Measuring User Responses to Age Verification Architectures: Evidence from a Deceptive Online Experiment

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IAB/W3C Workshop on Age-Based Restrictions on Content Access

CyLab Carnegie Mellon University Security and Privacy Institute

User Behavior Toward Online Age Verification

- **User behavior is legally relevant**: Age verification laws aim to protect minors, but adults' access can be chilled if users don't perceive these systems to be trusted or usable
- **Compliance doesn't guarantee user adoption**: Systems can meet legal and technical requirements yet still fail if users avoid, mistrust, or abandon age verification
- We provide behavioral evidence on how adults respond to age verification

RQs

We conducted a deceptive, between-subjects online experiment to examine adults' behaviors and attitudes when faced with age verification while attempting to access a gambling site.

RQ1: How do different age verification methods affect users' decisions to access an online gambling site?

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

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

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

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Preliminary Study Design

Experiment
(participants randomly assigned to ⅙ conditions)

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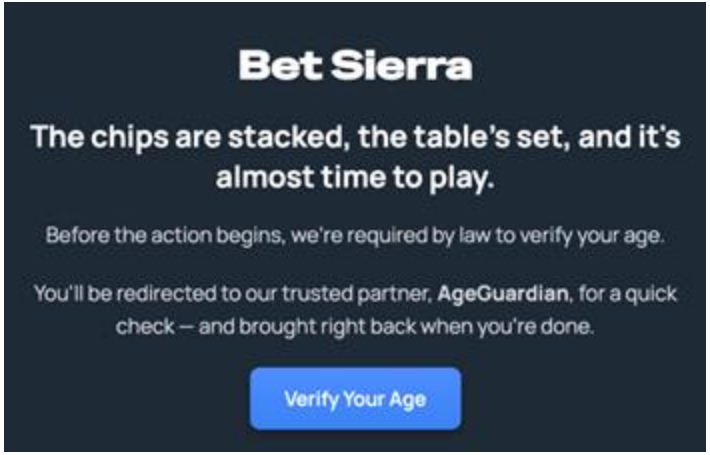
Survey
on attitudes and perceptions

- Recruited 99 U.S.-based participants (≥ 15 per condition) from Prolific
- Took 10 minutes to complete with $2.50 for compensation

Experiment Setup

recruited to “evaluate usability of gambling site” (deception!)

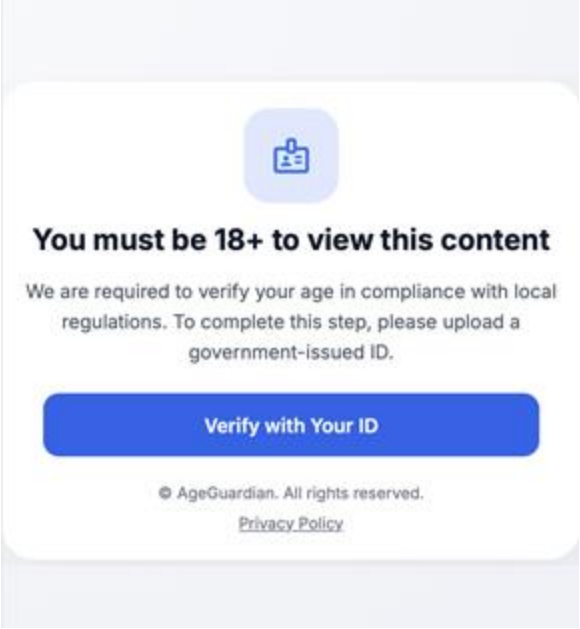
partial disclosure of study purpose; debrief provided after experiment



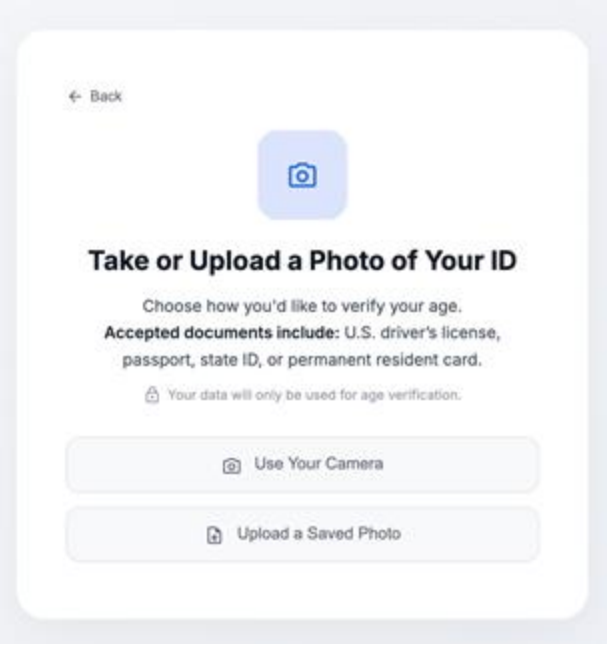
content gated by age verification before gaining access

