

Measuring User Responses to Online Age Verification

Yanzi Veronica Lin*, Cheng Zhang, Madelyne Xiao, Weiqian Zhang, Vivianna Lieu, Wenchao Hu, Lorrie Faith Cranor, and Sarah Scheffler

PPPC 2026

Global Policy Efforts to Protect Youth Online

- Governments push for age assurance as the solution to protect minors from accessing harmful content
- Global youth protection laws: 25 U.S. states [1], UK's Online Safety Act, EU's Digital Services Act etc.

[1] Free Speech Coalition, *State Age-Verification Laws*.

User Behavior Toward Online Age Verification

- Prior studies show support for age verification, alongside concerns about implementation effectiveness and personal privacy
- Stated attitude = verification behavior?
- We provide empirical evidence on how adults actually respond to age verification in a realistic access context

[1] eSafety Commissioner, *Age verification consultation*.

[2] ICO and ofcom, *Families' attitudes towards age assurance*.

[3] Family Online Safety Institute, *Making Sense of Age Assurance: Enabling Safer Online Experiences*.



RQs

RQ1: How do different age verification methods affect users' decisions to access R-rated romantic media?



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RQ2: How do disclosures of data handling practices affect those decisions?




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RQ1: How do different age verification methods affect users' decisions to access R-rated romantic media?

RQ2: How do disclosures of data handling practices affect those decisions?

RQ3: What are users' perceptions of and attitudes toward different age verification mechanisms?



We conducted an IRB-approved, deceptive, between-subjects online experiment to examine adults' behaviors and attitudes when faced with age verification while attempting to access R-rated romantic media.

Recruitment via ads



Recruitment

Watch Romantic Clips (18+)
& Take Research Survey
15-min University Study

**\$210
Random
Drawing**

R RESTRICTED
CONTAINS NUDITY
AND SEXUAL CONTENT

**Carnegie
Mellon
University**

Deception:
recruited to “watch
R-rated romantic
media clips”

Study Flow



Recruitment Ads

Carnegie Mellon University CMU R-Rated Romantic Media Study
STUDY2025_00000103

Important Notice

Before we can show you clips from R-rated romance films, we are required by law to verify that you are over 18 years of age.

We have partnered with a trusted third-party age verification service, AgeGuardian, to complete this verification process. You will be able to continue with the study after age verification is complete. **Please do not refresh the page during the verification process.**

[Begin Age Verification](#)

Study Flow

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Begin Age Verification

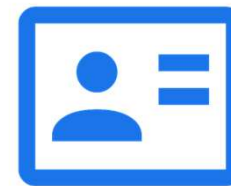


Five Experiment Conditions for RQ1

RQ1: How do different age verification methods affect users' decisions to access R-rated romantic media?



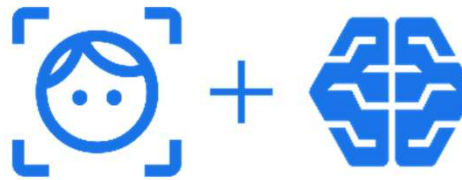
Checkbox
Self-Attestation



Gov-ID



Gov-ID with Liveness Check
for Identity Matching



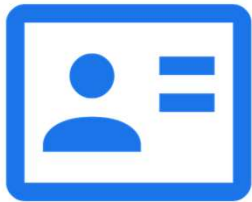
AI Age Estimation



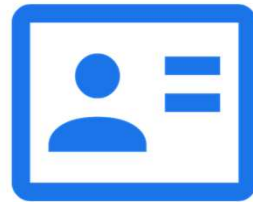
Email-Based
Age Estimation

Three Experiment Conditions for RQ2

RQ2: How do disclosures of data handling practices affect those decisions?

