RSA®Conference2019
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BETTER.

SESSION ID: **SEM-M01**

Humanistic Multi-Factor Authentication (MFA) Why We Don't Use MFA

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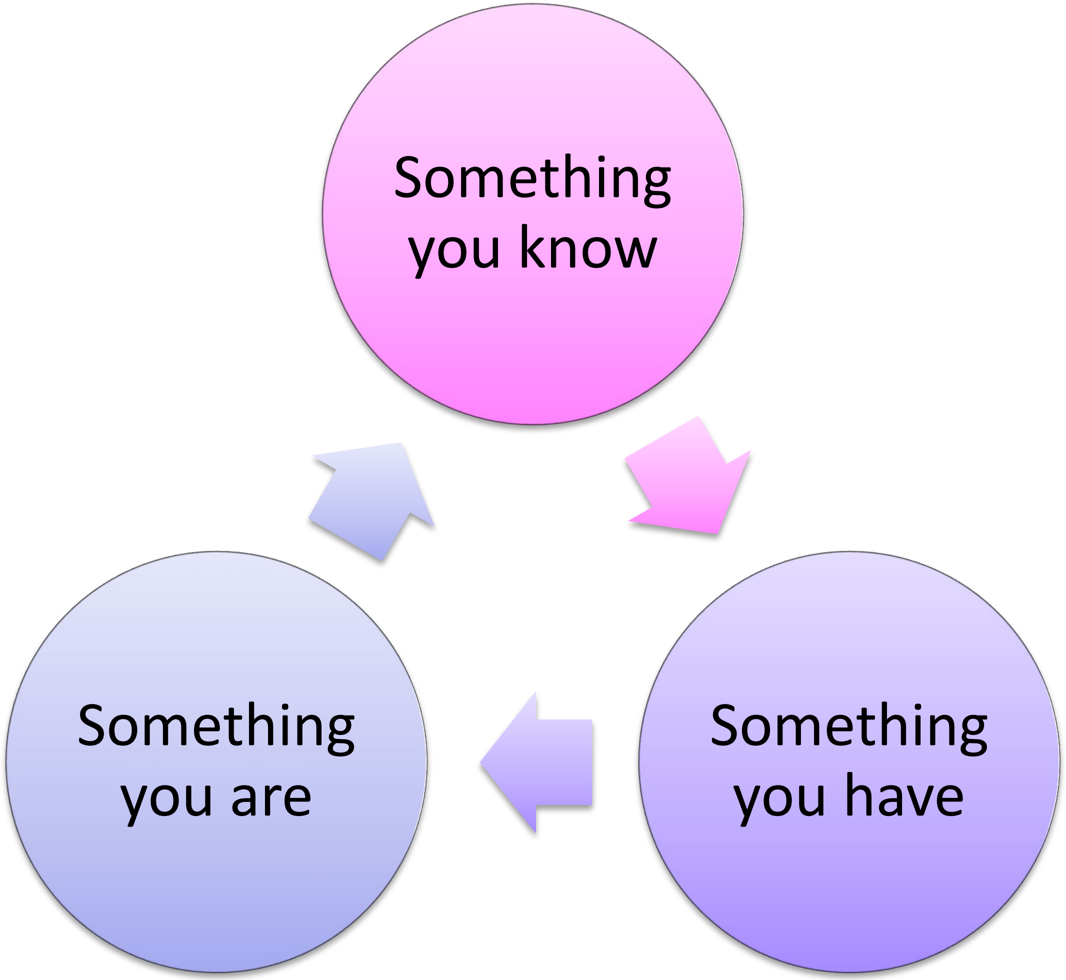
Authentication Technologies



Something you know

Something you have

Something you are

Are Passwords Secure?

- Reuse Passwords
- Overestimate Password Complexity
- Common Passwords

Rick Wash et al. “Understanding password choices: How frequently entered passwords are re-used across websites”. In: Symposium on Usable Privacy and Security (SOUPS). 2016.
Saranga Komanduri et al. “Of passwords and people: measuring the effect of password-composition policies”. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. ACM. 2011, pp. 2595– 2604

