TESTIMONY OF KEVIN OUTTERSON
ASSOCIATE PROFESSOR OF LAW
BOSTON UNIVERSITY SCHOOL OF LAW

PL 2009, CHAPTER 230 (LD 1183)

AN ACT TO PREVENT PREDATORY MARKETING PRACTICES AGAINST MINORS

October 15, 2009

BEFORE THE JOINT STANDING COMMITTEE ON JUDICIARY

This testimony addresses the constitutionality of proposed amendments to Maine's Public Law 2009, chapter 230, An Act To Prevent Predatory Marketing Practices Against Minors ("Chapter 230" or "the Law") under the Commerce Clause, First Amendment, and Supremacy Clause.

The operative provisions of the Law (as amended) are divided into two categories:

(a) prohibiting on the online collection of Protected Health Information ("PHI") (as defined by HIPAA)[1] from children (aged 13 or less) without verifiable parental consent ("the Data Collection Restriction"); and

(b) prohibiting the marketing of health products to children using PHI obtained in violation of the Data Collection Restriction ("the Health Marketing Restriction").

I. Executive Summary

The Law as amended will not violate the Dormant Commerce Clause because they are explicitly authorized under federal law and do not impose an undue burden on interstate commerce.

The Data Collection Restriction does not regulate protected commercial speech and will not be invalidated on First Amendment Grounds.

The Health Marketing Restriction will likely survive a First Amendment challenge if the legislature, considering the evidence in front of it, finds less restrictive alternatives will be ineffective, since it is narrowly tailored to prohibit only the marketing of health products using impermissibly obtained PHI.

[1] As used herein, PHI means "personal health information" as defined in HIPAA, the Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191.

II. Background

On June 2, 2009, Governor Baldacci signed Chapter 230 into law. The Law makes it unlawful to knowingly collect or receive health-related or personal information for marketing purposes from a minor without parental consent. The Law also makes it illegal to sell, offer to sell, or otherwise transfer health-related or personal information about a minor if the information (1) was collected without verifiable parental consent; (2) individually identifies the minor; or (3) will be used in marketing to minors. The Law also prohibits marketing products and services to minors using health-related or personal information. The Law was challenged quickly in federal court, where opponents argued it violated the First Amendment and the Dormant Commerce Clause, and that it is preempted by the Children's Online Privacy Protection Act, 15 U.S.C. § 6501-6508 (2000) ("COPPA"). Governor Baldacci agreed not to enforce the Law as it exists now, the suit was dismissed, and this committee scheduled a meeting for October 15, 2009, to review the language of the Law.

Under this proposal, Maine will clarify that the Law is a state expansion of privacy protections under HIPAA and COPPA. Under HIPAA, state privacy law will not be preempted "if the provision of State law imposes requirements, standards, or implementation specifications that are more stringent" than HIPAA regulations. § 264(c)(2). COPPA provides similar federal statutory authority for states to expand protections for children. 15 U.S.C. §6502(d).

This proposal will also narrow the focus from minors to children aged 13 or less. This proposal also narrows the focus from "Health-Related" and "Personal Information" and substitutes instead the definition of Protected Health Information (PHI).

This proposal also narrows the Law by limiting its prohibitions to the *online* collection and receipt of PHI.

Finally, the Health Marketing Restriction is strictly limited to the use of illegally-obtained PHI to market health-related goods and services to children.

Collectively, these changes address the most salient concerns of the critics of the Law.

III. The Amended Law Will Not Impose an Impermissible Burden on Interstate Commerce.

Enacted under HIPAA and COPPA's express grant of authority to the states to adopt more stringent regulations, the Data Collection Restriction will withstand a Commerce Clause challenge, since Congress can essentially immunize state regulation from Commerce Clause challenge. The Health Marketing Restriction is not directly protected by a federal statute, and requires more detailed analysis.

The Dormant Commerce Clause, inferred from Congress's Article I power to regulate commerce among the states, prohibits the state from regulating in a way that places an undue burden on interstate commerce. For the most part, laws that discriminate against

out-of-state commerce in favor of local businesses or interests are *per se* invalid. *C & A Carbone, Inc. v. Town of Clarkstown, N.Y.,* 511 U.S. 383 (1994). To determine if non-discriminatory regulations are constitutional, courts balance the nature and extent of the burden a regulation imposes on interstate commerce with the benefits it confers on the state. *Southern Pac. Co. v. State of Ariz. ex rel. Sullivan*, 325 U.S. 761, 770-71 (1945). Since this proposal applies equally to individuals collecting PHI or marketing health products from in- and out-of-state, it will be evaluated under the later balancing test. *See*, *e.g.*, *CTS Corp. v. Dynamics Corp. of Am.*, 481 U.S. 69 (1987) (holding Indiana Control Share Acquisitions Act had the same effects on tender offers whether or not offeror was a domiciliary or resident of Indiana and thus did not discriminate against interstate commerce). Non-discriminatory laws subject to the balancing test are overturned rarely – only when they impose a substantial burden on interstate commerce, while providing no real benefit to the state. *Bibb v. Navajo Freight Lines, Inc*., 359 U.S. 520 (1959).

The balancing test gives the court a great deal of discretion to determine if a state regulation of commerce is constitutional. *See Bendix Autolite Corp. v. Midwesco Enter., Inc.*, 486 U.S. 888, 898-99 (1998) (Scalia, J., dissenting) (finding the balancing test unpredictable, the interests on both sides to be incommensurate, and arguing it is for Congress to determine whether the state interest is sufficient to justify the burden on interstate commerce). Congress may give the states power to regulate interstate commerce, even when those regulations might otherwise violate the Commerce Clause, and "any action taken by a State within the scope of the congressional authorization is rendered invulnerable to Commerce Clause challenge." *Western & Southern Life Ins. Co. v. State Bd. Of Equalization of Cal.*, 451 U.S. 648, 652-53 (1981).