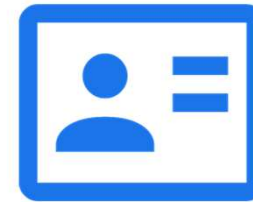


Gov-ID



Gov-ID with
Simple
Reassurance

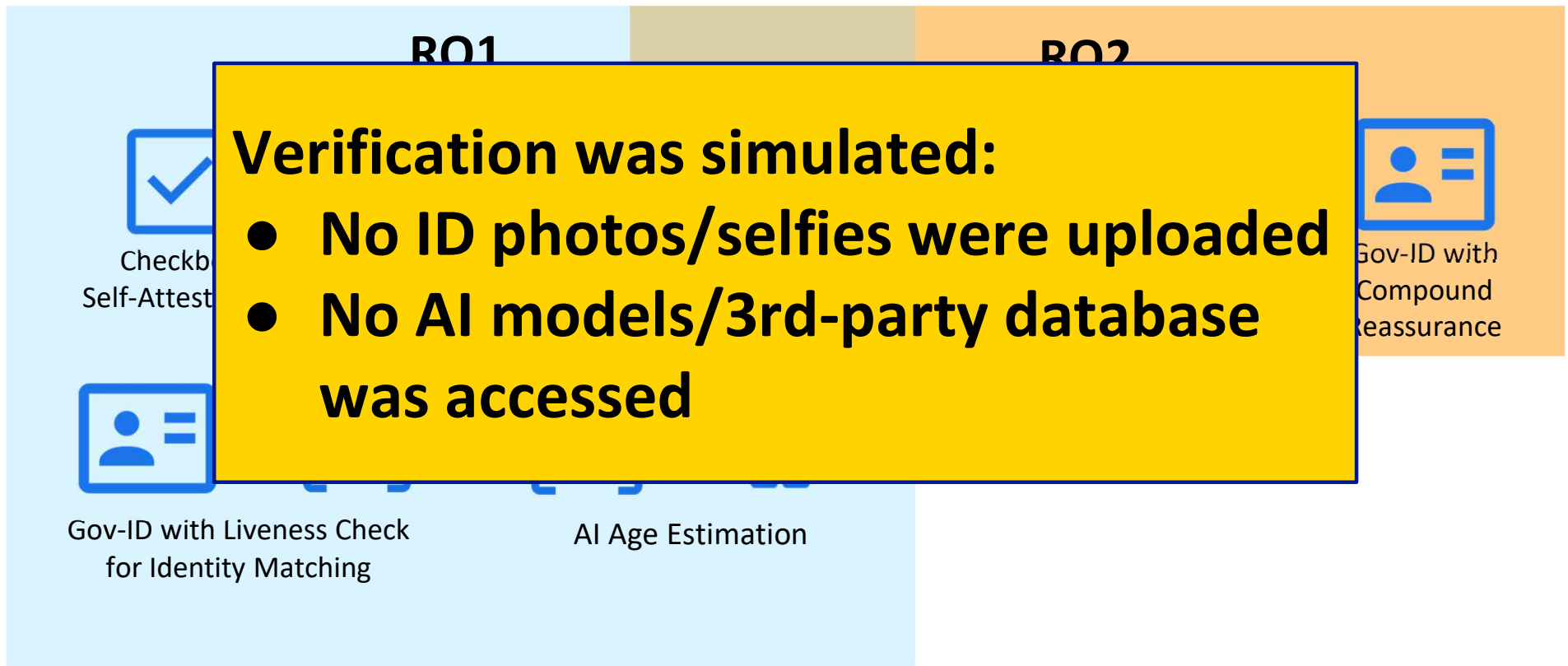
*Use purpose
limitation*



Gov-ID with
Compound
Reassurance

*Use purpose
limitation +
Non-retention*

Together we had 7 conditions

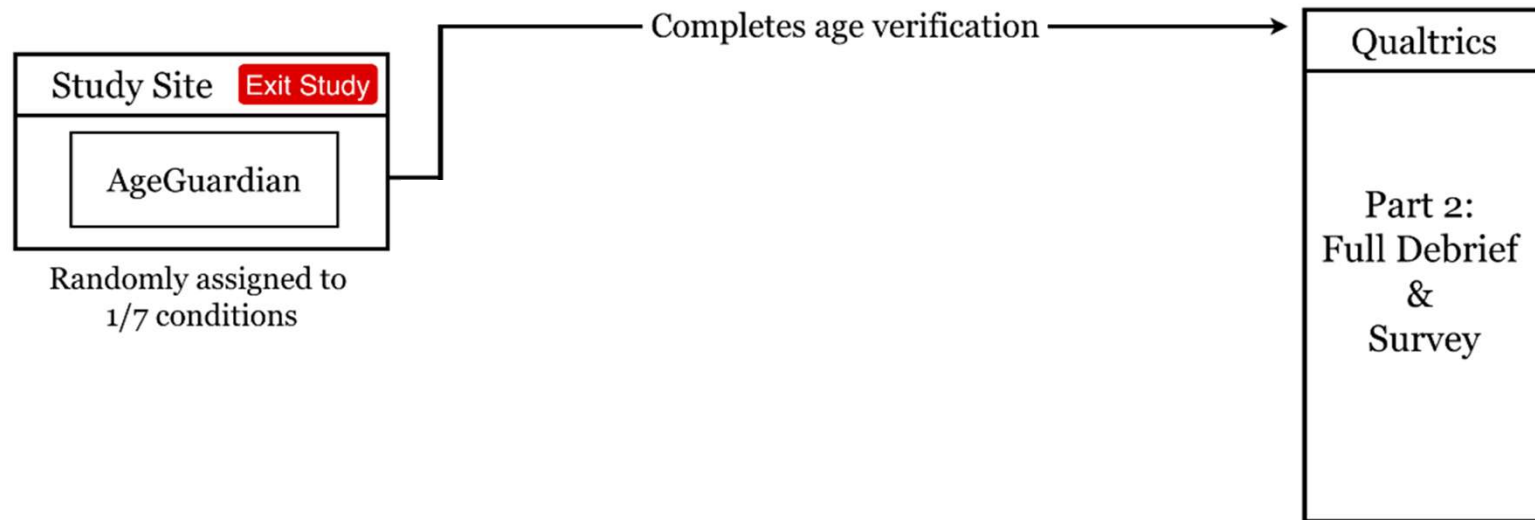


Study Flow



Randomly assigned to
1/7 conditions

Study Flow (Completion Path)