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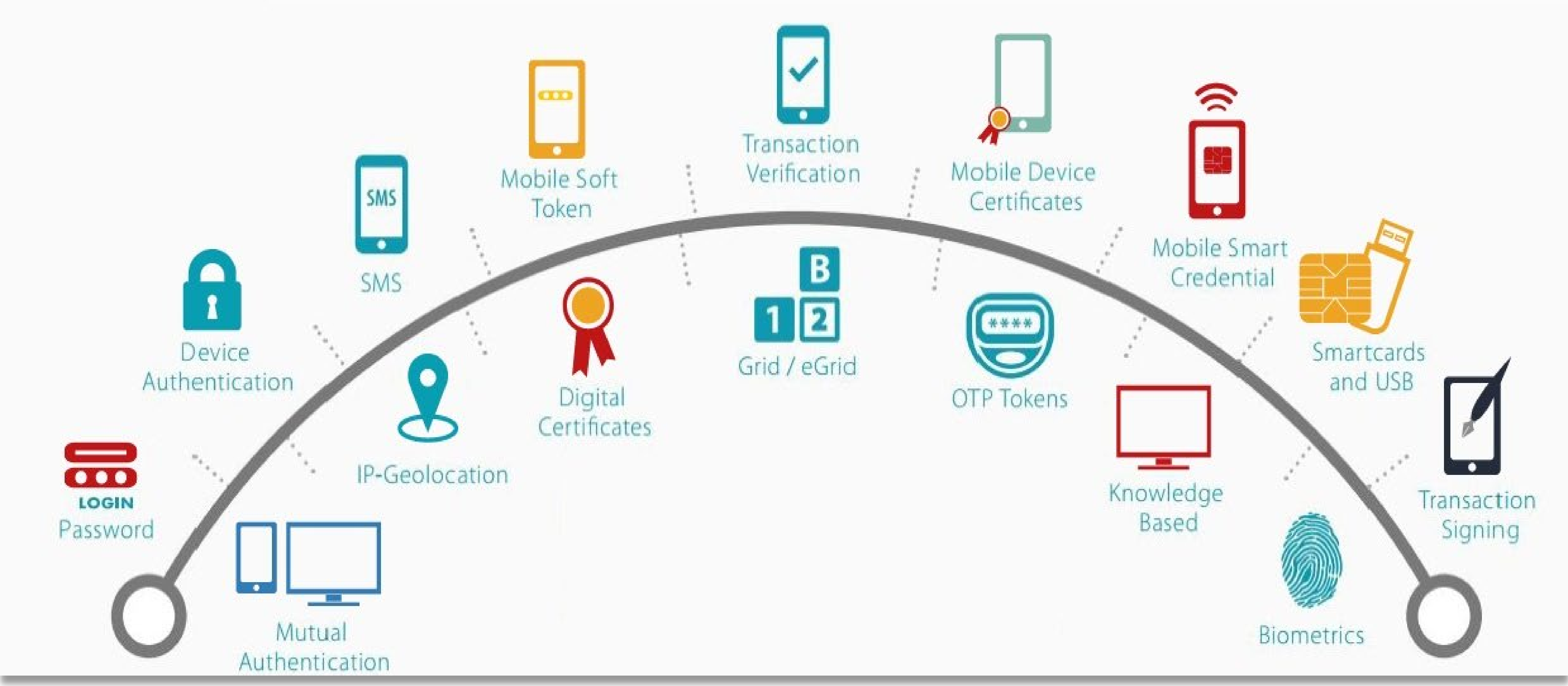
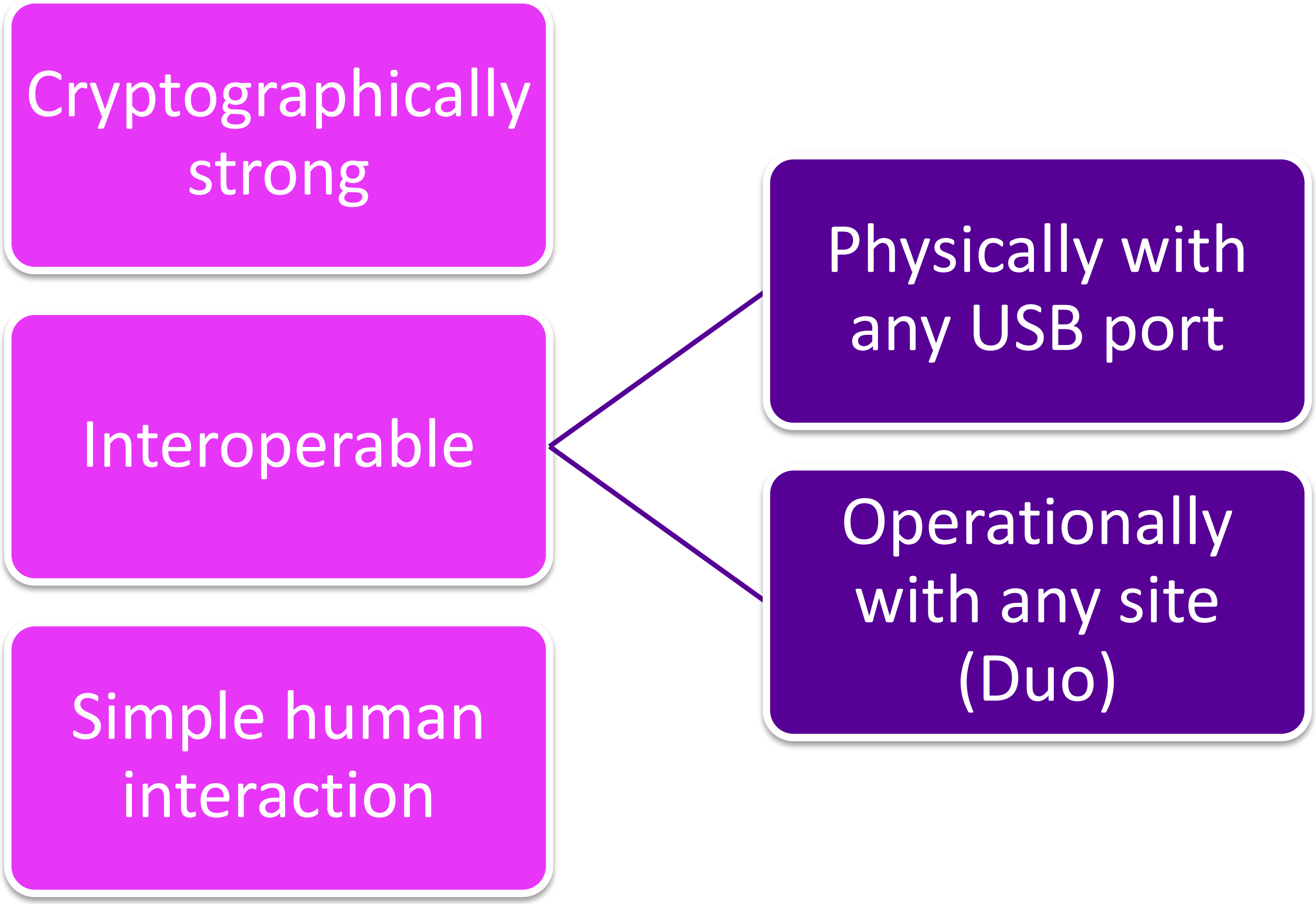
Multi-Factor Authentication



- https://www.google.com/url?sa=i&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiumJj--creAhWMulMKHbVyAhQQjRx6BAgBEAU&url=http%3A%2F%2Fwww.technoware.solutions%2Fmulti-factor-authentication&psig=AOvVaw0-GVvXqpJVZ3BFexuUHYsD&ust=1541978038009352

