



The effect of electronic cigarette advertising on intended use among college students



Craig W. Trumbo*, Se-Jin 'Sage' Kim

Department of Journalism and Media Communication, Colorado State University, 1785 Campus Delivery, Fort Collins, CO 80523, USA

HIGHLIGHTS

- We test the effect of e-cigarette video ads on college students.
- Attitudes and perceived social norms predict intention to use e-cigarettes.
- Many believe that e-cigarettes are less addictive than cigarettes.
- Positive reaction to e-cigarette ads may promote use.

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ABSTRACT

Introduction: . Aside from prohibiting health claims, there are presently no restrictions on electronic cigarette advertising in the U.S. Studies have shown college students have a positive view of e-cigarettes and use on campuses is increasing. The purpose of this study was to test if the appeal of e-cigarette advertisements and beliefs about the addictiveness of e-cigarettes may affect their uptake among college students.

Methods: The study was framed within the Theory of Reasoned Action, which posits that behavioral intention can be understood in terms of social norms and attitudes toward a behavior. We also included variables capturing appeal of e-cigarette advertisements, belief that e-cigarettes are not as addictive as cigarettes, and tobacco use. Attitudes toward e-cigarettes, perceived norms concerning their use, beliefs that e-cigarettes are not as addictive as cigarettes, and positive appraisal of e-cigarette advertising videos were all hypothesized to be independently positively associated with intention to use an e-cigarette. Data were collected through a survey of students at a major U.S. university (participation rate 78%, $N = 296$). Participants were exposed to three e-cigarette video advertisements in random order.

Results: In a regression analysis we found positive reaction to the ads and holding the belief that e-cigarettes are not as addictive were both independently associated with intention. Attitudes and norms were also associated but were controlled by inclusion of the other variables.

Conclusions: These findings suggest that advertising may promote the uptake of e-cigarettes and may do so in addition to current smoking and alternate tobacco use status.

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1. Introduction

Aside from prohibiting health claims, there are presently no restrictions on electronic cigarette advertising in the U.S. E-cigarettes are typically marketed as a safer, tech-savvy, fashionable recreational alternative to smoking (Ayers, Ribisl, & Brownstein, 2011). Print, Web, and TV (largely cable and local) advertising of these products emphasize the idea that the smoker may not have to suffer exclusion from places prohibiting smoking (Fairchild, Bayer, & Colgrove, 2014). The themes and imagery used are very similar to those used in the earlier period of televised and print cigarette advertising (Elliott, 2012, 2013).

Advertising revenue for e-cigarettes went from \$3.7 million to \$19.9 million between 2011 and 2012, with a fifth of that targeting television (Koch, 2013). The regulatory environment for e-cigarettes is currently in flux. Recently, the U.S. Food and Drug Administration has proposed a set of regulations that largely focus on prohibiting health claims and sales to minors. No regulations have been advanced concerning advertising. The proposed regulations are in a public discussion phase and industry groups are largely supportive of the light restrictions (Gray, 2014).

The purpose of the current study was to test if advertisements promoting e-cigarettes and associated beliefs about the addictiveness of e-cigarettes may potentially affect their uptake. Research has recently appeared in which e-cigarette advertising has been examined. In this work, it has been shown that e-cigarette advertising has been widely disseminated and likely targeted at youth, with youth exposure to e-

* Corresponding author. Tel.: +1 970 491 2077.
E-mail address: ctrumbo@mac.com (C.W. Trumbo).

cigarette advertising having increased three-fold between 2011 and 2013 (Duke et al., 2014; Emery, Vera, Huang, & Szczyepka, 2014). It has also been shown that middle-school students' interest in trying alternate tobacco products (including e-cigarettes) has been influenced by tobacco advertising (Agaku & Ayo-Yusuf, 2013). Further, studies have demonstrated that video advertisements can increase current smokers' interest in trying e-cigarettes—especially if the ads are based on differentiating e-cigarettes from tobacco cigarettes (Kim, Lee, Shafer, Nonnemaker, & Makarenko, 2013; Pepper, Emery, Ribisl, Southwell, & Brewer, 2014).

College students are of interest for several reasons. Approximately half of young adults in the U.S. attend a college or university (U.S. Census, 2012). Studies have shown a high degree of social acceptability for e-cigarette use by college students (Pokhrel, Little, Fagan, Muranaka, & Herzog, 2014; Trumbo & Harper, 2013). While longitudinal data on e-cigarette use by college students is as yet limited, research has shown an increasing trend (Sutfin, McCoy, Morrell, Hoepfner, & Wolfson, 2013). Associated trends in students' use of cigarettes (declining) and hookah (increasing) suggest that the college population is oriented toward uptake of non-cigarette delivered nicotine (Barnett et al., 2013). This particular demographic is an attractive target for marketers of a wide variety of products, especially those that are effectively promoted using persuasive strategies couched in rebellion and peer acceptance (including tobacco) (Noble, Haytko, & Phillips, 2009; Setodji, Martino, Scharf, & Shadel, 2014).

The outcome of interest in this study was the individual's expressed likelihood of using e-cigarettes in the near future. To frame this, we employed the Theory of Reasoned Action (Crano & Prislín, 2006; Eagly & Chaiken, 1993; Fishbein, 1967). The basic form of the TRA involves actions predicted by behavioral intention, which is itself predicted by attitudes and norms specific to the behavior in question. Perceived social norms are conceptualized as beliefs about the orientation of relevant others to the target behavior and the motivation to comply with such. Attitudes are conceptualized as beliefs about the behavior in question and an evaluation of such outcomes. Direct and indirect measurement schemes have been developed for both components (Ajzen, 2011).

