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CyLab



Engineering &
Public Policy



10- Quantitative data collection

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Usable Privacy and Security

Today's class

- Hypothesis Testing and Research Questions
- A Discussion of Data-Collection in your readings.
 - Why would you opt for one data-collection protocol over another?
 - What is the role of deception in data-collection?
 - What are the ethical considerations
- Let's do an in-class activity!

Hypothesis Testing

- A hypothesis is a conjecture, or guess, that *might* be true.
 - Longer passwords are more secure than shorter passwords
- A hypothesis must be **falsifiable**.
- A research question is more broad, and needn't be a statement to be disproven.
 - Often the case for exploratory work.
 - How do users make up longer passwords?

It's a Hard Lock Life: A Field Study of Smartphone (Un)Locking Behavior and Risk Perception

- *Marian Harbach, Emanuel von Zezschwitz, Andreas Fichtner, Alexander De Luca, Matthew Smith (SOUPS 2014)*

Research Goal

- "insights into real world (un)locking behavior of smartphone users"

Study Methodology

- Only wanted to look at current behavior
- Did not require comparing conditions
 - (Thus, conditions aren't needed)

Online Survey

- Good for collecting data from a large number of participants, across a wide geographic space
- Cheap and quick
- Difficult to verify information about participants
 - thus the QR code usage
- Better for measuring perception than behavior

Removing Participants

“We removed 60 response sets due to incorrect completion codes (i. e. the smartphone check failed), implausible timing, or wrong answers to two or more attention check questions”

- But can this be manipulated?
- Can researchers do this such that bias is introduced?

One-Month Field Study (n=52)

- Give participants in-the-moment questions at different times
- Record their answers against a given context
- Afterward, interview them

Advantages of a field study

- “shoulder surfing is only perceived to be a relevant risk in 11 of 3140 ... situations”
- “users spend up to 9.0% of the time they use their smartphone on dealing with unlock screens”

Discuss: Why are they using two different protocols?

- What does one methodology offer over the other?
- Is there a reason to conduct both rather than collect more data using a single methodology?

Limitations of Both Protocols

- Discuss: Where there limitations of both of these data-collection protocols?
- To what degree is the data reliable?
- How skewed is the sample population?
- Did participants behave as normal?

The Emperor's New Security Indicators: An evaluation of website authentication and the effect of role playing on usability studies.

- *Stuart E. Schechter, Rachna Dhamija, Andy Ozment, Ian Fischer (Oakland 2007)*

Two Objectives

- Evaluate online security indicators
 - (e.g., presence of *https*, presence of security pictures)
- Contrast real-life behavior and study behavior
 - (How are these objectives related? Why examine both at once?)

Methodology

- Laboratory study
- Three conditions
 - Role-playing
 - Role-playing with security priming
 - Asked to use their own information

Discussion

- Why was this a laboratory study?
- Could an online survey have worked?
- What about a field study?

Ethical Consideration

- Why was deception used in this study?
- Why the stipulation:
“participants must only be deceived in ways that cause them to believe they are less secure than they actually are.”
- Could this study have worked without using deception?
- How did this study use a *simulated attacker*?

Today's Activity — In Project Groups

- In the space of your project research area,
- Using 2 data-collection protocols,
- Create a *research question* per protocol.
 - You *can* use the same question for both
- Explain why the other protocols would be less effective to answer your question.
- Present it to the class.

- Expert Evaluation
- Field Study
- Online Survey
- In-Person Interview
- Lab Study
- Diary Study
- Focus Group
- Paper Survey
- Telephone Survey