

# Consent in Context: Why One-Time Consent Falls Short in Adaptive Camera Framing

## Introduction

- The growing use of **adaptive camera framing** technologies (e.g. Apple's center stage camera, Samsung's Auto Framing) has introduced new privacy implications in video communication.
- These systems **automatically track** users, **adjust the framing**, and can sometimes include additional participants based on facial detection or audio cues.
- These systems **continuously scan** and **analyze** their **surroundings** and often process private visual and auditory data without explicit user consent.
- Currently, applications rely on a **one-time privacy-related consent** process during **installation** or **initial setup**.
- However, this static model of consent is **inadequate** in an era where **AI-driven features** can exhibit dynamic and often unpredictable behavior.

## Research questions

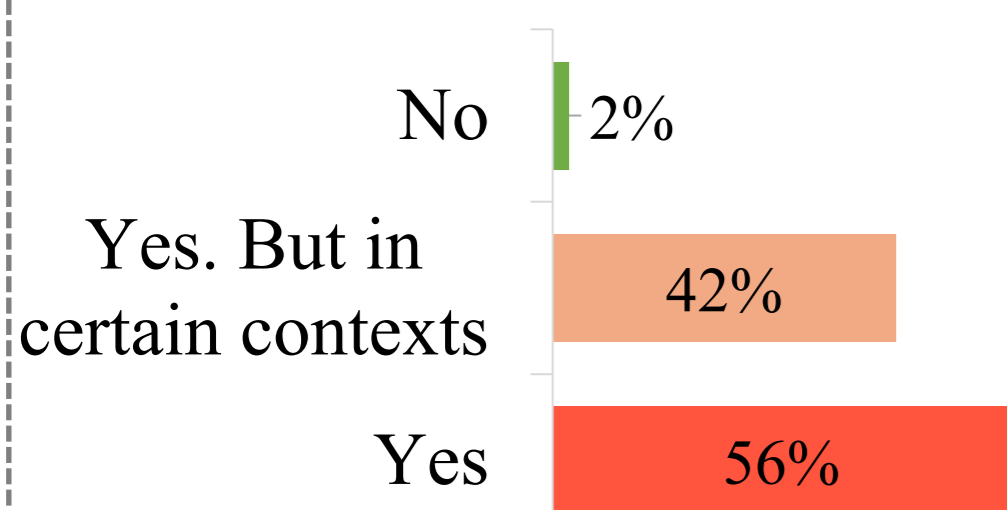
- RQ 1:** Does one-time consent align with user expectations and privacy needs in AI-powered applications?
- RQ 2:** What are users' perceptions of privacy when interacting with adaptive camera framing technologies during video communication?

## Methods

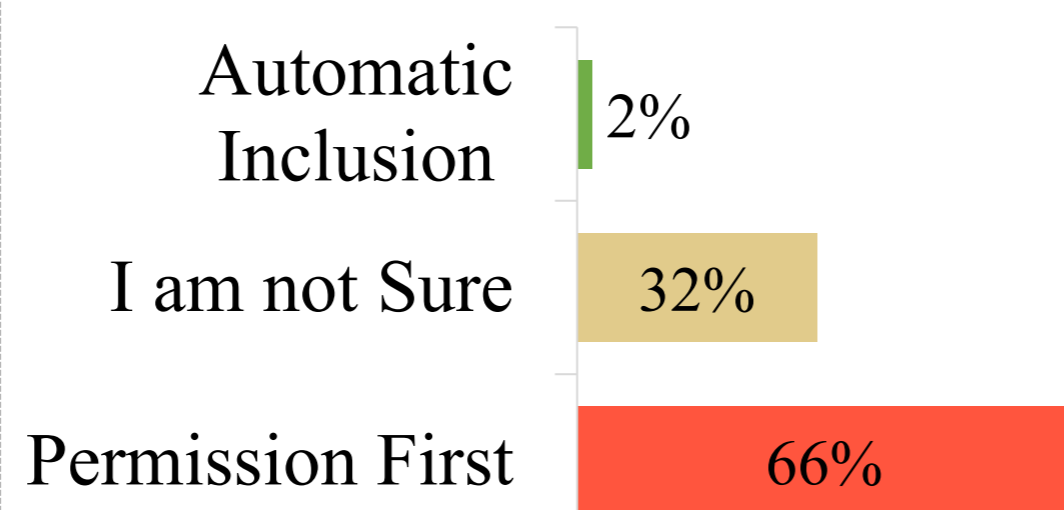
- We conducted an in-person survey with 50 participants, ensuring a roughly balanced gender representation.
- All over the age of 18 and **use smartphones** and make video calls at least **once a week**.
- The study took approximately 20 minutes. Two participants were randomly selected to receive a \$20 gift card.
- Participants were recruited in person due to the hands-on training component, which is difficult to conduct remotely.
- Participant engaged in a **hands-on** demonstration with **adaptive camera framing**, allowing them to observe how the camera dynamically adjusted the frame in response to certain events.

