Weighing Context and Trade-offs: How Suburban Adults Selected Their Online Security Posture

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Motivation

- Prior work on secure email
  - Succeeded in making it usable
  - People were interested, but unsure when they would use it

- Step back and understand users better

Methodology
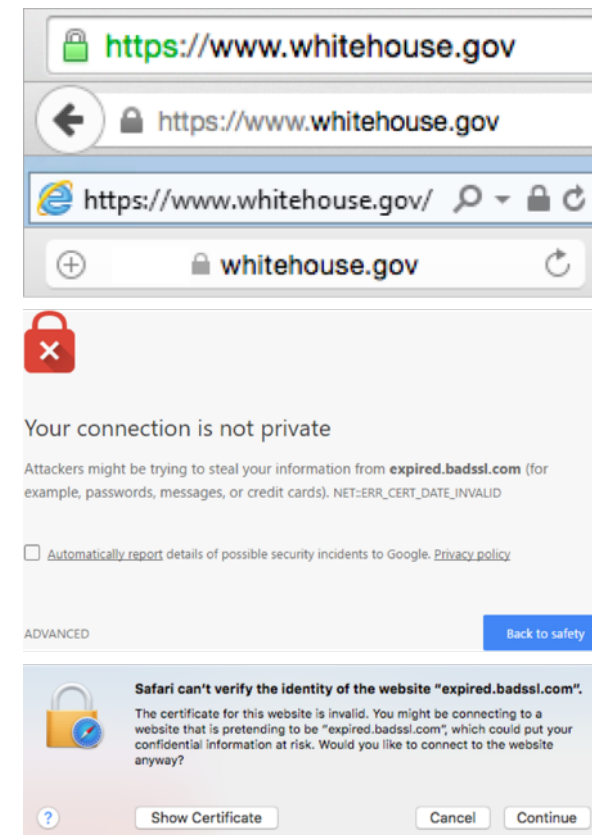
User Process

Encryption and TLS indicators

Wrap-Up

Participants

- Distinct demographic
  - Suburban
  - Middle-aged
  - Parents

- Compensated $25 USD
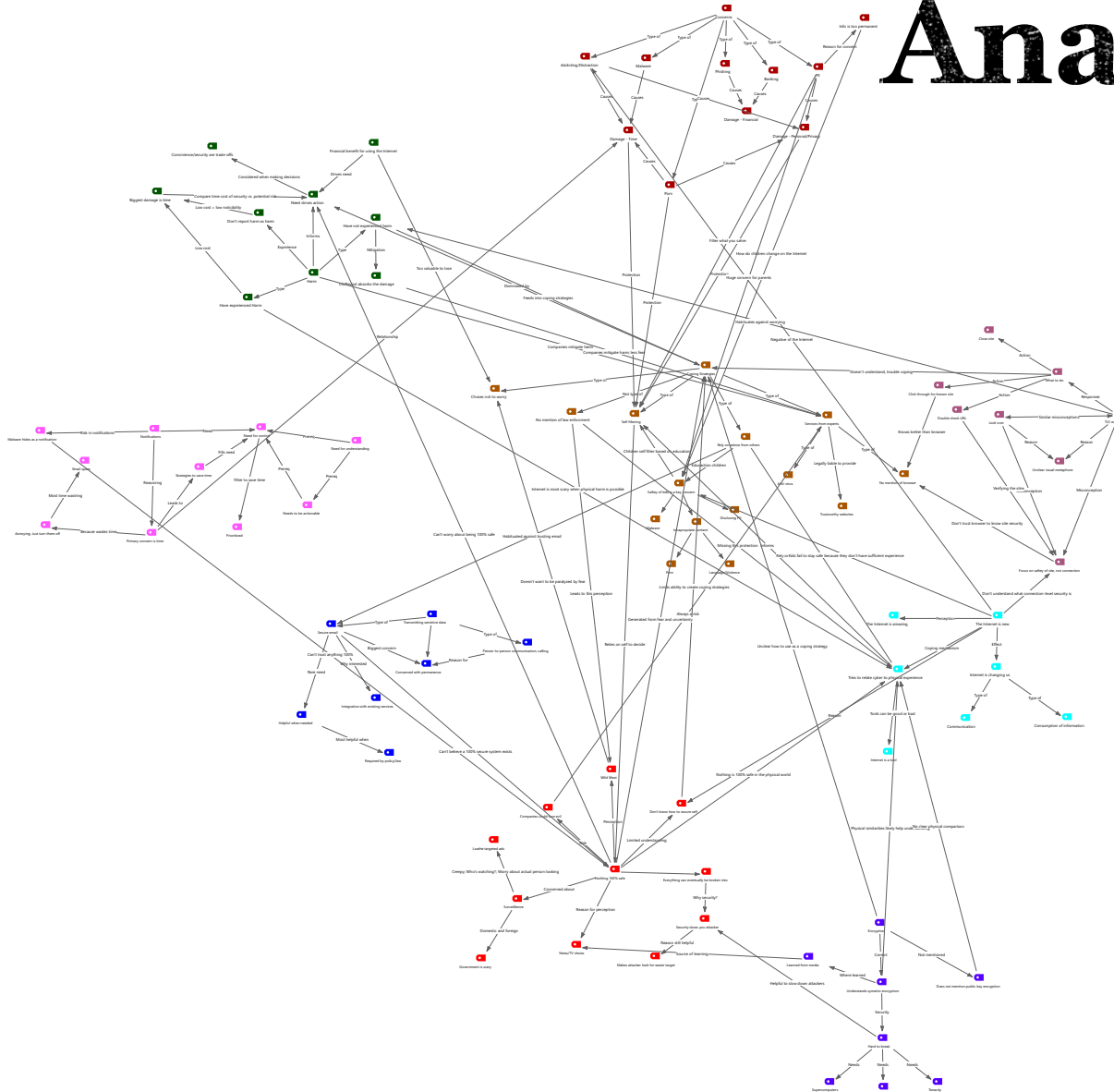 - 15-45 minute session

Gig Harbor, WA

Semi-Structured Interviews

1. Computer usage
2. **Threats and coping strategies**
3. Encryption
4. Security notifications
5. TLS browser indicators and warnings
6. Any remaining thoughts

Analysis

- Transcribed interviews

- Grounded Theory
  - Open coding (2,442 codes)
  - Axial coding (503 concepts)
  - Selective coding (9 categories)
  - Theory generation (1 process)

- Data available to the community

Methodology

→ User Process

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Wrap-Up

User Process

The Internet is Transformational

Learn about Threats ▶ Evaluate Risk ▶ Estimate Impact ▶ Select Coping Strategies ▶

Nothing is 100% Safe

Context: The Internet is Transformational

- Improved quality of life
  - *"[The Internet] made our whole home schooling process possible.… I mean our lifestyle would not have been possible before the Internet."*

