

SoK (or SoLK?): On the Quantitative Study of Sociodemographic Factors and Computer Security Behaviors

**Miranda Wei, Jaron Mink, Yael Eiger,
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security and privacy: a growing consideration of people

(people's)
acceptability of
computer systems

The Protection of Information in Computer Systems

JEROME H. SALTZER, SENIOR MEMBER, IEEE, AND
MICHAEL D. SCHROEDER, MEMBER, IEEE

h) **Psychological acceptability:** It is essential that the human interface be designed for ease of use, so that users routinely and automatically apply the protection mechanisms correctly. Also, to the extent that the user's mental image of his protection goals matches the mechanisms he must use, mistakes will be minimized. If he must translate his image of his protection needs into a radically different specification language, he will make errors.

1975

usability for
people

Why Johnny Can't Encrypt: A Usability Evaluation of PGP 5.0

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J. D. Tygar¹
EECS and SIMS

USERS ARE NOT THE ENEMY

ANNE ADAMS AND
MARTINA ANGELA SASSE

1999

equity among people

Net Benefits: Digital Inequities in Social Capital, Privacy Preservation, and Digital Parenting Practices of U.S. Social Media Users

Elissa M. Redmiles

Privacy and Security Threat Models and Mitigation Strategies of Older Adults

Alisa Frik,^{1,2} Leysan Nurgalieva,³ Julia Bernd,¹ Joyce S. Lee,² Florian Schaub,⁴ Serge Egelman^{1,2}
¹International Computer Science Institute (ICSI)

"Un-Equal Online Safety?" A Gender Analysis of Security and Privacy Protection Advice and Behaviour Patterns

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Magdalene Ng

How WEIRD is Usable Privacy and Security Research?