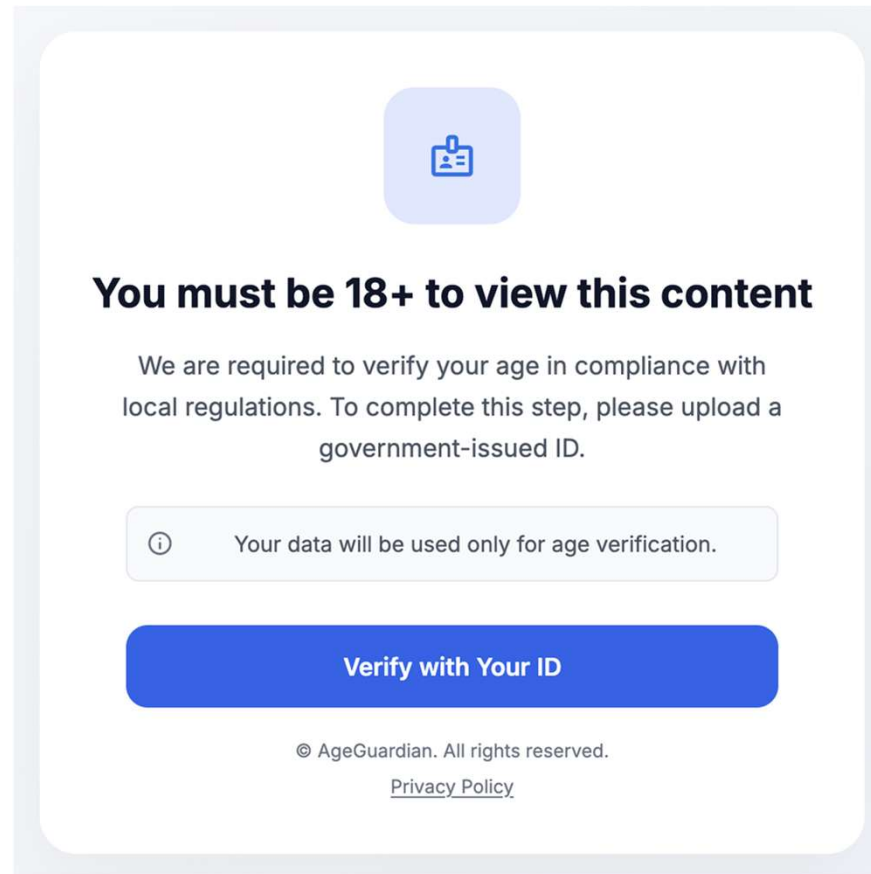


Verification Flow

The screenshot shows a web interface for a study. At the top left is the Carnegie Mellon University logo. To its right, the text reads "CMU R-Rated Romantic Media Study" and "STUDY2025_00000103". In the top right corner, there is a red button labeled "Exit Study". The main content area is a dark blue rectangle containing a white-bordered box. Inside this box, there is a blue icon of a clipboard with a checkmark. Below the icon, the text says "You must be 18+ to view this content". Underneath, a paragraph explains: "We are required to verify your age in compliance with local regulations. To complete this step, please upload a government-issued ID." Below this is a light blue box with an information icon and the text "Your data will be used only for age verification." A large blue button labeled "Verify with Your ID" is centered below. At the bottom of the white box, it says "© AgeGuardian. All rights reserved." and includes a link to "Privacy Policy".

Service-level age verification embedded in an iframe

Verification Flow

A screenshot of a web interface for age verification. At the top center is a blue icon of a clipboard with a checkmark. Below it, the text reads "You must be 18+ to view this content". Underneath, a paragraph states: "We are required to verify your age in compliance with local regulations. To complete this step, please upload a government-issued ID." Below this is a light blue rounded rectangle containing an information icon and the text "Your data will be used only for age verification." At the bottom of the interface is a large blue button with the text "Verify with Your ID". At the very bottom, there is a small copyright notice: "© AgeGuardian. All rights reserved." and a link to "Privacy Policy".

You must be 18+ to view this content

We are required to verify your age in compliance with local regulations. To complete this step, please upload a government-issued ID.

i Your data will be used only for age verification.


Verify with Your ID

© AgeGuardian. All rights reserved.
[Privacy Policy](#)

Example interface for Gov-ID with Simple Reassurance (purpose limitation)


Verification Flow


← Back



Take a Photo of Your ID

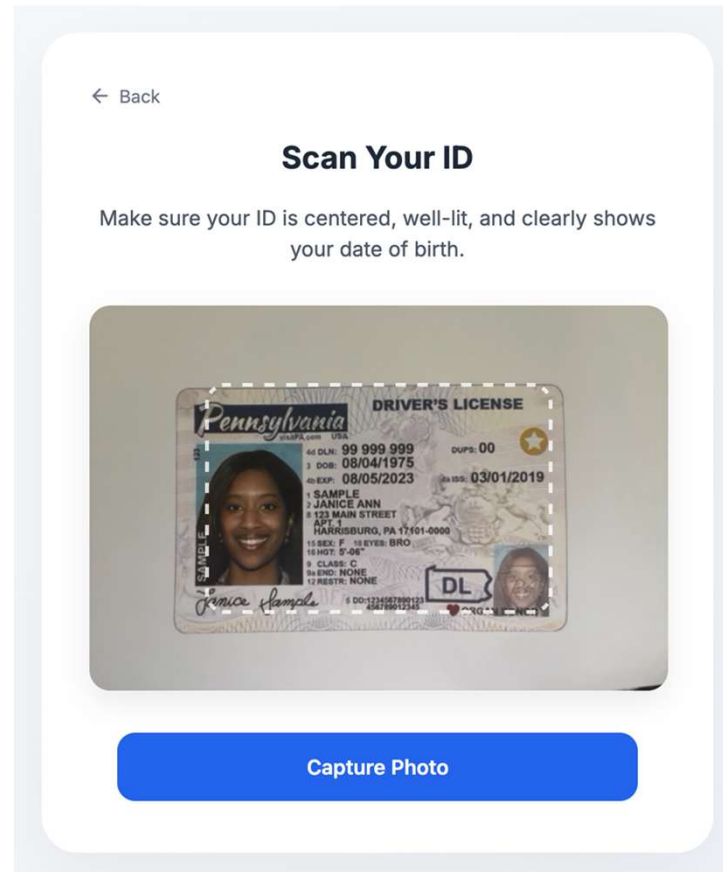
Choose how you'd like to capture your ID for age verification.
Accepted documents include: U.S. driver's license, passport, state ID, or permanent resident card.

