



Full length article

E-cigarette advertising exposure and implicit attitudes among young adult non-smokers



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ABSTRACT

Background: This study tested whether exposure to e-cigarette advertising affects the subliminal–spontaneous or automatic–attitudes towards e-cigarettes as a more pleasant or safer alternative to cigarettes among non-smoking young adults.

Methods: 187 young adult (mean age = 21.9; SD = 4.1) current non-smokers who had never used an e-cigarette were randomly assigned to one of the 3 conditions that involved viewing magazine advertisements. Two of the 3 conditions were experimental conditions where thematically different [harm-reduction (“Health”) vs. social enhancement (“Social”) focused] e-cigarette ads were interspersed among ads of everyday objects. The third condition was the control condition in which participants viewed ads of everyday objects only. Participants provided data on explicit (e.g., harm perceptions) and implicit [e.g., Implicit Association Test (IAT), Affect Misattribution Procedure (AMP)] measures after viewing the ads.

Results: Relative to the Control condition, participants in the Social condition showed 2.8 times higher odds of being open to using an e-cigarette in the future. Participants in the Health condition showed significantly higher implicit attitudes towards e-cigarettes as a safer alternative to cigarettes than participants in the Control condition. E-cigarette stimuli elicited more positive spontaneous affective reactions among participants in the Social condition than participants in the Health condition.

Conclusions: E-cigarette ads may implicitly promote e-cigarettes as a reduced-harm cigarette alternative. Marketing of e-cigarette use as a way to enhance social life or self-image may encourage non-smoking young adults to try e-cigarettes. Findings may inform regulations on e-cigarette marketing.

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1. Introduction

1.1. E-cigarette use, e-cigarette marketing and young adults

E-cigarette use prevalence is increasing rapidly among youth and young adults. According to a recent Monitoring the Future (MTF) survey (Johnston et al., 2015), past-30-day e-cigarette use prevalence among high school students has surpassed the prevalence of past-30-day cigarette use. Among U.S. adults, young adults

(18–24 year olds) show the highest prevalence of e-cigarette use (21%; Schoenborn and Gindi, 2015). Although e-cigarette use prevalence is concentrated mostly among current or former regular cigarette smokers, there are concerns that e-cigarette use is on the rise even among those youth and young adults who do not smoke tobacco (Wills et al., 2015; Primack et al., 2015). Among U.S. young adults, approximately 10% of never cigarette smokers report having tried an e-cigarette (Schoenborn and Gindi, 2015).

The role of tobacco product marketing in promoting tobacco use initiation is well-documented (National Cancer Institute, 2008). E-cigarette marketing appears to be expanding aggressively. For example, between 2011 and 2013, young adults' exposure to television e-cigarette ads increased by 321% (Duke et al., 2014). The e-cigarette marketing expenditures for 2013 represented more than twice the expenditures for 2012 (Kornfield et al., 2015). At present, e-cigarette marketing is not regulated. This is of concern

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because e-cigarette marketing is thought to be using tactics similar to those used by the tobacco industry to market cigarettes in the past (Grana and Ling, 2014). To date, limited empirical evidence exists as to whether e-cigarette advertising persuades young people to believe that e-cigarettes are less harmful than cigarettes or that e-cigarette use may enhance their social lives or self-image.

1.2. E-cigarette advertising and automatic attitudes towards e-cigarettes

In consumer psychology and social cognition research, the effects of spontaneous or automatic cognitive processes—presumed to function outside awareness or consciousness—on consumer decision-making are well recognized (Maison et al., 2001; Brunel et al., 2003). However, such processes have not received sufficient attention in research on tobacco product marketing. Past tobacco research has almost exclusively assessed marketing effects using self-report measures which capture variables that are “explicit” or within the reaches of awareness. Although valid and useful, such explicit processes may be just one of the two main ways that the effects of tobacco product marketing are mediated. Automatic processes are measured by using implicit instruments, which assess the implicit attitude or cognition construct indirectly by having participants perform certain tasks or tests (e.g., word association, sentence completion; De Houwer, 2006).

Strategic use of implicit measures in research may help demonstrate how tobacco product marketing shapes automatic attitudes towards tobacco products among potential consumers, including current non-users of tobacco products. Such evidence may be especially important in regulating new tobacco products such as e-cigarettes which are currently unregulated. E-cigarette marketing appears to be using implicit, if not overt, tactics to attract young people or promote e-cigarettes as a safer alternative to cigarettes (Grana and Ling, 2014). Such implicit tactics may encourage spontaneous association of e-cigarettes with reduced risk attributes or enhanced social life or self-image.