Ayako A. Hasegawa
NICT

Daisuke Inoue
NICT

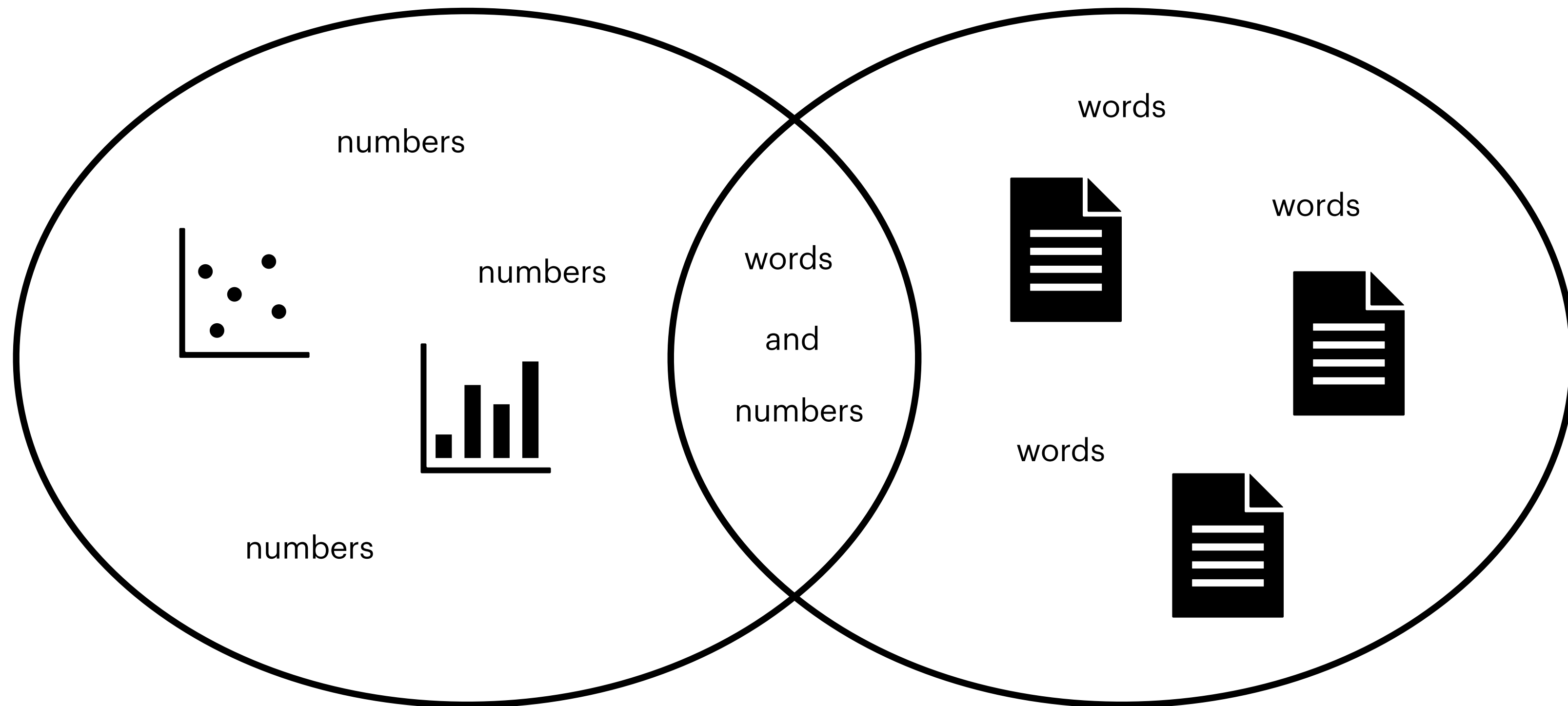
Mitsuaki Akiyama
NTT

2000s — now

security, privacy, and people 101: methods

quantitative

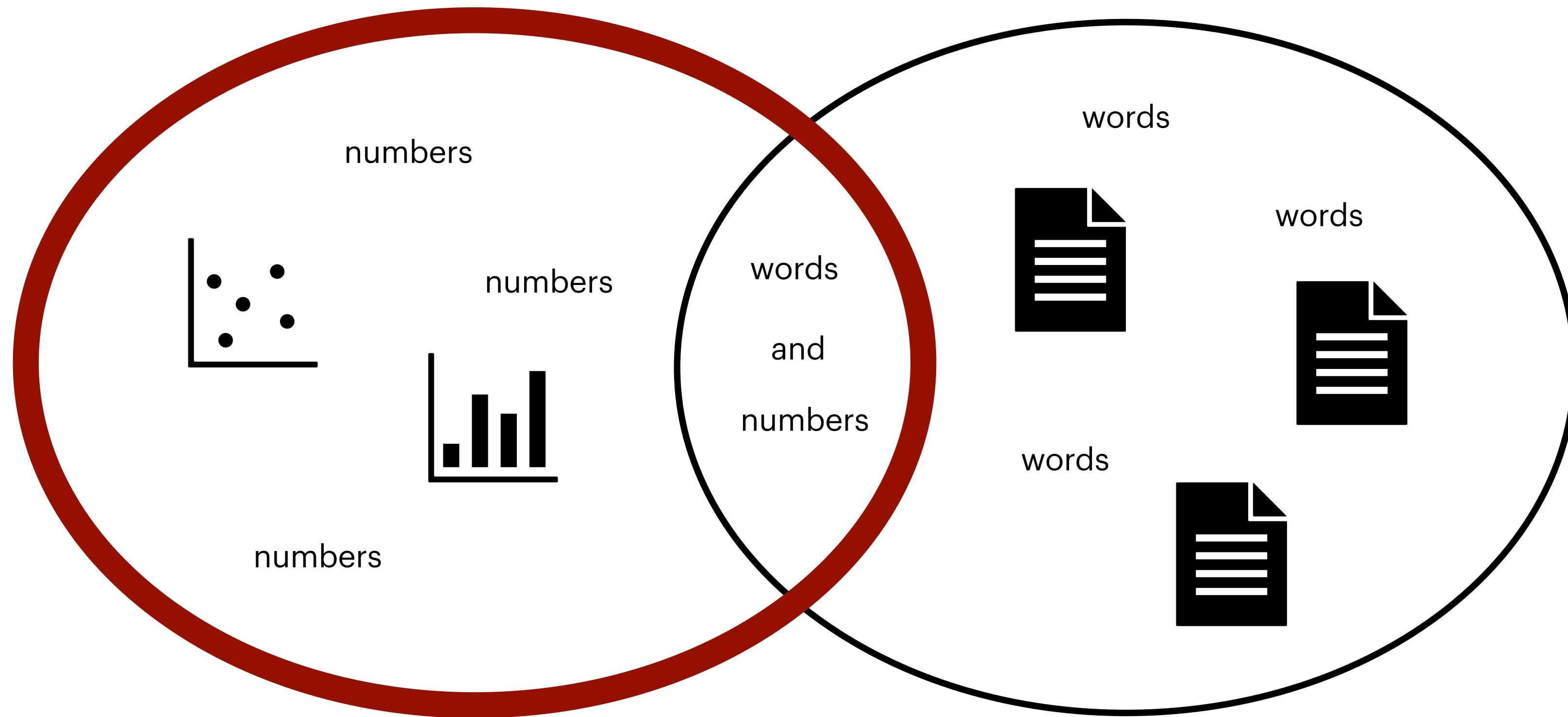
qualitative



security, privacy, and people 101: methods

quantitative

qualitative



examples of sociodemographic factors

education

(dis)ability

internet skill

gender

age

culture

race

income

iStock™

Credit: wildpixel

research goals

considering how sociodemographic factors relate to security & privacy (S&P) behaviors...

what is currently known?

past

what gaps remain?

present

how and what should future research study?

future

research goals

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literature review

case study & guidelines

