Share & Share Alike?

An Exploration of Secure Behaviors in Romantic Relationships

Cheul Young Park, Cori Faklaris, Siyan Zhao, Alex Sciuto, Laura Dabbish, and Jason Hong

Aug. 13, 2018

USENIX Symposium on Usable Privacy and Security (SOUPS 2018), Baltimore, Md., USA

Carnegie Mellon University
Human-Computer Interaction Institute





Key takeaways from our study

1. The **"1 user - 1 account"** model of end-user cybersecurity poses **usability challenges for romantic couples**.

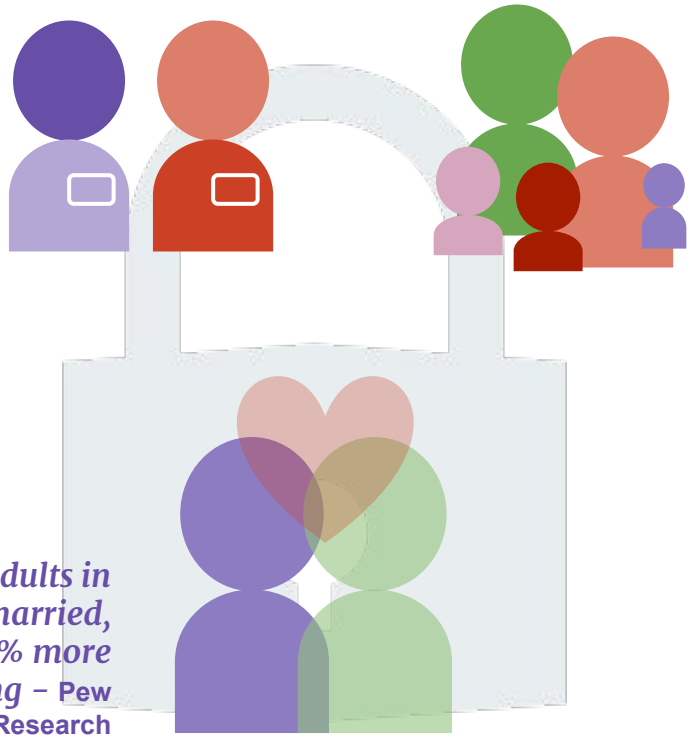
- *Ex:* Who carries the **"thing you have"** for two-factor authentication of shared accounts?
- *Ex:* Partner as **"insider threat"** to personal data in a breakup or domestic dispute.

2. When designing **account sharing features for romantic couples**, evaluate how they support users' **functional AND emotional goals**:

- **Household maintenance.**
- **Trust.**
- **Convenience.**
- **Relationship maintenance** *(the novel finding of our study)*.

Growing emphasis on ‘social cybersecurity’

- Previous studies have looked at sharing in such social contexts as **households**, **companies**, and **indigenous communities**.
- Our work is among the first to examine security behaviors in **romantic relationships**.



Half of U.S. adults in 2016 were married, with 7% more cohabitating – Pew Research

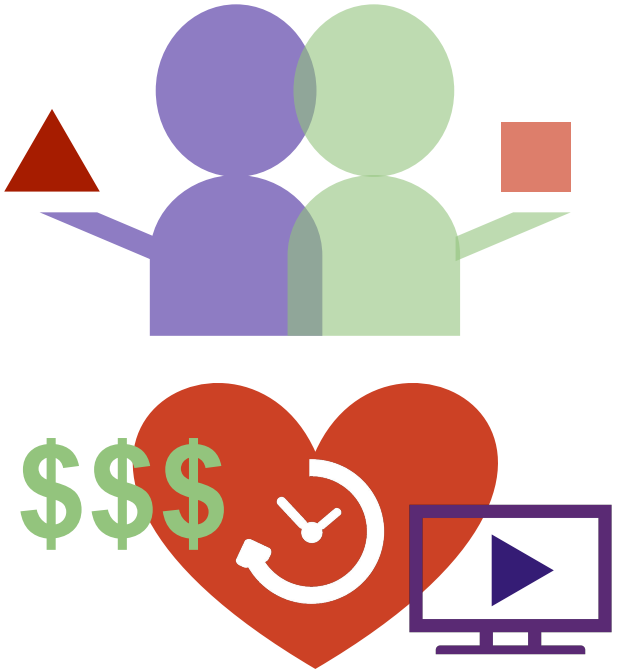
Related works in usable security research