- Worked its way into all aspects of our life
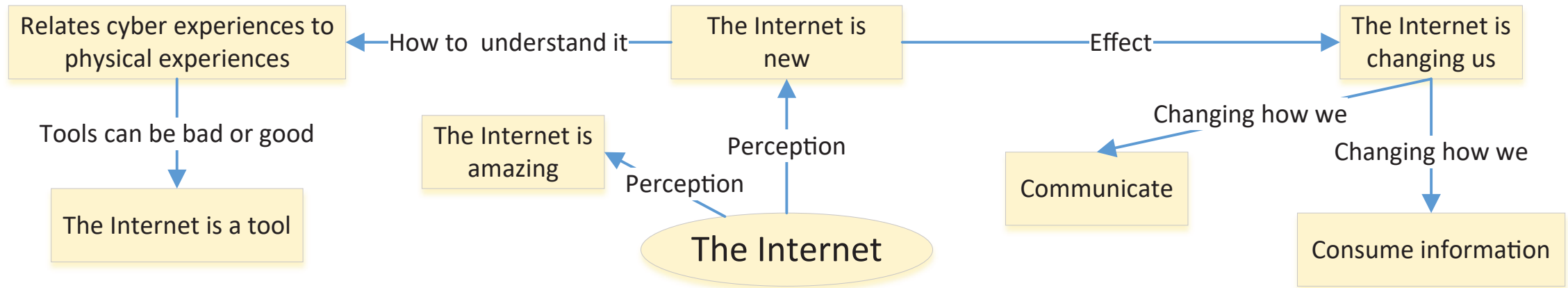
Context: Nothing is 100% Safe
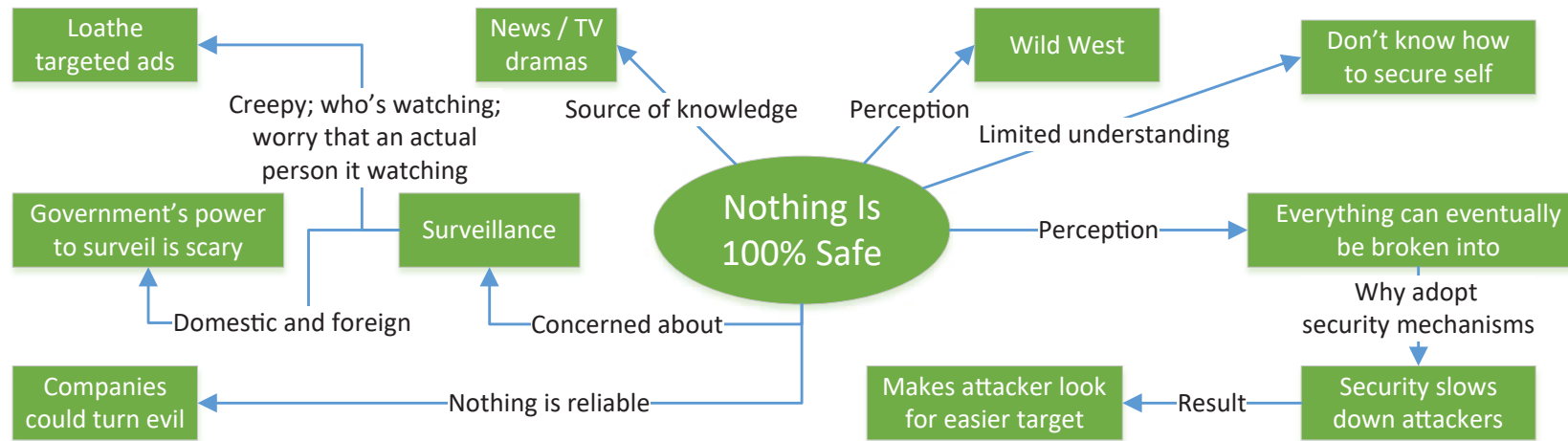
- Anything can be broken with enough effort
  - Movies, news reports, relation to the physical world

- Focus on deterrence
  - *[If] you throw enough stumbling blocks in [an attacker's] way, they're gonna look for somebody else that's easier to [compromise].*

Process: Learning about Threats

- Mostly from media
  - News reports
  - TV dramas
  - Movies
  - Advertisements

- Acquaintances provide clarification

- Reliance on spouse

Process: Evaluate Risk

- Threat don't imply risk
  - 1 in a million
  - Not foolproof

- Key risks
  - Malware, phishing attacks, inappropriate content
  - Permanence, surveillance

