Published in final edited form as:

Subst Use Misuse. 2018 August 24; 53(10): 1706–1714. doi:10.1080/10826084.2018.1429473.

Attitudes towards Tobacco, Alcohol, and Non-Alcoholic Beverage Advertisement Themes among Adolescent Boys

KL Friedman¹, ME Roberts¹, B Keller-Hamilton¹, KA Yates², ED Paskett^{1,3,4}, ML Berman^{1,5}, MD Slater⁶, B Lu¹, and AK Ferketich¹

¹OSU College of Public Health, The Ohio State University, Columbus, Ohio, USA

²Harvard Medical School, Boston, Massachusetts, USA

³OSU Comprehensive Cancer Center, The Ohio State University, Columbus, Ohio, USA

⁴OSU College of Medicine, The Ohio State University, Columbus, Ohio, USA

⁵OSU Moritz College of Law, The Ohio State University, Columbus, Ohio, USA

⁶OSU School of Communication, The Ohio State University, Columbus, Ohio, USA

Abstract

Background—Previous studies have examined what adolescents find appealing in tobacco and alcohol advertisements and how different themes in advertisements are used to manipulate consumer behaviors. Yet, we know little about the relationship between the themes portrayed in advertisements and youth attitudes towards those themes.

Objectives—This study compared attitudes towards advertisements for different products in a sample of urban and rural adolescent boys in order to examine how marketing themes impact adolescent attitudes towards those advertisements.

Methods—Participants were 11- to 16-year-old boys (N=1220) residing in either urban or rural Ohio Appalachian counties. Each participant viewed five print advertisements (one each for cigarettes, electronic cigarettes (e-cigarettes), smokeless tobacco (SLT), non-alcoholic beverages, and alcohol), presented in a random order. All advertisements had appeared in magazines that adolescent males commonly read. Attitude towards each advertisement was assessed. The advertisements were then coded for the presence of various themes, including social acceptance and masculinity. Analyses were conducted to determine associations between advertisement type and the attitude measure, and between the presence of a theme and the attitude measure.

Results—Overall, participants preferred non-tobacco advertisements to tobacco advertisements, rural participants had less positive attitudes and participants who had peers who used tobacco had more positive attitudes. Social acceptance and entertainment themes increased the appeal of

Corresponding Author: Ferketich.

No commercial relationship exists for any of the listed authors.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

This paper has not been published elsewhere and it has not been submitted simultaneously for publication elsewhere.

smokeless tobacco advertisements, and sex appeal increased the appeal of e-cigarette advertisements.

Conclusions/Importance—Findings suggest that advertisements that promote the social nature of use in SLT advertisements may be of particular concern for their influence on adolescent boys.

Keywords

tobacco; alcohol; advertisements; marketing; adolescence

Introduction

By the time American adolescents finish high school, 14% will be current smokers and 34.4% will have tried a cigarette at least once in their life (Miech et al., 2015). While the rates of cigarette smoking and smokeless tobacco (SLT) use are decreasing, electronic cigarette (e-cigarette) use is rising, especially among seniors in high school (Miech et al., 2015). Tobacco use rates are particularly high in rural areas of the country. For example, in 2015, 7.3% of adolescents aged 12-17 years smoked cigarettes in non-metro areas, whereas 3.4% smoked in large metro areas and 4.4% in small metro areas (Substance Abuse and Mental Health Services Administration, 2016). Similarly, 3.5% of non-metro 12-17 year-olds used SLT while only 1.0% of youth in large metro areas and 1.6% of youth in small metro areas used it. Furthermore, adolescent males have higher rates of tobacco use than adolescent females. Overall, in 2016, 8.3% of adolescent males ages 11-13 years and 23.5% of males ages 14-17 years were current users of tobacco products, compared with 5.9% and 17.0% of females, respectively (CDC, 2017).

The continued high prevalence of adolescent smoking appears to be due, in part, to intensive advertising efforts by tobacco companies (e.g., Hanewinkel, Isensee, Sargent, & Morgenstern, 2011; Henriksen, Feighery, Schleicher, & Fortmann, 2008; Morgenstern, Sargent, Isensee, & Hanewinkel, 2013). In 2014, the tobacco industry spent \$8.5 billion on advertising and promoting cigarettes, and \$600.8 million for SLT products (United States Federal Trade Commission [US FTC], 2016). In 2014, \$115 million was spent on marketing e-cigarette products (CDC, 2016). Although the cigarette advertising budget has decreased since 2013, the amount spent on SLT and e-cigarette advertising has risen during the past year (US FTC, 2016). Due to the United States Constitution's protection of free speech—even commercial and advertising speech—the U.S. courts have allowed this intensive spending by the tobacco industry to continue. This is in order to prevent, as the courts have written, “unnecessary intrusions on expressive freedom” (Bayer and Kelly, 2010).

Advertising Strategies and Themes

Research points to several reasons why advertisement content can impact smoking initiation. De Pelsmacker and colleagues (1998) found that three major dimensions—emotional content, informational content, and format of advertisements—influence how advertisements are perceived and remembered, thus impacting purchasing intentions. For example, tobacco companies use the anxieties, fears, and desires adolescents face—including autonomy, self-image, social approval, and peer bonding—in advertisements to subtly make their products

more appealing, tempting, and memorable (Lovato et al., 2011). Altman and colleagues (1987) found that tobacco advertisements moved to an emphasis on life-affirming activity—adventure, socializing, romance, sports—following the Surgeon General’s report on tobacco in 1964, presumably to divert attention from the health-threatening aspects of tobacco use.