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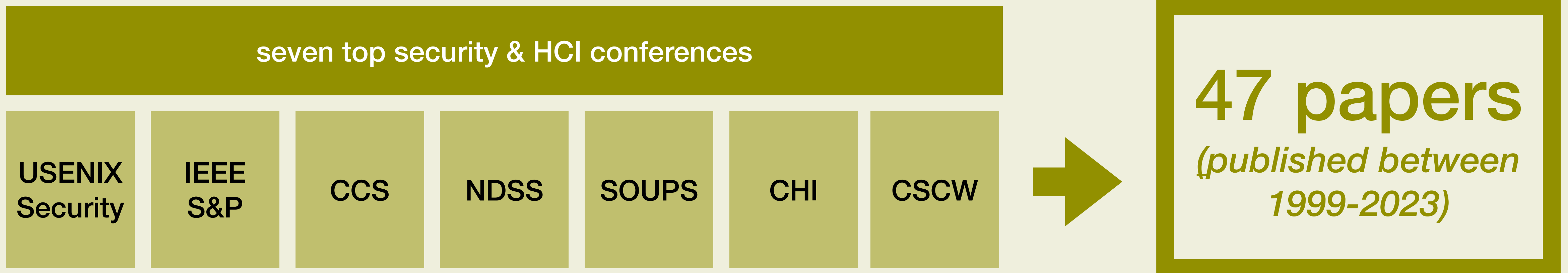
literature review

case study & guidelines

literature review

scope to **quantitative** studies of **actual security and privacy behaviors**

- excluded studies of intended behavior, concerns, knowledge, or attitudes
- must compare behavior between groups



trends: security behaviors ~ sociodemographics

RQ1: what is currently known?

factor	# papers (N=47)	overall trend
gender	38	women seem to focus more on information protection behaviors, men seem to focus more on technical security
age	30	older users seem to exhibit more security-related behaviors while younger users focus more on privacy
education	14	does not seem to be correlated with security behaviors
...

trends: security behaviors ~ sociodemographics

RQ1: what is currently known?

