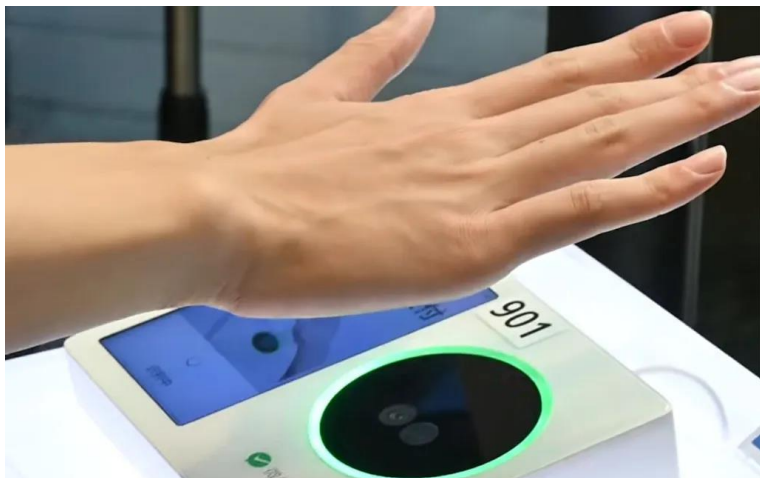
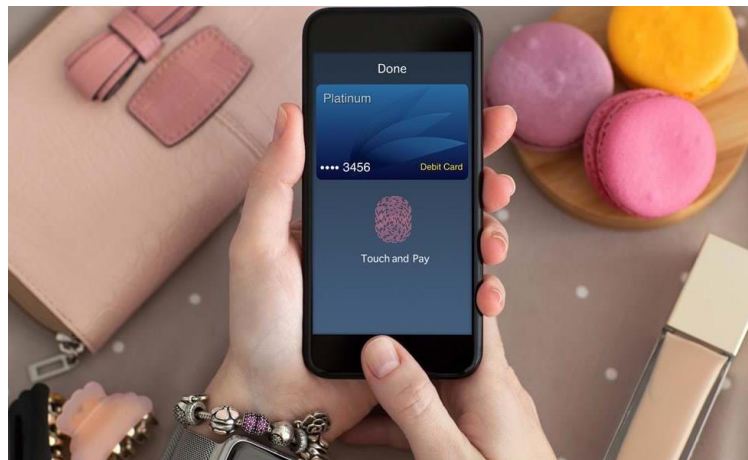


# “What If My Face Gets Scanned Without Consent”: Older Adults’ Experiences with Biometric Payment

**Yue Deng**<sup>1,2</sup>, Changyang He<sup>2</sup>, Bo Li<sup>1</sup>, Yixin Zou<sup>2</sup>

<sup>1</sup>Hong Kong University of Science and Technology

<sup>2</sup>Max Planck Institute for Security and Privacy



Forcing to learn  
unfamiliar payment  
systems



Operational  
challenges

Memory  
challenges

...

“What if my face gets scanned without consent?”



I. Payment Initiation



II. Facial Recognition



III. Payment Confirmation



IV. Payment Success

# Research Questions

- **RQ1 (motivations):** What drives older adults to use biometric payment?
- **RQ2 (concerns):** What are older adults' perceived concerns about using biometric payment?
- **RQ3 (protective behaviors):** What protective behaviors do older adults adopt when using biometric payment?
- **RQ4 (improvements):** What improvements do older adults desire in biometric payment?

# Method

**Intro**  
Research overview and informed consent

**Basic Understanding**  
Familiarity with biometric payment  
General usage (for users only)

**General Perceptions (Users)**  
Usage experience and emotional responses

**General Perceptions (Non-users)**  
Attitudes toward biometric payments; why no usage

**Motivations (Users)**  
Reasons for adoption and perceived benefits

**Motivations (Non-users)**  
Not applicable

**Concerns (Users)**  
Difficulties and negative experiences

**Concerns (Non-users)**  
Perceived risks and uncertainties

**Protective Behaviors (Users)**  
Risk-mitigation measures

**Protective Behaviors (Non-users)**  
Not applicable

**Desired Improvements**  
In terms of functions, features, and interactions

Semi-structured interview with 22 older adults who are

- 1) more than 50 years old and
- 2) have experience using mobile payment

# Motivation for Using Biometric Payment



Convenience



“  
*It's especially convenient. Wherever you go, even if your phone dies, you can still pay with facial recognition.*  
”

# Motivation for Using Biometric Payment



Convenience



Higher security



“ *It's especially convenient. Wherever you go, even if your phone dies, you can still pay with facial recognition.* ”

“ *If you're under surveillance, your password might be exposed. But with fingerprint-based payments, there's such risk.* ”

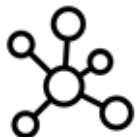
# Motivation for Using Biometric Payment



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Social influence

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“  
*Many people were using it, so it just felt natural to set up.*  
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# Motivation for Using Biometric Payment



Convenience



Higher security



Social influence



Reminders & incentives

“ *It's especially convenient. Wherever you go, even if your phone dies, you can still pay with facial recognition.* ”

“ *If you're under surveillance, your password might be exposed. But with fingerprint-based payments, there's such risk.* ”