Adolescent Advertisement Exposure

Research has examined the specific aspects of advertisements that adolescents find appealing, as well as how these aspects influence adolescent attitudes. Adolescents, in general, deem advertisements significantly more socially desirable, cool, and in-style if they contain images, as opposed to just text (Kelly et al., 2002). Research among adolescents also shows that brand ratings for cigarette and alcohol products tend to increase if advertisements have visually stimulating designs instead of solely text (Kelly et al., 2002). While the Master Settlement Agreement prohibits cigarette companies from engaging in “youth targeting,” adolescents are still exposed to tobacco advertising in magazines with heavy youth readership, as well as at convenience stores and other indoor and outdoor points of purchase (Belstock, et al., 2008).

Cigarette advertisements in youth magazines have generally tended to depict attractive models in fun, active situations, as well as romantic or erotic themes playing on adolescent interests and aspirations (Altman et al., 1987; Basil et al., 1991). Such portrayals are consistent with influence through accessible prototypes of the ideal smoker, which the prototype-willingness model suggests are likely to influence assessments of risky behaviors (Aloise-Young, Slater, & Cruikshank, 2006; Gerrard et al., 2005; Gibbons, Gerrard & Lane, 2003).

Due to the clever manipulation of themes that appeal to adolescents, advertisements play a significant role in an adolescent’s decision to initiate smoking in the future (Morgenstern et al., 2013). Morgenstern et al. (2013) found that the more adolescents see tobacco advertisements (e.g., around their community or in magazines), the higher likelihood that they will begin smoking, even if they were originally at low risk of smoking. Likewise, middle and high school students who reported exposure to e-cigarette advertising had higher odds of e-cigarette use (Singh et al., 2016).

Attitudes towards the Advertisement

A principal theory of the effects of advertising on consumer behavior, from the advertising research field, is known as Attitude Toward the Ad (Mackenzie, Lutz, & Belch, 1987; Shimp, 1981). The theory is a simple and intuitive one. Research provides evidence consistent with the theory that consumers generate affective attitudinal responses to advertisements, which shape their attitudes to the brand advertised, which in turn impacts the consumer’s purchase intention (Brown & Stayman, 1992).

Researchers have adapted this theory to the study of adolescents and substance advertising (including tobacco, alcohol, and non-alcoholic beverages). One study, for example, found that attitudes to such advertisements influenced not only adolescents’ attitudes to the brand advertised, but also to the product category as a whole (Kelly et al 2012). In other words, liking a tobacco advertisement led to liking the tobacco brand, which in turn predicted more

positive assessments of tobacco products overall. Based on Attitude Toward the Ad theory, then, there is good reason to believe that such attitudes to the advertisement are likely to influence attitudes toward tobacco products and the future likelihood of use.

Current Study Hypotheses and Research Questions

Previous studies examined what adolescents found appealing in tobacco and alcohol advertisements and how different themes in advertisements are used to manipulate consumer behaviors. To date, however, we know little regarding the relationship between specific themes portrayed in advertisements and youth attitudes towards those themes, particularly in the context of new products such as e-cigarettes and in comparisons of cigarettes, e-cigarettes, and SLT. The present study draws from earlier communication research on tobacco advertising (e.g., Altman, Slater, Albright, & Maccoby, 1987) to examine key advertising themes, such as social acceptance, sex appeal, and masculinity, that are likely to increase the appeal of such advertising to youth. Given the existing rural-urban differences in tobacco use, it is also important to examine if there are any differences in adolescent attitudes in urban and rural areas. We also compare responses to alcohol and non-alcohol beverages, to ascertain whether these advertisement themes were particularly influential in tobacco advertisements, or have similar impact across the board. In addition, of course, alcohol and soft drink use by adolescents are also important health concerns.

Our first aim was to determine which types of advertisements are associated with more positive adolescent attitudes. We hypothesized (H1) that participants would have more positive attitudes towards non-tobacco advertisements, specifically alcohol advertisements, given the positive assessments of alcohol advertising found in the research cited above, and the negative associations with tobacco marketing resulting from national counter-marketing campaigns (e.g., Farrelly et al., 2005).

Our second aim was to determine if attitudes towards these advertisements would differ by characteristics of the participants, including urban vs. rural status, age, race/ethnicity, tobacco use in the household, ever use of tobacco by the participant, and peer use of tobacco. We hypothesized (H2) that rural boys, older boys, and those who were exposed to tobacco (through use, peer use, or household exposure) would perceive tobacco advertisements more favorably.

Our third aim was to determine if certain themes in advertisements significantly impacted adolescent attitudes. We hypothesized (H3) that the themes of masculinity, athleticism or physical activity, sex appeal, and social acceptance would be the most favorable and attractive to adolescent boys, given that these are key aspirations for adolescent males (e.g., Cortese & Ling, 2011) and that these themes might counter associations of tobacco use with illness, disability, and death (Altman et al., 1987).