## Key findings

### Preference for notification before including others



### Automatic inclusion vs request permission

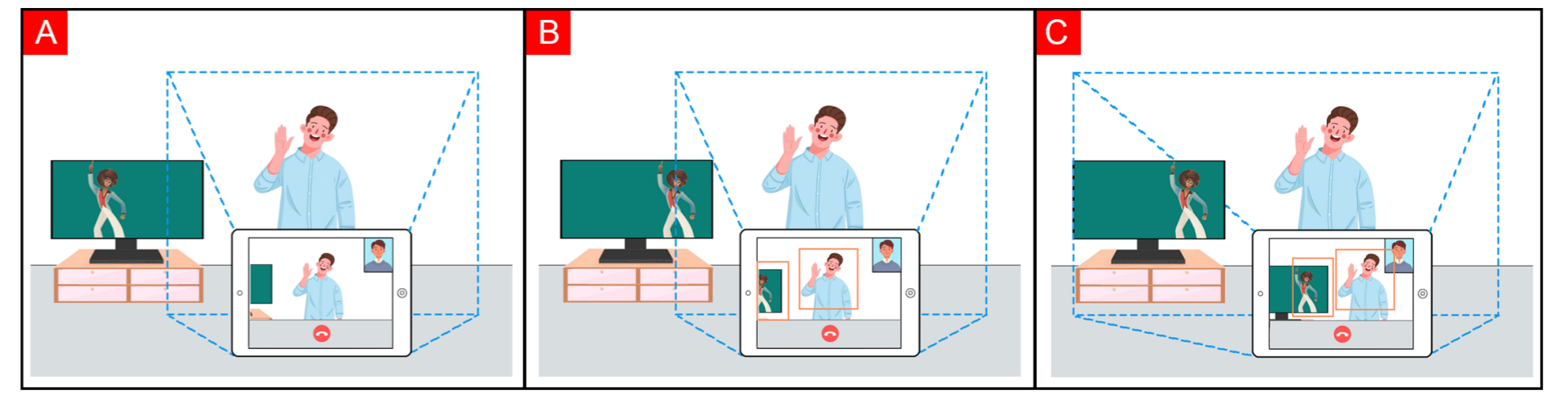


- A majority (56%) **supported prior notification**.
- Another 42% preferred **prior notification** but in **certain situations**.
- A majority (66%) wanted **explicit permission** from user before inclusion.

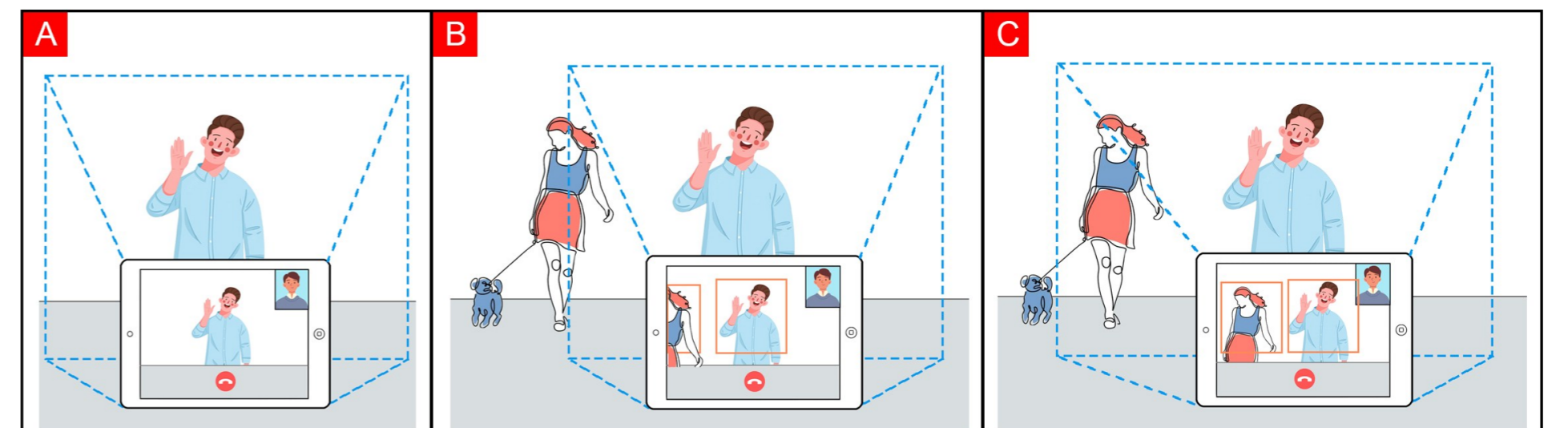
The current privacy consent model (One-time consent) is unable to fulfill user expectations and privacy needs in AI-powered applications.

