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Receptivity to cigarette and tobacco control messages and adolescent smoking initiation

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Abstract

Background—Tobacco industry cigarette advertising is associated with increased adolescent smoking, while counter tobacco advertising is associated with reduced smoking. As these campaigns compete for influence, there is a need to understand their inter-relationship on youth smoking.

Methods—This study reports data from a national population of families (n=1036) with an oldest child aged 10–13 years, identified by random digit dialling. Parent and child dyads completed baseline questionnaires in 2003. Adolescents were resurveyed in 2007–2008 (response rate 74%). Adjusted logistic regression explores associations between receptivity to cigarette and tobacco control advertising and adolescent smoking initiation.

Results—In 2007–2008, 57.9% of adolescents reported a favourite tobacco control advertisement and 43.3% reported being receptive to cigarette advertisements. Thirty per cent reported receptivity to cigarette and tobacco control advertisements. Among those receptive to cigarette advertising, having a favourite anti-smoking advertisement had a borderline significant association with a 30% lower smoking rate. Anti-industry tobacco control messages were three times more likely to be favourites of those who were receptive to cigarette advertising than other tobacco control advertising.

Conclusions—Receptivity to tobacco control advertising appeared to ameliorate the promotion of initiation from cigarette advertising. Anti-industry advertising appears to be the most effective counter for tobacco control and should be considered for wider use. A larger longitudinal study is needed to confirm these findings.

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Introduction

A substantial body of evidence supports a causal association between cigarette advertising and increases in youth smoking.¹ Restrictions on such marketing and large scale tobacco control media campaigns have been associated with major reductions in youth initiation. Receptivity to tobacco control advertising may be independent of receptivity to cigarette advertising as a determinant of future smoking risk.²³ Exploring whether tobacco control advertising counteracts influence of receptivity to cigarette advertising may inform policy and resource decisions.

Persuasive communication theory⁴ has guided studies of the effectiveness of cigarette advertisements⁵ and has led to the use of a binary measure of receptivity with criterion validity in evaluation of such advertising.⁶⁷ Two major types of anti-smoking messages have been used in the USA: those that emphasise health consequences and those that attempt to counter cigarette advertising by calling into question the credibility of the message source. Thrasher and Jackson⁸ demonstrated that the latter type of message may lead to changes in attitudes toward smoking that might make teens less receptive to cigarette advertising.

This study is a secondary data analysis of a randomised controlled trial of the role of parenting in problem behaviours. Since the intervention did not change smoking behaviour, we treat this study as a multi-wave national longitudinal study of US adolescents. Receptivity to cigarette advertising was collected on multiple survey waves, and has been previously shown to predict smoking initiation.⁶ As receptivity to tobacco control advertising was only collected on the 2007–2008 survey, we restrict this analysis to a cross-sectional report on this survey. In this paper, we report smoking status for different categories of receptivity to cigarette and tobacco control advertising. Our analysis explores how receptivity to tobacco control advertising may modify the influence of receptivity to cigarette advertising on smoking behaviour.

Methods

Data sources

In 2003, a random digit-dialled national probability sample, conducted by Westat, identified families (N=1036) with an oldest child aged 10–13 years. Parents with most responsibility for the child were invited to participate in a parenting study to prevent problem behaviours, the protocol for which is published elsewhere.⁹ The study sample includes all children who were never smokers at baseline who had complete data at the 2007–2008 follow-up (N=688).

Measures

Receptivity to tobacco-related media—Following previous research,⁶⁷ adolescents were asked “What is the brand of your favourite cigarette advertisement?”. Responses were dichotomised where receptive adolescents were those who nominated a cigarette brand. Receptivity to tobacco control advertising was assessed with the open-ended question: “What is your favourite ad against smoking?”.¹⁰ Once acceptable reliability had been

demonstrated, two coders classified responses into the following tobacco control genres: health consequences, anti-industry, secondhand smoking, quitting, general antidrug and other anti-smoking. Responses that gave no clear message were coded as 'other.' Using both receptivity variables, adolescents were categorised as receptive to: (a) only cigarette advertising, (b) only tobacco control advertising, (c) both or (d) neither.