Experiment: AgeGuardian

Transition Page

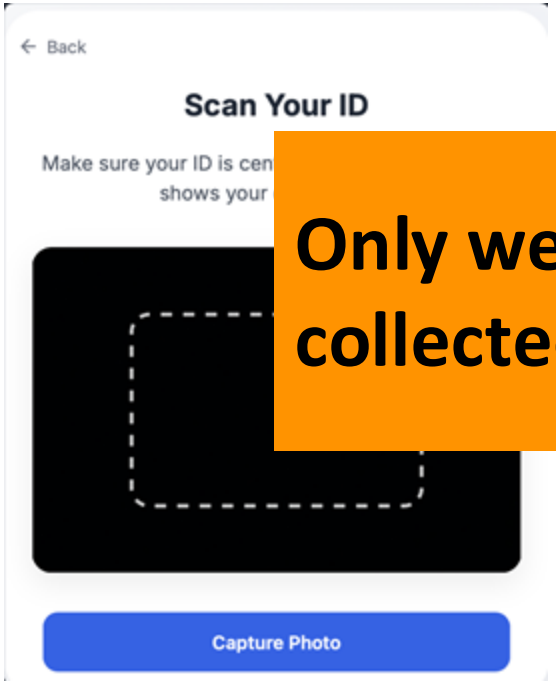


AV Requirement



Upload Options

Experiment: AgeGuardian



Only web activity data was collected, no photos were uploaded

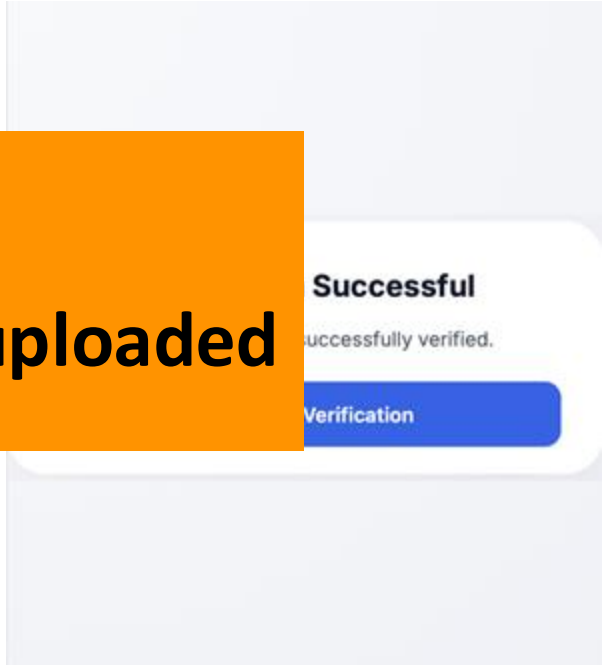


Photo Taking

Loading

Final Page