- **Trust & convenience as drivers of sharing**
  - *Ex:* Singh et al. “Password sharing: implications for security design based on social practice.” *(CHI 2007)*
- **Taxonomy of sharing types**
  - *Ex:* Matthews et al. "She'll just grab any device that's closer: A Study of Everyday Device & Account Sharing in Households." *(CHI 2016)*
- **Social psychology lens for security behaviors**
  - *Ex:* Das et al. "The effect of social influence on security sensitivity." *(SOUPS 2014)*
- **Intimate partner abuse**
  - *Ex:* Muslukhov et al. "Know your enemy: the risk of unauthorized access in smartphones by insiders." (*International conference on Human-computer interaction with mobile devices and services*. 2013.)

Research questions for our study

- **RQ1:** *How do individual differences affect sharing behaviors — age, gender, income, education, relationship status, and relationship duration?*

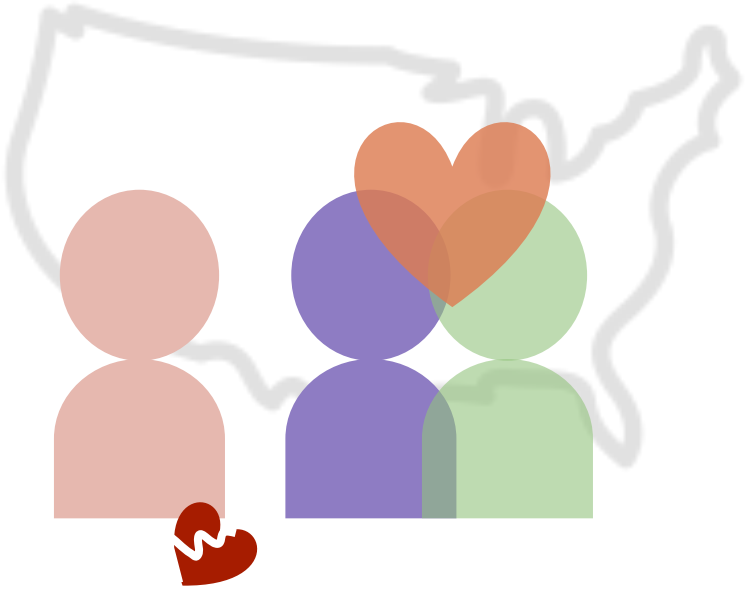
- **RQ2:** *Do sharing behaviors differ with types of accounts and stages of a relationship — finance vs. entertainment accounts, early vs. late relationships?*



Methodology: *Participants recruited on MTurk*

- We aimed to recruit workers on Amazon Mechanical Turk with
  - an **approval rating >95%** and
  - **>1000 tasks approved**.

- The study was limited to
  - **U.S. residents age 18 or older**
  - who had ever experienced a romantic relationship **for longer than one month** *or*
  - had **broken up less than one year ago**.



Methodology: *Online questionnaire*

We deployed a Qualtrics survey between Aug. 30 and Sep. 6, 2017, covering these questions:

1. ***What accounts do people own and share?*** — Original list of accounts drawn from Alexa.com
2. ***How & why do people share their accounts?*** — Ownership, frequency of usage, ease of access, reasons and methods for sharing (and hiding)
3. ***Demographics:*** gender, age, income, education, sexual orientation, etc.