Methodology

Participants

This study used baseline data from a large prospective cohort study focused on examining the impact of tobacco advertising and marketing on tobacco use initiation among adolescents in urban and rural Appalachian counties. The goal of the parent study is to examine factors that are associated with single use and dual use of cigarettes and SLT among urban and rural male adolescents. The participants (N = 1,220) were males between the ages of 11 and 16 who resided in either one urban county or one of nine rural Appalachian counties. Parents or legal guardians gave permission for the boy to participate, and boys provided assent. Exclusion criteria included any hearing or vision impairments, or the inability to read and speak English.

Participants were recruited using both probability sampling and non-probability recruitment from the community. The probability sampling method was address-based sampling (ABS). ABS is a recruitment methodology that utilizes the U.S. Postal Service's address list to select households to contact about the study. The selected addresses were sent a packet about the research study and a screening letter in order to determine if there were any eligible boys in the household. The community recruitment strategies included attending community events like county fairs, snowball sampling, and advertising in the newspaper and on the radio. For each eligible household (selected either through ABS or at a community event), an interviewer contacted the parent or legal guardian to set up a meeting time, obtain informed permission and assent, and complete the baseline session.

Procedures

Prior to the start of the study, the Institutional Review Board at our University approved the protocol. Trained interviewers, who resided in the same region as the participants, administered a baseline survey to the participant. The questionnaire included both interviewer-administered and audio-administered items, depending on the level of sensitivity of the item in order to provide the boys privacy when their parents were around. For example, tobacco use, alcohol use, substance use, and psychosocial questions were asked using the audio-administered format. Participants listened to these questions on a headset and responded on the computer without the assistance of the interviewer.

Comparison advertisements—We used two types of comparison advertisements in the study: alcohol advertisements, a product that is illegal for adolescent use, and non-alcoholic beverages. Adolescents often recall and like alcohol advertisements more than other non-alcoholic beverage advertisements (Koordeman et al., 2012; Martin et al., 2002). Alcohol advertisements provide a more comparable product to tobacco than non-alcoholic beverages, while attitudes towards non-alcoholic beverages could reflect attitudes towards legal consumable products more generally.

Tobacco, soft drink, and alcohol advertisements were taken from *People Magazine*, *Sports Illustrated*, *Popular Science*, *ESPN Magazine*, and *Rolling Stone* print editions published between 1/1/2014 and 8/31/2015. These magazines were chosen because of their relatively

high youth readership. Each edition of the five magazines was searched for cigarette, e-cigarette, SLT, alcohol, and non-alcoholic beverage advertisements. Alcohol advertisements included beer, wine, and hard liquor. Non-alcoholic beverages included energy drinks like Gatorade, soft drinks like Coke, and flavored water. Advertisements were excluded if they were larger or smaller than one page; if the advertisement was clearly targeting women; if the brand was only sponsoring an interview, event, or sweepstakes; or if the advertisement was inappropriate for adolescent boys (ultimately, one advertisement was excluded for being overtly sexual). Advertisements were selected to be as current as feasible, thus we replaced the stimulus set half way through data collection to ensure that subjects were not reacting to old advertisements.

For the ad-viewing activity, the advertisements from the magazines were copied and laminated. Adolescents viewed a series of five randomly ordered advertisements: one advertisement from each of our five categories (alcohol, cigarette, SLT, e-cigarette, and non-alcoholic beverage) was randomly selected. After every advertisement was viewed for 8 seconds, participants were asked to numerically rank it (0-10, from low to high) on three attitude measures: whether it was enjoyable, likeable, and appealing.

Measures

Attitude towards Advertisements—The three attitude items (enjoyable, likeable, and appealing) were measured on a Likert scale (from 0 to 10) and averaged together and used as the overall attitude scale, as seen in previous studies (Kelly et al., 2002). For each product attitude, Cronbach's alpha indicated good reliability (α s ranged from 0.89-0.94).

Advertisement Themes—All advertisements were content coded using a codebook created by the authors and guided by similar coding work (Basil et al., 1991; Schooler, Feighery, and Flora, 1996; Warner, 1985; Kelly et al., 2002). The main themes focused on attractiveness cues. Selected cues in this section include sex appeal, masculinity, social acceptance, and athleticism. Advertisements could have multiple codes or none at all. The sex appeal cue focused on whether there were scantily-dressed models in a romantic setting; if the model was in a coy pose or giving seductive eye contact to either another model or the camera; or if there were words like "pleasure" or "passion" connected to sex appeal or romance. The masculinity cue included models who were tough or assertive; if the advertisement featured male-gendered activities or sports such as camping, machinery, football or basketball; or if the models were dirty or in the dirt. The social acceptance cue was defined as two or more people enjoying active lifestyles or parties. The athleticism cue was coded if there was competitive or non-competitive physical activity; activity that would raise a heart rate; or athletic tools, equipment, or clothing. The presence of the product (tobacco, alcohol, non-alcoholic beverage) and if the product was held in the models' hands or mouth was coded as well, as some advertisements did not visually depict the product it was advertising (e.g., some advertisements would just be of people having a good time).