The proposed Health Marketing Restriction will impose some burden on interstate commerce, as it will limit the ability of companies in the health-products business to target marketing into the state of Maine. However, the burden this regulation would impose is not likely to be excessive. Most importantly, it only forbids marketing using information obtained in violation of the Data Collection Restriction. Marketing in the state of Maine would still be allowed and marketers of health products could still target their advertisements using properly obtained PHI. These burdens are modest compared with the effects of the Law. Thus, the law under this proposal should survive a Commerce Clause challenge.

IV. The Amended Law Does Not Violate the Supremacy Clause.

Under the Supremacy Clause of the Constitution, the Constitution and laws or treaties adopted under it are the supreme law of the land. U.S. Const. art. IV. Any state law that interferes with, or is contrary to the laws of Congress, is invalid. *Gibbons v. Ogden,* 22 U.S. 1, 82 (1824). The question of whether a state law is preempted is one of congressional intent. *Gade v. Nat'l Solid Wastes Mngmt. Ass'n*, 505 U.S. 88, 98 (1992). There are two ways to find preemption of a state or local law – "where Congress's command is explicitly stated in the statute's language or implicitly contained in its structure and purpose." *Id.* Preemption is implied when the Congressional regulatory scheme is so pervasive that it leaves no room for the state to regulate, when compliance

with both the federal and state laws is physically impossible, or when the state law stands as an obstacle to the purpose of the federal law. *Id.*

COPPA makes it unlawful for the "operator of a website or online service directed to children, or any operator that has actual knowledge that it is collecting personal information from a child, to collect personal information from a child" without verifiable parental consent. 15 U.S.C. § 6502. COPPA defines a child as anyone under age thirteen. 15 U.S.C. § 6501. COPPA was enacted: "(1) to enhance parental involvement in a child's online activities in order to protect the privacy of children in the online environment; (2) to enhance parental involvement to help protect the safety of children in online fora such as chatrooms, home pages, and pen-pal services in which children may make public postings of identifying information; (3) to maintain the security of personally identifiable information of children collected online; and (4) to protect children's privacy by limiting the collection of personal information from children without parental consent." 44 Cong. Rec. S12741 (Oct. 7, 1998) (Statement of Sen. Bryan). Under COPPA no state may "impose any liability for commercial activities or actions by operators in interstate or foreign commerce in connection with an activity or action described . . . that is inconsistent with the treatment of those activities or actions" under COPPA. 15 U.S.C. 6502(d).

Cases where the court has found express preemption have involved much stronger preemptory language than the "inconsistent" clause in COPPA. *See*, *e.g.*, *Jones v. Rath Packing Co.*, 430 U.S. 519, 530-31 (1977) (finding express preemption in language prohibiting state from imposing requirements "in addition to or different than" those made under Federal Meat Inspection Act); *Morales v. Trans-World Airlines, Inc.*, 504 U.S. 374 (1992) (finding express preemption in language prohibiting state from "enacting or enforcing any law rule, regulation, standard or other provision having the force and effect of law relating to rates, routes or services of any air carrier"). Here, Congress is preempting only inconsistent laws, not all state laws in this area. Therefore, a Maine law under either proposal would not be expressly preempted by COPPA.

Similarly, this language shows intent to preempt inconsistent regulations, not the entire field, leaving states free to regulate in a consistent way. Thus, this proposal will not be invalidated because Congress has preempted the entire field. Additionally, since both statutes are aimed at protecting private data about children, Maine's legislative goals here are clearly consistent with the purposes underlying COPPA. This means it is unlikely a court would find a Maine law creates an obstacle to the purposes of the federal regulatory scheme.

The meaning attached to the language "inconsistent with" will likely determine whether a Maine law is preempted. The Court has deemed state laws "inconsistent" with federal law when compliance with both was impossible. *Free v. Bland*, 369 U.S. 663 (1962) (finding state law giving estate of deceased spouse a one half interest in U.S. savings bond inconsistent with federal law which expressly created a right of survivorship in widowed husband). From this it might be argued that a state law is consistent with federal regulation if the two are not in direct conflict and it is possible to comply with

both. A state law that merely imposes a stricter standard than the federal floor would then be consistent with the federal law. In many cases the Court has accepted the argument that stricter, non-conflicting state laws are permissible when Congress has not preempted the entire field, as is the case here. *See*, *e.g.*, *Fl. Lime & Avocado Growers, Inc., v. Paul*, 373 U.S. 132 (1963). Since this proposal merely strengthens existing protections under HIPAA and COPPA it will survive a preemption challenge.

Maine's law should be drafted carefully to ensure it does not conflict with COPPA and is limited to an expansion of COPPA protections. Specifically, the verifiable parental consent definition, adopted from COPPA, should be retained as it exists now so marketers do not have to go through separate or inconsistent procedures in obtaining parental consent. Maine would also have to add a provision honoring the safe harbors approved under COPPA, since a refusal to do so would essentially be a denial of rights expressly granted by the federal government. *See* 16 C.F.R. § 312.10 (1999). *See also* Federal Trade Commission, *Safe Harbor Program*, http://www.ftc.gov/privacy/privacyinitiatives/childrens_shp.html (last visited Oct. 6, 2009) for information on approved safe harbor programs.

V. This Proposal is Likely to Withstand a First Amendment Challenge.

A. Protecting Children from the Dangers of Targeted Health-Related Marketing is a Compelling State Interest

The protection of children is a recognized compelling state interest. *See*, *e.g.*, *Denver Area Educational Telecommunications Consortium, Inc. v. F.C.C.*, 518 U.S. 727, 755 (1996). The Law is designed to protect children from the dangers of targeted data collection and health products marketing. *See*, *e.g.*, *An Act to Prevent Predatory Marketing Practices Against Minors Regarding Data Concerning Health Care Issues: Hearing on LD 1183 Before the Joint Standing Committee on Business, Research and Economic Development*, 124th Leg. (Testimony of Rep. Sharron Treat). *See also*, Francesca Lunzer Kritz, *What Teens are Hearing About Drugs*, Wash. Post, Sept. 9, 2008 (detailing pharmaceutical advertising campaigns targeted at teens and their potential dangers). The Maine Legislature should carefully consider the dangers of the collection of PHI from children without verifiable parental consent, as well as the dangers of marketing of health products to children. This legislative record should be helpful if necessary to satisfy the compelling government interest requirement. *See* Appendix A-L for peer-reviewed studies and other authorities documenting the effects of advertising on children. These studies should be reviewed and evaluated, with the opportunity for parties with different viewpoints to discuss the conclusions reached in these studies.