 Use Computer Camera

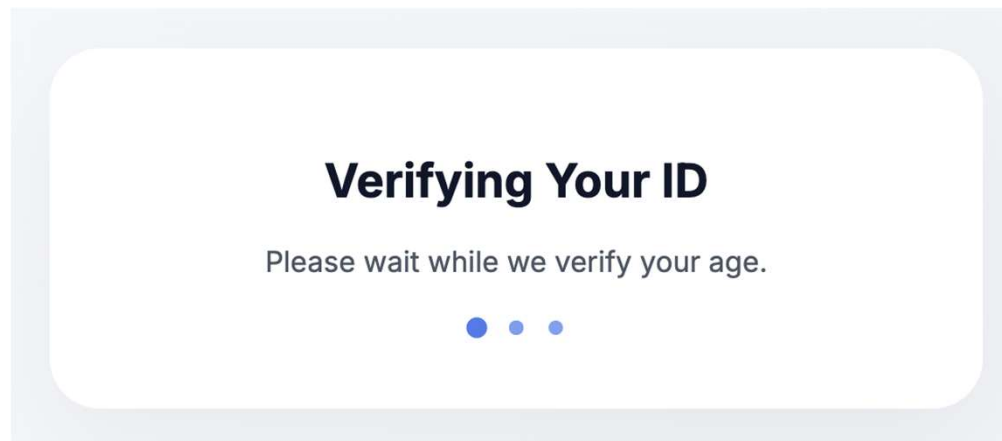
 Use Phone (QR Code)

© AgeGuardian. All rights reserved.
[Privacy Policy](#)