Two implicit attitude measures commonly used in social attitudes research are the Implicit Association Test (IAT; (Greenwald et al., 1998) and the Affect Misattribution Procedure (AMP; Payne et al., 2005). For the current investigation the IAT was specifically adapted to assess the automatic preference for e-cigarettes as a safer or healthier alternative to cigarettes. The IAT is a categorization task which functions on the assumption that individuals are faster at categorizing those concepts together that are compatible to them spontaneously than those that are incompatible. The AMP was adapted to assess spontaneous affective reaction (e.g., pleasant vs. unpleasant) to e-cigarette and cigarette stimuli. The task works under the assumption that individuals are likely to subliminally misattribute the affect induced by a priming stimulus (e.g., image of an e-cigarette or cigarette) to another stimulus that is ambiguous in terms of affect (e.g., irregular shapes with no meaning).

1.3. The present study

This experimental study examined the subliminal impact of real-world print e-cigarette ads on currently non-smoking young adults. Four main hypotheses were tested: (1) participants exposed to Health ads (i.e., ads containing implicit or explicit reduced-harm or health-benefit messages) would score higher on the IAT than those exposed to Control or Social ads (i.e., ads containing implicit or explicit messages promoting e-cigarettes as a means to enhance one's social life or self-image); (2) for e-cigarette cues, participants in the Social condition would score higher on the AMP than those in the Health or the Control condition; (3) implicit attitude measures would be moderately correlated with explicit measures of attitudes, including openness to use e-cigarettes, indicating that they

assess distinct yet related constructs; and (4) participants in the experimental conditions would show increased openness to using e-cigarettes in the future relative to those in the control condition.

The second hypothesis was based on the assumption that young adults would find Social ads more attractive than the Health ads because Social ads, by definition, would include images or words signifying pleasant lifestyle that are particularly attractive to young adults. Hypotheses concerning the effects of the experiment on explicit attitudes were not tested at the current phase of the study because such effects were assumed to be very small, as the current experiment involved a relatively indirect exposure to e-cigarette ads and the sample included young adults who were non-smokers.

2. Material and methods

2.1. Participant recruitment

Participants (N = 187) were recruited on college campuses in the Hawaiian island of Oahu. The study was advertised at one 4-year and two 2-year colleges through the use of flyers, classroom presentations, and e-mail listservs. Interested students telephoned a research project staff who conducted the initial screening for participation eligibility over the telephone. Participants were invited to the study laboratory if they met the following inclusion criteria: they (1) were 18–29 years in age; (2) had never used an electronic cigarette; and (3) had smoked less than 100 cigarettes in their lifetime and none in the past year.

2.2. Design and data collection

An experimental design was employed. Participants were randomly assigned to one of the following three conditions where they viewed still ads on a laptop computer: “Health” condition (n = 63) in which participants viewed 6 real-world e-cigarette ads containing health-benefit or reduced-harm themes, interspersed randomly among 14 filler ads; “Social” condition (n = 63) in which participants viewed 6 real-world e-cigarette ads containing messages promoting e-cigarette use as a means of attaining better social life or self-image, interspersed randomly among 14 filler ads; and “Control” condition (n = 61) in which participants viewed 20 real-world ads of everyday items, 14 of which were the same filler ads as the other two conditions. Each ad was shown on screen for 30 s. In the experimental conditions, e-cigarette ads were mingled with ads of other products because in real life, people usually come across ads, especially still ads, in the course of observing several other things, including other images. Interspersing ads of interest among other ads is a common practice in communications and marketing research (e.g., Homer, 1990; Homer and Yoon, 1992).

The study involved a one-time lab visit. Participants provided written informed consent before commencing study participation. Age and smoking status were verified against government-issued ID and breath Carbon Monoxide test, respectively. Data were collected immediately after participants viewed the ads via laptop computers. Participants first completed the implicit measures and other performance tasks (e.g., neurocognitive tasks) and then responded to the self-report questionnaire. Each participant was provided a \$30 supermarket gift card in compensation for his or her time.

2.3. Ad selection

Experimental ads were selected following a series of iterative steps. First, over a period of 6 months (June–December, 2014), two research staff gathered a pool of e-cigarette ads from the internet, including social media sites such as Facebook and Instagram, and young-adult-oriented print magazines that have been known to

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