



Original article

Direct-To-Consumer Tobacco Marketing and Its Association With Tobacco Use Among Adolescents and Young Adults



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A B S T R A C T

Objective: We assess exposure to direct-to-consumer tobacco marketing and its association with ever having tried smoking, smoking within past 30 days (current), and smoking ≥ 100 cigarettes in lifetime (established) among adolescents and young adults.

Methods: We surveyed a U.S. telephone sample of 3,342 15- to 23-year-olds and 2,541 respondents subsequently completed a web-based survey. Among respondents completing both the telephone and web-based surveys ($N = 2,541$ [75%]), we assessed their exposure to direct-to-consumer tobacco marketing (receiving direct mail from tobacco companies and seeing tobacco company websites) and their associations with ever having tried smoking, current smoking, and established smoking.

Results: Overall, 12% of 15- to 17-year-olds and 26% of 18- to 23-year-olds were exposed to direct-to-consumer tobacco marketing. Racial/ethnic minority nonsmoking respondents were more likely to see tobacco websites than nonsmoking whites. Respondents exposed to either form of direct-to-consumer tobacco marketing were more likely to currently smoke (adjusted odds ratio 2.2, 95% confidence interval 1.3–3.8), while those exposed to both forms of marketing experienced even higher odds of currently smoking (adjusted odds ratio 2.7, 95% confidence interval 1.1–6.6). We observed similar relationships for ever having tried smoking and established smoking.

Conclusions: Direct-to-consumer tobacco marketing reaches adolescent and young adult nonsmokers and is associated with smoking behavior.

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IMPLICATIONS AND CONTRIBUTION

United States national tobacco policies have placed limits on media-based tobacco marketing, causing the tobacco industry to refocus funding to direct-to-consumer promotional advertising through the mail and Internet. Direct-to-consumer tobacco marketing reaches adolescents and nonsmoking young adults; exposure to tobacco mail and websites is associated with smoking behavior.

Conclusive evidence spanning decades shows that advertising and promotion activities funded by the tobacco industry cause the onset and continuation of smoking among adolescents and young adults [1]. The 1998 Master Settlement Agreement (MSA) between

46 states and the largest tobacco manufacturers established restrictions on tobacco company marketing and advertising that would be seen by youth (e.g., billboards, transit ads, cartoon characters, and major sport events) and prohibited the distribution of tobacco brand merchandise. As MSA restrictions did not encompass price discounting at the point-of-sale or direct-to-consumer marketing practices, tobacco industry marketing efforts have shifted focus to these areas [2]. In 2010, for example, the tobacco industry spent \$236 million in cigarette coupons (regularly distributed via postal mail and e-mail), \$35 million in smokeless tobacco coupons, and \$22 million in Internet marketing [3,4]. Internet marketing may be more cost-effective to the tobacco industry than traditional

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advertising and provides greater reach to young smokers via social media. Passage of the Family Smoking Prevention and Tobacco Control Act granted the U.S. Food and Drug Administration authority to regulate marketing of tobacco products, including via the mail and Internet [5]—marketing modalities to which adolescents and young adults may be especially vulnerable [6,7].

Compared with established adult smokers, adolescents and young adults may be particularly sensitive to price discounting for tobacco products [8–10] and, therefore, more receptive to the direct-to-consumer marketing that offers these discounts. In addition to price discounting, some adolescents may also actively seek direct-to-consumer marketing because of their strong need for novel experiences and risky behaviors. Of course, direct-to-consumer tobacco marketing may not be originally intended for adolescent and young adults. Nonetheless, these vulnerable populations may be exposed to such marketing because of their parents, older siblings, and older friends who smoke. We do not know the extent to which adolescents and young adults, especially nonusers of tobacco, are exposed to direct-to-consumer tobacco marketing. We also do not know whether exposure to direct-to-consumer marketing is associated with tobacco use over and above well-established correlates of smoking including sensation seeking, friends smoking, and parental smoking.

