

# Mental Models of Domain Names and URLs

Richard Roberts, Daniela Lulli, Abole Raut, Kelsey R. Fulton, Dave Levin

## Motivation

Many users are **unable to identify** fraudulent, impersonating domains and URLs:

apple.com.find-device-location.review  
 www.google-search.com  
 facebook.com  
 ebay.com-item-apple-iphone-x-gray-256gb-unlocked.kl7.us  
 d05de63f3.pw/login.google.com  
 yahoo.com  
 facebook.com.token-03144cce5266c0bf3f3.pw

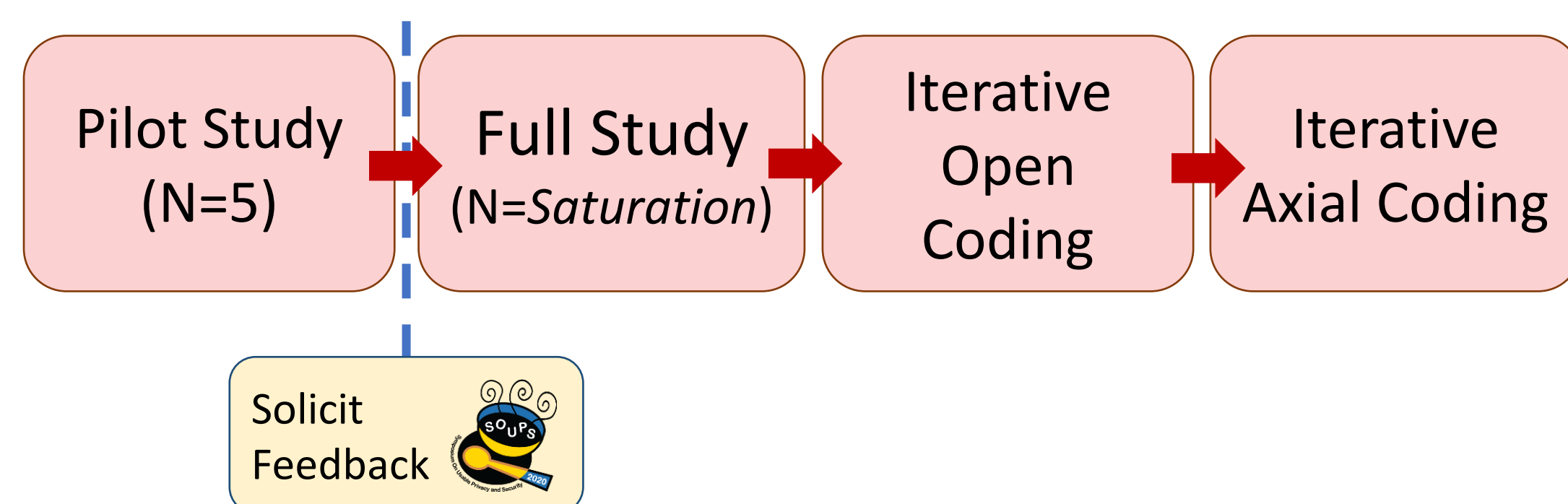
## Research Questions

- Why are users tricked by impersonating domains?
- What **mental models** do users have about how domains/URLs are used?

## Methodology

- 1 hour, semi-structured interview
- Diverse Population (Recruit via Craigslist)
- Compensate participants (\$30 gift card)
- IRB approved
- Pilot interview script before full-scale study

## Research Plan



## Pilot Responses

Only 2 subjects used the URL to verify what website they were on

“I look for the company logo.” –P3

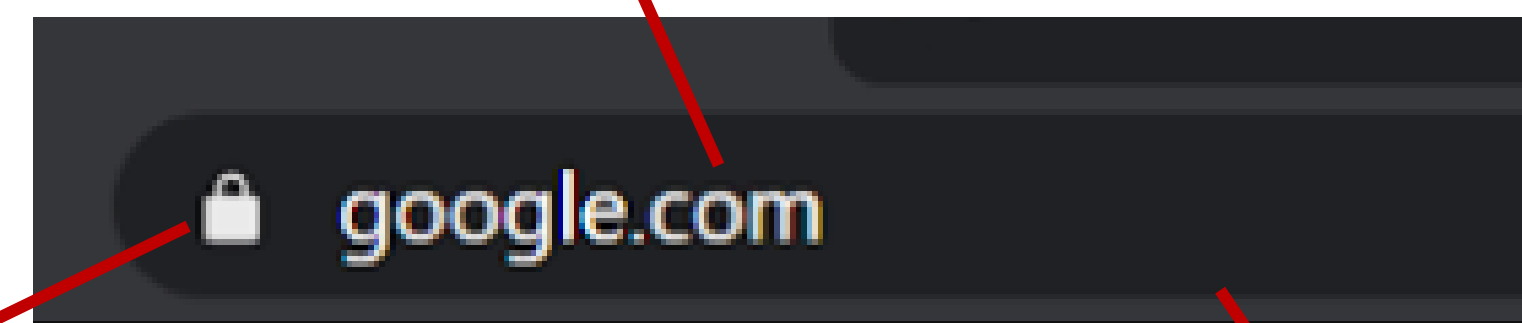
Subjects use “www.” or “.com” to orient themselves

“It goes to a secure login page.” –P1  
 crumptury.com-login.secure

Subjects were most wary of typos, but accepted structural impersonation with varying degrees of comfort and confidence

Lock icon means: safety, encryption, website accepts personal information, Google says it is ok, you can buy something there

“It’s impossible for a lock to be next to a bad URL.” –P5



4 subjects primarily associate the address bar with web searches, not URLs

“A hyphen (-) is the same as a slash (/).” –P2

## Interview Protocol

### 1. Navigation Tasks

“Please Navigate to youtube.com.”  
 “How do you know you are on YouTube?”

### 2. Security Hygiene

“What are some things you do to stay safe online?”  
 “Where did you learn about these things?”

### 3. Domain Presentation and Registration

“How do you think a company gets a URL?”  
 “Is there anything not allowed in a URL?”

### 4. Domain Comprehension

“What would you expect to see in the blank? What does it represent?”  
 \_\_\_\_google.com

### 5. Brand Identification

“What is the name of the fictional company that owns this URL?”  
 crumptury.com-  
 login.secure

### 6. Domain Component Comparison

“Which parts of these URLs have the same technical purpose?”  
 amazon.com/login  
 login.ebay.com

### 7. Free-Form Domain Responses

“Do you have any thoughts about this domain?”  
 google-search.com

### 4. Lock Icon and Impersonation

“What does it mean if the lock is not there?”  
 “Why might a website pretend to be a different website?”