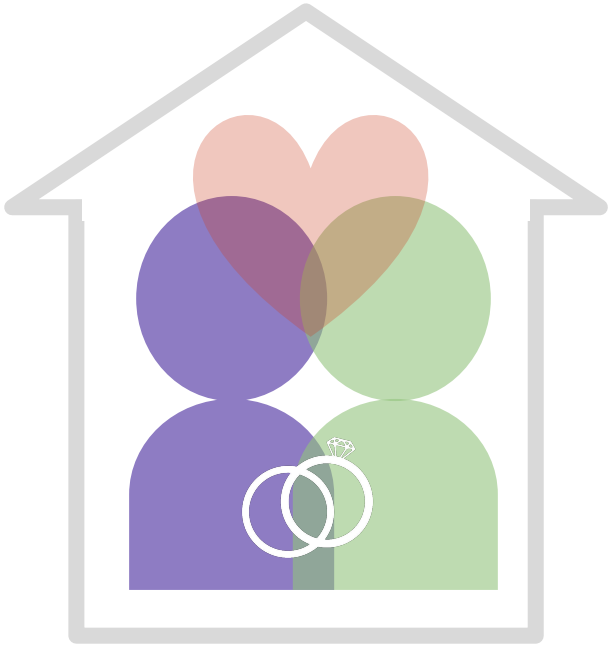


Methodology: *Data analysis*

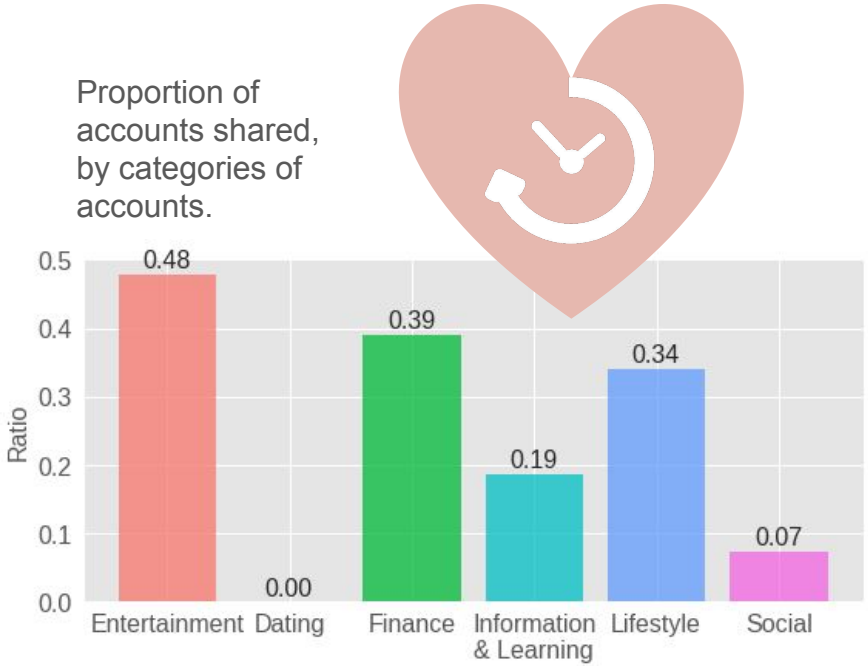
- **Quantitative analysis** to infer how demographic or relationship variables affected sharing for ***n*=174 participants**.
  - *Hypothesis 1:* Those who are younger and more educated would report sharing less. **Not supported.**
  - *Hypothesis 2:* Those who reported less income and were in a relationship or cohabiting for a longer time would report sharing more. **Partly supported.**
- **Qualitative analysis** to identify themes in open-ended responses to questions about sharing motivations and methods.
  - Iterative coding of text responses conducted by 3 authors (α = 0.49-0.79).

Trigger for sharing - romantic ‘leap of faith’?

- Statistically significant differences in account sharing were found for **marital status**, **cohabitation status**, **relationship duration**, and **cohabitation duration**, with positive effect sizes. (*RQ1*)
- Effects are **more pronounced in male subgroups** than females (although gender itself is not significant). (*RQ1*)
    - Possibly reflecting that males traditionally are registered owners of properties used by couples?



First comes Netflix, then comes Costco ...