Experiment Conditions for RQ1

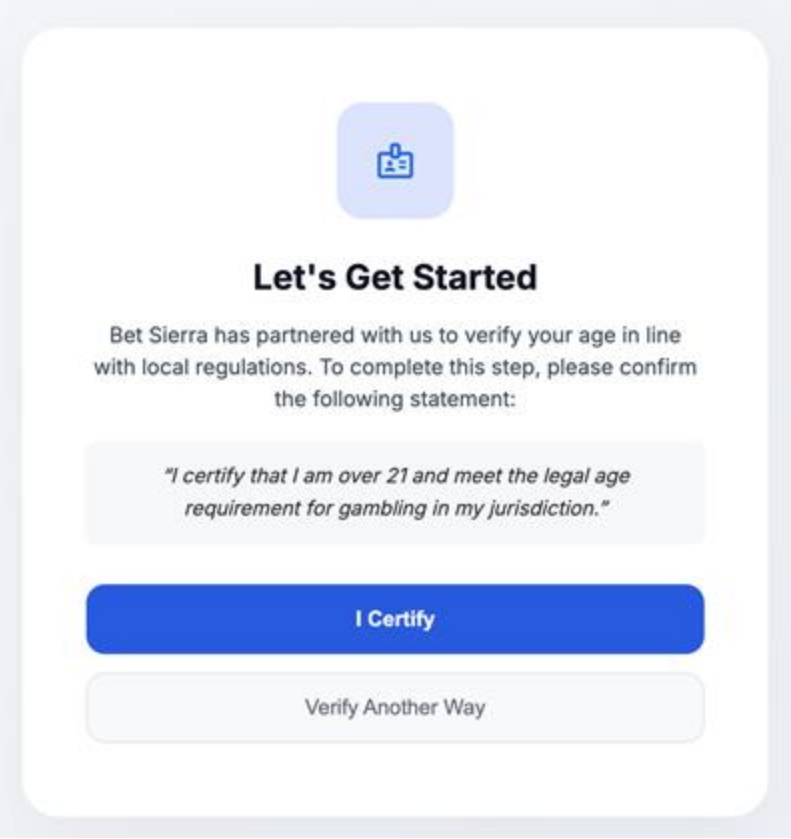
Checkbox
Self-Attestation

Gov-ID

Gov-ID with Real-Time Selfie
for Identity Matching

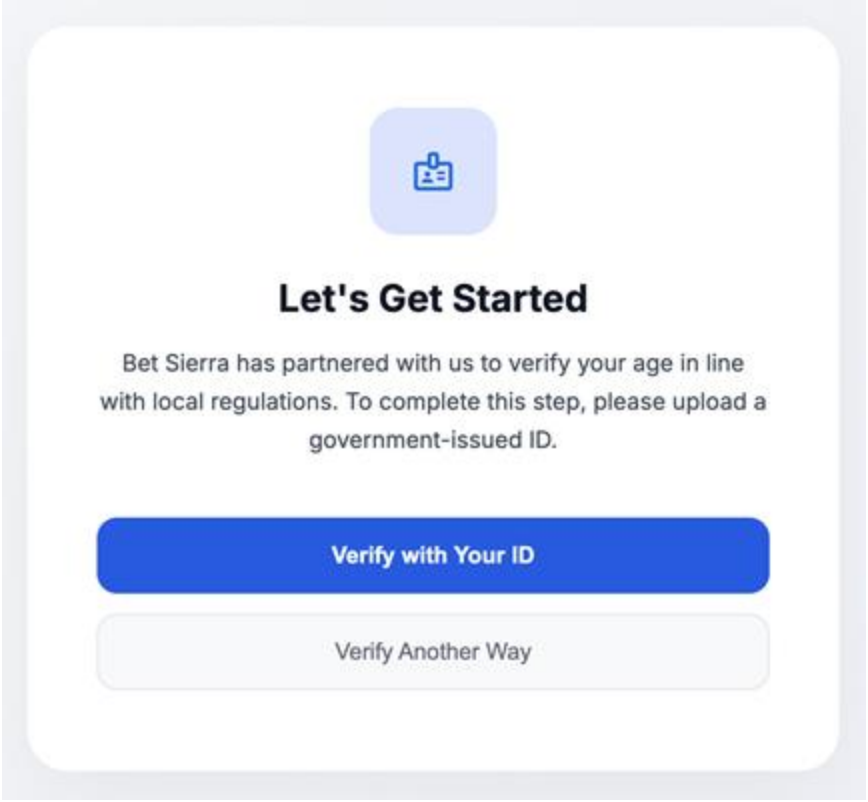
AI Age Estimation

Experiment Conditions for RQ1



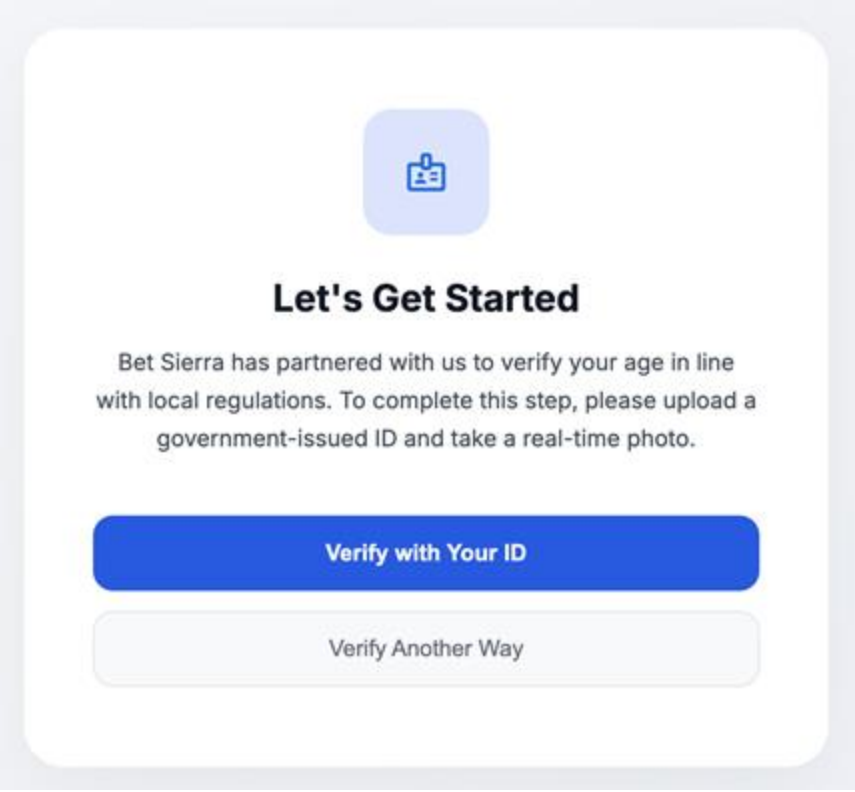
Checkbox
