

**Bots and professional survey takers: Recruitment challenges for tobacco regulatory science online surveys**

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**Background**

Online surveys can have lower cost and increased convenience relative to in-person surveys. Bots and professional survey takers present recruitment challenges. We describe issues encountered and risk mitigation strategies employed by the Vaping and Patterns of E-cigarette use Research (VAPER) Study.

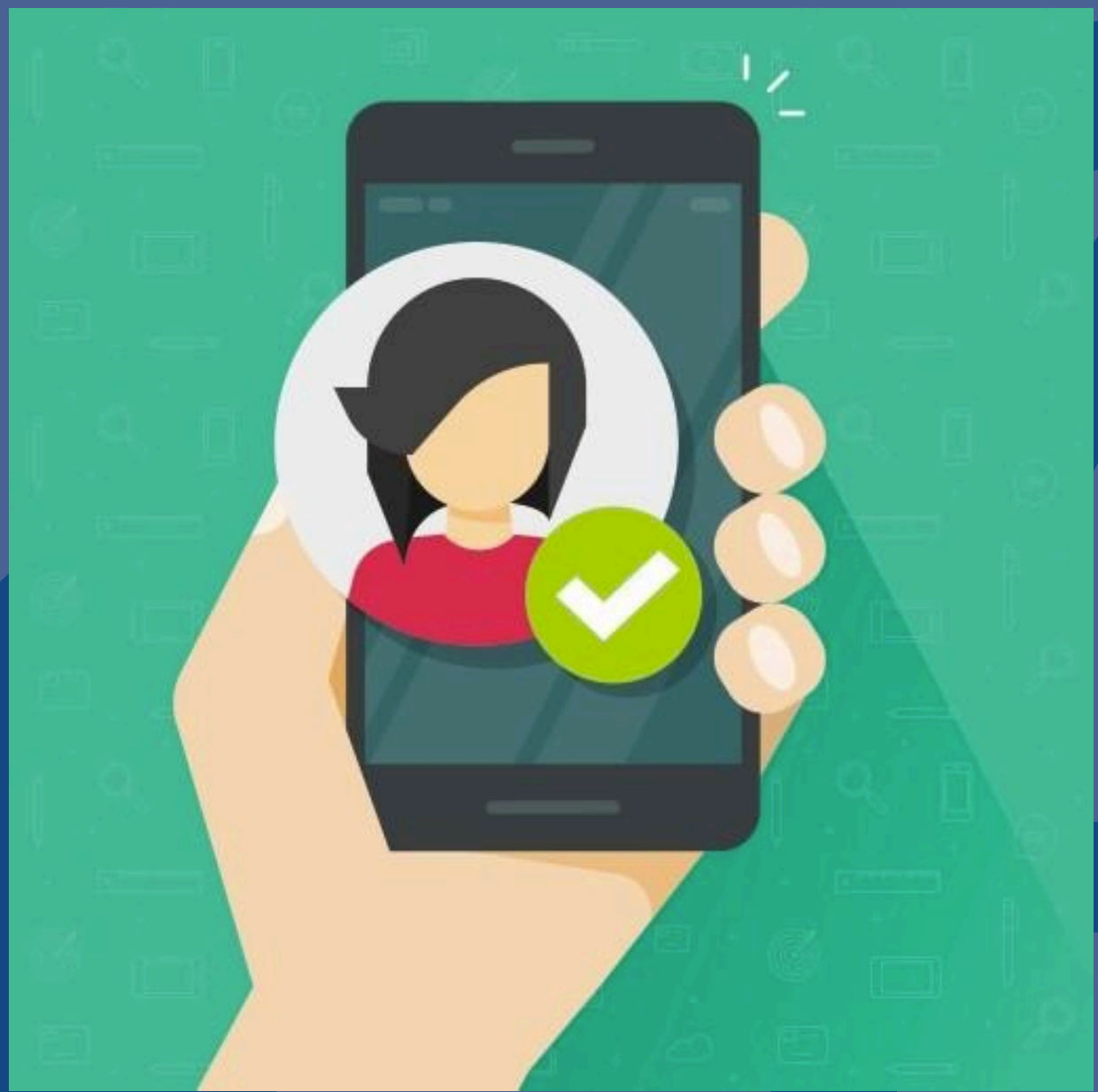
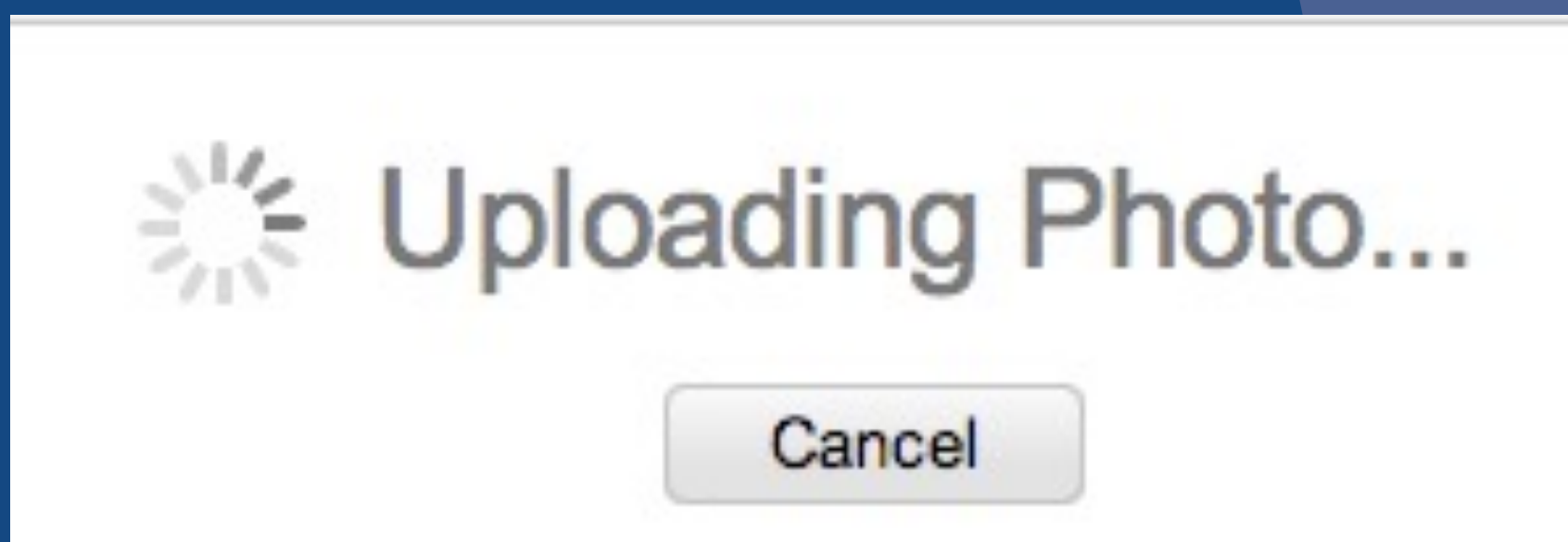
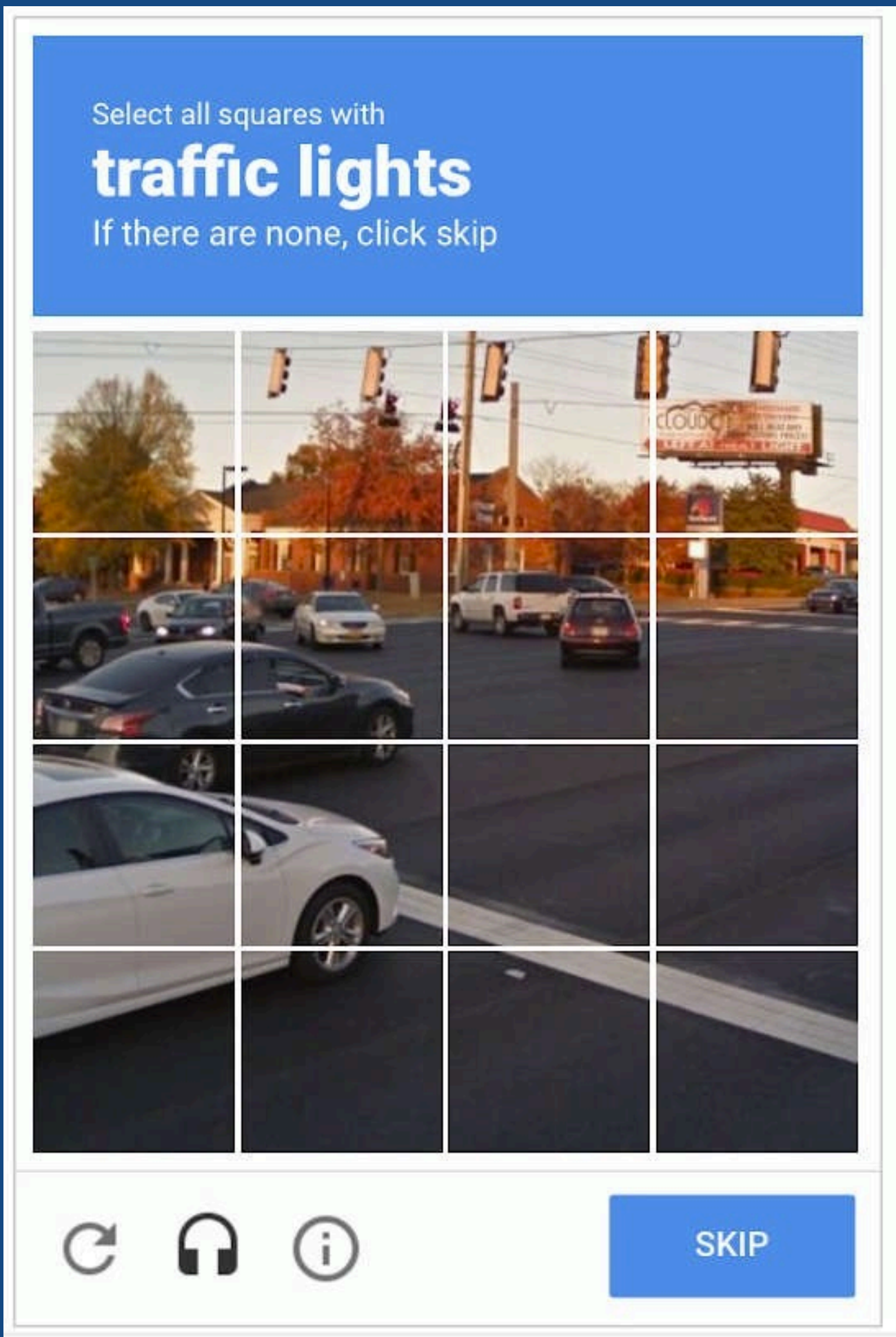
**Study details**