The TRA has been well supported empirically. Meta-analyses have reported significant effects, on the order of 40% of intention and 30% of behavior typically accounted for (Crano & Prislín, 2006). Use of the TRA in health research has been especially prevalent (Cooke & French, 2008; Hackman & Knowlden, 2014; Plotnikoff, Costigan, Karunamuni, & Lubans, 2013; Tyson, Covey, & Rosenthal, 2014). Augmenting the TRA is a common approach and is often used as a test of the adjunct variable's effect based on the TRA's sufficiency claim, which states that attitudes and norms should explain most if not all of the variance in behavioral intention (Conner & Armitage, 1998).

In the present study, we applied the TRA in an augmented form that included the effects of e-cigarette advertising appeal, beliefs about the addictiveness of e-cigarettes, and tobacco use behaviors to predict behavioral intention to use an e-cigarette in the near future. Based on theory and previous results, we employed a model that addressed four hypotheses and two research questions. We hypothesized that (1) attitudes toward e-cigarettes and norms concerning their use will each be independently positively associated with intention to use an e-cigarette in the near future. To follow this, we asked if attitudes and norms were controlled by the addition of addictiveness beliefs and ad appeal. Next we hypothesized that (2) addictiveness beliefs about e-cigarettes would be independently positively associated with intention to use an e-cigarette in the near future, (3) that appeal of e-cigarette advertising videos would be independently positively associated with intention to use an e-cigarette in the near future, and (4) that tobacco use items (tried e-cigs, alternate tobacco use, ever smoked) would each be independently positively associated with intention to use an e-cigarette in the near future. Finally, we asked if attitudes, norms, addictiveness beliefs, or ad appeal are controlled by the addition of tobacco use items.

2. Methods

2.1. Participants and data collection

The study was conducted at a Southwestern public university (undergraduate enrollment approximately 22,000). Subsequent to approval from the university's institutional review board, a survey was presented as an extra credit activity in a freshman-sophomore level large lecture class that served a broad cross-section of students. The survey was completed outside of class at a place of the student's choosing over the course of 1 week. Unique student identification numbers were required so to prevent multiple completions. Of the 398 students enrolled in the course, 309 completed the survey (78%) in October 2013. After removal of incompletes, 296 cases were available for analysis. There were no missing data.

In the online survey, participants were exposed to e-cigarette advertisements by being shown three different e-cigarette video advertisements taken from YouTube for the products MistiC, blu, and Njoy (blu, 2014; MistiC, 2014; Njoy, 2014). All participants saw each ad, and the order of the ads was randomized. These specific ads were selected because at the time two brands (blu, Njoy) were the top market leaders (Esterl, 2013). The ads featured actors of opposite sex making emotion-based appeals. The third ad for MistiC was selected (7th in sales) because it featured an unknown actor making a more rationally based appeal. As a group, the ads represented a good diversity of the current marketing at the time.

2.2. Measures

Appeal is a positive evaluation of the set of ads. This was measured by replicating the approach of Kelly, Slater, and Karan (2002). The product brand and appeal of the ad itself were assessed: "In your opinion, is this advertisement (or product brand) enjoyable, likable, appealing?" Responses were on a scale from 1 = not at all to 7 = very. This yielded six items for each of the three ads, 18 items overall, which were summed for an index measure which presented $\alpha = .95$. *Addictiveness* indicated that the participant believed that "e-cigarettes are less addictive than cigarettes," with a 5-point response strongly disagree to strongly agree (Choi & Forster, 2013).

Ever smoked is having smoked 100 cigarettes in lifetime (1 = yes, 0 = no), from the Behavioral Risk Factor Surveillance System (CDC, 2009). Current use was also assessed (now smoking every day, some days, or not at all). *Alt. Tobacco* was a score for how many other tobacco products had ever been used. This was measured by an inventory of five products: hookah, pipe, cigars, snuff, and chewing tobacco. Responses were on a 1–4 scale, including Never, Tried once or twice, Some days, Every day. A summed index was computed, which presented $\alpha = .74$. *Tried E-cigs* indicated that the participant had tried an e-cigarette (1 = yes, 0 = no).

The three TRA items were measured using best practice recommendations (Ajzen, 2011). *Intention* is the likelihood of using an e-cigarette in the future. We asked "How likely do you think it is that you would use an e-cigarette in the not-too distant future, say in the next six months?" Responses ran a 7-point scale from absolutely not, very unlikely, unlikely, maybe yes maybe no, likely, very likely and to absolutely yes. *Attitude* was a positive appraisal of the e-cigarette as a new way of smoking. It included three items with 5-point responses (strongly disagree to strongly agree): "Use of e-cigarettes should be legal for adults; E-cigarettes are a big step forward; E-cigarettes are a more modern way of using tobacco." This measure was summed across the three items for an index that presented $\alpha = .62$. *Norms* was a positive perception that significant others would be approving of e-cigarette use. The was measured with three pairs of items, all with 5-point responses (strongly disagree to strongly agree): "It would be acceptable to my closest friends (most people I know, closest family members) if I used e-cigarettes; when it comes to things like e-cigarettes it is important for

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