A Physical Token to Control Account Access

Yubico Security Keys



Cryptographically strong

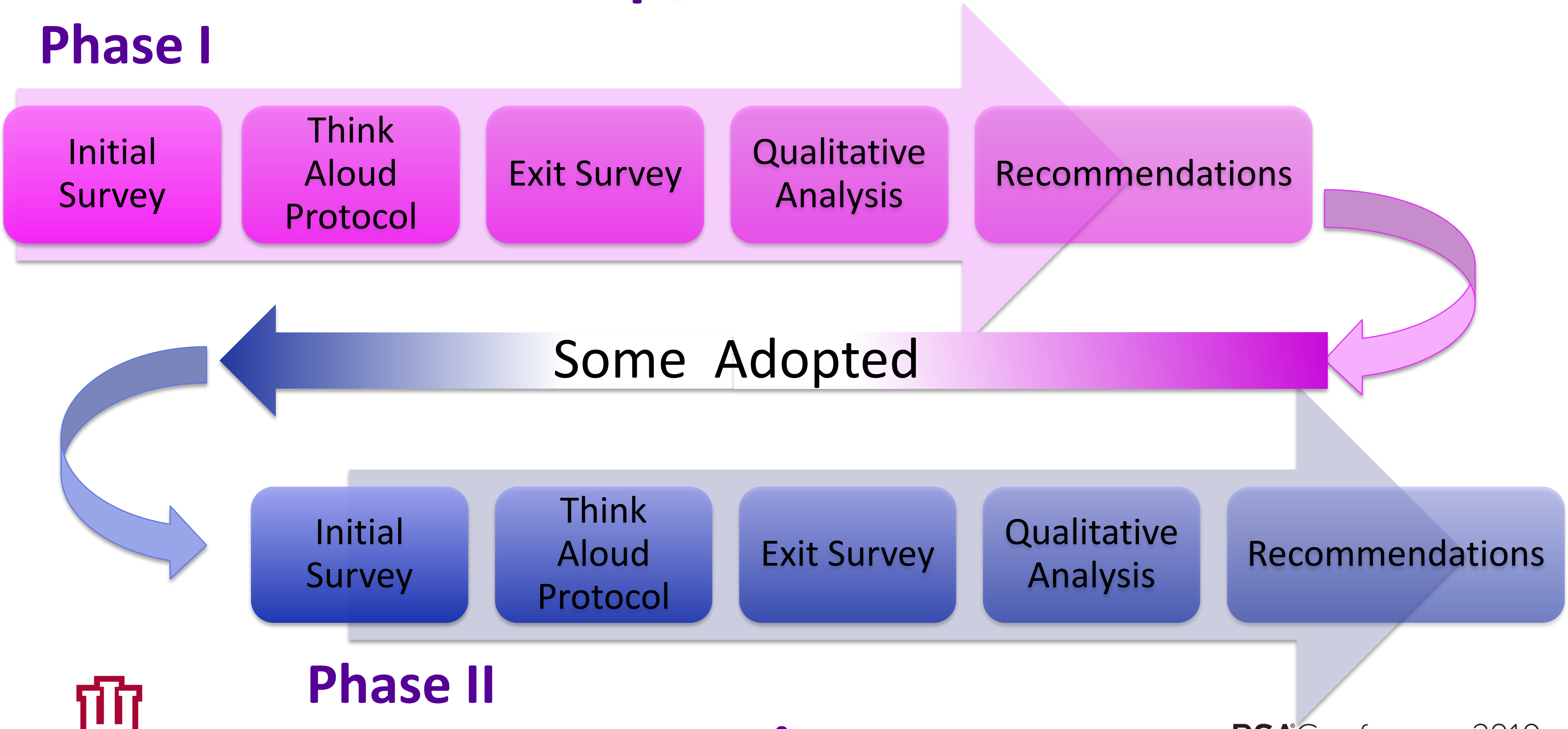
Interoperable

- Physically with any USB port
- Operationally with any site (Duo)

Simple human interaction

Brainless

Identical Experimental Protocol



Phase I

Initial Survey

Think Aloud Protocol

Exit Survey

Qualitative Analysis

Recommendations

Some Adopted

Initial Survey

Think Aloud Protocol

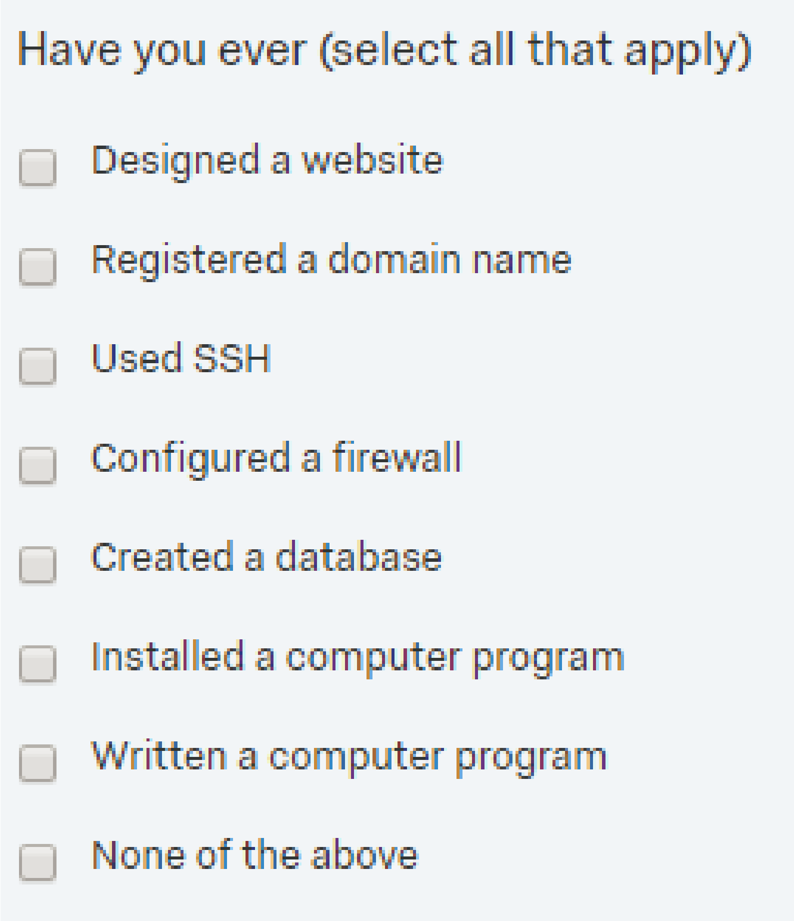
Exit Survey

Qualitative Analysis

Recommendations

Phase II

Pre-survey Expertise, Demographics, Experience



Have you ever (select all that apply)

- □ Designed a website
- □ Registered a domain name
- □ Used SSH
- □ Configured a firewall
- □ Created a database
- □ Installed a computer program
- □ Written a computer program
- □ None of the above

- I often ask others for help with the computer.
- Do you know any computer programming languages?
- Have you ever suffered data loss for any reason? (ex. Hacking, data corruption, hard drive failure.)

- Rajivan, P., Moriano, P., Kelley, T., & Camp, L. J. (2016). What Can Johnny Do?–Factors in an End-User Expertise Instrument. In *HAISA* (pp. 199-208).

