

Following e-cigarette conversations on Twitter using artificial intelligence

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The advertising of nicotine products is highly restricted, but social media allows a way for these products to be marketed to young people. What's more, e-cigarette flavorings make them particularly appealing to teenagers and young adults. A team of researchers have developed machine learning methods to track the conversations on social media

about flavored products by one of the most popular e-cigarette brands, JUUL.

"An increasing amount of discussions on e-cigarettes is taking place online, in particular in popular social [media](#) such as Twitter, Instagram, and Facebook. As the content related to e-cigarettes is often targeted at youth—who are also very active on many [social media platforms](#)—it is important to explore these conversations' says Dr. Aqdas Malik, postdoctoral researcher in the Department of Computer Science at Aalto University.

Previous research has shown that [young people](#) find the flavoring of e-cigarettes appealing, and Malik himself has used AI to study how vaping companies are using Instagram to promote their products to young people. In their new work, the team developed machine learning methods to study key themes and sentiment revolving around the Twitter conversations about JUUL flavors.

The team analyzed over 30,000 tweets, and found many positive tweets about the different flavors. "Popular flavors, such as mango, mint, and cucumber are highly appealing but also addictive for young people, and must be further regulated," said Malik. "There is also a need to cap the promotional activities by e-cigarettes retailers such as giveaways, announcing new stock arrivals, discounts, and "buy more, save more" campaigns."

Overall, the tweets were overwhelmingly positive in tone, though some arguments were made against the product and the addictiveness of its flavors. Another core theme among negative conversations was proposed legislation, mostly from anti-tobacco campaigners and news outlets.

The team hopes that the AI tools that they have developed, which are built upon the open-source BERT platform by Google, could be used by

regulators to help monitor how [e-cigarette](#) products are promoted to youngsters. Trained on web-based data, Google BERT is a relatively new machine learning technique for [natural language processing](#) and has been previously shown to excel at predicting sentiment—allowing the team to label individual tweets as positive or negative.

While this work has focused on Twitter messaging, the tools used can be easily applied to textual data on other [social media](#) platforms, too. For the next stage of their work, Malik's team will apply their machine learning methods to understand trends in how people talk about e-cigarettes and other substances on TikTok, Reddit, and YouTube.

The paper, "Modeling Public Sentiments about Juul Flavors on Twitter through Machine Learning," is published in *Nicotine & Tobacco Research*.

More information: Aqdas Malik et al, Modelling Public Sentiments about Juul Flavors on Twitter through Machine Learning, *Nicotine & Tobacco Research* (2021). [DOI: 10.1093/ntr/ntab098](https://doi.org/10.1093/ntr/ntab098)

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