but... why? 🤔

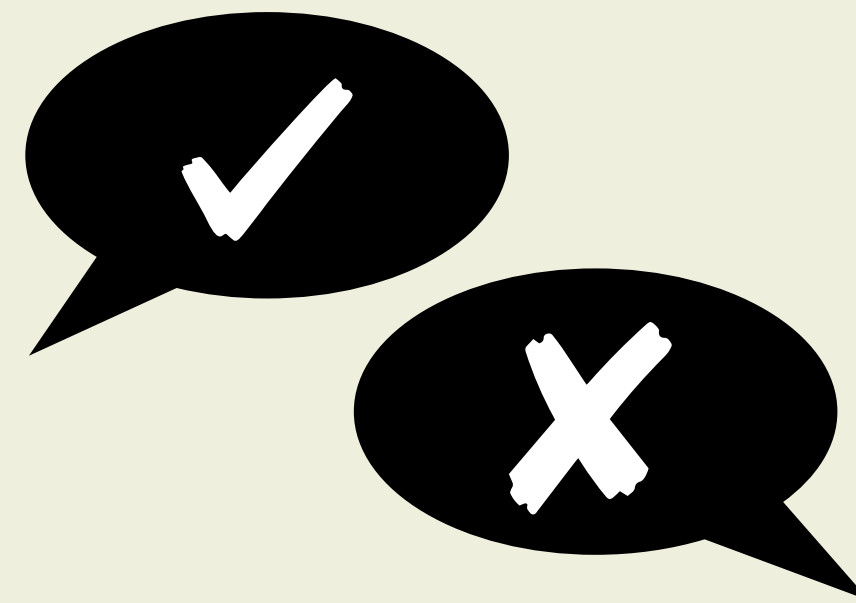
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opportunities: security behaviors ~ sociodemographics

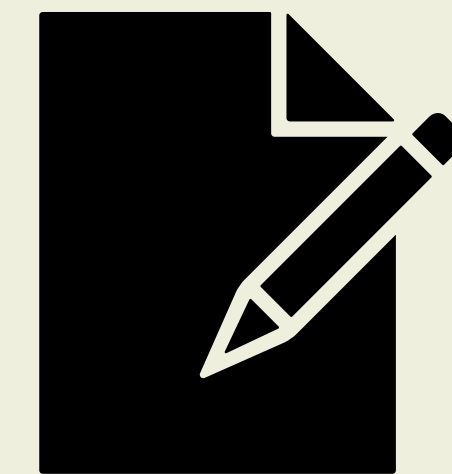
RQ2: what gaps remain?



groups
underrepresented in
research, e.g.,
nonbinary genders,
non-Western



unresolved
contradictions in
findings



over-reliance on
self-reporting
methods

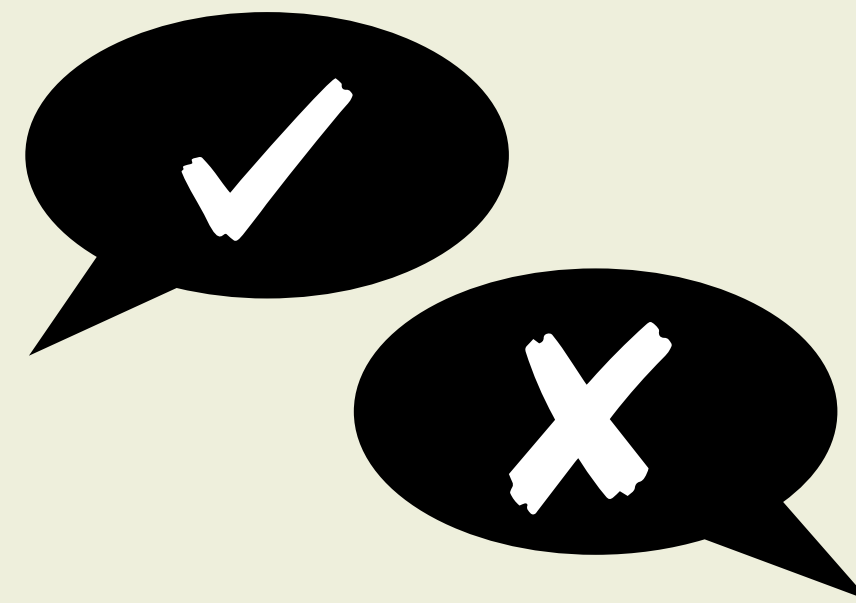
opportunities: security behaviors ~ sociodemographics

RQ2: what gaps remain?

is this why? 🤔 → SoLK!