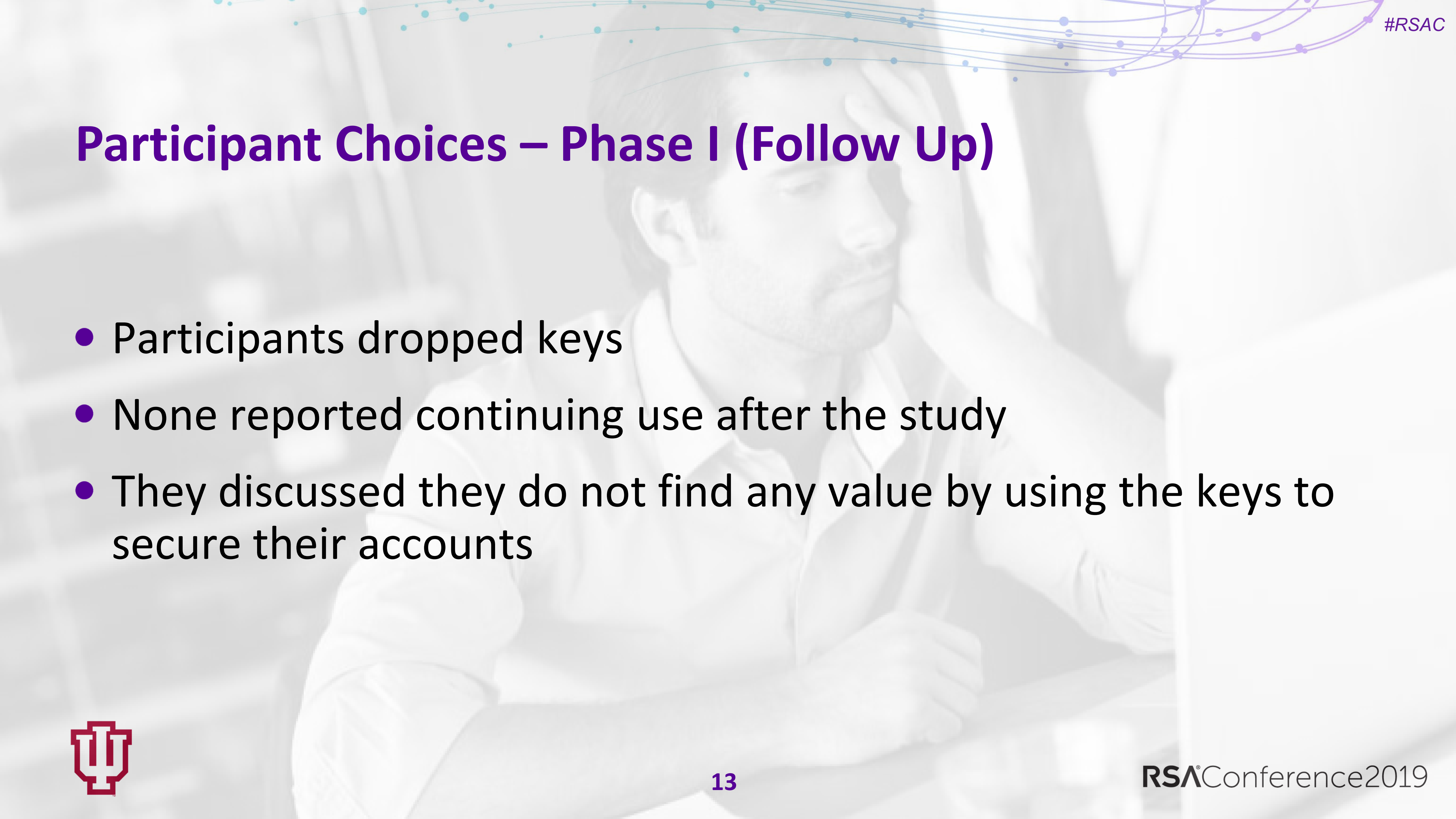
Installation Precedes Operation

- Instructions – Yubico & Google
- Task analysis – Think Aloud Protocol
  - Ask what they are doing
  - Identify stop points
  - Mitigate & continue
- Ideally matches your cognitive walkthrough
  - They Never Do

Interview Questions

- How could you test to confirm that your key is working?
- If your key was lost or stolen, what would you do? (ie. Do you understand the recovery process?)
- Based on your current understanding of the technology, could you use the same key with an account on another web site, or would you need to obtain an additional key?
- Based on your current understanding, could you add a second key to your account?
- Do you see any benefits from using the security key? Please explain.
- Do you expect to continue to use your key after today? Why or why not?
- How would you remove a key from your account if you decided to?
- Do you use alternative emails or file sharing to avoid 2FA?

Participant Choices – Phase I (Follow Up)



- Participants dropped keys
- None reported continuing use after the study
- They discussed they do not find any value by using the keys to secure their accounts

Participant Evaluation – Phase I

“No, my password is secure enough and alerts are active.”

“Why is it still asking for a password?”

“Probably not [on] gmail is not important. Would have used for work”.

“For my use, No, it is inconvenient to use. The reason is that I don’t have any sensitive information.”