Self-Attestation

Experiment Conditions for RQ1



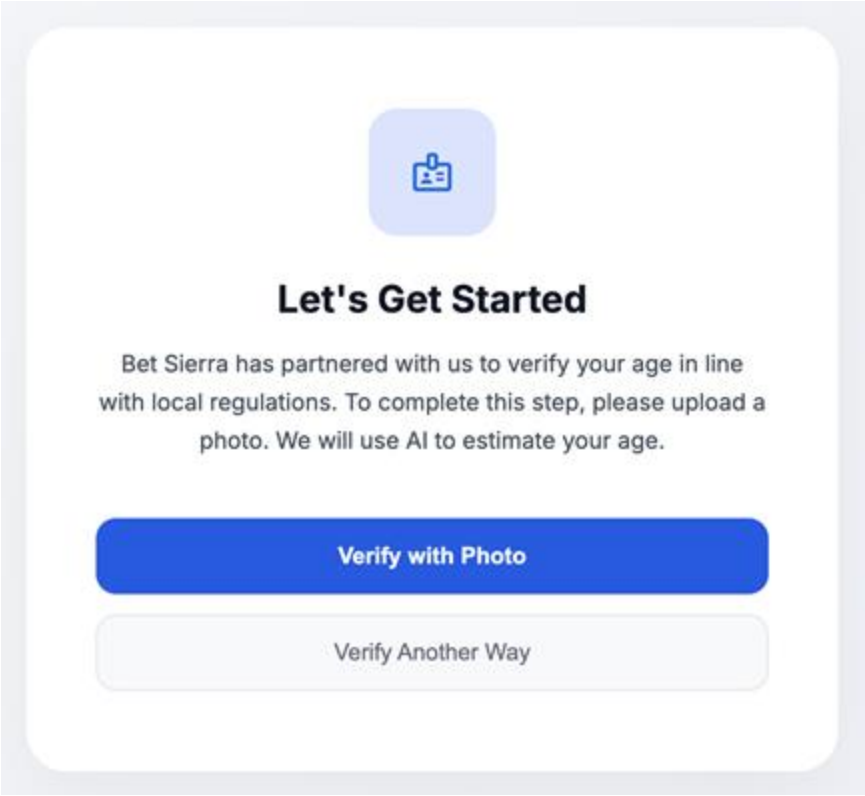
Gov-ID

Experiment Conditions for RQ1



Gov-ID with Real-Time Selfie for Identity Matching

Experiment Conditions for RQ1

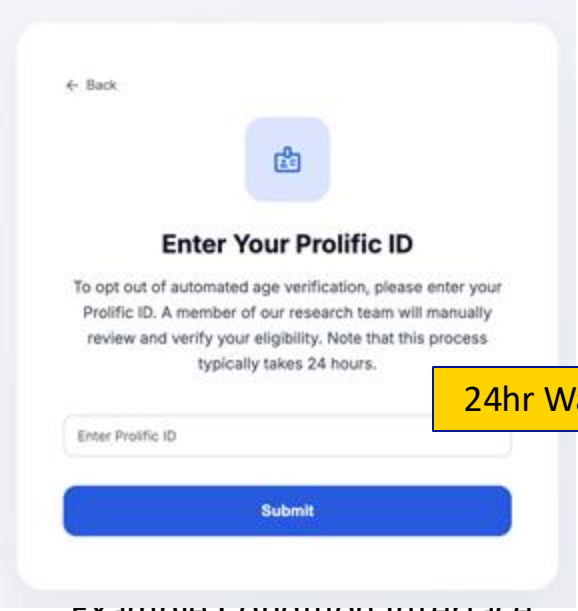


AI Age Estimation

Evaluation Metrics