In this article, we seek to fill important evidence gaps in our knowledge of adolescent and young adult exposure to direct-to-consumer tobacco marketing by addressing the following three research objectives. First, we assess the level of exposure to direct-to-consumer tobacco marketing via the mail and the Internet among adolescents and young adults. Second, we determine the characteristics of nonsmoking adolescents and young adults associated with increased exposure to direct-to-consumer tobacco marketing. Finally, we assess whether the level of exposure to direct-to-consumer tobacco marketing is associated with smoking behavior among adolescents and young adults.

Methods

Recruitment

We recruited participants through a three-stage sample selection process. In stage 1, we identified a list-assisted sample of 578,542 landline phone numbers and 145,260 cell phone numbers from all states in the United States. In stage 2, interviewers called each number and successfully completed screener interviews with 60,189 households and identified the 6,466 households with age-eligible adolescents and young adults. In stage 3, interviewers obtained permission and consent from participants 18 years and older and parental permission and adolescent assent from participants under the age of 18 years. In total, we recruited 3,342 15- to 23-year-olds between Fall 2010 and Spring 2011. Finally, 2,541 of the 3,342 participants who completed the phone-based survey subsequently completed the web-based survey. Participants received \$10 for completion of the telephone survey and an additional \$10 or \$25 for completion of the web-based survey, depending on how quickly they completed it. The weighted screener response rate using the American Association for Public Opinion Research response rate 3 equaled 20% for the cell phone sample and 37% for the landline sample [11]. The weighted completion rate for the web-based survey equaled 75%. Compared with the 801 respondents only completing the phone-based survey, the 2,541 respondents completing both the phone- and web-based surveys were more likely to be adolescents, female, non-Hispanic white, and a current

cigarette smoker (Supplementary Table 1). The Dartmouth Committee for the Protection of Human Subjects approved the study.

Compared with the 2011 U.S. Current Population Survey (CPS), the unweighted survey sample was broadly similar with respect to gender, region of the country, and household income but had fewer young adults and fewer minorities, especially non-Hispanic blacks and Hispanics (8% and 12% of the survey compared with 14% and 20% in the CPS, respectively). To improve generalizability, data were weighted to compensate for survey undercoverage based on the CPS for the U.S. population within the 15- to 23-year-old age range. Specifically, we weighted the survey data according to the respondents' region, race/ethnicity, age group (0–17 years and 18–24 years), parental education, household income, and whether respondents' parents owned or rented their home.

Outcomes

Our assessment of smoking was based on respondents' self-report of the recency and intensity of their smoking behavior. First, we assessed whether respondents had ever tried smoking ("Have you ever tried smoking a cigarette, even just a puff?"). Second, we considered a respondent to be a current smoker if he or she smoked cigarettes ≥ 1 day in past 30 days ("During the past 30 days, on how many days did you smoke cigarettes?"). Third, we considered a respondent to be an established smoker if he or she smoked ≥ 100 cigarettes in their lifetime ("How many cigarettes have you smoked in your life?") without respect to their current smoking status.

Marketing exposures

We assessed two modes of exposure to direct-to-consumer tobacco marketing. First, in the telephone portion of the survey, we ascertained if respondents had ever been exposed to direct mail from tobacco companies or tobacco retailers ("Have you ever received anything in the mail for tobacco products? For example, discounts on snus or cigarettes, coupons for free packs, or other tobacco-related merchandise?"). Direct tobacco mail may have been sent to the respondent directly or to the respondents' parents, older siblings, or older friends. Our survey measure on exposure to direct tobacco mail did not determine the recipient listed on the mail.

Second, in the Internet portion of the survey, respondents were asked image-based cued-recall questions that showed the current homepage for American Spirit, Camel, Kool, Marlboro, and Newport websites after their respective age-verification pages (e.g., "This is the website for Marlboro. Have you ever seen it?"). We focused on these five brands because Marlboro, Newport, Camel, and Kool represent nearly 90% of the brands usually smoked among current adolescent smokers and 60% among current adult smokers [12,13]. Additionally, American Spirit is among the fastest growing brands in the United States [14]. The homepage of each tobacco company was the first page shown on their website after the age-verification process was completed. This cued-response approach to ascertaining advertising exposure has been successful in prior studies of alcohol marketing [15–17].

Covariates

We also collected demographic characteristics of respondents including their age, sex, race, and ethnicity (non-Hispanic white [henceforth referred to as "whites"], non-Hispanic black

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