B. The Health Marketing Restriction is Narrowly Tailored

Narrow tailoring has posed a problem in previous child protection laws. *See*, *e.g.*, *Am. Civil Liberties Union. v. Mukasey*, 534 F.3d 181, 190-98 (3d Cir. 2008); *Am. Booksellers Found. v. Dean*, 342 F.3d 96 (2d Cir. 2003); *PSINET, Inc. v. Chapman*, 362 F.3d 227, 234 (4th Cir. 2004). The courts in these cases found the statutes were not narrowly

tailored because they regulated substantially more speech than was necessary to further the legislative goal in question. *Id.* For example, in *Mukasey*, the Child Online Protection Act ("COPA"), which makes it a crime to knowingly post material that is harmful to minors (under 17) on the Web "for commercial purposes," was challenged on First Amendment grounds. 534 F.3d 181. COPA limited liability to "persons making communications 'for commercial purposes,'" much like the Law now limits liability to those collecting or disseminating information for "marketing purposes." *Id.* Yet the court found COPA was not narrowly tailored in part because it would apply too broadly. *Id.* For example, COPA would apply not just to those in the business of obscenity but also to "[w]eb publishers who have posted any material that is 'harmful to minors' on their Web sites, even if they do not make a profit from such material itself or do not post such material as the principal part of their business." *Id.*

The Health Marketing Restriction is limited to prohibit marketing health products using PHI obtained from children without parental consent. Unlike in *Mukasey*, where the court objected to the fact that the statute would apply to anyone who derived profit from a website, here the Law would apply only to a targeted subset of people or companies using illegally obtained PHI to market a specific kind of product to children. *Id.* at 192. Banks, universities and other organizations would still be able to use properly collected data to market their products to children, and would face no restrictions past age 13. Thus, while the court has a fair amount of discretion in evaluating whether a law is narrowly tailored, the Health Marketing Restriction will likely satisfy the narrow tailoring requirement.

C. To Establish they have Selected the Least Restrictive Alternative the Maine Legislature must Evaluate the Proposed Alternatives and Determine if Less Restrictive Options Would be Less Effective at Furthering its Legislative Goals

To satisfy the least restrictive means requirement, the Legislature must show that it has considered less restrictive ways of furthering its compelling interest and has found those alternatives to be less effective. *Ashcroft v. Am. Civil Liberties Union*, 542 U.S. 656, 665 (2004) (finding plaintiffs likely to prevail on claim COPA violated the First Amendment since there were plausible, less restrictive alternatives available). The Court in *Ashcroft* found COPA likely violated the First Amendment because the legislature failed to show that filtering software would be a less effective way to further their legislative goals. *Id.* This software imposes "selective restrictions on speech at the receiving end, not universal restrictions at the source," and it may be one alternative the Maine Legislature should rule out before proceeding under either proposal. *Id.* at 667.

To ensure the least restrictive means requirement is satisfied, a detailed review of alternatives proposed and of their effectiveness at furthering the Legislature's goal is required. Indeed, that is one purpose of these Hearings.

The Legislature should select an alternative that is both effective and as unrestrictive as possible. To that end, the law proposed herein is targeted to protect children's private

health data online and prevent that data from being exploited to market health products to children, who often lack the capacity to evaluate product risks and alternatives. Yet, the Law still allows collection of PHI from children with parental consent and allows marketing using legally obtained data, as well as marketing of non-health products.

D. This Proposal is not an Impermissible Regulation of Commercial Speech Under *Central Hudson.*

Opponents have argued the Law violates the First Amendment by drying "up a major source of information used for commercial speech." Maine Ind. Colleges Ass'n v. Baldacci, Complaint (D. Me. 2009).

As revised, the Data Collection Restriction will simply extend privacy protections already granted under HIPAA and COPPA. HIPAA has been upheld on First Amendment grounds. *See*, *e.g.*, *Citizens for Health v. Leavitt*, 428 F.3d 167 (3d Cir. 2005); *Ass'n of Am. Physicians & Surgeons, Inc. v. U.S. Dept. Of Health & Human Services*, 224 F.Supp.2d 1115 (S.D. Tex. 2002). The Court in *Central Hudson Gas & Elec. Copr. v. Public Service Commission of N.Y.*, limited commercial speech protections to lawful activity. 447 U.S. 557, 564 (1980). Here, Maine is extending privacy protections under HIPAA and COPPA in a way contemplated by both statutes. HIPAA § 264(c)(2); 15 U.S.C. §6502(d). This law will make it illegal to collect PHI from children without parental consent. Thus, with no lawful right to this private data, opponents' commercial speech claims that they have a First Amendment right to obtain PHI from children will fail.

The Health Marketing Restriction does regulate commercial speech and must satisfy the test set out in *Central Hudson*. 447 U.S. 564-66. Under this test, the government may regulate non-misleading commercial speech related to lawful activity if the restriction furthers a substantial government interest, directly advances that interest, and the regulations restrict no more speech than is necessary to further that interest. *Id.* Commercial speech regulations do not necessarily need to be content neutral. *See Metromedia, Inc. v. City of San Diego,* 453 U.S. 490, 514 (1981) (finding the state "may distinguish between the relative value of different categories of commercial speech").

As discussed above, protecting children is more than a substantial state interest; it is a compelling state interest, and the legislature, after a review of the evidence before it, can likely satisfy this requirement. *Denver Area Educational Telecommunications Consortium, Inc.* 518 U.S. at 755. The Court has held that a commercial speech regulation "may not be sustained if it provides only ineffective or remote support for the government's purpose." 44 *Liquormart v. R.I.*, 517 U.S. 484, 505 (U.S. 1996) (holding "without any findings of fact, or indeed any evidentiary support whatsoever, we cannot agree with the assertion that [a] price advertising ban will significantly advance the State's interest in promoting temperance"). Presumably, if the legislature is concerned with the effects of targeted health marketing to children using personal information, a law prohibiting the collection of personal information without parental consent and stopping predatory marketing practices by health companies will be considered to directly advance

that goal.