## Privacy issues in adaptive camera framing

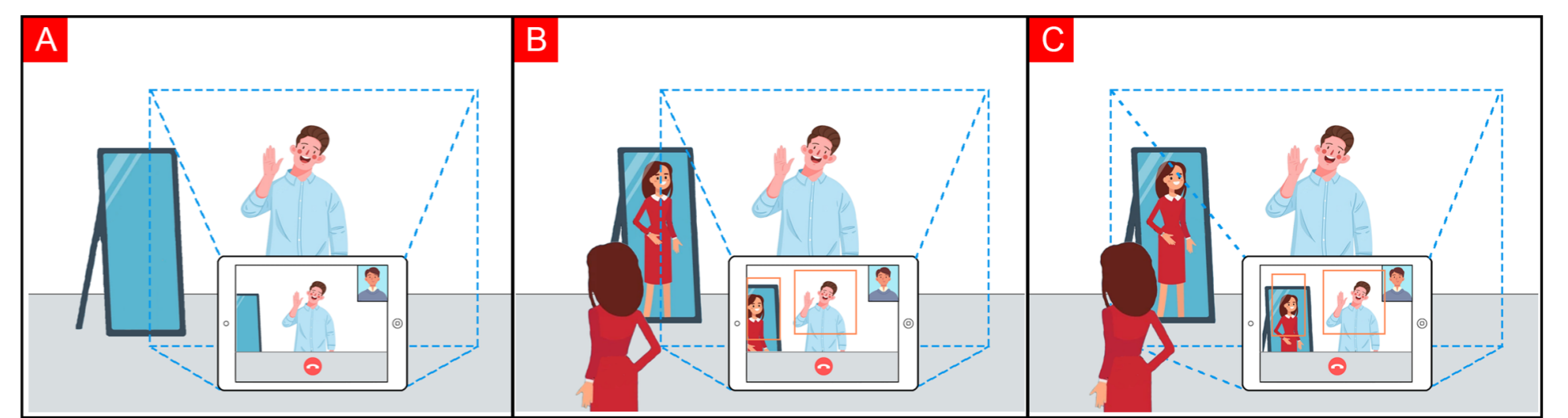
### Scenario 1: Inclusion of digital faces in the frame



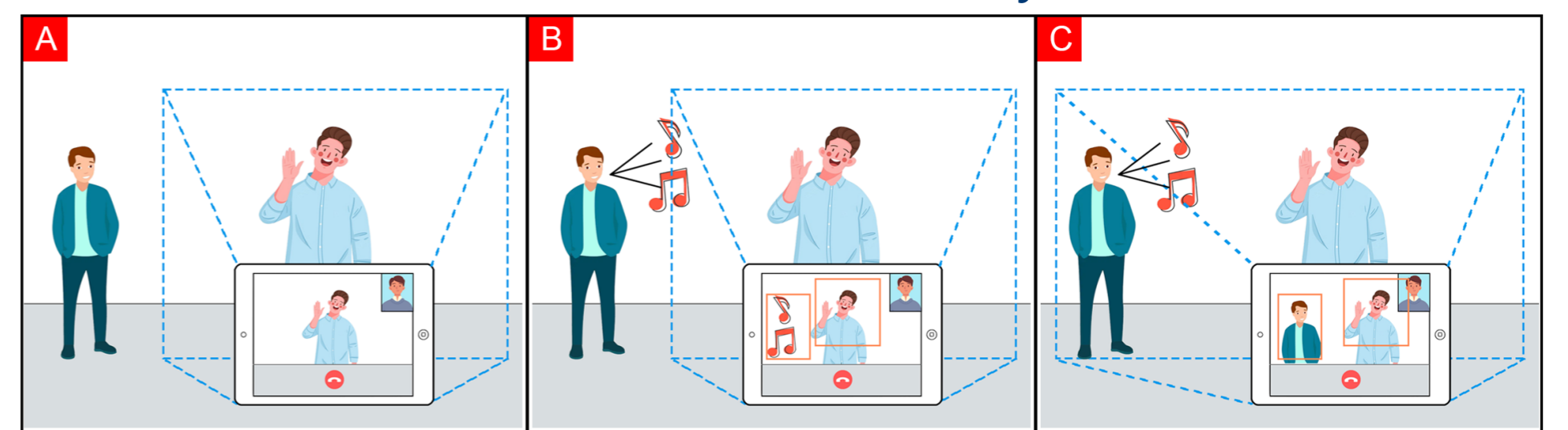
### Scenario 2: Inclusion of bystanders or passersby