Analysis

Transcription

Think aloud results

Interview questions

Qualitative coding

Three independent coders

Create *code book* from identified themes

Set of themes or codes to represent all notable data

Qualitative clustering

Halt Point: participants could not move forward without help

Confusion Point: slowed or stopped, expressed desire for help

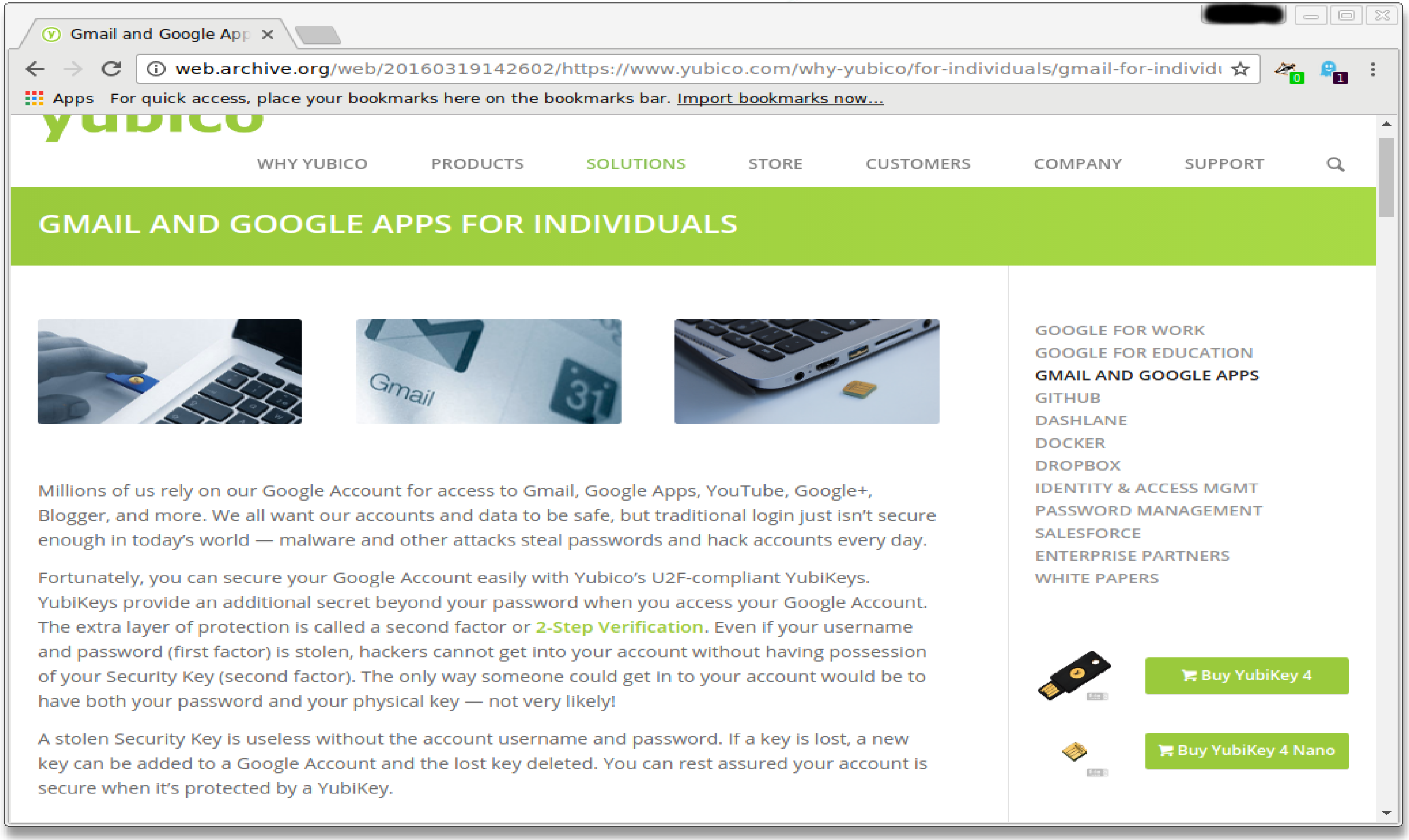
Value perception: statements about the perceived utility

Results

Discussion: return to transcripts as needed for nuance

Analysis: coding allows quantitative as well as qualitative

Recommendations



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Gmail and Google App ×
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Apps For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
yubico
WHY YUBICO
PRODUCTS
SOLUTIONS
STORE
CUSTOMERS
COMPANY
SUPPORT

GMAIL AND GOOGLE APPS FOR INDIVIDUALS

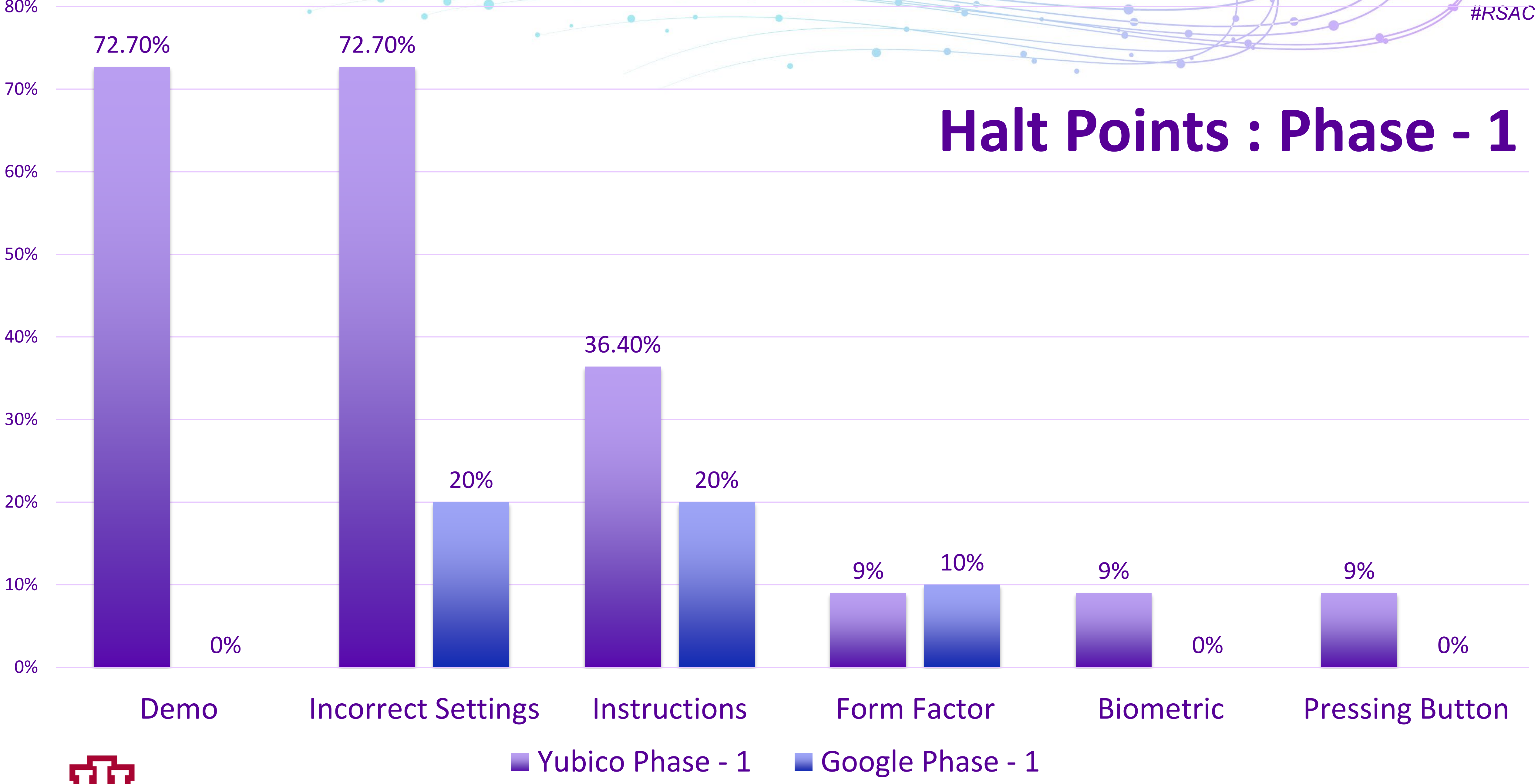
Millions of us rely on our Google Account for access to Gmail, Google Apps, YouTube, Google+, Blogger, and more. We all want our accounts and data to be safe, but traditional login just isn't secure enough in today's world — malware and other attacks steal passwords and hack accounts every day.