This proposal certainly restricts less speech than Law in its current form because it restricts only health product marketing to children using improperly obtained PHI while allowing marketing of *any* product using data obtained with parental consent. However, whether it restricts no more speech than is necessary will depend on the Legislature's assessment of the viability of the options before it and their effectiveness at protecting children.

VI. Conclusion

The State of Maine should consider these proposed amendments to the Law, as possible ways to achieve the goals of the legislation within the confines of the Constitution.

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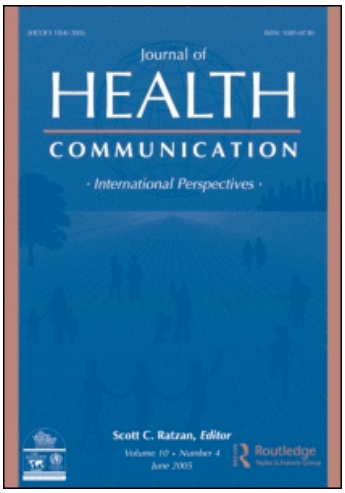

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Mediators and Moderators of Magazine Advertisement Effects on Adolescent Cigarette Smoking

Patricia A. Aloise-Young [a]; Michael D. Slater [a]; Courtney C. Cruickshank [a]
[a] Colorado State University, Fort Collins, Colorado, USA

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Mediators and Moderators of Magazine Advertisement Effects on Adolescent Cigarette Smoking

PATRICIA A. ALOISE-YOUNG, MICHAEL D. SLATER, AND COURTNEY C. CRUICKSHANK

Colorado State University, Fort Collins, Colorado, USA

The purpose of the present study is to examine the relation between magazine advertising for cigarettes and adolescent cigarette smoking. Participants (242 adolescents) reported their frequency of reading 46 magazines and their attention to cigarette ads. Recognition of cigarette ads, passive peer pressure (i.e., normative beliefs), and the smoker image also were assessed. Results indicate that exposure to cigarette advertising and recognition of ads augment the effect of passive peer pressure on smoking. In addition, a positive smoker image was associated with attention to advertising and mediated the relation between attention and smoking. It is suggested that the effect of magazine ads on adolescents should be considered in policymaking on cigarette advertising.

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In 1998, the Master Settlement Agreement (MSA) between the tobacco companies and the state Attorneys General eliminated or severely limited several forms of tobacco advertising including billboards, merchandising, and sporting event sponsorships. Consistent with past history (i.e., after the ban on advertising in broadcast media in 1971) this has resulted in an increase in magazine advertising of cigarettes. Specifically, from 1998 to 1999 the tobacco industry reported a 34% increase in magazine advertising expenditures (Federal Trade Commission, 2001). Similarly, in an analysis of advertising in 20 youth-oriented magazines, King and Siegel (2001) found that cigarette advertising increased 25% from 1998 to 1999.

Given that magazine advertising is a primary venue through which teens are exposed to cigarette advertising (Davis, 1987), it is now more important than ever to understand the relation between exposure to magazine advertising and adolescent cigarette smoking. In particular, research efforts should identify mechanisms that can explain how advertising exposure can lead to adolescent smoking uptake. In this study, we examine two possible mechanisms: (1) magazine advertising of cigarettes may enhance adolescents' images of smokers and (2) cigarette advertisements may reinforce the effect of peer influence on adolescents.

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Address correspondence to Pat Aloise-Young, Psychology Department, Colorado State University, Fort Collins, CO 80523-1876, USA. E-mail: aloiseyo@lamar.colostate.edu

Some researchers have suggested that adolescents are *more* susceptible to the persuasive impact of cigarette advertising than are adults (Pollay et al., 1996). This increased vulnerability seems plausible given that adolescence is a time for identity exploration (Erikson, 1963). That is, adolescents are more likely than are adults to try out different personas. Most cigarette advertising is aimed at projecting an image of the *person* who smokes (Barbeau, DeJong, Brugge, & Rand, 1998). Given their need to determine who they are, one would expect that adolescents would be more likely to experiment with the smoker persona conveyed in those advertisements than would adults.

In studying the relation between cigarette advertising and teen smoking, researchers have taken varied approaches. Population-based research examining the relation between historical trends in advertising expenditures and teen smoking (e.g., Pierce, Lee, & Gilpin, 1994; Pollay et al., 1996) has revealed that changes in cigarette brands' market shares among adolescent consumers covary with brand-specific advertising expenditures. Research with individual-level measures of exposure to cigarette advertising such as brand recognition and awareness of cigarette advertising campaigns has revealed that teens who smoke are more aware of cigarette advertising (e.g., Aitken, Leathar, O'Hagan, & Squair, 1987) and have greater brand recognition (e.g., Chapman & Fitzgerald, 1982) than do nonsmoking adolescents. Moreover, nonsmoking adolescents who have a favorite cigarette advertisement are significantly more likely to begin smoking than are those who do not have a favorite advertisement (Pierce, Choi, Gilpin, Farkas, & Berry, 1998). Finally, experimental studies have found that viewing advertisements with image-oriented visuals (i.e., the type typically found in magazines) results in more positive attitudes toward smoking than does viewing black and white ("tombstone") ads (Kelly, Slater, & Karan, 2002). It is noteworthy that studies utilizing widely varied methodologies have all pointed to one common finding: cigarette advertising affects adolescents.

