

# 10- Quantitative data collection

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# 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