Fortunately, you can secure your Google Account easily with Yubico's U2F-compliant YubiKeys. YubiKeys provide an additional secret beyond your password when you access your Google Account. The extra layer of protection is called a second factor or 2-Step Verification. Even if your username and password (first factor) is stolen, hackers cannot get into your account without having possession of your Security Key (second factor). The only way someone could get in to your account would be to have both your password and your physical key — not very likely!

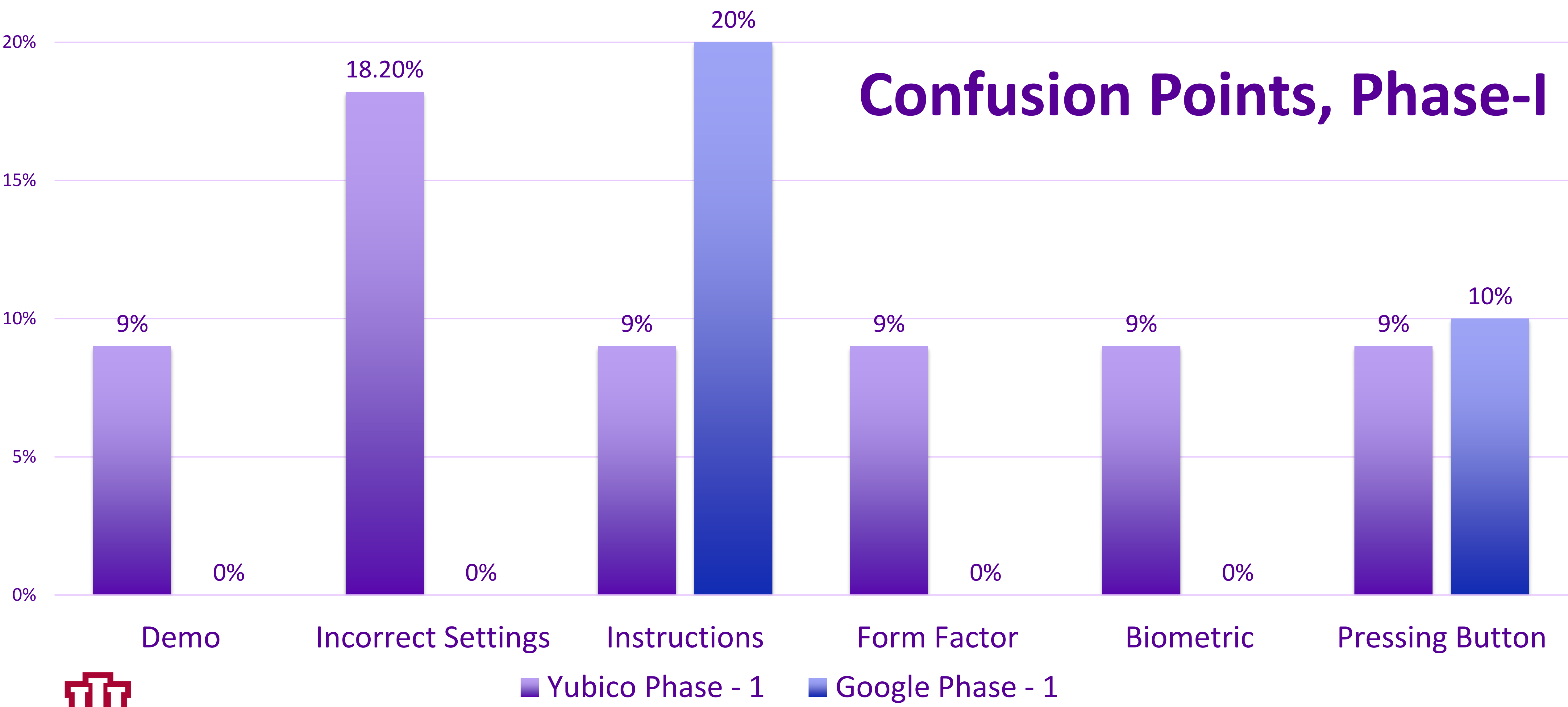
A stolen Security Key is useless without the account username and password. If a key is lost, a new key can be added to a Google Account and the lost key deleted. You can rest assured your account is secure when it's protected by a YubiKey.

Phase-I Setup Instructions

Halt Points : Phase - 1



Confusion Points, Phase-I



Adopted Recommendations

Demo versus reality

Correctly identifying the device

Biometric versus touch

Finding Instructions

User Approval and Device Use

1

Enter username and password in the login field of any app that supports FIDO U2F.

