Testing the TikTok algorithm: Can underage TikTok users elicit e-cigarette content recommendations?

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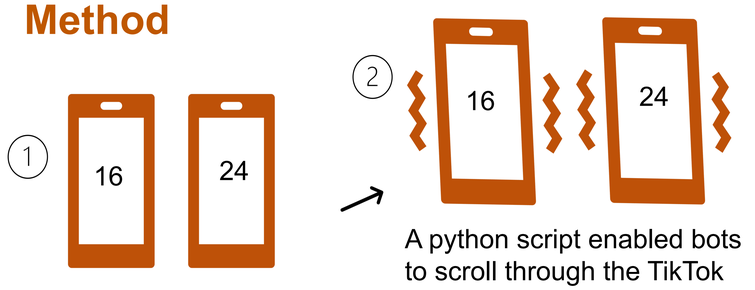
Introduction

- Social media has enabled the rapid spread of **e-cigarette** content.
- **TikTok** is a video app **popular with youth** (60% of users are **under the age of 18**).
- TikTok is **a source of exposure** to vaping products.
- Studies show a **history** of **TikTok** routinely **recommending age-inappropriate content.**
- We assess whether **heavy engagement** with vape content on TikTok leads to an increase in **recommended videos** that feature **vape content**.

Key Question:

Does engagement with vape content on TikTok lead to greater exposure to vape content?

Method



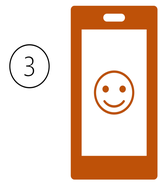
We created two fictitious user profiles (bots):

1. The first one: 16 years old (**underaged)**
2. The second one: 24 years old **(young adult)**

A python script enabled bots to scroll through the TikTok feed (recommended content)

The bots' engagement with recommended content was **dependent** upon if the videos contained vape-related content or not.

Experimental Manipulation



Videos with No Vape Content
- Bots watched only **10% - 30%** of the video
- Did not comment on the post
- Continued scrolling

Videos with Vape Content
- Bot watched **60% - 80%** of the video
- Made a comment from a set of pre-defined text (e.g., "vapes are cool!")
- Continued scrolling

N=492 N=483

The total recommended videos encountered by the bots were retained for analysis

Content Analysis

Text: Topic Analysis
- We employed the **BERTopic** machine learning algorithm on both datasets to identify vape-related content.
  - **BERTopic** is an unsupervised machine-learning method that clusters text into discrete topics.

Videos: Object Detection
- We employed an object detection algorithm derived from our previous work.
  - This algorithm detects and locates vape-related objects and activities in the frame (e.g., vape products, smoke clouds) in a video.

Results

Qualitative Analysis

16-year-old bot

Text
We found **0.08%** of **492** recommended posts contained **vape-related** hashtags (4 posts).
- Video content
  - Manufacturing process
  - Vape tricks using household items

Video
We found **1 video (0.02%)** containing **vape-related** content
- Video content
  - Subject refilling a vape
  - Subject vaping

24-year-old bot

Text
We found **NO** recommended posts contained **vape-related** hashtags.

Video
We found **NO videos** that featured **vape-related** video content

Conclusion

- We found **very few cases** of **vape-related** content recommended to our experimental, **underaged bot**, and **none recommended** to our experimental **young adult bot**.
  - This was despite our manipulation to ensure **heavy engagement** with **vape content on TikTok**. This may indicate that **TikTok's algorithm** is somewhat successful in restricting vape content **in general.**
- Our data suggest that **heavy engagement** could lead to exposure of **200+ videos per year**.
  - Underscores the need to strengthen policies to protect the **~600 million underaged users** on this platform.
- **Future Studies**
  - The TikTok algorithm is **not transparent** and thus NOT directly observable. This underscores the need for **expanded experimental methods** (like those performed in this study) to approach any semblance of independently verifiable **platform accountability**.

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