Advertisements were coded for the presence or absence of each theme by three coders. In order to assess reliability, the coders individually coded twenty randomly selected advertisements, which were then analyzed using Krippendorff's Alpha. For each code that

did not achieve a 0.80 or above, the coders discussed and resolved discrepancies with co-authors, then revised the codebook as necessary. Independent coding of advertisements began when alpha levels were 0.80 or higher for each code used.

Statistical Analysis

To appropriately reflect our sampling design (a combination of probability and non-probability samples), we calculated survey weights in three steps. First, we generated weights as usual only using the probability sample (ABS sample). Second, we calibrated weights for the non-probability sample based on key covariates and combined them with the probability sample. Finally, we trimmed the weights to stabilize the estimates.

Descriptive statistics on the sample, including age, race/ethnicity, and participant tobacco use, were computed. All analyses were completed using Stata 14.1 (College Station, Texas), and all analyses were weighted to adjust for the sampling design. For all analyses, an alpha level of 0.05 was set for statistical significance.

The average attitude distributions were heavily skewed and hence we could not fit a model that assumed a continuous outcome. Therefore, we created a binary outcome variable indicating whether the participant's average attitude for each product was zero or greater than zero. The first aim involved testing the hypothesis that there are product-level differences in non-zero attitudes. Because the five observations were nested within each participant, we built a generalized estimating equation (GEE) model with robust variance estimates. The GEE model with a logit link and an exchangeable correlation structure contained indicator variables for product type. We exponentiated model coefficients to calculate odds ratios comparing the odds of greater-than-zero average attitudes between products, and robust standard errors were used to obtain p-values and construct confidence intervals.

For the second aim which involved testing whether attitudes towards these advertisements differed by characteristics of the participants, GEE models were fit to model non-zero attitudes, with advertisement type and select characteristics of the boy included as covariates, as well as the interaction between advertisement type and covariate. The covariates included county type (rural vs. urban), age (11-13 years vs. 14-16 years), race/ethnicity, adult tobacco use in the home, ever use of any tobacco by the boy, and peer use of tobacco (no friends use vs. at least some friends use).

For the third aim, which involved testing the hypothesis that attitudes differed by theme portrayed in the advertisements, we used chi-square tests to evaluate whether advertisement themes were associated with the proportion of average attitudes that were greater than zero for each product. For significant associations, Cramer's V effect sizes were calculated to allow the reader to determine the strength of the association.

Results

Summary statistics

There were 1,220 participants in this study, with 708 from the urban county and 512 from the nine Appalachian counties. ABS was used to recruit 991 participants, whereas the remaining 229 were recruited through convenience sampling. The average age of the participants was 13.9 years (Table 1). With respect to race/ethnicity, 68.2% of the boys identified themselves as Non-Hispanic White, which is consistent with Census demographic data for the region. Overall, 18.4% of the sample population had ever used tobacco, with a higher prevalence of use in the rural sample (22.8%) compared to the urban sample (13.9%). Participants who were missing data from one or all of the three original attitude measures (how enjoyable, likeable, or appealing was the advertisement) were excluded from analysis (n=3).

Statistical findings

There were significant differences between the percent of non-zero attitudes by advertisement type (Table 2), consistent with H1. The percent of non-zero attitudes for the non-alcoholic beverage advertisements was greater than for the three tobacco advertisements (all $p < .001$). Similarly, the percent of non-zero attitudes for the alcohol advertisements were significantly higher than those for tobacco advertisements (results not shown). Attitudes did not differ significantly by type of tobacco advertisement (cigarettes, e-cigarettes, and SLT).

Tables 2 and 3 contain the results from the second aim of this study. As indicated by the percent non-zero attitudes contained in Table 2, there are differences in attitudes towards advertisement by demographic and tobacco exposure variables. The GEE models fit to the selected covariates indicated that only rural vs. urban and peer use vs. no peer use significantly modified the effect of advertisement type on odds of non-zero attitude. As indicated in Table 3, urban boys had significantly higher odds of having non-zero attitudes towards tobacco advertisements only, whereas boys whose peers used tobacco had significantly higher odds of having non-zero attitudes towards all advertisements. These models controlled for previous tobacco use by the participant.

Results for the third aim are in Table 4. There were no statistically significant differences by theme and non-zero attitude for the cigarette advertisements. For e-cigarette advertisements, the presence of a sexual appeal theme resulted in a significantly higher percent of non-zero attitudes ($p = .046$, Cramer's V effect size .07). For SLT advertisements, party themes ($p = .023$, Cramer's V effect size .08) and social acceptance themes ($p = .019$, Cramer's V effect size .09) were associated with a significantly higher percentage of non-zero attitudes. For alcoholic beverage advertisements, the presence of a masculinity theme resulted in a significantly higher percentage of non-zero attitudes ($p = .039$, Cramer's V effect size .07). Finally, for non-alcoholic beverages, sex appeal resulted in a significantly lower percentage of non-zero attitudes ($p = .004$, Cramer's V effect size .10) and sport themes resulted in a significantly higher percentage of non-zero attitudes ($p < .001$, Cramer's V effect size .11).