RQ1: How do different age verification methods affect users' decisions to access an online gambling site?

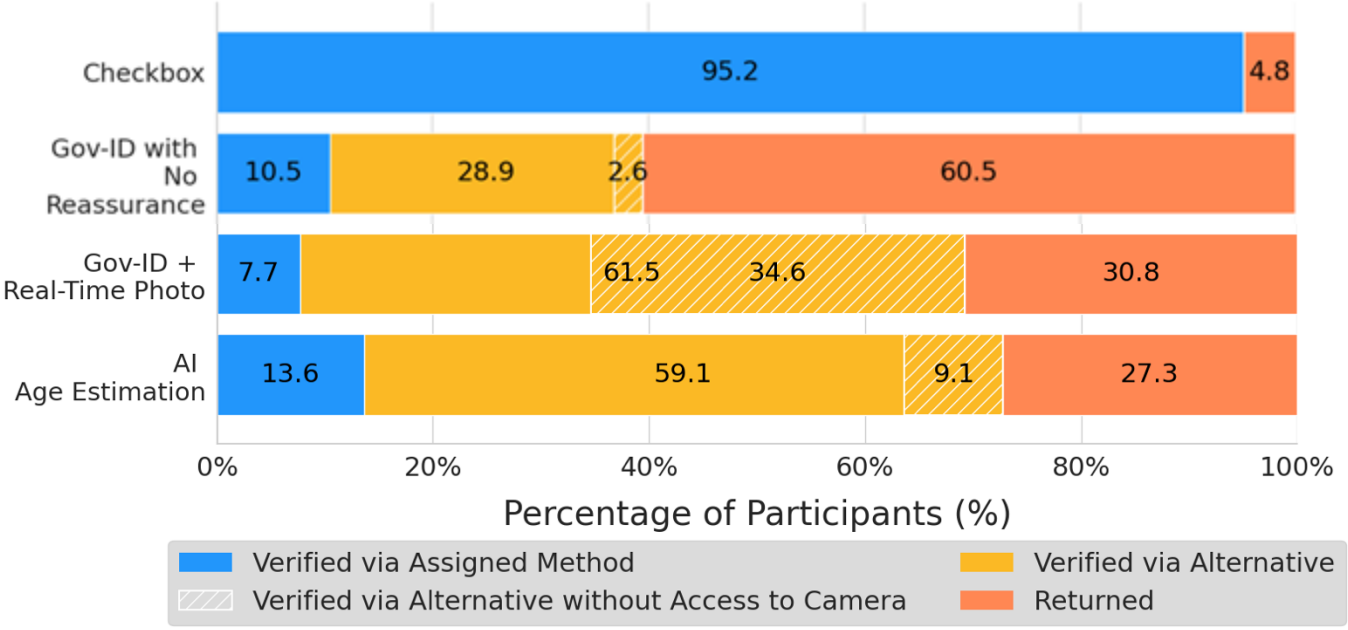
- Measured completion rates
- Measured alternative path usage
- Counted those who "returned" the study on Prolific after consenting