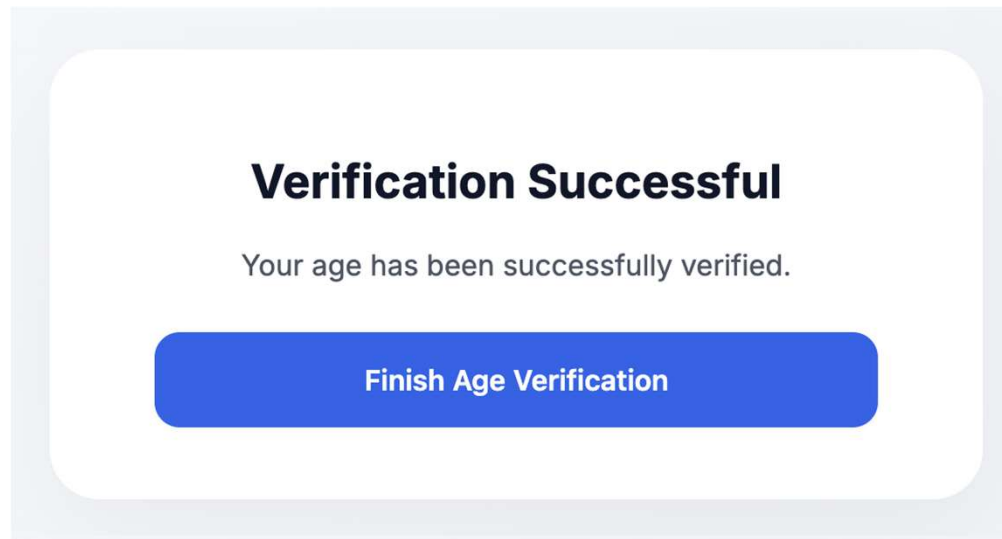
Verification Flow



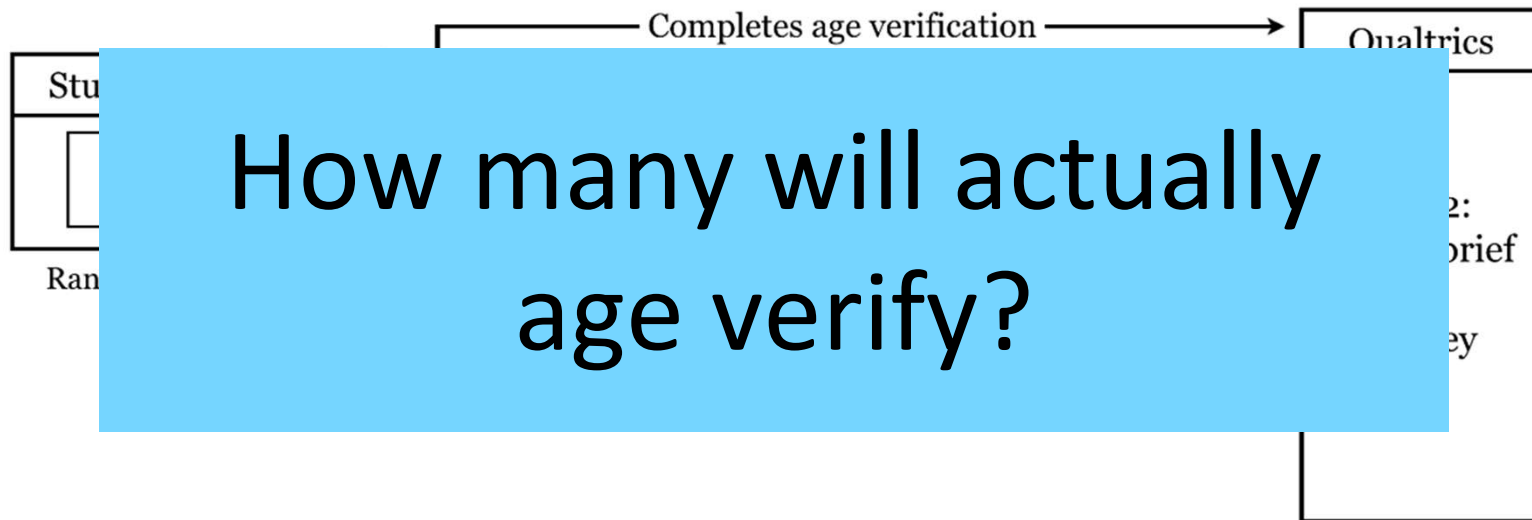
Verification Flow



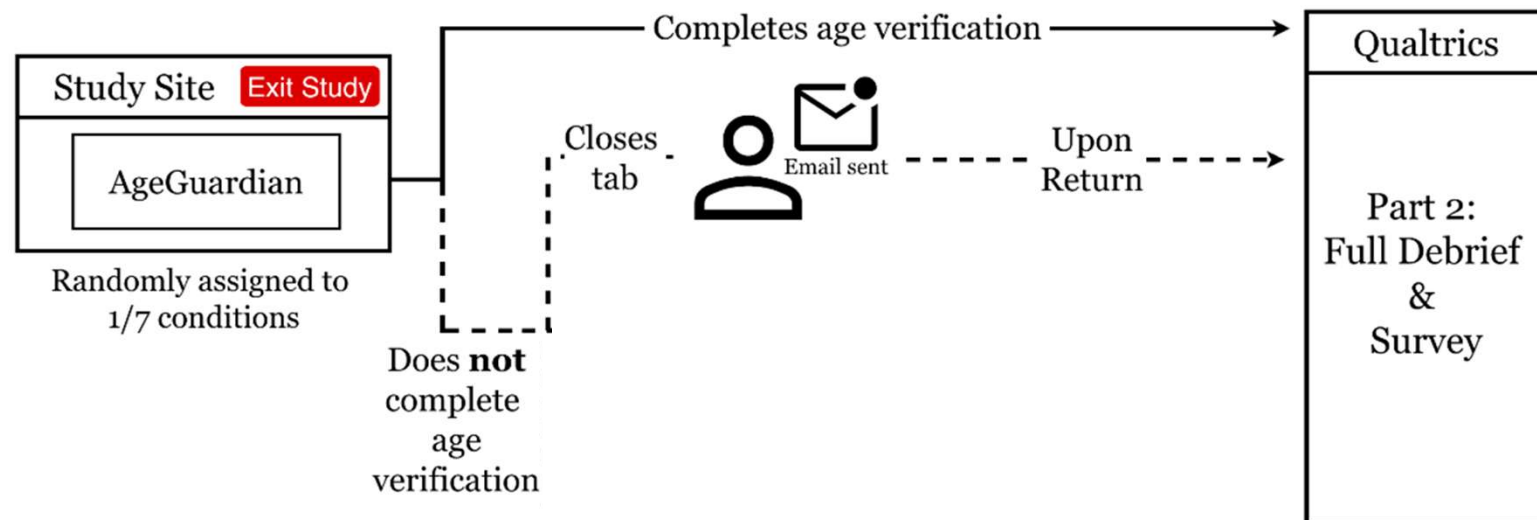
Verification Flow



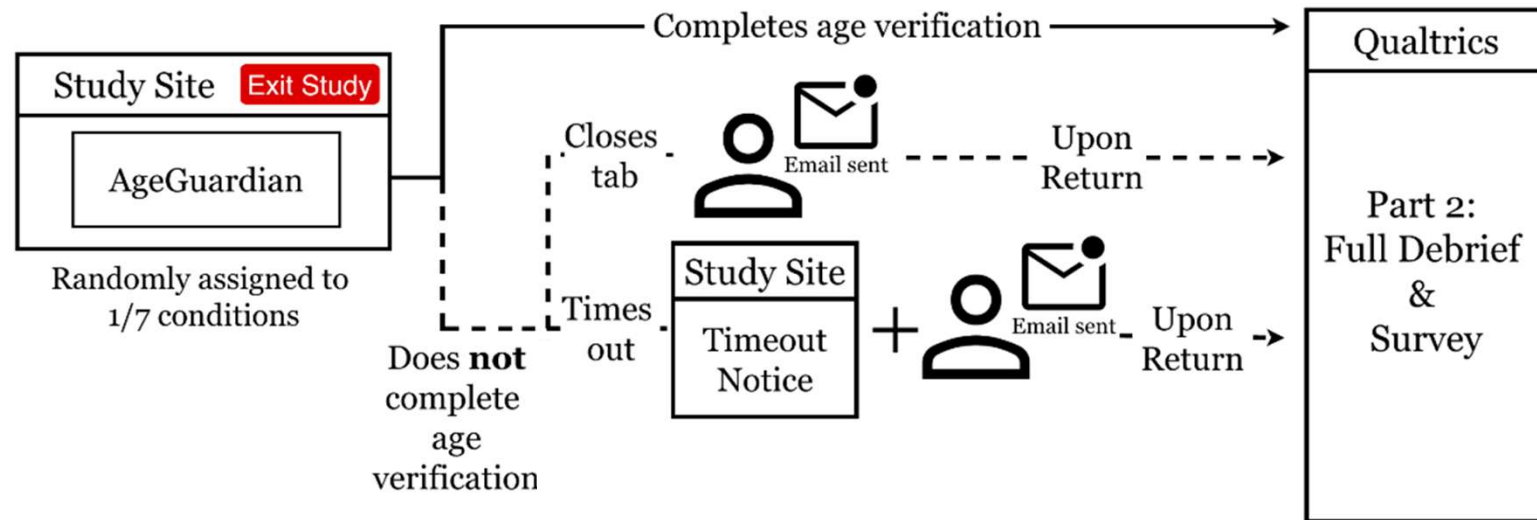
Study Flow (Completion Path)



