Val had been watching Ash put their password into the phone over the last few weeks.
  - Val tried to access the phone using Ash's date of birth, and it worked.
What did Val do once they gained access?

Val inspected archives of non-public conversations in text form, such as text messages, emails, instant messages, or chats.

Val inspected archives of visual media, such as photo galleries.

Val inspected social media activity.

Val did one of 18 other types of actions.
Making sense of incidents

- Close reading of stories
- Reflexive process of finding latent meanings

Outcome: two themes
Trust as performative vulnerability

“**Ash** had nothing to hide but **feared not being trusted if they kept their phone with them** at all times” - P43

“**Val** was suspicious. **Ash** would take their smartphone everywhere including when they were showering. **Ash** would turn their smartphone off if they had to leave it in a room with **Val**.” - P75
Trust as performative vulnerability

“Ash discovered what had been done to their phone from unusual battery consumption. It was the end of their relationship.” - P1

“Ash found out about what Val did by new apps being open, and the phone being in a different place. Consequentially, Ash and Val are no longer roommates, and do no longer talk.” – P45
Self-serving sensemaking

“Val is the **controlling type**” - P2

“Val is quite **possessive**” - P5

“Val is a **lunatic**” - P69

“Val has a mind which works in a suspicious manner” - P40
Self-serving sensemaking

“Val is the controlling type” - P2

“Val is quite possessive” - P5

“Val is a lunatic” - P69

“Val has a mind which works in a suspicious manner” - P40

“Val caught Ash in their bedroom talking on telephone at 3AM” - P53

“Val was worried because Ash received many texts in the last days” - P101

“Val started to think about how Ash had seemed distant lately” - P37
What are incidents of unauthorized physical **access** to smartphones involving people known to each other like?
When considering user-facing security technologies:

Model for the possibility of non-stranger access
A “showertime attack”
When considering user-facing security technologies:

Account for the possibility of non-stranger access

Ask: how can this be used to signal trust?
Vulnerability & Blame:  
Making Sense of Unauthorized Access to Smartphones

We explored:

- What happens in incidents of unauthorized access to smartphones
- How people’s conceptions of interpersonal trust interacts with security

When thinking about user-facing security technologies:

- Build threat models accounting for non-stranger access
- Ask: how can this be used to signal trust?

Diogo Marques  
Tiago Guerreiro  
Luís Carriço  
Ivan Beschastnikh  
Konstantin Beznosov