24hr Wait

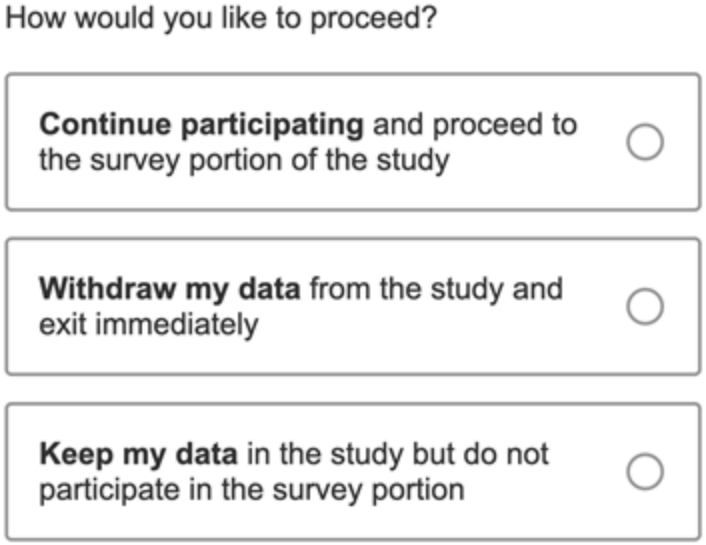
Example condition interface
Alternative method

Completion Outcomes Across AV Methods



Survey Setup

Those who did not return the study received a full debrief



Post-experiment survey exploring attitudes

Attitudes and Perceptions

- Distrust of unfamiliar site collecting their data:

  “I won’t be sharing any personal information or images with companies that I don't trust.”

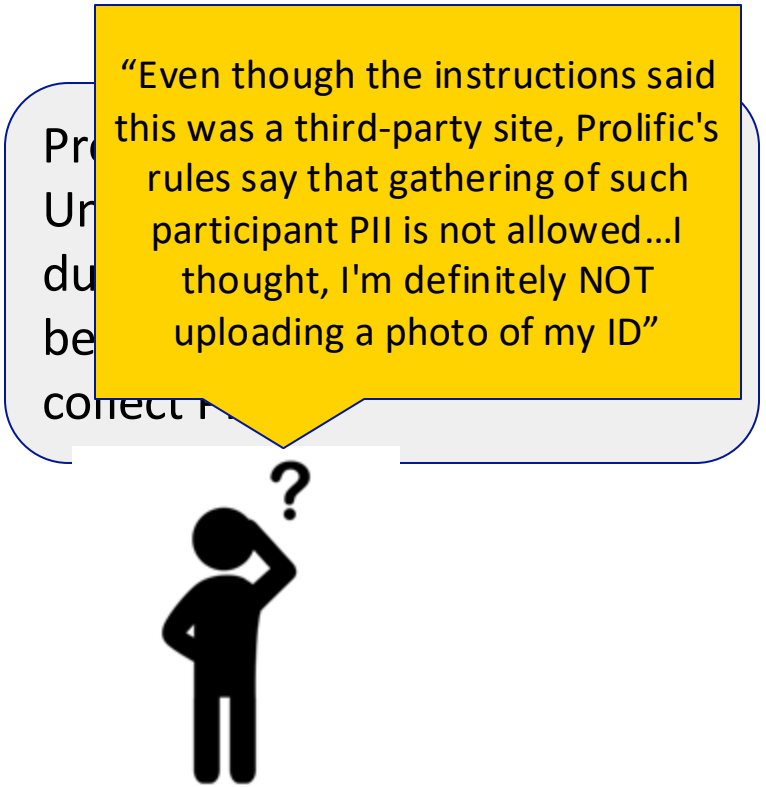
- Confusion about the multi-party architecture
- Self-attestation was easy to complete but not effective:

  “Not requiring additional verification beyond my confirmation made it seamless for me, but I have concerns with its ability to catch people who are under 21 who will lie.

- Skepticism about AI age estimation accuracy:

  “AI can glitch and ruin things for a lot of people.”

Limitations & Next Steps for Full Study



Limitations & Next Steps for Full Study

Gambling site typically requires ID verification for payment

Takeaways

- Participants avoided methods they found intrusive or technically demanding
- Participants distrusted unfamiliar parties collecting their data
- Multi-party architecture obscured user understanding of data flows and accountability

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