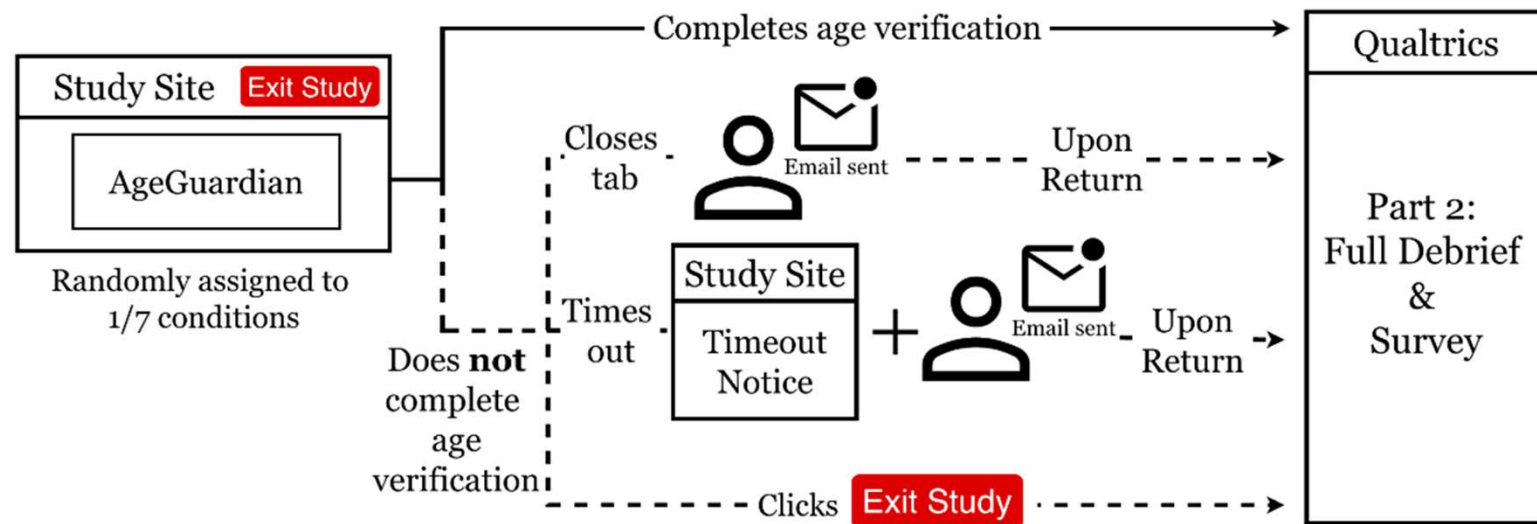
Study Flow (Non-Completion Paths)



Study Flow (Non-Completion Paths)



Study Flow (Non-Completion Paths)



Study Flow: Debrief

How would you like to proceed?

Continue participating and proceed to the survey portion of the study

- **True purpose disclosed**
- **Only web activity data was collected**

a full debrief

Keep my data in the study but do not participate in the survey portion

Part 2: Survey



Survey
on attitudes and
perceptions

- Explored comfort, perceived risk, effectiveness, and convenience with the process
- Prior experience with age verification
- Demographic information

Part 2: Survey



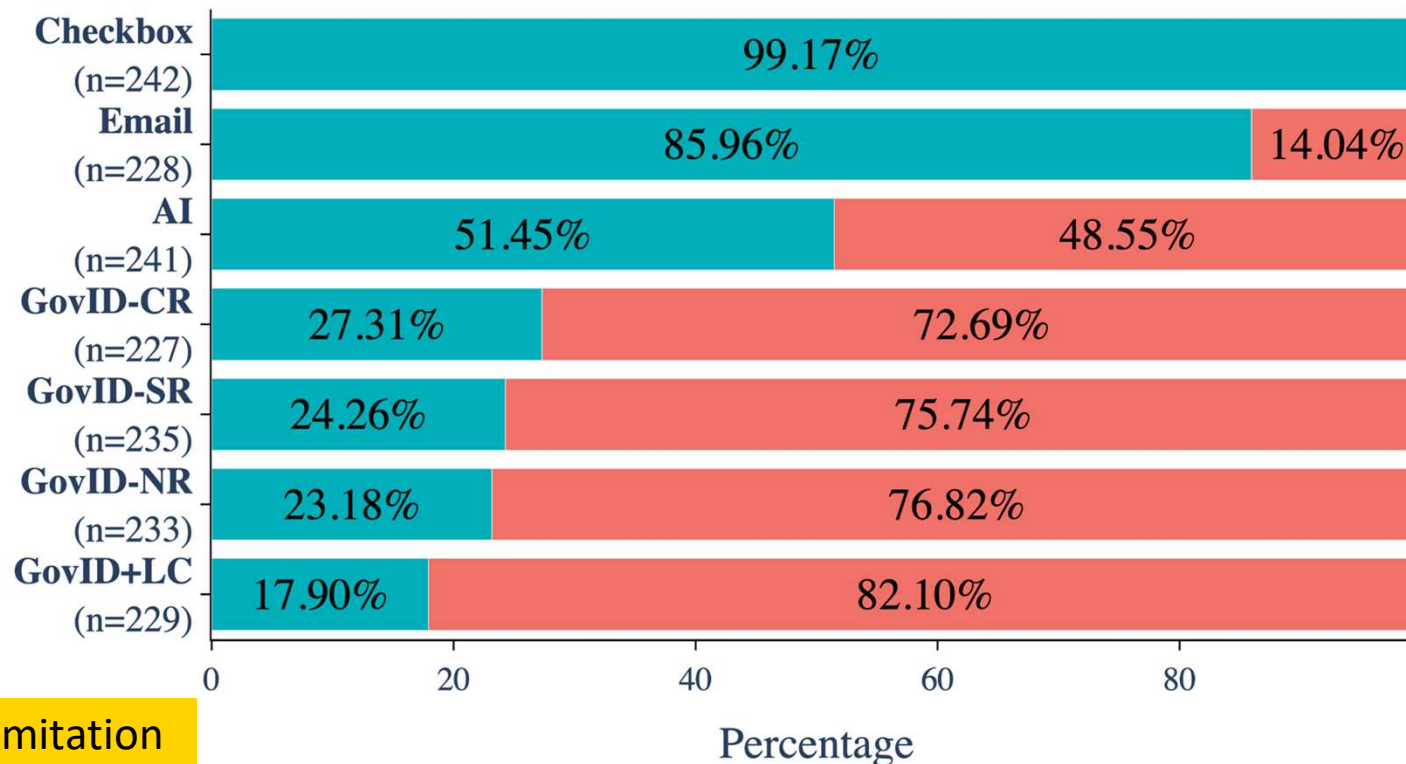
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Sample