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case study & guidelines

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case study: Facebook users' behaviors

method: **logged** behaviors from 16,829 users in 16 countries

dependent
variables



4 security behaviors

related to settings and authentication

independent
variables



6 sociodemographic factors

incl. gender, education, etc.



4 platform characteristics

related to account usage

G1: factor selection

identify sociodemographic factors of interest at the beginning, report null results

case study: **users' behaviors**

method: **log** from 829 users in 16 countries

dependent
variables



independent
variables



intro: no sociodemographics

background: no sociodemographics

methods: no sociodemographics

results: sociodemographics!!!

conclusion: sociodemographics!!!

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identify sociodemographic factors of interest at the beginning, report null results

case study: Facebook users' behaviors

method: **logged** behaviors from 16,829 users in 16 countries

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4 security behaviors
related to settings and authentication

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4 platform characteristics
related to account usage

G1: factor selection

identify sociodemographic factors of interest at the beginning, report null results

G2: group selection

consider and justify which groups are included or excluded

case study: Facebook users' behaviors

but... why?

why do gender differences exist, e.g., women focus more on information protection and men focus more on technical security?

gender difference results:

- ✓ women more likely than men to make changes to security settings
- ✗ no differences found in password strength or 2FA use

G4: results interpretation

correlation \neq causation;
pose multiple interpretations for observed differences

the missing “why”

social constructionism

men encouraged to learn about computing?

women given individual responsibility to protect themselves?

biological essentialism

men are more logical, thus better at using technology?

womens’ emotions make them more gullible?

other theories

???

without understanding WHY...

- don’t know if interventions are beneficial
- risk perpetuating stereotypes
- hard to engage intersectionality

sociodemographic factors

education

(dis)ability

internet skill

gender

age

culture

race

income

sociodemographic factors **exist in context**

education

(dis)ability

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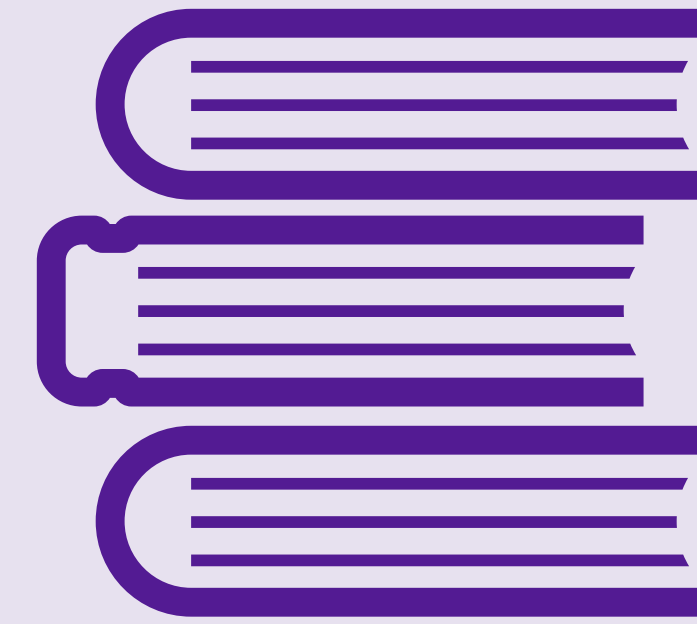
income



towards answering “why”



explore epistemic
diversity of methods



engage social theories

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 don't hesitate to email me!


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URBANA-CHAMPAIGN

GEORGETOWN
UNIVERSITY