- We conducted an online cohort survey recruiting adults (21+) who use ENDS 5+ days/week.
- Initially, we aimed to recruit 1200 participants using social media ads in three U.S. cities.
- The survey was anonymous, incentives were delivered by email with minimal review, and fraud detection software was used to prevent multiple completions by each participant.

**Challenges**

- Recruitment began slowly (1-10 submissions per day per city) but accelerated to 11-124, raising concerns that halted data collection.
- Survey submissions (n=1624) were investigated for evidence of bots or professional survey takers; 363 survey submissions were assessed to be valid.

# Bots and professional survey takers create challenges for online surveys; these can be mitigated using specific strategies



**Solutions**

- We restarted recruitment and implemented a risk mitigation strategy.
- Participants were required to undergo identity verification using LexisNexis, CAPTCHA, two-factor authentication, data quality reviews, and were mailed their incentive (via USPS).
- High costs and slow recruitment also forced a transition to Craigslist postings (125 locations). Subsequently, data quality was high.
- Despite these efforts, a sophisticated bot breached our procedures, in part, by using personal information likely obtained from the dark web; these submissions were removed.
- Additional mitigation procedures included requiring a photo of participants' ENDS, verifying photos were unique and authentic, and regularly reviewing open-ended responses. We have since completed three waves.

**Conclusions**

- Online data collection is a promising methodology but strong risk mitigation strategies must be implemented to ensure data quality.

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Competing Interests: Dr. Eissenberg is a paid consultant in litigation against the tobacco industry and also the electronic cigarette industry and is named on one patent for a device that measures the puffing behavior of electronic cigarette users, on another patent application for a smartphone app that determines electronic cigarette device and liquid characteristics, and a third patent application for a smoking cessation intervention.