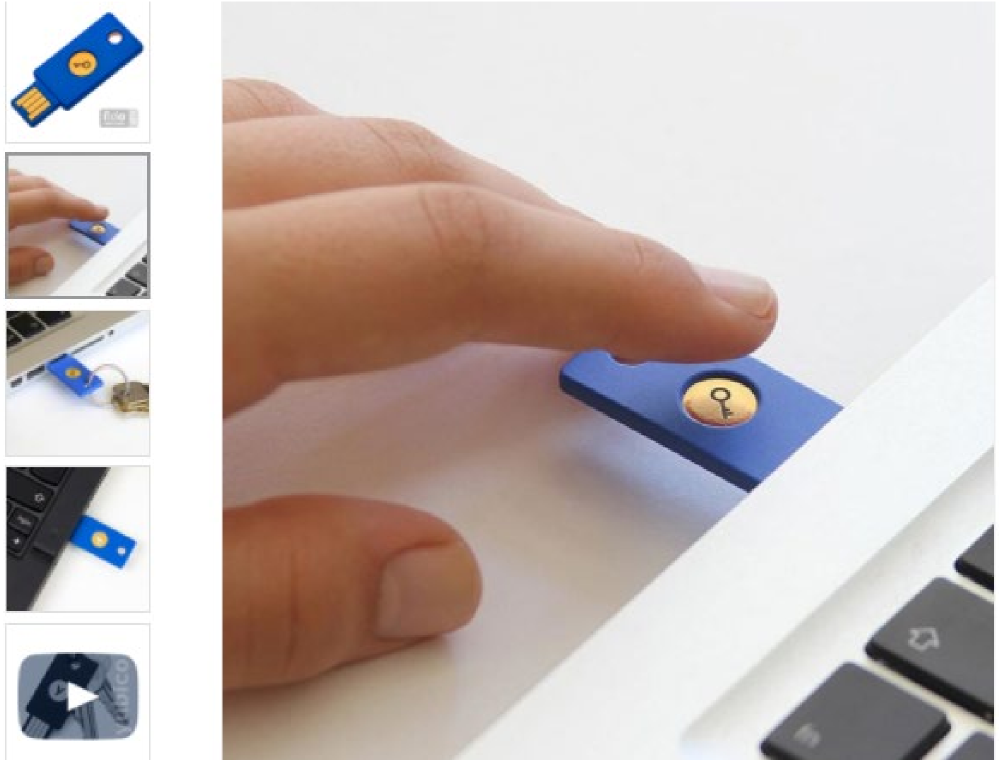
2

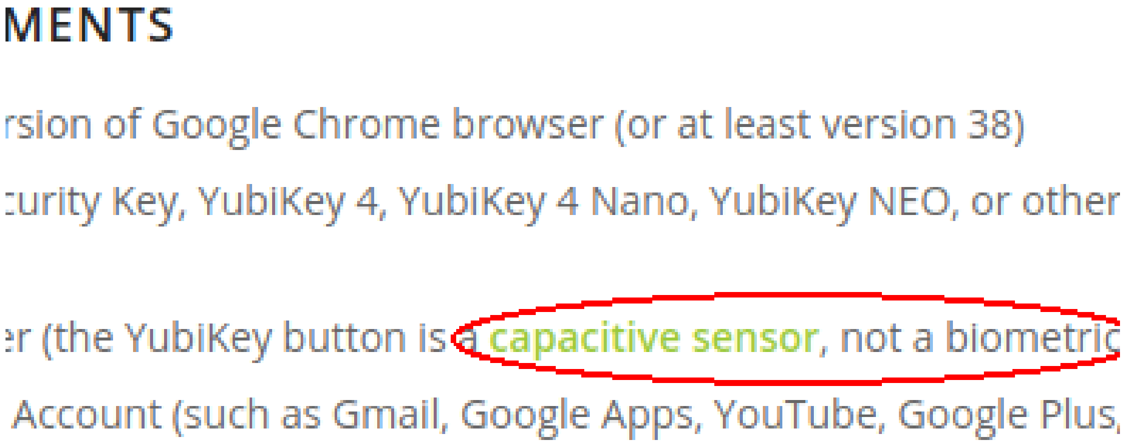
Insert the Security Key in a USB port with the **gold side up**.

3

Touch the gold button on the Security Key to generate the secure login credentials.