- U.S.-based
- 84% recruited from Reddit, 13% from TrafficJunky, and 3% from Meta
- 1635 experiment participants (~230 per condition)
- 881 survey participants (~94 per condition)

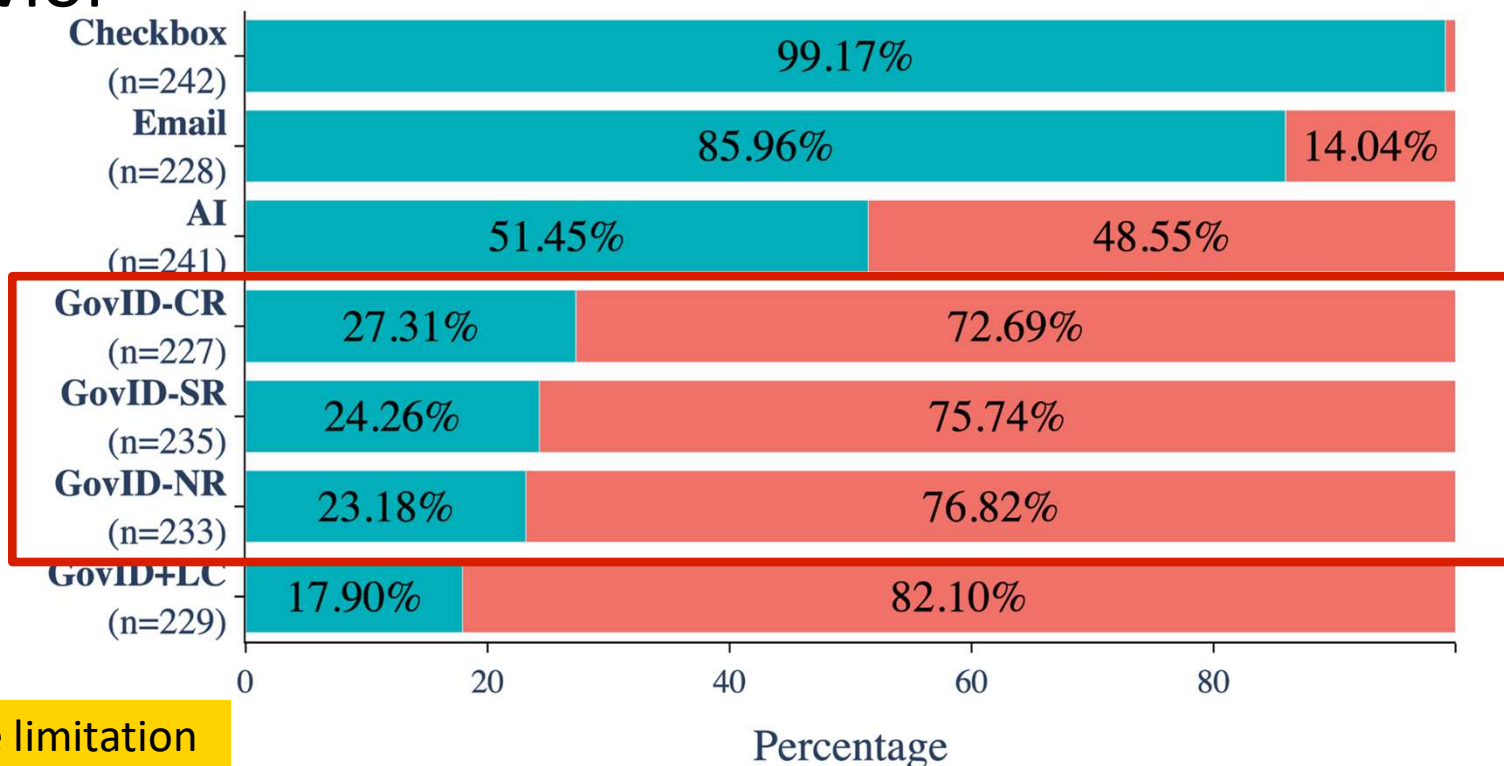
Results: Methods impact verification decisions



SR: purpose limitation
CR: purpose limitation
+ non-retention
LC: liveness check

■ Completed age verification ■ Did not complete age verification

Results: Reassurances do not change verification behavior



Not significant

SR: purpose limitation
CR: purpose limitation + non-retention
LC: liveness check

Reassurances affect comfort

“How did seeing [statement] impact your feelings about the age verification process?”