An important limitation to the literature, however, is that few studies have examined teens' real-world exposure to magazine advertising of tobacco products and its relation to tobacco use and underlying attitudes and beliefs. To date, so far as we have been able to ascertain, there have been only two studies of this kind. In 1986, Botvin, Goldberg, Botvin, and Dusenbury (1993) surveyed 602 seventh and eighth graders about their smoking, several psychosocial factors related to smoking (e.g., peer use, estimated prevalence of peer and adult use), and their exposure to cigarette advertising in several magazines. Specifically, they asked the teens how often they read 22 magazines that contained tobacco advertising. This exposure was weighted by the percentage of cigarette ads the teens reported reading (defined as looking at for 5 seconds or more). As expected, Botvin and colleagues found that exposure to magazine advertising of cigarettes was positively related to smoking.

In the second study to directly measure magazine advertising exposure (Pucci & Siegel, 1999), 307 12- to 15-year-olds listed up to three magazines they had read during the previous month, and exposure measures were computed for each participant by summing the number of cigarette ads that appeared in each of the three magazines during 1993. Separate exposure measures were computed for various brands. The results indicated that exposure to magazine advertising for specific cigarette brands significantly predicted brand of initiation among new smokers 4 years later.

The present study was designed to replicate and extend that of Botvin and colleagues (1993). Although that study made an important contribution, there were limitations to their design, which we sought to address. The most serious limitations

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deal with how exposure to cigarette advertising was measured. The first of these limitations was the magazine selection process. The authors noted that the literature did not provide a basis for selecting magazines. Consequently, focus groups were conducted and a list of 22 magazines with high levels of cigarette advertising were selected for inclusion in the study. In the present study, the results of the Simmons Teen Age Research Study (STARS; Simmons Market Research Bureau, 1994) were used to identify magazines for inclusion (see the Method section for details). In comparison with the magazines studied by Botvin and colleagues, the list of magazines used in the present study (a) was selected based on large-scale market research to ensure inclusion of magazines with substantial adolescent readerships; (b) was more extensive and included a wider variety of publications; and (c) included some magazines that lacked cigarette advertising as well as those that contained cigarette ads (Botvin and colleagues studied only magazines with cigarette advertising).

A second limitation to Botvin and colleagues' study was that readership of all the magazines was given equal weight, despite the fact that they contained different amounts of cigarette advertising. In the present study, data on the amount of cigarette advertising in each publication were obtained and these data were used to form a more accurate measure of cigarette advertising exposure.

The final limitation of the Botvin and colleagues' study was that their measure of exposure was derived by multiplying magazine readership by attention to cigarette advertising. This multiplicative measure was included as a predictor of smoking without controlling for the individual effects of readership and attention. This approach is equivalent to testing for an interaction without controlling for main effects (Evans, 1991).

The goal of the present study was not only to address the limitations of the Botvin and colleagues' study, but also to extend previous research on the relation between advertising and smoking in two important ways. First, multiple measures of cigarette advertising were included: (a) exposure to cigarette advertising determined by self-reported magazine readership and the advertising content in those magazines, (b) self-reported attention to magazine advertising for cigarettes, and (c) recognition of cigarette advertising. Research on media effects usually includes only memory measures or attention and self-reported exposure measures. Including both sets of measures, however, enabled us to compare results across measures. In addition to the methodological implications of such analyses, there also may be theoretical implications. For example, if the mechanisms to be tested in the present study were supported for some measures of cigarette advertising but not for others, this might help us to distinguish between effects of different aspects of advertising exposure. Such differential findings can have implications for understanding mechanisms of cigarette ad effects and provide insight into conflicting results obtained by other researchers.

Another way in which the present study extends previous associational studies of advertising effects on adolescent substance use is by examining potential mechanisms through which cigarette advertising affects adolescent cigarette smoking. Most associational studies of advertising effects assume implicitly or explicitly a social learning mechanism, in which young people adopt the behavior based on vicarious rewards implied in the advertisements (Bandura, 1989). In the present study the possibility that the development of a positive smoker image mediates the relation between cigarette advertising and smoking is explored. In addition, the possibility that exposure to advertising might moderate the effect of peer influence is also examined.

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According to McGuire's (1985) model of persuasion, advertising should work by creating a positive affective or cognitive response to the product. In the present study, the social cognitive response to be investigated is a positive smoker image. From the perspective of the Elaboration Likelihood Model of persuasion (Petty & Cacioppo, 1986) smoker image might be influenced through two different paths. If the ad recipient is motivated to attend closely to the advertising content (which typically would be due to an interest in smoking), it is likely that this closer scrutiny, or central processing, would not only influence perceptions about the brand but also perceptions about people who use cigarettes in general (Kelly et al., 2002). If the recipient is not motivated to scrutinize the ad closely (peripheral processing), attention to peripheral cues such as the attractiveness of the models portrayed in the ad also may lead to impact on smoker image. In the latter case, the systematic-heuristic model (Chaiken, 1980) suggests that even this casual form of attention increases the effects on heuristic judgments (such as perceived attractiveness of smokers).

Moreover, previous work has demonstrated that adolescents' views of smokers become more positive with increased age (Botvin, Botvin, & Baker, 1983). It has been suggested that this change may be due in part to exposure to advertising of cigarettes (Aloise-Young & Hennigan, 1996). Clearly, one of the major goals of cigarette advertising is to associate certain images and personal characteristics with the act of smoking. Most early adolescents report that cigarette ads convey the idea that smoking makes people popular, cool, and attractive (Barbeau et al., 1998). Moreover, exposure to cigarette ads has been shown to increase positive views of smokers, whereas exposure to antismoking ads leads adolescents to view smokers more negatively (Pechmann & Ratneshwar, 1993). Consequently, in the present study, it was hypothesized that the relation between magazine advertising of cigarettes and smoking would be mediated by a positive smoker image because not only is advertising exposure associated with positive views of smokers, but also because a positive smoker image (or stereotype) has been linked to adolescent smoking (e.g., Barton, Chassin, Presson, & Sherman, 1982).

According to the prototype/willingness model, the development of a positive smoker image increases the probability of smoking by increasing the individual's willingness to be included in the category of people who engage in that behavior (Gibbons & Gerrard, 1995). Specifically, when a situation presents itself where an adolescent might choose to smoke, individuals who have a positive smoker image are more likely to do so. Thus, exposure to cigarette advertising might *set the stage* for smoking initiation by affecting adolescents' images of smokers.