Adolescent measures—Age, gender, adolescent smoking status, exposure to other smokers, best friend smoking and household smoking rules were assessed using standard questions from national studies.¹⁰ Susceptibility to smoking was assessed using a validated three-item scale¹¹; any answers other than “definitely not” to all three questions categorised the respondent as susceptible.

Parent Measures—Responses to an earlier parent survey were used for household income,¹⁰ education level¹⁰ and child's school performance.¹⁰

Statistical analysis

Analyses were performed using SAS statistical software V.9.3.¹² Exploratory analysis was undertaken using t tests and Pearson's χ^2 tests. Logistic regression was used to explore relationships between recall of favourite tobacco advertisements and adolescent cigarette experimentation, adjusting for covariates at baseline.

Results

Sample characteristics

Youth participants (N=688, table 1) were equally represented across gender and three-fifths were aged 15 years or 16 years (61.6%) in 2007–2008. A third came from minority backgrounds and 32% came from households with smokers. Over a third (36.8%) were susceptible to smoking at baseline. Over half performed well at school (mostly or all As); 37% had grades of Bs or Cs; 6% had lower grades.

Most parents surveyed were female (82.9%), high school graduates (76.9%), and 80.1% lived with a partner. Over a third (37.8%) reported annual household income <\$50 000 and 19.2% reported incomes >\$100 000. The highest proportion of families resided in the south (40.4%), followed by the midwest (24.3%), west (19.6%) and northeast (15.7%).

Combinations of receptivity to cigarette and tobacco control advertising

Overall, study adolescents were more likely to be receptive to tobacco control advertisements compared with cigarette advertisements (57.0% vs 43.3%). The smallest proportion (13.2%) was receptive only to cigarette advertisements. The other three combinations had approximately equal proportions: 27.9% receptive to only tobacco control advertisements; 30.1% receptive to cigarette and tobacco control advertisements; and 28.8% not receptive to either set of messages.

Of those receptive to tobacco control advertisements, the following message genres were the most popular: anti-industry (28.6%); other antidrug (10.9%); health consequence messages (9.3%); and other anti-smoking; 9.2%). Nomination of antiindustry advertising as a

favourite was more likely among adolescents who were also receptive to cigarette advertising, (35.6% vs 23.3%, $p=0.004$). Receptivity to health consequences tobacco control advertising did not differ by receptivity to cigarette advertising.

Tobacco control advertisements appear to mitigate the influence of cigarette advertising

We report the relationship between reporting a favourite cigarette and tobacco control ad as a combined variable to current smoking status. Across receptivity categories, adolescents receptive to only cigarette advertising represented the highest proportion of ever smokers ($39.6\pm 3.1\%$) and we used these as the reference group (table 1). Teens receptive to cigarette and tobacco control advertising appeared to be 30.0% less likely to have started smoking compared with this reference group, although this only reached borderline statistical significance ($OR=0.7$, 95% CI 0.4 to 1.2). Teens receptive to tobacco control advertising alone were the least likely to start smoking (39.6% vs 17.2%, $OR: 0.4$, 95% CI 0.2 to 0.7).

Discussion

This study provides the first evidence that tobacco control advertising may counter the effectiveness of receptivity to cigarette advertising in promoting adolescent smoking behaviour. For adolescents already receptive to cigarette advertising, receptivity also to an anti-smoking message may reduce the probability that they will start smoking by as much as 30.0%, although this finding needs to be replicated in a larger study. However, not all tobacco control messages appear to be equally effective at countering cigarette advertising among teens. Messages associated with the Truth campaign, which focused on fostering negative attitudes about the tobacco industry,¹³¹⁴ appeared more salient to youth who were receptive to cigarette advertising. Evidence suggests these messages may effectively counter cigarette advertising because trust is often a higher value for adolescents and loss of trust in the message source can result in downgrading of its salience.⁸

Although cigarette advertisements in the broadcast media have been banned since 1971 and print advertising restricted by the 1998 Master Settlement Agreement (MSA),¹¹⁵¹⁶ tobacco industry advertising continues to reach young people¹⁶ through magazines,⁶ point of sale ads,¹⁷ and likely the internet and social media.¹⁸ In 2007–2008 receptivity to cigarette advertising still increased the probability of smoking by approximately 60.0% over the 4-year period.