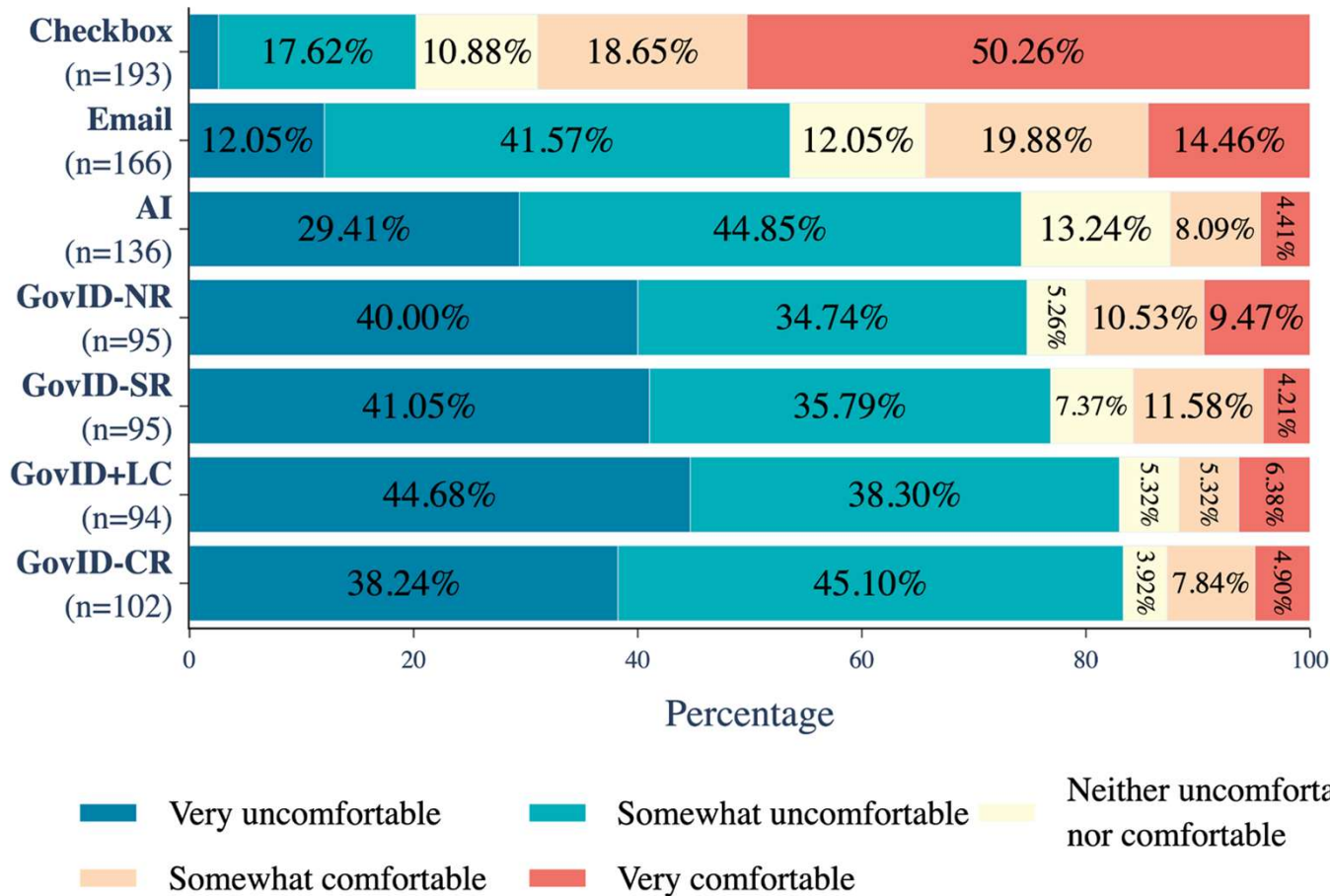
Among those who age verified: 48-57% reported **increase in comfort**

“I was less worried that my data would be exposed by hacking or data breaches in the future” (GovID-CR)

Among those who did *not* age verify: 56-76% reported **no change in comfort**

“I never really trust what they say about making sure the records used for verification stay separate or deleted from the list of verified users” (GovID-CR)

Survey Results on Comfort



Discomfort was common across all non-checkbox methods

Qualitative insights on discomfort

Most cited reasons for discomfort:

- Distrust in AgeGuardian or verifiers in general:

“I do not trust any private entity to securely store or process my information, period.” (GovID-CR)

- Security concerns about uploading PII:

“Given the proliferation of AI and deepfakes, I’d rather not upload an ID photo that could easily be used maliciously.” (GovID-SR)

Qualitative insights on discomfort

- Anonymity concerns:

“I don’t like the idea of my government ID being able to be tied to what I watch online.” (GovID-NR)

- Insufficient/inaccessible information on how data are collected, stored, and used post-verification:

“The only way to know if my photo would be deleted or stored would be to read through a dense terms and conditions statement that I would need to be an attorney to understand.” (GovID-CR)

Implications for Policymakers

- Reconsider government-ID requirements: Physical gov-IDs for age verification may lead to substantial adult non-compliance (~75% from gov-ID methods did not age verify)

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Tech Report:



Reasonable Age Verification Methods

(Texas H.B. 1181)

“Reasonable age verification methods” includes verifying the individual seeking to access the material is eighteen years of age or older by:

1. Providing **digital identification**; or
2. Requiring the individual attempting to access the material to comply with a commercial age verification system including the use of:
 - a. **Government-issued identification**; or
 - b. Any commercially reasonable method that relies on public or private **transactional data** to verify the age of the individual attempting to access the information is eighteen years of age or older.”