### Scenario 3: Inclusion via reflective surfaces



### Scenario 4: Inclusion of human by audio cues

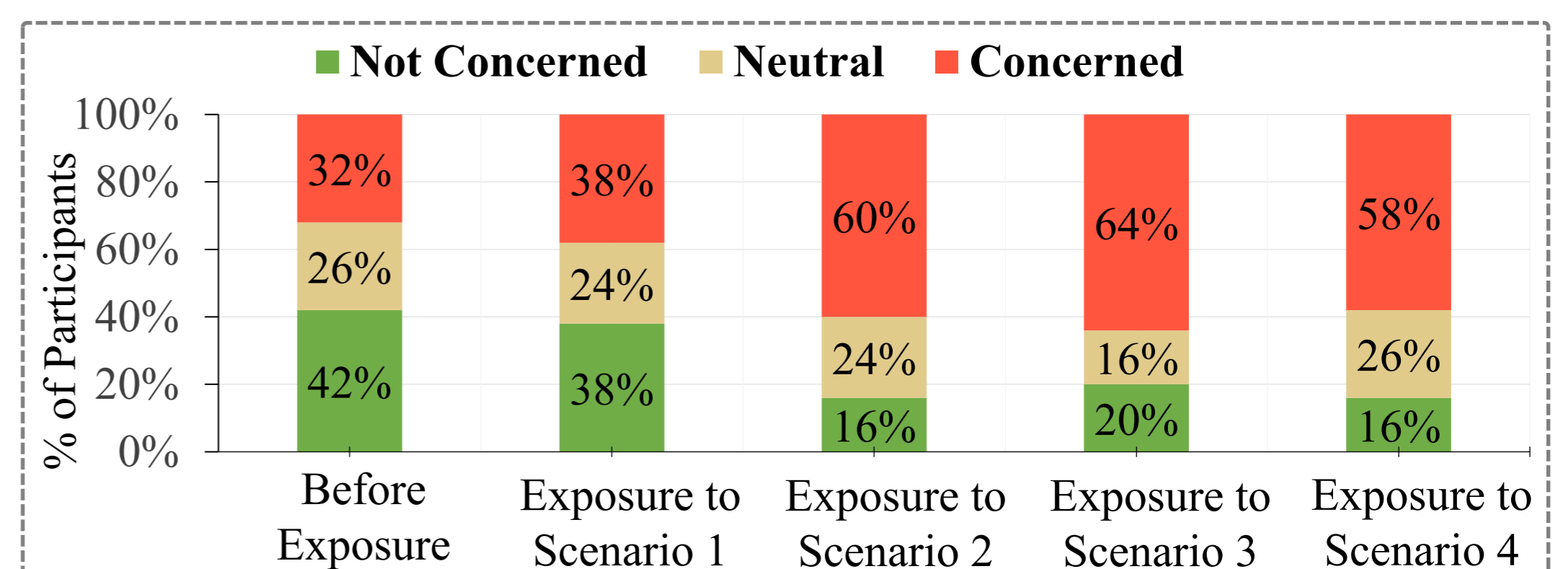


These behavior aligns with the intended functionality of adaptive camera framing. However, it may lead to the **unintentional inclusion of individuals who were not meant to appear in the video feed**.

## Target Stakeholder



## Users' perceptions of privacy when interacting with adaptive camera framing



- Initially, **42%** reported **not being concerned**, while **32%** expressed **concern** about adaptive camera framing.
- After exposure to the first scenario, **concern rose slightly to 38%**. Following the second scenario, **concern increased significantly to 60%**.
- In the third scenario, **concern rose further to 64%**. Finally, after the fourth scenario, **58%** of participants expressed **concern**.