[…] there is some concern with kids using Facebook and having a personality develop online….we were able to grow and mature and change, and leave behind our old selves at some point.
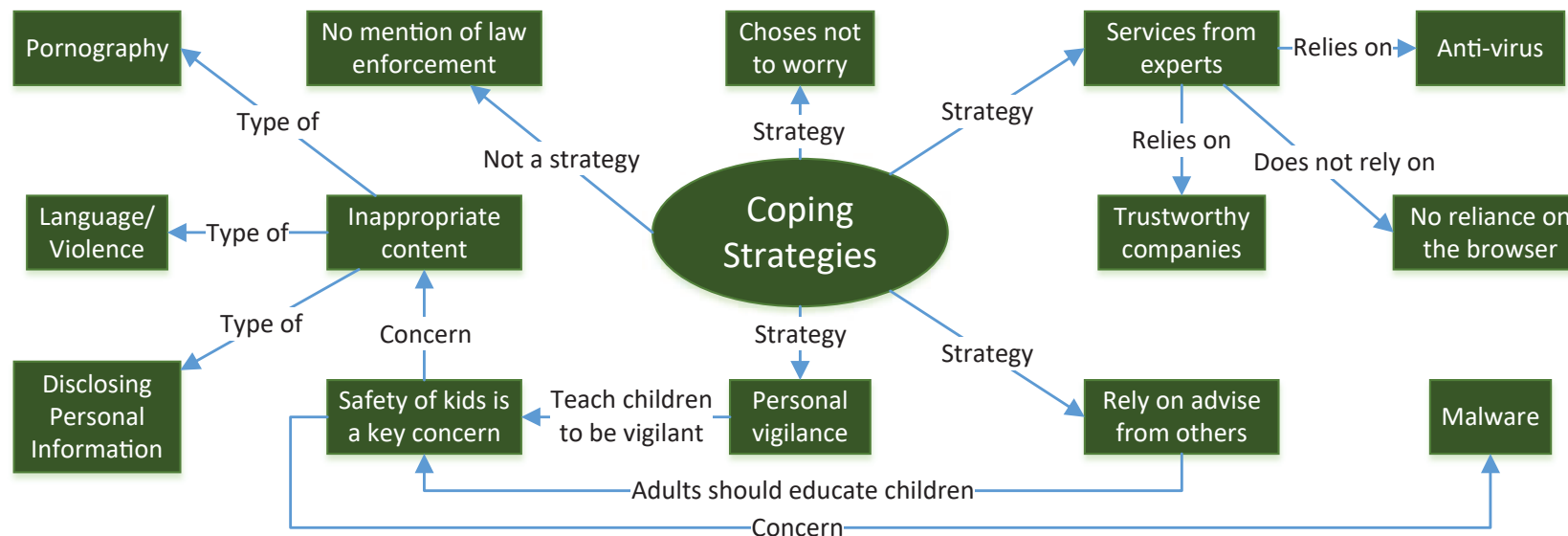
[…]You'd feel more free to develop in that way if you knew that they weren't going to be a permanent part of your record to everybody for now and ever.