Another potential way in which exposure to cigarette advertising might predispose adolescents to begin smoking is by increasing their sensitivity to peer influences. Cigarette advertising, by suggesting that cigarette smoking is normative in the larger social world, may validate and reinforce perceptions of normativeness of use among peers in an adolescent's immediate social environment. Overestimation of peer smoking or the perception that "everyone's doing it" is an important form of passive peer pressure (Graham, Marks, & Hansen, 1991). These types of normative beliefs are among the most powerful predictors of smoking initiation (Collins, Sussman, Rauch, & Dent, 1987) and have been linked to exposure to cigarette advertising (Botvin et al., 1993). Although normative beliefs are an important contributor to adolescent cigarette smoking, not all adolescents succumb to this passive peer pressure. Recently, research has revealed that the effects of passive peer pressure are strengthened by high sensation-seeking tendencies (Slater, 2003) and low levels

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of authoritative parenting (Mounts & Steinberg, 1995). It is believed that these characteristics moderate the effect of passive peer pressure by affecting the perceived rewards/costs of smoking. Given that cigarette advertising emphasizes potential positive social consequences of smoking, it seems likely that such advertising would enhance the effects of passive peer pressure. Consequently, in the present study it was hypothesized that exposure to cigarette advertisements would serve to augment (i.e., moderate) the effect of normative beliefs on adolescent smoking.

Method

Participants

There were 242 middle school and high school students (51% female, 49% male) who participated in the present study. Students were surveyed in their health classes. In the participating school district, health was offered in the seventh and tenth grades; however, high school students were permitted to enroll in the health class in other grades. Thus, the sample consisted of 52 seventh graders ($M = 12$ years, 11 months), 22 ninth graders ($M = 14$ years, 9 months), 140 tenth graders ($M = 15$ years, 8 months), 13 eleventh graders ($M = 16$ years, 11 months), 8 twelfth graders ($M = 17$ years, 9 months), and 6 high school students who failed to indicate their grade. The most ethnically diverse high school in the school district and its "feeder" middle schools were recruited for the study. Consequently, the sample was ethnically diverse, including 74% non-Hispanic White, 10% Hispanic, 5% multiethnic, 3% Asian, 1% Native American, and 1% African American (6% of the sample did not indicate their ethnicity). Active parental consent was obtained prior to administration of the survey.

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Procedure

Data collection occurred between late October 1999 and early February 2000. Surveys were distributed and collected by research staff who were not affiliated with the students' schools. Regular teachers were not in the classroom during the survey administration. The surveys did not include names or identification numbers; consequently, the participants' responses were completely anonymous. Students read and completed the surveys and then placed them in an envelope with their classmates' surveys. Most of the survey responses were recorded on optical scan forms that were entered in the computer electronically. However, information that the students wrote in was hand entered.

Measurement

Cigarette Smoking

Four questions were included on the survey regarding participants' lifetime and current use of cigarettes. Specifically, participants were asked: (a) how many cigarettes they had smoked in their whole life (from none to more than 5 packs); (b) how many days they had smoked cigarettes in the past 30 days (six responses ranging from none to pretty much every day); (c) how many cigarettes they had smoked in the last 7 days (six responses ranging from none to 1 pack or more) and (d) what kind of smoker they were (ranging from nonsmoker to very heavy smoker, with an

Table 1. Magazines included in survey

Name	% read	Amount of cigarette advertising
Better Homes & Gardens	17.7	62[b]
Bop	9.1	0[d]
Car & Driver	22.0	40[b]
Cosmopolitan	25.3	115[b]
Cosmopolitan Girl	14.1	0[d]
Entertainment Weekly	32.1	220[b]
Field & Stream	21.0	76[b]
Game Pro	18.3	0[d]
Glamour	24.7	91[b]
Health	10.2	0[c]
Hot Rod	21.1	80[b]
Inside Sports	20.4	–[a]
Ladies' Home Journal	5.9	47[b]
Latina	4.3	43[b]
Life	31.0	56[b]
Low Rider	20.0	0[c]
Mademoiselle	15.1	82[b]
Maxim	9.1	102[b]
Men's Health	9.1	0[c]
Motor Trend	21.5	51[b]
Muscle & Fitness	22.0	0[c]
National Geographic	59.7	0[c]
National Enquirer	27.4	38[b]
Newsweek	28.1	33[b]
People en Espanol	6.0	21[b]
People	57.0	219[b]
Reader's Digest	28.0	0[c]
Redbook	9.1	48[b]
Rolling Stone	40.3	234[b]
Seventeen	54.3	0[c]
Shape	9.7	0[c]
Soap Opera Digest	8.6	131[b]
Spin	15.1	134[b]
Sport	17.3	66[b]
Sports Illustrated	59.1	234[b]
Teen Beat	15.1	0[d]
Teen People	40.3	0[c]
Teen	45.7	0[c]
The Source	11.8	0[d]
Time	40.3	61[b]
TV Guide	36.4	152[b]
US	9.1	99[b]
Vibe	9.8	77[b]
Vogue	21.0	80[b]

(*Continued*)

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Table 1. Continued

Name	% read	Amount of cigarette advertising
World Wrestling Federation	9.7	0[d]
YM	42.5	0[c]

[a]Data on cigarette advertising could not be obtained for this publication.
[b]Data obtained from Competitive Media Reporting Inc. for January–December 1999.
[c]Data obtained from a visual examination of 2 issues between January 1999 and March 2000.
[d]Data obtained from a visual examination of 1 issue available on newsstands October 2001.

alternative for former smoker). These four measures were standardized to *z* scores and a mean composite was formed.