Discussion

Our first hypothesis that attitudes differed by product advertised was supported by the data, as we found that non-alcoholic beverage advertisements generated more positive attitudes compared to tobacco and alcohol advertisements. Interestingly, previous research (Martin, et al 2002; Koordeman, et al 2012) demonstrated that teenagers often liked and recalled alcohol advertisements more than non-alcoholic beverage advertisements. This difference may be due to our study having a younger average age of participant. The preference for both types of advertisements in comparison to tobacco advertisements was as hypothesized, given the wide understanding of the inherently unhealthy impact of tobacco products and longstanding national campaigns intended to counter tobacco marketing efforts (United States Department of Health and Human Services, 2012).

As for our second hypothesis that participant characteristic predicted attitudes towards advertisements, we found that urban boys had significantly higher odds of having non-zero attitudes towards tobacco advertisements, whereas boys whose peers used tobacco had significantly higher odds of having non-zero attitudes towards all advertisements. However, while rural boys had less positive attitudes towards tobacco advertisements, they were more likely to use tobacco, which is an unexpected finding. It is possible that factors other than advertising are important for smoking among rural boys, but further research should look into this relationship.

With respect to the third hypothesis, we found support that some themes generated more positive attitudes towards advertisements, but results differed by product. The presence of the social acceptance theme was significant for SLT; alcohol and the other two tobacco product advertisements that featured social acceptance had non-significantly higher percentages of non-zero attitudes. This pattern of results suggests that social acceptance content, to some extent, counteracts negative feelings these youths have about tobacco advertisements. In other words, perhaps anti-tobacco efforts have succeeded in framing tobacco use as socially undesirable, and advertisements that illustrate social acceptance may serve to counter this framing. Future research should examine this phenomenon more closely and explore ways in which media literacy and tobacco education might in turn counter such an advertising strategy.

Other themes appeared influential for certain tobacco products and not others. Party and entertainment themes generated positive attitudes towards SLT advertisements. Masculinity increased positive responses to alcohol advertisements; sex appeal themes increased positive responses to e-cigarette advertisements but had no effect or (in the case of alcohol advertisements) a negative effect on responses to other products. These themes may tap elements of self-concept related to social acceptance and desirability, which may serve to counteract the social undesirability that is increasingly associated with tobacco use (Altman et al., 1987).

The apparent importance of social acceptance-related themes, from among the themes identified as foci of tobacco advertising efforts subsequent to the Surgeon General's report (Altman et al., 1987), suggests that there may be a noteworthy shift in the context and

reception of such advertising. Altman et al. (1987) suggested that advertising themes implicitly counter health concerns about tobacco use. Today, it may be that advertising themes that are effective among youth must go further, and counter the perception of the limited social acceptability or desirability of using tobacco.

Under the Federal Cigarette Labeling and Advertising Act (as modified by the 2009 Family Smoking Prevention and Tobacco Control Act), state and local governments do not have the authority to impose bans or specific restrictions on the *content* of cigarette advertising, although they can regulate the “time, place, and manner” of such advertising. Additionally, the courts have struck down some federal content restrictions for cigarette and SLT advertisements on the basis of the First Amendment’s protection of free speech. In *Discount Tobacco City & Lottery, Inc v. United States* (6th Cir. 2012), the 6th Circuit Court of Appeals ruled that the Family Smoking Prevention and Tobacco Control Act’s requirement limiting cigarette and SLT advertisements to black and white text (with no images) was unconstitutional because it was too broad of a restriction. However, the Appellate Court added that restrictions that were more tailored, and included exceptions for innocuous colors and images, could pass the Court’s review. Thus, our study’s findings could help inform future regulations of advertisement content that would be legally allowable by the courts.

Limitations

This is an ongoing study and the data discussed here are from the first wave of data collection. One limitation to this study is the fact that the participants verbally reported their attitude ratings to the interviewer, which could have produced a social desirability bias. Another limitation is that we used advertisements from five magazines that have a high readership and are read by adolescents. Advertisements that may only be at the point of sale or online were thus excluded. These advertisements could be different in nature. In addition, advertising campaigns change over time and the execution of themes vary by campaign; it is possible some patterns of results would change using samples of advertisements drawn at different times. However, this time period was one of particular interest, paralleling the launch of e-cigarettes as a widely used tobacco product. We also recognize that multiple testing was performed to examine relationships between themes and attitudes by product type, which could introduce type I errors. We caution readers to consider this limitation as they interpret the results. Finally, we recognize that the sample was not entirely a random sample. While it is a diverse sample that has been weighted to population totals, our parameter estimates may not be generalizable to other populations. Our findings are based on, and only speak to, a subset of magazines with high youth readership and advertisements available during data collection.

Conclusions

This study demonstrates that adolescents’ attitudes toward advertisements differ depending on the product advertised, which themes are present, and on some of their characteristics. In particular, evidence reveals that certain themes and scenes, including social acceptance, sporting venues, and entertainment scenes, influence adolescent attitudes. The pattern of results suggests that advertising that promotes the social nature of use may be of particular concern with respect to tobacco advertising, and could potentially reduce the impact of

tobacco counter-advertising efforts. Future waves of data collection with the present study will allow us to observe whether these differences in attitudes predict adolescent tobacco use behaviors longitudinally. The policy implications for our results are mainly in the area of mass media campaigns. The findings reported here could inform the FDA and/or state governments in their efforts to inform the public using counter-marketing approaches.