Process: Estimate Impact
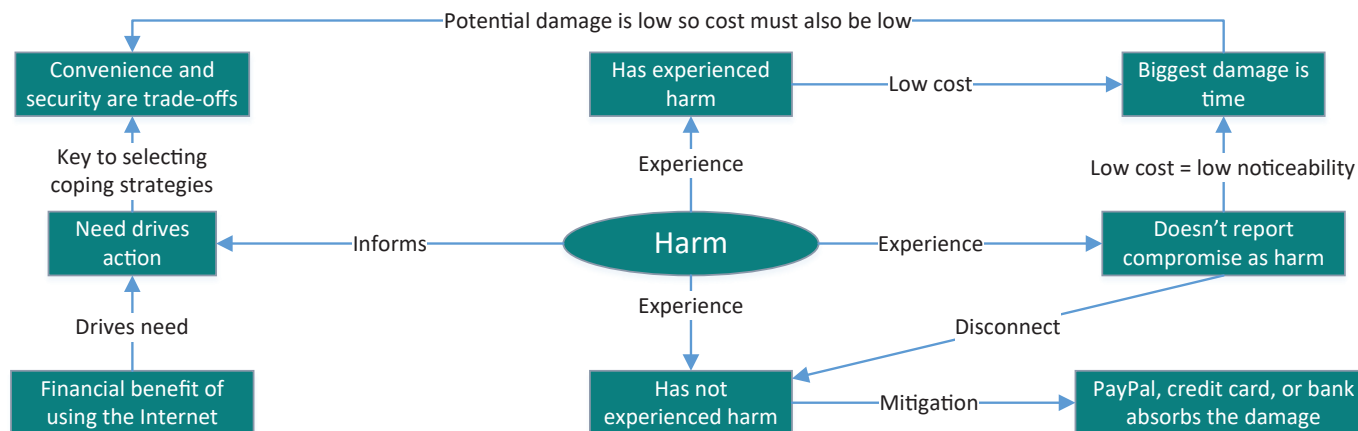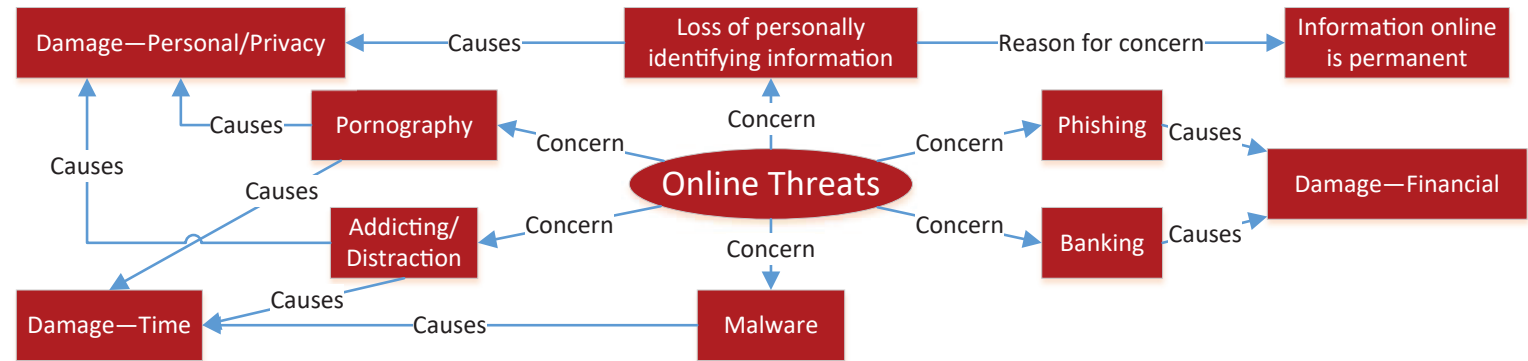
Process: Select Coping Strategies

- Extremes
  - Implement no coping strategies
  - Refuse to bank online
- Most users fall in the middle

- Strong focus on personal vigilance
  - Necessary to teach this to children
- Work with trustworthy companies
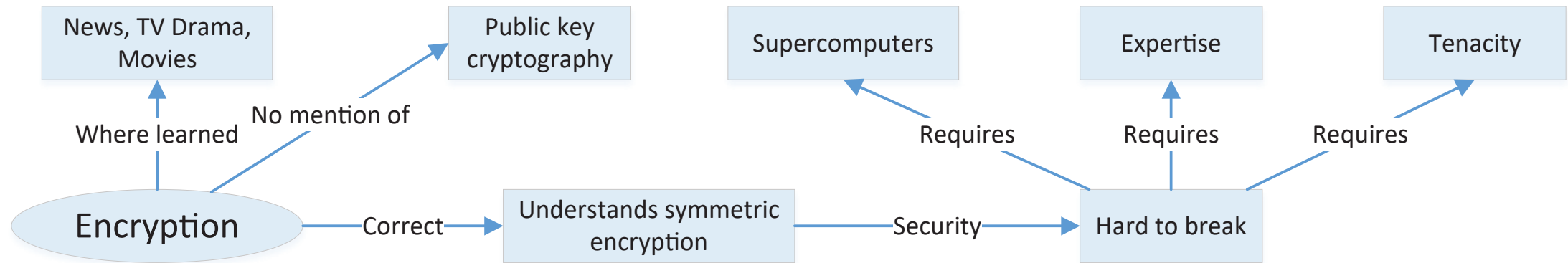- If all else fails, **choose** not to worry

