



# Indiana Statewide Cybersecurity Summit 2023

# Examining the Safety of Biometrics

Kat Haggemueller; Advisor Dr. Sid Stamm  
haggenk@rose-hulman.edu

## Introduction

In the digital age, it is important to guarantee the safety of users' personal information and to guarantee that no unauthorized people will get access to private data. For the longest time, this was done by using passwords. However, due to numerous risks accompanying the use of passwords, new authentication methods are constantly being developed and improved upon. The most popular of these alternative methods is Biometric Authentication.

## Biometric Authentication

- == Something that you have
- Ideal Method: universal, individual, accurate, reliable, high acceptability
- Decentralized: No central database; stored on device
- Concern: Underestimation of risk

## Research Question

How safe are biometric authentication mechanisms and are they safer than traditional passwords?

## Related Work

- Sunil Swamilingappa Harakannanavar, Prashanth Chikkanayakanahalli Renukamurthy, and Kori Basava Raja. Comprehensive study of biometric authentication systems, challenges and future trends. *International Journal of Advanced Networking and Applications*, 10:3958–3968, 2019
- Christian Rathgeb, Pawel Drozdowski, and Christoph Busch. Makeup presentation attacks: Review and detection performance benchmark. *IEEE Access*, 8:224958–224973, 2020
- Stephanie A.C Schuckers. Spoofing and anti-spoofing measures. *Information Security Technical Report*, 7:56–62, 12 2002.
- Julian Ashbourn. *Biometrics in the New World*. Springer International Publishing, 2014.