References

- Altman DG, Slater MD, Albright CL, Maccoby N. How an unhealthy product is sold: Cigarette advertising in magazines, 1960–1985. *Journal of Communication*. 1987; 37(4):95–106. DOI: 10.1111/j.1460-2466.1987.tb01010.x
- Aloise-Young PA, Slater MD, Cruickshank CC. Mediators and moderators of magazine advertisement effects on adolescent cigarette smoking. *Journal of health communication*. 2006; 11(3):281–300. DOI: 10.1080/10810730600613955 [PubMed: 16624795]
- Bayer R, Kelly M. Tobacco Control and Free Speech — An American Dilemma. *The New England Journal of Medicine*. 2010; 362(4):281–283. DOI: 10.1056/NEJMp0909626 [PubMed: 20071696]
- Basil, Michael D., Schooler, Caroline, Altman, David G., Slater, Michael, Albright, Cheryl L., Maccoby, Nathan. How cigarettes are advertised in magazines: Special messages for special markets. *Health Communication*. 1991; 3(2):75–91. DOI: 10.1207/s15327027hc0302_1
- Belstock SA, Connolly GN, Carpenter CM, Tucker L. Using Alcohol to Sell Cigarettes to Young Adults: A Content Analysis of Cigarette Advertisements. *Journal of American College Health*, 46(4). 2008; :383–389. DOI: 10.3200/JACH.56.4.383-390
- Brown SP, Stayman DM. Antecedents and consequences of attitude toward the ad: A meta-analysis. *Journal of consumer research*. 1992; 19(1):34–51. DOI: 10.1086/209284
- Centers for Disease Control. Youth online: High school's YRBS, Ohio 2013 and United States 2013 results 2015 Retrieved from <https://nccd.cdc.gov/youthonline/App/Results.aspx?TT=G&OUT=0&SID=HS&QID=QQ&LID=OH&YID=2013&LID2=XX&YID2=2013&COL=&ROW1=&ROW2=&HT=QQ&LCT=&FS=S1&FR=R1&FG=G1&FSL=&FRL=&FGL=&PV=&C1=OH2013&C2=XX2013&QP=G&DP=1&VA=CI&CS=N&SYID=&EYID=&SC=DEFAULT&SO=ASC&pf=1&TST=True>
- Centers for Disease Control. E-cigarette Ads and Youth 2016 Retrieved from <http://www.cdc.gov/vitalsigns/ecigarette-ads/>
- Centers for Disease Control. Youth and Tobacco Use 2017 Retrieved from https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm
- Cortese DK, Ling PM. Enticing the new lad: Masculinity as a product of consumption in tobacco industry-developed lifestyle magazines. *Men and Masculinities*. 2011; 14(1):4–30. DOI: 10.1177/1097184X09352177 [PubMed: 21687813]
- Substance Abuse and Mental Health Services Administration. Results from the 2015 National Survey on Drug Use and Health: Detailed Tables 2016 Retrieved from <http://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs-2015/NSDUH-DetTabs-2015/NSDUH-DetTabs-2015.pdf>
- De Pelsmacker P, Decock B, Geuens M. Advertising characteristics and the attitude towards the ad - A study of 100 likeable TV commercials. *Marketing and Research Today*. 1998; 26(4):166–179.
- District Tobacco City & Lottery, Inc. v. United States, 674 F.3d 509 (6th Cir. 2012)
- FTC Releases Reports on 2014 Cigarette and Smokeless Tobacco Sales and Marketing Expenditures Report 2016 Retrieved from <https://www.ftc.gov/news-events/press-releases/2016/11/ftc-releases-2014-cigarette-smokeless-tobacco-sales-marketing>
- Gerrard M, Gibbons FX, Stock ML, Lune LSV, Cleveland MJ. Images of smokers and willingness to smoke among African American pre-adolescents: An application of the prototype/willingness model of adolescent health risk behavior to smoking initiation. *Journal of Pediatric Psychology*. 2005; 30(4):305–318. DOI: 10.1093/jpepsy/jsi026 [PubMed: 15863428]
- Gibbons, FX., Gerrard, M., Lane, DJ. A social reaction model of adolescent health risk. In: Suls, J., Wallston, KA., editors *Social Psychological Foundations of Health and Illness* Malden: Blackwell Publishing; 2003 107-136 Blackwell series in health psychology and behavioral medicine