Methodology
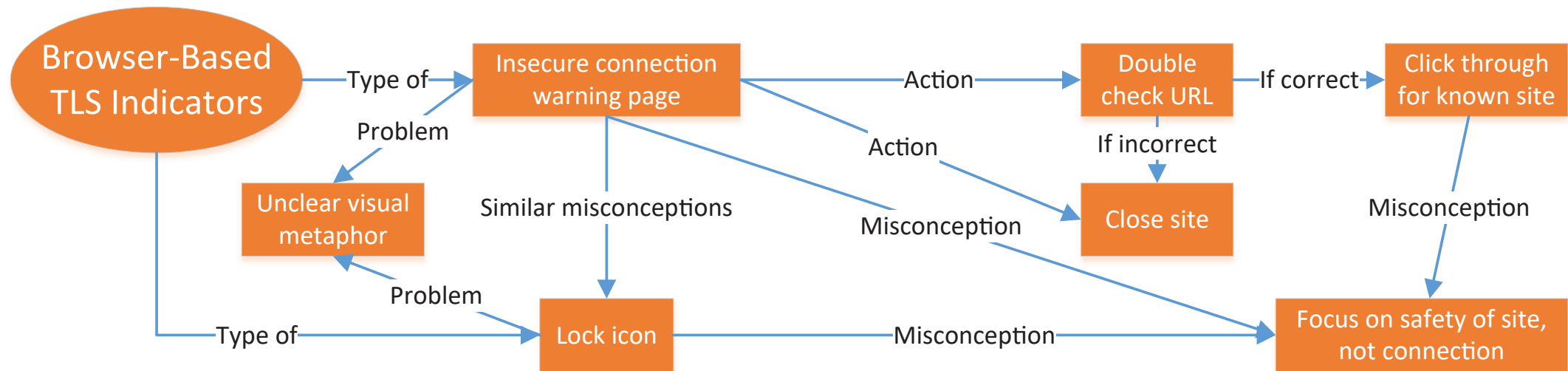
User Process

➡ Encryption and TLS indicators

Wrap-Up

Encryption

News, TV Drama, Movies

Public key cryptography

Supercomputers

Expertise

Tenacity

Where learned

No mention of

Requires

Requires

Requires

Encryption

Correct

Understands symmetric encryption

Security

Hard to break

- Two-thirds understand that it protects data from unauthorized parties

- One-half understood the need for a secret key

- Nothing being 100% safe
  - Encryption slows down attackers
  - Determined attackers can still break it
  - Requires supercomputers

Browser-Based TLS Security Indicators

- Confused about meaning
  - Site safety vs. connection security
  - Website authentication

- Can lead to unsafe behavior
  - Overtrust in site
  - Ignoring warnings for large, well-established sites

Methodology

User Process

Encryption and TLS indicators

➡️ **Wrap-Up**

Wrap-Up

Related Work

- Extended Parallel Process Model
- *So Long, and No Thanks for the Externalities*, Herley '09
- And many more…

Future Work

- Low cost, high impact recommendations
- Educating users through media
  - YouTube
  - Whiteboard-style presentations
- Privacy-preserving systems for children
- Browser indicators

Thank You

- Data available online
  - http://soups2017.isrl.byu.edu
  - Full study guide

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Questions?