



**THE ASSOCIATION OF ADOLESCENT E-CIGARETTE HARM PERCEPTION TO  
ADVERTISING EXPOSURE AND MARKETING TYPE**

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**Introduction**

Adolescent electronic cigarette (e-cigarette) use has witnessed a dramatic increase over the past decade. 27.5% of high school students and 10.5% of middle school students reported e-cigarette use in the latest nationally representative survey. There is a general consensus amongst public health experts that the variety and intensity in marketing practices from e-cigarette companies has contributed to the general increase in tobacco use, particularly for adolescents. An estimated 70% of American adolescents have been exposed to e-cigarette advertising, often on television, social media, or in local stores. Past research overwhelmingly suggests that increased exposure to e-cigarette advertising is associated with an increased likelihood of future e-cigarette use and decreased perception of e-cigarette harm. Adolescents view e-cigarette advertising in a variety of formats, the most common of which are social media, television, newspaper, radio, and billboard. Research indicates that exposure to any of these aforementioned forms of advertising is associated with reduced e-cigarette harm perception, but there is limited research comparing these forms of advertisement to one another in terms of their influence on harm perception. Conversely, anti-tobacco marketing can have the opposite effect. Viewing anti-tobacco ads or health label warnings as well as reporting that close family and friends have negative views regarding e-cigarettes is associated with increased harm perception. The present study examined the associations between adolescent e-cigarette harm perception and five separate types of e-cigarette advertising exposure: social media, radio, billboard, newspaper and television, with and without controlling for several measures of anti-tobacco exposure and environmental support. These findings should provide a stronger understanding of how pro and anti-tobacco advertising interact with one another to shape perceptions of e-cigarettes within the adolescent population.

**Methods**

This study used data from the Population Assessment of Tobacco and Health (PATH) survey questionnaire study. Data were obtained from youth wave 4.5, composed of participants aged 12-17. For the outcome variable of harm perception, a cumulative factor score was derived based on three separate items pertaining to harm perception in the PATH questionnaire. Additionally, four covariates (number of friends using e-cigarettes, family/friend views on e-cigarettes, self-reported exposure to tobacco health label warnings, past year exposure level to anti-tobacco advertising) were selected to be controlled for in our statistical analysis. Linear regression analyses were performed to analyze the association between past 30 day exposure to each form of advertising and our factored harm perception variable, with and without controlling for the

effects of the selected covariates. A p-value of 0.05 or lower was considered to be statistically significant.

## **Results**

The sample was composed of 12,570 adolescents aged 12-17. Unadjusted for the effects of our selected covariates, past 30 day exposure to newspaper, radio, billboard, and social media advertising was correlated with reduced adolescent harm perception, yet this association was only statistically significant for social media and newspaper ( $p < 0.001$ ). After adjusted for our selected covariates, the association between advertising exposure and reduced harm perception was weakened for each form of e-cigarette advertisement. Additionally, a statistically significant association was found between increased e-cigarette harm perception and exposure to radio, billboard, and television advertising.

## **Conclusion**

While past e-cigarette marketing research overwhelmingly indicates that adolescents are more likely to perceive e-cigarettes as less harmful following exposure to advertisements across all types. The majority of these studies, however, fail to account for the influence of several confounding variables in their analyses. Unadjusted for these covariates, our findings aligned with previous research. For both social media and newspaper advertisement exposure, we observed a large and significant negative association with adolescent harm perception. For radio, billboard, and television advertisements, we observed smaller, non-significant negative associations between exposure and adolescent harm perception. The particularly strong influence of social media and newspaper advertising may be attributed to a recently identified phenomena known as influencer marketing, in which popular social media users, or “influencers”, reach a large audience through posting with products such as e-cigarettes. Our secondary analysis controlled for several possible confounding variables identified by past research as likely exerting an influence on adolescent e-cigarette harm perceptions. Once these were controlled for, the strength of the association between advertising exposure and reduced harm perceptions decreased across each form of advertisement. For several forms (billboard, radio, television), the association even became positive, meaning e-cigarette advertisement exposure was associated with increased perception of e-cigarette harm in these cases. This suggests that our selected covariates in conjunction were able to effectively combat the effects of pro e-cigarette advertising. Ultimately, our findings re-affirmed that e-cigarette advertising does have a substantial influence on adolescent harm perceptions, particularly via social media and newspapers. Adjusting for covariates pertaining to environmental support and exposure to anti-tobacco marketing dramatically weakened this association across all forms. This affirms the efficacy of anti-tobacco marketing practices as well as social environments that discourage e-cigarette use. Anti-tobacco and e-cigarette initiatives should therefore aim to disseminate information at a high volume as well as focus on educating parents and other family members to most effectively combat the increased susceptibility imposed on adolescents via pro e-cigarette marketing.