- Grant C, Hassan L, Hastings G, Mackintosh A, Eadie D. The influence of branding on adolescent smoking behaviour: Exploring the mediating role of image and attitude. *International Journal of Nonprofit and Voluntary Sector Marketing*. 2008; 13:275–285. DOI: 10.1002/nvsm.329
- Hanewinkel R, Isensee B, Sargent JD, Morgenstern M. Cigarette advertising and teen smoking initiation. *Pediatrics*. 2011; 127(2):e271–8. DOI: 10.1542/peds.2010-2934 [PubMed: 21242217]
- Henriksen L, Feighery Ellen C, Schleicher Nina C, Fortmann Stephen P. Receptivity to alcohol marketing predicts initiation of alcohol use. *Journal of Adolescent Health*. 2008; 42(1):28–35. DOI: 10.1016/j.jadohealth.2007.07.005 [PubMed: 18155027]
- Kelly K, Slater M, Karan D. Image advertisements' influence on adolescents' perceptions of the desirability of beer and cigarettes. *Journal of Public Policy and Marketing*. 2002; 21(2):295–304. DOI: 10.1509/jppm.21.2.295.17585
- Koordeman R, Anschutz DJ, Engels RC. The effect of alcohol advertising on immediate alcohol consumption in college students: an experimental study. *Alcohol: Clinical and Experimental Research*. 2012; 36(5):874–80. DOI: 10.1111/j.1530-0277.2011.01655.x
- Lovato C, Watts A, Stead LF. Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *The Cochrane Database of Systematic Reviews*. 2011; (10)doi: 10.1002/14651858.CD003439.pub2
- Martin SE, Snyder LB, Hamilton M, Fleming-Milici F, Slater MD, Stacy A, Chen MJ, Grube JW. Alcohol Advertising and Youth. *Alcoholism: Clinical and Experimental Research*. 2002; 26(6): 900–906. DOI: 10.1111/j.1530-0277.2002.tb02620.x
- MacKenzie SB, Lutz RJ, Belch GE. The role of attitude toward the ad as a mediator of advertising effectiveness: A test of competing explanations. *Journal of Marketing Research*. 1986; :130–143. DOI: 10.2307/3151660
- Meyer MG, Toborg MA, Denham SA, Mande MJ. Cultural perspectives concerning adolescent use of tobacco and alcohol in the Appalachian mountain region. *The Journal of Rural Health: Official Journal of the American Rural Health Association and the National Rural Health Care Association*. 2008; 24(1):67–74. DOI: 10.1111/j.1748-0361.2008.00139.x
- Miech, R., Johnston, L., O'Malley, P., Bachman, J., Schulenberg, J. Monitoring the future: National survey results on drug use 1975-2014: Volume 1, secondary school students Ann ArborThe University of Michigan Institute for Social Research; 2015
- Morgenstern M, Sargent JD, Isensee B, Hanewinkel R. From never to daily smoking in 30 months: The predictive value of tobacco and non-tobacco advertising exposure. *BMJ Open*. 2013; 3(6)doi: 10.1136/bmjopen-2013-002907
- Nemeth JM, Liu ST, Klein EG, Ferketich AK, Kwan MP, Wewers ME. Factors influencing smokeless tobacco use in rural Ohio Appalachia. *Journal of Community Health*. 2012; 37(6):1208–1217. DOI: 10.1007/s10900-012-9556-x [PubMed: 22427033]
- Schooler C, Feighery E, Flora JA. Seventh graders' self-reported exposure to cigarette marketing and its relationship to their smoking behavior. *American Journal of Public Health*. 1996; 86(9):1216–1221. [PubMed: 8806371]
- Shimp TA. Attitude toward the ad as a mediator of consumer brand choice. *Journal of advertising*. 1981; 10(2):9–48. DOI: 10.1080/00913367.1981.10672756
- Singh T, Agaku IT, Arrazola RA, Marynak KL, Neff LJ, Rolle IT, King BA. Exposure to advertisements and electronic cigarette use among US middle and high school students. *Pediatrics*. 2016; 137(5)doi: 10.1542/peds.2015-4155
- Slater MD, Rouner D, Beauvais F, Murphy K, Van Leuven J, Domenech- Rodriguez MM. Adolescent male reactions to TV beer ads: The effects of sports content and programming context. *Journal of Studies on Alcohol*. 1996; 57:425–432. DOI: 10.15288/jsa.1996.57.425 [PubMed: 8776685]
- Terry-McElrath Y, Wakefield M, Ruel E, Balch GI, Emery S, Szczypka G, Flay B. The effect of antismoking advertisement executional characteristics on youth comprehension, appraisal, recall, and engagement. *Journal of Health Communication*. 2005; 10(2):127–143. DOI: 10.1080/10810730590915100 [PubMed: 15804904]
- United States Department of Health and Human Services Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General Atlanta, GA: U.S. Department of Health and

Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012

Warner KE. Tobacco industry response to public health concern: A content analysis of cigarette ads. *Health Education Quarterly*. 1985; 12(2):115–127. DOI: 10.1177/109019818501200111 [PubMed: 3997535]

Wiener RC. Association of smokeless tobacco use and smoking in adolescents in the US: Youth risk behavior survey, 2011. *Journal of the American Dental Association*. 2013; 144(8):930–938. DOI: 10.14219/jada.archive.2013.0212 [PubMed: 23904581]

Table 1

Weighted and Survey-Adjusted Distributions of Sociodemographic and Tobacco Use Characteristics of Participants, 2016 (n is the unweighted raw count).