“ *Many people were using it, so it just felt natural to set up.* ”

“ *A cashier told me, 'If you use Alipay's facial recognition payment, you'll get a discount.'* ”

# Concerns Regarding Biometric Payment



Lack of Knowledge



“  
*Trying new things feels like exploring the unknown. If no one explains it to us, we're afraid of making mistakes.*  
”

# Concerns Regarding Biometric Payment



Lack of Knowledge



Lack of Control



“  
*Trying new things feels like exploring the unknown. If no one explains it to us, we're afraid of making mistakes.*”

“  
*What if my face gets scanned when I don't need it to? For example, I'm not trying to make a payment, but it still scans my face without my consent.*”

# Concerns Regarding Biometric Payment



Lack of Knowledge



Lack of Control



S&P Concerns



Unauthorized biometric data collection

“

*I heard that with just a spray of powder, your fingerprint becomes crystal clear.*

Biometric data leakage

”

“

*I'm afraid that once others get hold of our biometric information, they'll sell it everywhere.*

Hacking

”

“

*One of my friends fell victim to facial recognition fraud when a scammer video-called him, and the scammer used his video to spoof his face.*

Identity theft

”

“

*Someone might take my biometric information and use it to secure illegal loans.*

”

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# Concerns Regarding Biometric Payment



Lack of Knowledge



Lack of Control



S&P Concerns



Low Adaptability

**aging-related changes**

temporary changes

environmental conditions

“ *My eyelids droop, and my face puffs up. It used to recognize me instantly, but these days, any slight change sets off extra verification steps.* ”

# Protective Behaviors



## limiting disclosure

*I don't do video calls with people I'm not familiar with.*



# Protective Behaviors



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## only using private devices

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*I haven't used the merchant's checkout kiosk because I'm not sure whether it might have viruses or could collect my information.*

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## only enabling specific payment applications

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*Alipay and WeChat also have facial recognition, but I only activated the one with mobile banking.*

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## selective use based on payment amounts

“

*For large amounts, I use passwords, and for small amounts, I use facial payment.*

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## using a dedicated low-balance card

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*I always use the same card online which is just for spending.*

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## using a dedicated low-balance card

“

*I always use the same card online which is just for spending.*

”



## enabling instant bank notifications

“

*I went to the bank and requested that they send me a notification every time a payment is made.*

”



# Desired Improvements for Biometric Payment

## ➤ Enhancing Cognitive Confirmation for Biometric Payment

➤ Lightweight behavioral verification plus biometric recognition



“ *There should be an extra step, like blinking or turning your head. These simple actions could be different each time.* ”



- **system prompted facial actions**
- user-predefined gestures

“ *I can set the ‘Yeah’ gesture, someone else might choose ‘OK’. Everyone has their own gestures.* ”



# Desired Improvements for Biometric Payment

## ➤ Enhancing Cognitive Confirmation for Biometric Payment

### ➤ Lightweight behavioral verification plus biometric recognition

- system prompted facial actions
- **user-predefined gestures**

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# Desired Improvements for Biometric Payment

## ➤ Enhancing Cognitive Confirmation for Biometric Payment

- Contextual voice input plus biometric recognition
  - incorporate context-relevant semantic content

“

*For example, if I'm buying something that costs 105 yuan, I could say, 'I'm [nickname], I want to pay 105.' Even if someone steals my voice, they cannot replicate it exactly.*

”



# Desired Improvements for Biometric Payment

## ➤ Providing Biometric Payment Guidance

- Content of guidance
  - **hands-on guidance**
  - informational support

“

*It would be great to have someone come and teach us how to set it up or use it.*

”



# Desired Improvements for Biometric Payment

## ➤ Providing Biometric Payment Guidance

- Content of guidance
  - **hands-on guidance**
  - informational support
- Formats of guidance
  - in-person instruction
  - **peer support**
  - more accessible learning opportunities

“

*It would be great to have someone come and teach us how to set it up or use it.*

”



“

*We go to the senior university. Usually one or two people are more tech-savvy, and we learn from them.*

”



# Discussion

- Unrevealing Biometric Payment Usage through the Lens of Older Adults
  - Tension: ease of use <-> security and privacy concerns
  - Tension: password-free benefits <-> perceived lack of control
  - Tension: perceptions <-> technical realities
  
- Positioning Biometric Payment in Older Adults' Broader Technology Use
  - Digital payment vs. biometric payment: shared foundations and new complexities
  - Biometric technology vs. biometric payment: perceived risks carry across context
  
- Toward Inclusive Biometric Payment
  - Combining biometric and cognitive authentication
  - Supporting older adults' autonomy in adoption
  - Integrating protections into existing infrastructure

# “What If My Face Gets Scanned Without Consent”: Older Adults’ Experiences with Biometric Payment

- ❑ We discover older adults’ motivations and concerns regarding biometric payment usage, shedding light on older adults’ risk-benefit balance
- ❑ We unpack older adults’ strategic protective behaviors to secure biometric payment use, providing design implications to mediate the interplay between usability and security
- ❑ We reflect on older adults’ desired features in biometric payment, emphasizing the natural alignment between biometric and cognitive authentication processes