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Smoker Image

The surveys included a measure of the smoker image that was similar to that used by Aloise-Young and colleagues (Aloise-Young & Hennigan, 1996; Aloise-Young, Hennigan, & Graham, 1996). The measure included nine ratings designed to tap three constructs: cool, smart, and attractive. Participants were asked to rate most kids their age who smoke from 1 to 4 on each of these dimensions. A factor analysis revealed that these nine ratings formed a single factor (only a single eigenvalue >1). Consequently, the total number of positive ratings (from 1 to 9) was used as the measure of the *positive smoker image*.[1]

Passive Peer Pressure

Participants were asked how many kids their age had tried smoking, and how many smoked regularly. Response alternatives for both questions were: (a) none or almost none; (b) only a few; (c) more than a few, but not half; (d) about half; (e) many; and (f) all or almost all. Responses to these two questions were standardized to z scores and combined into a single measure of passive peer pressure (alpha = .72).

Magazine Readership

The results of the STARS (Simmons, 1994) were used to identify magazines for inclusion (see Table 1). The STARS marketing survey was conducted with 2,892 respondents between 12 and 19 years of age. On the STARS survey, youth were asked about a variety of products including 47 magazines. These data were used to identify 26 magazines that were in the top 20 magazines read by either males or females. To increase the diversity of the magazines included, 19 magazines were added to the list, including magazines geared toward Hispanic readers, health-related publications, current events publications, music magazines, and several magazines that are oriented toward adolescent and young adult readers.

[1]The placement of this measure was counterbalanced, with half of the participants rating most smokers before they viewed the cigarette ads and half rating most smokers after they had viewed the ads. There were no significant differences in the smoker image between the two groups, so this variable was not included in the analyses. It should be noted, however, that all nine mean differences were in the same direction, with ratings becoming more positive after viewing the ads.

Students also were given the opportunity to write in the names of up to 3 magazines that they had read during the year that were not included in the survey. Approximately half of the participants wrote in the name of at least one additional magazine. However, only 2 magazines were mentioned by more than 4 participants. *Playboy* and *Jump* were both listed by 7 participants. Magazines that were written in were not included in the measure of cigarette exposure. Rather, these data were collected to confirm that we had not failed to include any magazines with significant readership among our participants.

Participants were asked two questions about each of the 46 magazines. Specifically, participants were asked how often and how thoroughly they read each magazine. For example, participants were asked, "How many issues of *Rolling Stone* have you read this year?" There were five response alternatives ranging from none to every issue. In addition, participants were asked, "When you read *Rolling Stone* do you usually... (a) read it from cover to cover; (b) read select articles and skim the rest of the magazine; (c) skim the whole magazine; (d) read select articles only; (e) skim parts of the magazine; or (f) I have *not* read *Rolling Stone* this year." These two ratings were combined to form a readership score for each magazine. Specifically, responses to the frequency measure ranged from 0 to 4. Participants who indicated that they had been exposed to the whole magazine (alternatives a, b, and c above) received a readership score that was equal to the frequency rating for that magazine. For participants who indicated that they had been exposed to only part of the magazine (alternatives d and e above), the readership score was one-half of the frequency rating. Participants who indicated that they had not read the magazine received a readership score of 0.

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Self-reported Exposure to Cigarette Advertising

Of the 46 magazines, 29 included cigarette advertising. Information about the amount of cigarette advertising contained in each of these magazines from January 1, 1999, to December 31, 1999, was obtained from Competitive Media Reporting Inc. These figures are provided in Table 1. Self-reported exposure to cigarette advertising was computed by multiplying the readership score for each of those 29 magazines by its corresponding amount of cigarette advertising. A total was obtained by summing the amounts for the magazines.[2] In addition to this measure of cigarette advertising exposure, a mean readership score was computed for the magazines containing cigarette advertising and for those not containing cigarette advertising.

Attention to Cigarette Advertising

Participants also were asked to report how much attention they pay to cigarette advertising. Specifically, they were told, "Magazines often have ads for cigarettes. We want to know whether you pay attention to these ads, or whether you just turn the page without really looking at them." Participants then were asked how many ads they pay attention to and how many they look at for at least 5 seconds. There were four response alternatives for each question: (a) none, (b) some of the them,

[2]In cases where data for one of the magazines was missing ($N = 12$), zero exposure was assumed for that magazine. In addition, in instances where there were conflicting responses ($N = 3$; e.g., indicating that one had read half of the issues, but also indicating that one had not read the magazine during the previous year), the response that indicated a lower level of exposure was used.

(c) about half, and (d) most of them. These measures were standardized to z scores and a single measure of cigarette ad attention was formed by averaging the responses to these two questions (alpha = .79).

Recognition of Cigarette Advertisements

Participants also were shown six magazine advertisements (four cigarette ads and two foils, see the Stimuli section below). The images were approximately 2 inches × 3 inches and all six ads were presented on a single page in the survey. The instructions said, "We're going to show you 6 ads that have been published in magazines. For each one we want you to tell us whether or not you've seen it, and if you have, what brand is being advertised." The response alternatives were: (a) definitely haven't seen; (b) maybe have seen; (c) definitely have seen 1–3 times; and (d) definitely have seen more than 3 times. Then participants were asked to write in the brand being advertised. Two memory measures were derived from these responses: (a) the number of cigarette advertisements correctly identified (from 0 to 4) and (b) the mean perceived recognition for the four cigarette ads. A *foil* score was also obtained by computing the mean for the two foils. The two memory measures were standardized to z scores and averaged to form the recognition measure.

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Stimuli

Cigarette Advertisements

Four cigarette advertisements that appeared in magazines during 1999 were edited and included as stimuli. All of the ads featured human characters. Three of the four ads were color, one was black and white. All brand name information was removed, as were warnings from the Surgeon General. Ads that contained images of people smoking were altered to remove the cigarettes. The brands represented in these advertisements were: Marlboro, Kool, Winston, and Virginia Slims. Adolescent exposure to advertising for these brands tends to be high (Pucci & Siegel, 1999).

Foils

Two noncigarette advertisements were included as foils. These ads appeared in a French language magazine to which few American adolescents would be exposed. One ad depicted a woman hanging/swinging from the branch of a tree. The other depicted a man and woman at a breakfast table drinking coffee. One of the ads was color, the other was black and white.