- People in new relationships (*<7 months duration*) share more entertainment accounts. *(RQ2)*
  - Those in new relationships also share significantly fewer financial accounts. *(RQ2)*
- People who are in relationships that are not new (*>= 7 months in duration*) share more jointly owned accounts. *(RQ2)*

Account sharing is both *functional* & *emotional*

People reported sharing accounts for reasons that fell into one of four general categories:

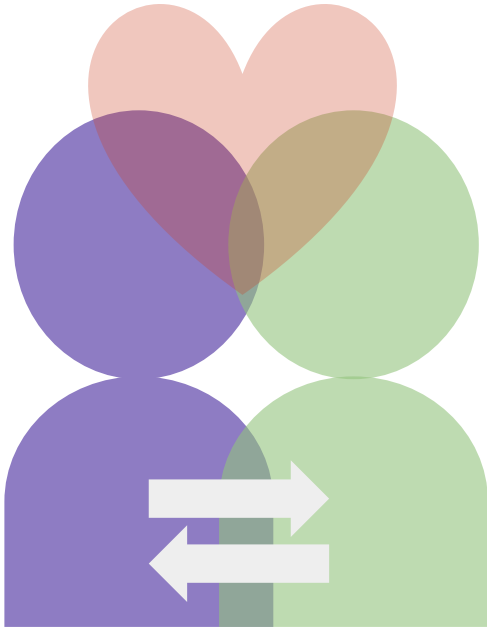
- **Convenience** (63.8% of responses).
- **Household maintenance:**
  - *Economics* (60.1%).
  - *Logistics* (67.3%).
- **Trust** (45.3%).
- **Relationship maintenance:**
  - *Relationship well-being* (20.9%).
  - *Support* (5.6%).



Functional: *Convenience, Household Maintenance*

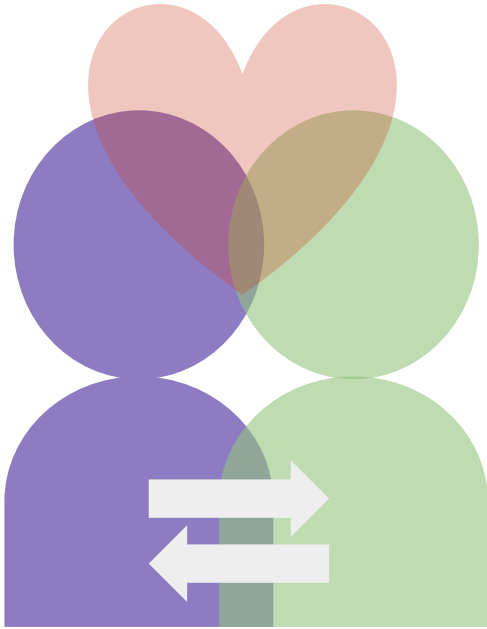
- *"These are common streaming accounts that we share. **There is no need for us to have our own accounts when it comes to streaming.**"*

- *"We have been married for 7 years so far and have 2 kids. **We both need to know what we have in the accounts in order to make purchase and pay bills. It[']s important we have a working knowledge of the money we share.**"*

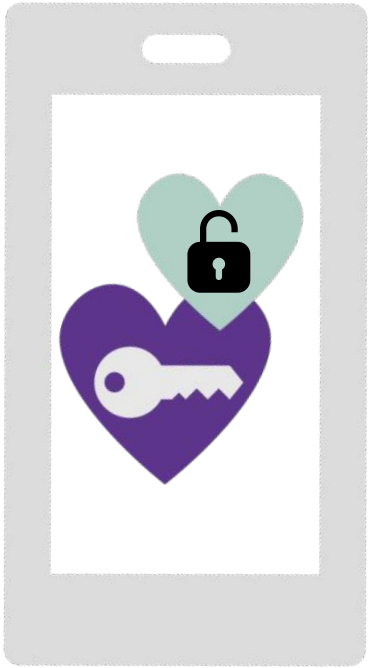


Emotional: *Trust, Relationship Maintenance*

- *"I choose to share for utilities **because I trust my partner**, and **believe both people should have access to them.**"*
- *"**[We share accounts] to discuss sports and see highlights of the night before.** [We] use [it] for different content also."*
- *"I already had a netflix account before we started dating. ... **I gave her my password so she could watch when we weren't together.**"*