Our data are consistent with earlier results in Florida, California and the Truth campaign indicating the effectiveness of strong anti-industry messages to decrease adolescent smoking prevalence.¹³¹⁹²⁰ However, the recent large national campaigns notably do not include anti-industry messages. It will be important to see whether receptivity to anti-smoking messages in these campaigns counters receptivity to cigarette advertising.

Study strengths include its longitudinal design and assessments from both parents and teens in a US probability sample. However, the smoking rate in this telephone survey was considerably lower than that identified in school surveys taken at the same time,²¹ a finding that appears to be a consistent mode difference across studies.²² In addition to the mode effect, this study was likely more attractive to parents with children who were already at

lower smoking risk. Thus, our results may not be generalisable to the US population. That our results came from a population at low risk to smoke suggests that the interaction between tobacco-related ad preferences and adolescent smoking behaviour may be even stronger in the general population.

A study limitation is that receptivity to tobacco control advertising was not measured in earlier survey waves, limiting results to a cross-sectional analysis. The study time period was 2007–2008, also limiting generalisability as advertising content changes quickly. Further, there was no objective validation of self-reported smoking. Future studies specifically designed to investigate how well tobacco control advertising counteracts the effectiveness of cigarette advertising are needed.

In summary, the evidence is encouraging for tobacco control programmes. Using hard-hitting anti-industry messages is an alternate approach that needs to be tested in longitudinal studies. However, the tobacco industry has objected to these types of messages,²³ and most governmental agencies use such messages sparingly.²⁴ Certainly the fact that over 40% of this low-risk population was receptive to effective cigarette advertisements is cause for concern and may explain the still high initiation rate among US youth.

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What the paper adds

- The tobacco industry continues to effectively encourage a large proportion of adolescents to be receptive to their marketing and this is a strong predictor of later initiation.
- It would appear that tobacco control messages may be able to effectively counter this tobacco industry influence.
- This paper highlights the need for well-designed research focused on countering the influence of tobacco advertising.

Table 1
Cross-sectional adjusted logistic regression exploring for associations between favourite tobacco advertisement and adolescent smoking initiation (N=688, initiators n=178)[‡]

Variables	Response	Experimentation at Survey Five			
		n/N (initiators/total population)	178/700	% initiated 25.4%	OR (OR) 95% CI
Parent education	High school grad (ref)	114/529		21.6	1
	Less than high school	61/159		38.4	1.6* (1.01 to 2.50)
Grades	Mostly As (ref)	69/394		17.5	1
	Bs and Cs	80/255		31.4	1.9** (1.22 to 2.79)
	Ds or Fs	26/39		66.7	6.4*** (2.95 to 13.84)
	Complete (ref)	86/440		19.6	1
Home smoking restrictions	All other responses	89/248		35.9	1.5 (0.97 to 2.35)
	No household smokers (ref)	94/468		20.1	1
Household smokers	All other responses	81/220		36.8	1.48 (0.94 to 2.33)
	No best friends smoke (ref)	139/628		22.1	1
Best friend smoking	Has smoking best friends	36/60		60.0	4.7*** (2.55 to 8.52)
	Tobacco industry only (ref)	36/91		39.6	1
Favourite tobacco Advertisement (Ad)	Tobacco control only	33/192		17.2	0.4** (0.20 to 0.69)
	Industry and control	60/207		29.0	0.7 (0.36 to 1.18)
	No ad	46/198		23.2	0.5** (0.28 to 0.94)

Hosmer-Lemeshow goodness of fit $\chi^2=7.4562$, df=8, p value=0.4883.

[†] p<0.1,

* p<0.05,

** p<0.01,

*** p<0.001.

[‡]Model adjusts for child gender, child age, child ethnicity and household income.