Phase-II Instructions





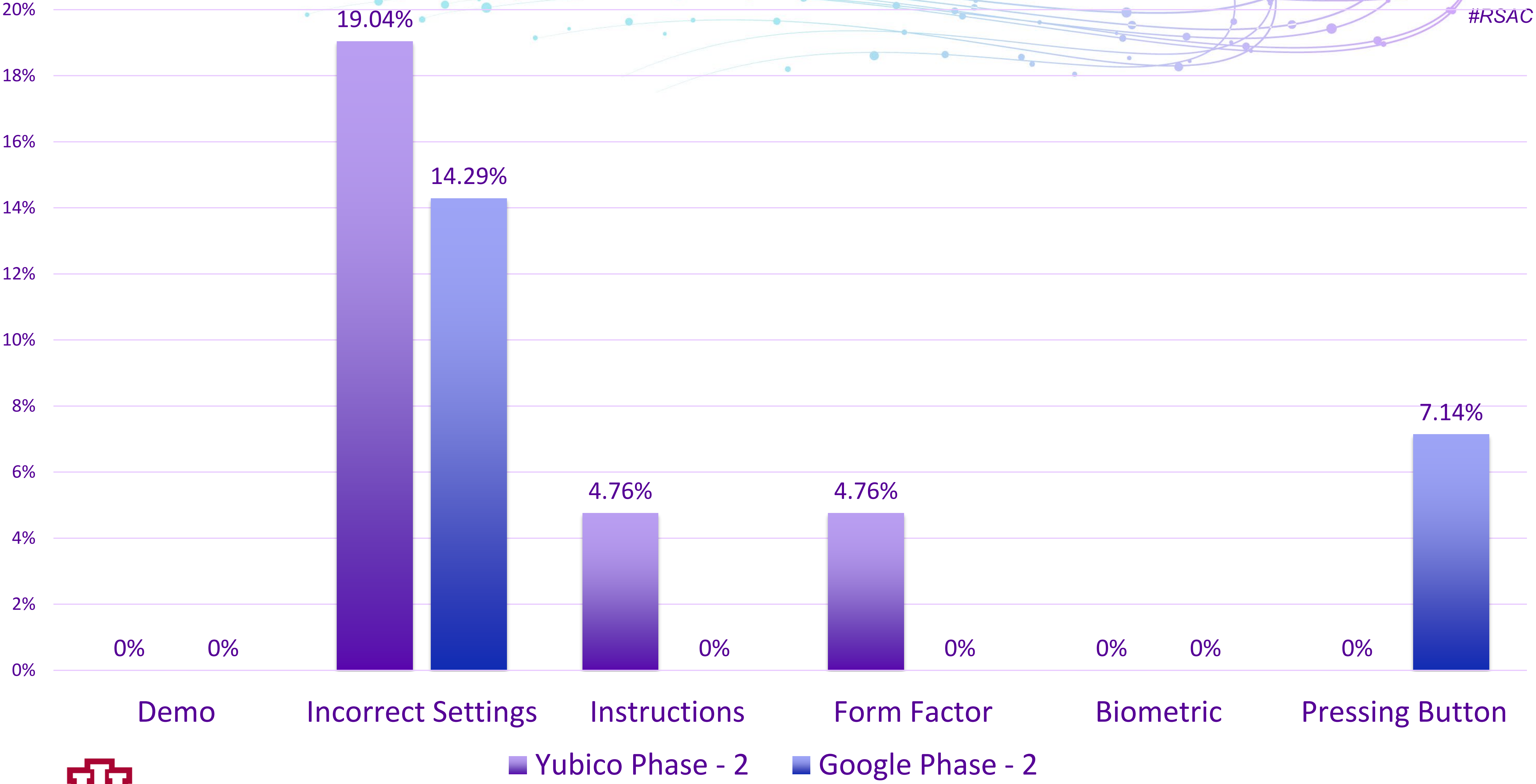
MENTS

rsion of Google Chrome browser (or at least version 38)

:urity Key, YubiKey 4, YubiKey 4 Nano, YubiKey NEO, or other

er (the YubiKey button is a capacitive sensor, not a biometric

Account (such as Gmail, Google Apps, YouTube, Google Plus,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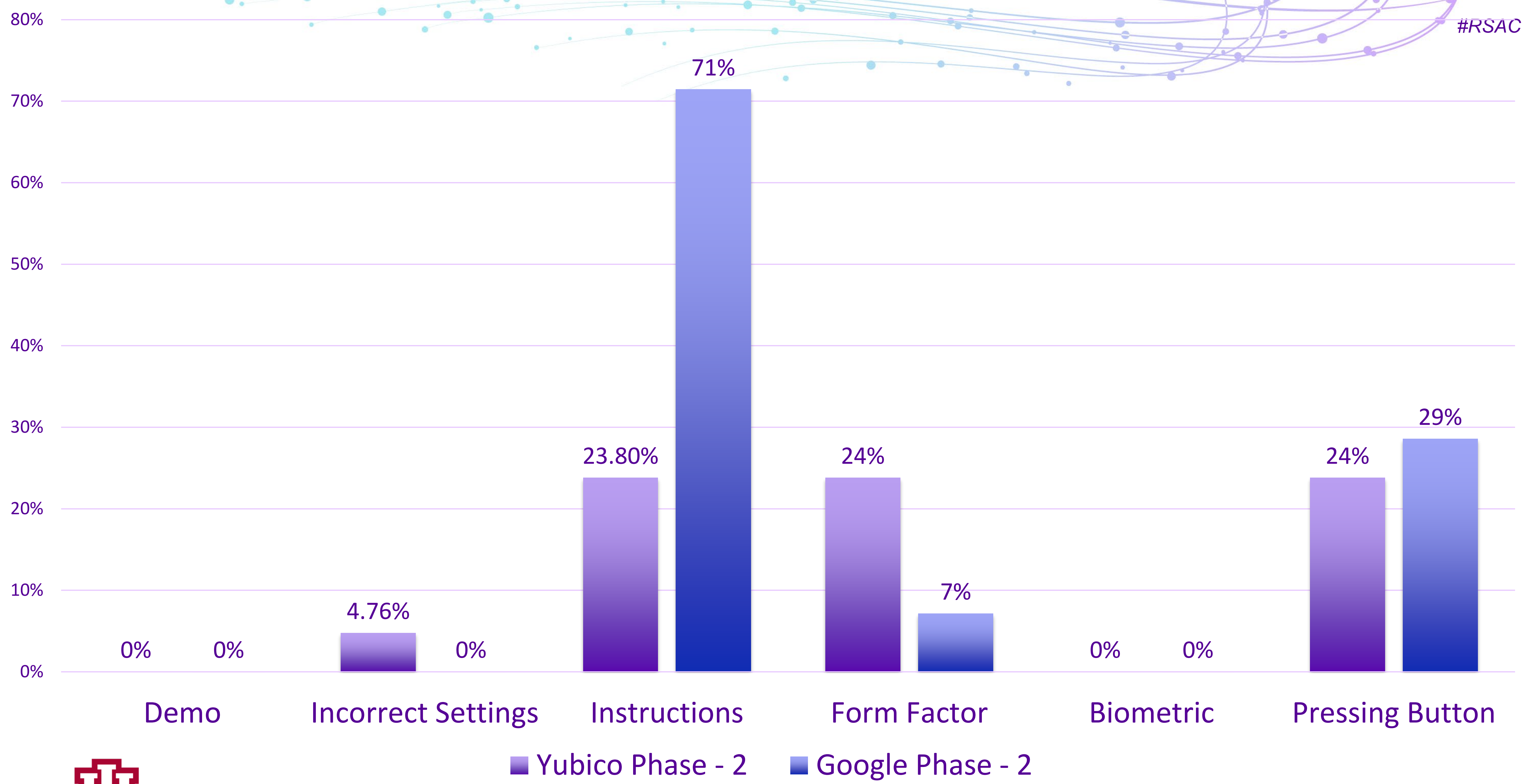
Demo
Incorrect Settings
Instructions
Form Factor
Biometric
Pressing Button
▨ Yubico Phase - 2
▨ Google Phase - 2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29%
Demo
Incorrect Settings
Instructions
Form Factor
Biometric
Pressing Button
Yubico Phase - 2
Google Phase - 2

Participant Evaluation – Phase II

"I find it much easier to use on Duo (2 factor) instead of using my phone. I just keep it in my laptop case."

"It's a convenient way of utilizing two factor authentication without needing to look at my mobile device."

"Improve ease of access for me."

"…I don't use it much because I almost never use a computer that is not my personal computer and the account that I set it up with is not one that I need to access very often anyway."

"Too lazy."

Scope of Improvement

Recommendations - Phase-II

INSTRUCTION CLARITY

CONFIRMATION OF INSTALLATION

COMMUNICATE THE INTRINSIC BENEFIT

COMMUNICATING THE RISKS

Why We Don’t Use MFA -- Solutions

- Hassle
  - Providing the technology is not enough
- We cannot predict
  - Watch in-action
- Why use? Too Lazy
  - Risk communication for motivation
- Research, Application
  - Qualitative studies and Quantitative Studies

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Thank You!

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Questions?

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