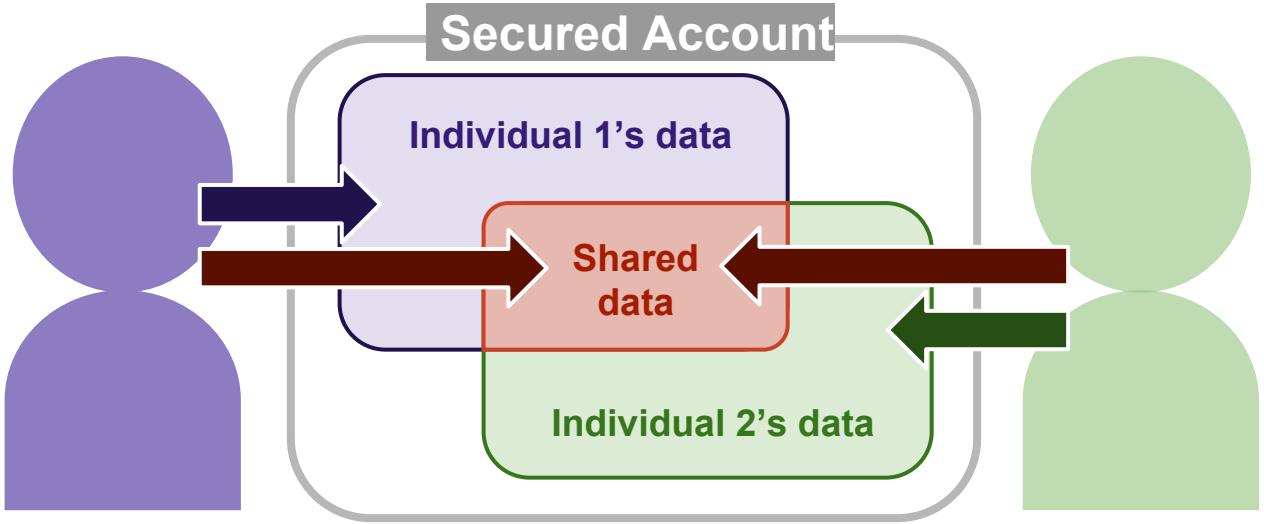
Many usability challenges for couples sharing



- Some participants reported using **less-secure practices** or **"workarounds"** for accounts that didn't easily accommodate secure sharing.
  - *Ex: "**The amazon account is automatically signed in.** We both use it/share the Prime account to keep costs down and **use our own credit cards attached to it.**"*
- Some participants mentioned hiding accounts or keeping separate accounts to **guard privacy or individuality**, also **for surprises or gifts**.

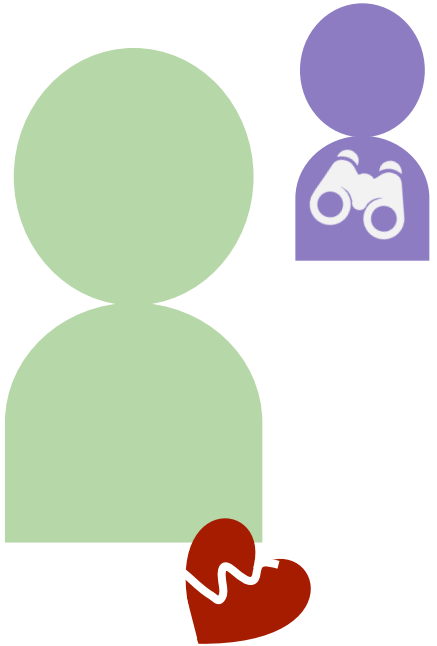
Alternative to ‘1 user-1 account’ architecture

- We suggest designing a security architecture to support the **“multiple profile - 1 account”** model used by Netflix & Hulu as a way to help romantic partners balance data intimacy and privacy.



Many usability challenges for those *breaking up*

- Support **easier separation and/or download of individual data** that is held in shared accounts.
- For jointly owned accounts, incorporate programming to **easily allow for the splitting of accounts when couples part ways**.
- **Help users to keep track of unauthorized usages of their accounts** through such affordances as notifications and reminders.



1. The *"1 user – 1 account"* model of end-user cybersecurity poses ***usability challenges for romantic couples***.
2. Design for account sharing to support ***relationship maintenance*** along with trust, household maintenance, and convenience.

Any questions?

You can find me at

- Twitter: **@heycori** | Email: **heycori @cmu.edu**
- Website: **http://corifaklaris.com**



CONNECTED EXPERIENCE LAB





Carnegie Mellon University