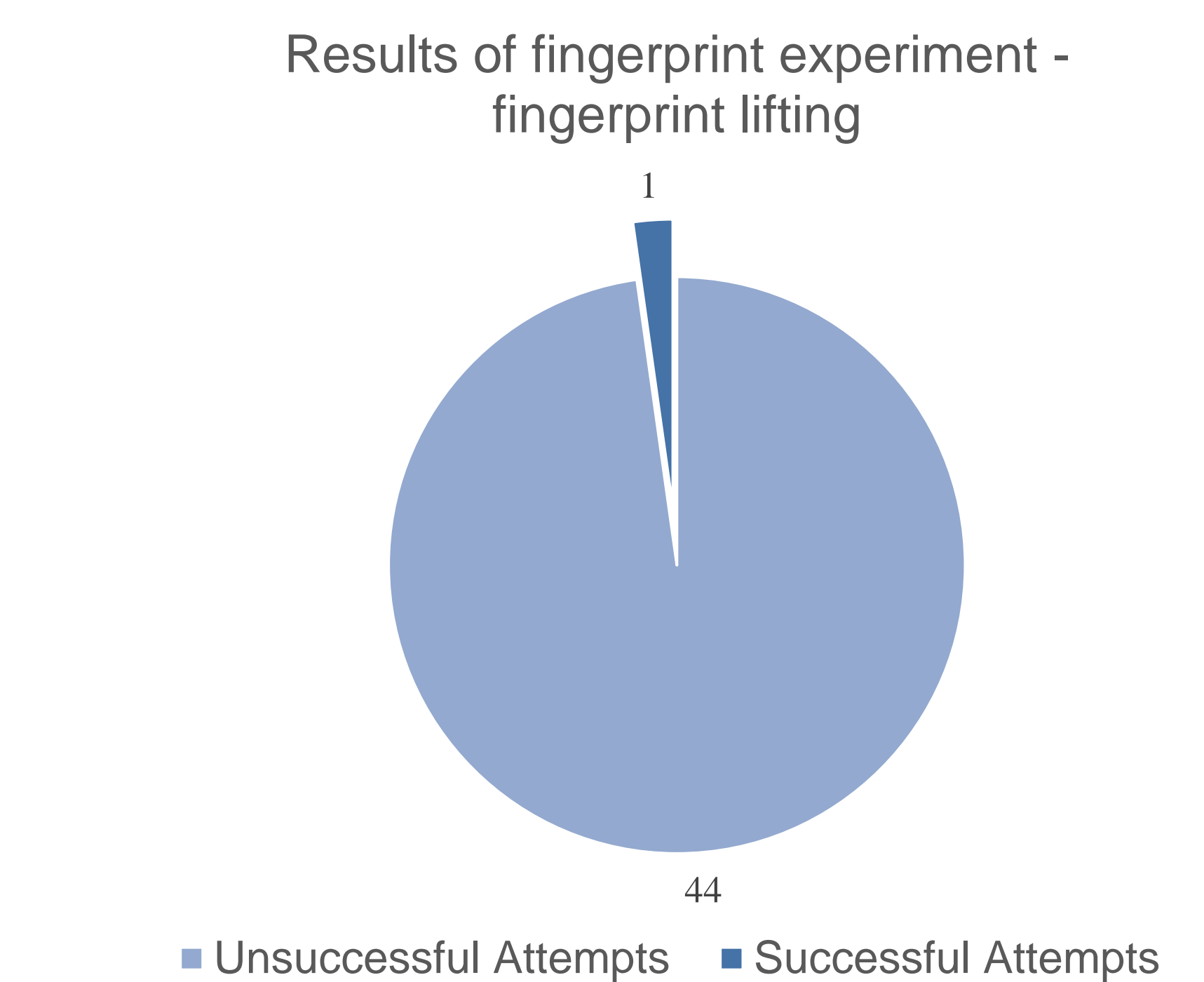
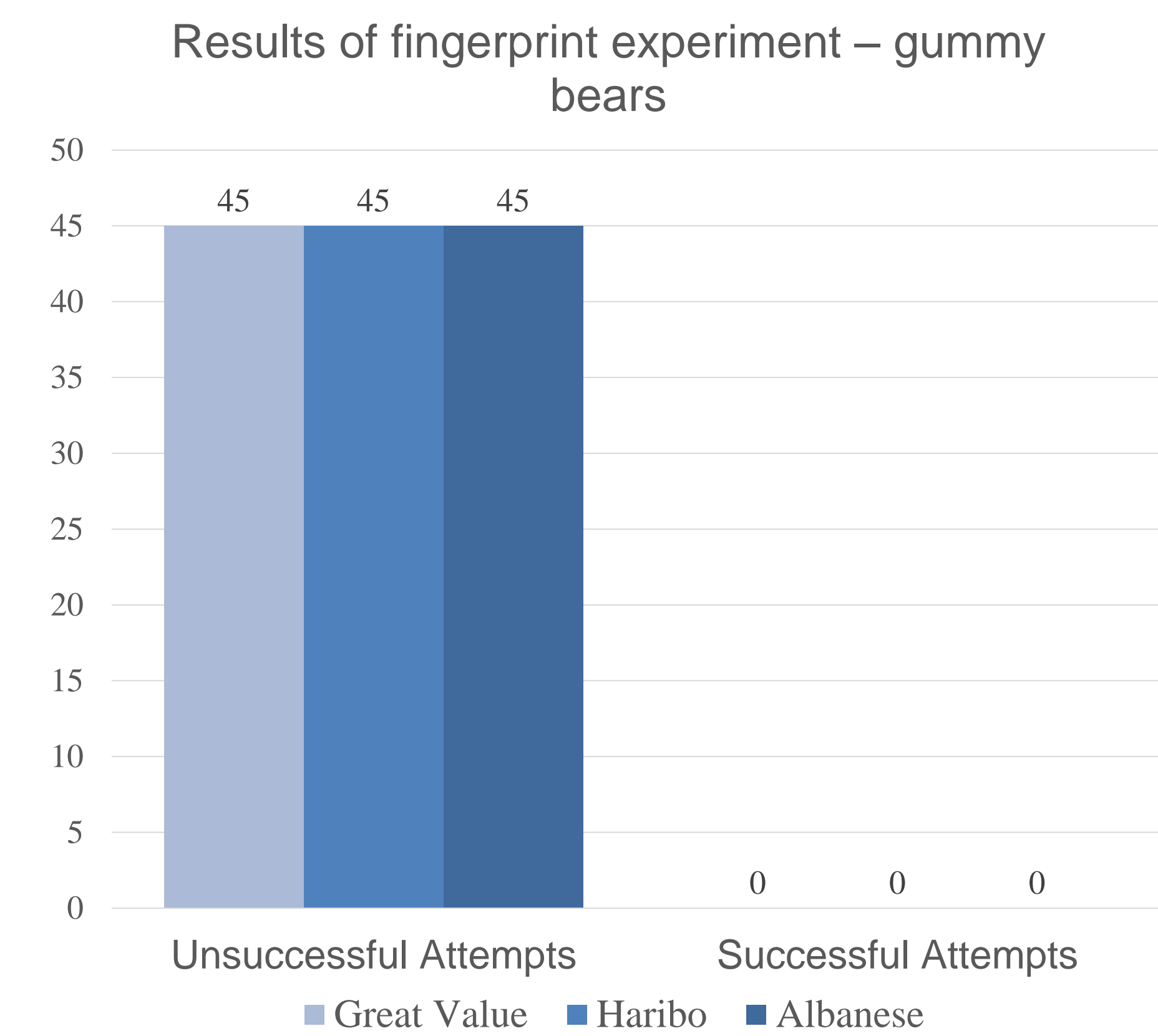
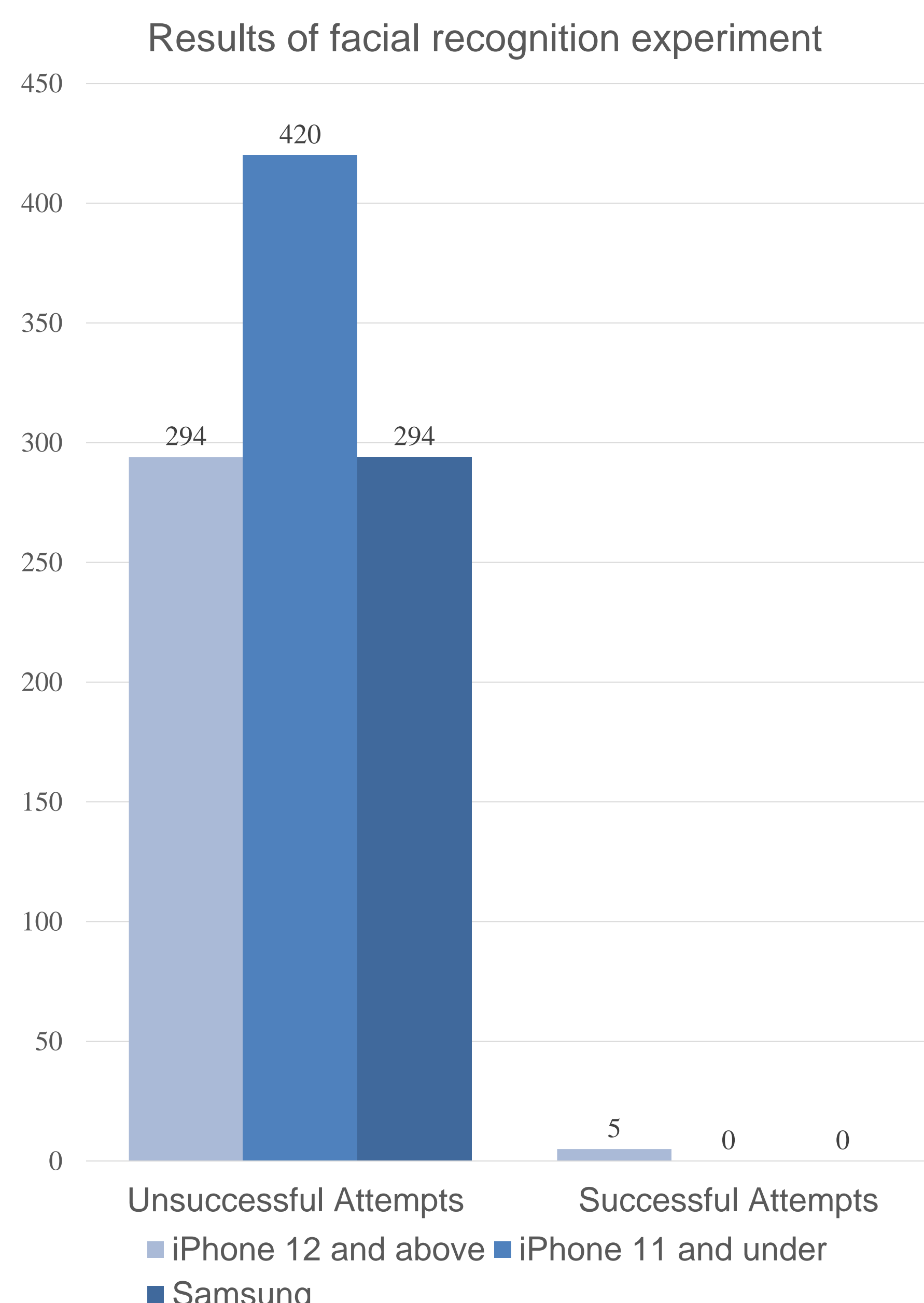
## Methodology

- Goal: investigate how safe biometric authentication methods are and whether they are safer than traditional passwords.
- Methodology: literature review, experimental research, data analysis

## Experimental Research

- Goal: Test accuracy of facial recognition & fingerprint sensors
- Device: Cell Phones
- Sample Size: 26
- Method: Use face to unlock others' phones; Use lifted fingerprints to unlock own phone
- Nr. of attempts per device:
  - Facial Recognition: ca. 42
  - Fingerprint Sensor: ca. 20

## Results



## Conclusion

- Small sample size
- Biometric Authentication not entirely secure
- Data-analysis required
- Analyze safety: passwords vs biometrics