Characteristic	Urban (n=708)	Rural (n=512)	Total
Age (Mean, SE)	13.9 (0.1)	13.9 (0.1)	13.9 (0.06)
Race/ethnicity			
Non-Hispanic White	60.1% (n=433)	90.6% (n=465)	68.2% (n=898)
Non-Hispanic Black	21.5% (n=141)	1.6% (n=9)	16.2% (n=150)
Non-Hispanic Other	3.2% (n=23)	1.6% (n=6)	2.8% (n=29)
Non-Hispanic Multi-racial	5.6% (n=50)	4.3% (n=21)	5.3% (n=71)
Hispanic/Latino	6.0% (n=40)	1.0% (n=7)	4.7% (n=47)
Don't know/Refused	3.6% (n=21)	0.9% (n=5)	2.8% (n=26)
Any Tobacco			
Ever use	13.9% (n=109)	22.8% (n=116)	16.2% (n=225)
Current use	3.5% (n=32)	6.5% (n=33)	4.3% (n=65)

Weighted and Survey-Adjusted Percentage Distributions of Non-Zero Attitudes by Advertisement Type

Table 2

	% Non-Zero Attitude				
	E-cig.	Cigarette	SLT	Alcohol	Beverage
Overall	55.4%	56.1%	53.0%	67.1%	89.8%
County Type					
Urban	60.5%	59.1%	56.0%	68.5%	90.9%
Rural	40.9%	47.2%	44.3%	62.8%	87.0%
Age Category					
11-13 years	47.0%	47.7%	48.1%	60.9%	89.0%
14-16 years	64.1%	64.6%	58.0%	73.4%	90.8%
Race/ethnicity					
Non-Hispanic White	54.7%	58.3%	55.3%	70.5%	90.2%
Non-Hispanic Black	54.6%	46.3%	44.9%	55.1%	90.0%
Non-Hispanic Other	72.4%	69.7%	54.9%	65.3%	89.5%
Non-Hispanic Multirac.	50.5%	44.4%	44.6%	61.5%	91.4%
Hispanic	55.8%	50.9%	49.6%	55.2%	90.2%
Adult Tob. Use in Home					
No	56.7%	57.3%	54.9%	69.3%	90.3%
Yes	53.0%	53.8%	49.1%	62.1%	88.2%
Ever Use of Tobacco					
No	52.8%	54.2%	51.4%	64.8%	88.6%
Yes	68.9%	65.3%	60.8%	78.4%	96.7%
Friend Use of Tobacco					
No Friends Use	51.5%	53.5%	50.0%	65.2%	87.3%
Some Friends Use	66.5%	63.7%	61.1%	75.4%	97.2%

Table 3

Weighted and Survey-Adjusted Odds Ratios from GEE Models * Fit to Non-Zero Attitudes by Advertisement Type

Advertisement Type	OR for Urban vs. Rural (95% CI)	OR for Peer use vs. No Peer Use(95% CI)
E-cigarette	2.33 (1.76, 3.10)	1.87 (1.34, 2.61)
Cigarette	1.70 (1.28, 2.26)	1.52 (1.09, 2.11)
Smokeless tobacco	1.69 (1.27, 2.24)	1.57 (1.13, 2.18)
Alcoholic beverage	1.34 (1.00, 1.81)	1.64 (1.15, 2.34)
Non-alcoholic beverage	1.55 (0.93, 2.60)	5.14 (2.64, 10.03)

* GEE models were fit to the outcome “non-zero attitude.” Interactions between urban/rural and product type and peer use/no use and product type were significant. Models controlled for ever use of tobacco.

Table 4Weighted and Survey-Adjusted Distributions of non-Zero Attitudes by Theme in Advertisement⁷

Theme	Percent of non-Zero Attitudes				
	Cigarette	E-cigarette	SLT	Alcohol	Non Alc. Beverage
Sporting Venue					
Yes	65.7%	–	60.5%	71.1%	95.3% *
No	55.4%	–	52.6%	66.8%	87.8% *
Party/Entertainment					
Yes	51.8%	59.9%	62.0% *	70.8%	–
No	57.3%	53.8%	51.1% *	66.9%	–
Romantic Encounter					
Yes	60.7%	60.9%	52.2%	67.3%	–
No	54.8%	55.3%	53.0%	67.1%	–
Sex Appeal					
Yes	59.3%	60.9% *	58.5%	–	78.1% *
No	54.0%	53.1% *	52.8%	–	90.6% *
Femininity					
Yes	–	–	–	–	91.4%
No	–	–	–	–	89.3%
Masculinity					
Yes	60.8%	69.1%	52.5%	79.2% *	91.9%
No	54.3%	55.1%	53.4%	66.2% *	88.2%
Social Acceptance					
Yes	60.8%	57.7%	60.1% *	67.5%	–
No	54.3%	53.6%	50.4% *	67.0%	–
Athleticism					
Yes	60.0%	–	55.7%	74.8%	90.8%
No	55.7%	–	52.6%	66.0%	88.9%
Presence of Tobacco/Drink					

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Theme	Percent of non-Zero Attitudes				
	Cigarette	E-cigarette	SLT	Alcohol	Non Alc. Beverage
Yes	56.7%	-	-	66.5%	90.4%
No	53.6%	-	-	76.0%	81.8%

Entries designated with “-” are for themes that were not present in any of the advertisements or theme was present in all advertisements. For example, no e-cigarette advertisement had a sports scene depicted. Whereas all e-cigarette and SLT advertisements featured the product.

* p < 0.05 comparing presence versus absence of theme by non-zero attitude percentage using weighted and survey-adjusted chi-square tests.