Results

Readership of Magazines That Contain Cigarette Ads Versus Those That do Not

Before proceeding with analyses of the relation between cigarette ad exposure and smoking, several descriptive analyses were conducted. The first descriptive analysis was a comparison of adolescents' readership patterns for magazines containing cigarette ads and those that do not. Because the number of magazines with and without cigarette advertising was not equal, the readership scores for each type of magazine were averaged. A repeated measures ANOVA was conducted with magazine content as the repeated factor (2: cigarette ads vs. no cigarette ads). The between-subjects factors were gender (2) and grade (4). Due to the small number of eleventh and

Table 2. Mean readership levels by magazine advertising content, gender, and grade

Advertising content	Grade				Gender	
	7	9	10	11/12	Boys	Girls
Cigarettes	.24	.23	.28	.20	.23	.24
No cigarettes	.42	.30	.38	.19	.16	.49

twelfth graders, those two groups were combined into a single grade level. This analysis revealed significant main effects of content, F (1, 231) = 16.94, $p = .000$; gender, F (1, 231) = 34.20, $p = .000$, and a marginally significant effect of grade, F (1, 231) = 2.52, $p = .058$. In addition, the Content × Gender and Content × Grade interactions were also significant, F (1, 231) = 111.13, $p = .000$, and F (3, 231) = 3.23, $p = .023$, respectively.

The Content × Gender interaction was due to the fact that girls and boys do not differ in their tendency to read magazines that contain cigarette advertisements; however, girls are more likely to read magazines that do not contain cigarette ads as well (means are provided in Table 2). To follow-up on the content × grade interaction, separate univariate ANOVAs were conducted for readership of magazines with cigarette ads and those without. These analyses revealed that there was no significant grade effect for magazines with cigarette ads. Younger adolescents were just as likely as older adolescents to read those magazines. Readership of magazines without cigarette ads, however, decreased significantly from the seventh to the ninth, eleventh, and twelfth grades (see Table 2 for means). Other studies have focused on the extent to which adolescents read magazines with cigarette advertising, and have found similarly disturbing patterns (King & Siegel, 2001; Pucci & Siegel, 1999; Sanchez, Sanchez, Goldberg, & Goldberg, 2000). This is the first study however, to compare readership in magazines with and without cigarette ads. The tendency to read magazines with and without cigarette ads was not significantly different at any grade level (although it approached significance for the seventh graders). These results suggest that virtually any adolescent who is reading magazines is exposed to cigarette advertising.

One of the reasons for including magazines that do not advertise cigarettes was to rule out the possibility that magazine reading per se is related to smoking rather than exposure to magazine advertising of cigarettes. For example, it might be argued that adolescents who read magazines are more image conscious and are therefore more likely to smoke. A regression analysis was performed in which smoking was regressed on readership of magazines that do not contain cigarette advertisements, grade, and gender. That analysis revealed that reading magazines without cigarette ads is completely unrelated to cigarette smoking, $p = .953$.

Cigarette Advertising and Smoking: Moderating and Mediating Effects

Analysis Plan

The relation between cigarette advertising and cigarette smoking, and the potential moderating effect on passive peer pressure, were examined by regressing the cigarette smoking composite measure on grade, gender, ethnicity, advertising, passive peer

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pressure, and all two-way interactions. The measure of advertising differed across analyses. In the first analysis, self-reported exposure and attention were entered into the model. In the second analysis, ad recognition was entered in the model. Grade, passive peer pressure, and the advertising measures were mean centered (the mean was set to 0) to aid in the interpretation of moderating effects and to reduce collinearity between main effects and interactions. Gender was dummy coded, with females set as the reference group. Ethnicity was also dummy coded. Non-Hispanic White was defined as the reference group and all of the other ethnicities were coded as 1. Due to the wide range of ethnic groups represented, no one group contained sufficient numbers to allow for separate analysis. Across all of the analyses, the main effects and interactions involving gender and ethnicity were all nonsignificant. Consequently, the models reported below included only grade, advertising, passive peer pressure, and all two-way interactions involving advertising.

In cases where advertising was significantly related to smoking, mediational analyses were conducted next to determine whether the relation was mediated by a positive smoker image. Using the framework set forth by Baron and Kenny (1986) and elaborated by Holmbeck (2002), the following set of mediational analyses were conducted: (a) test the relation between the predictor (advertising) and outcome (smoking), (b) ascertain whether advertising is significantly related to the proposed mediator (positive smoker image), and (c) regress smoking on both advertising and positive smoker image to determine whether there is significant mediation.

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Self-reported Exposure and Attention

The first regression analysis utilized self-reported exposure and attention to cigarette advertising as predictors of smoking. Following the reasoning and analytic plan of Chaffee and Schleuder (1986), a hierarchical regression analysis was performed. The first step included grade and passive peer pressure. The second step included the main effect of self-reported exposure to cigarette advertising, the Exposure $\times$ Grade and the Exposure $\times$ Passive peer pressure interactions. In the third step, the effect of attention to cigarette advertising and its two-way interactions were entered. Exposure was entered into the model first based on the idea that the effect of attention is above and beyond the effect of mere exposure. The final step included only the exposure $\times$ attention interaction. The results for the hierarchical regression are presented in Table 3.

The model for the first step was significant, $F\,(2, 229) = 8.68$, $p = .001$, and the effect of passive peer pressure was significant. The model for the second step showed significant improvement in prediction, $F\,(5, 226) = 5.31$, $p = .001$, $\Delta R^2 = .035$. In this model, the effect of exposure was marginally significant, and the exposure $\times$ grade and exposure $\times$ passive peer pressure interactions were both significant. The third step also produced a significant increase in variance accounted for, $F\,(8, 223) = 4.75$, $p = .001$, $\Delta R^2 = .041$. In this step, only the effect of self-reported attention to cigarette advertising was significant. The final step, in which the interaction of attention and exposure was added, did not improve prediction of cigarette smoking.

These results support a moderating effect for self-reported exposure to advertising on the relation between passive peer pressure and cigarette smoking. This effect was not significant for attention to cigarette advertising. Specifically, the positive value of the beta coefficient for the Exposure $\times$ Passive peer pressure interaction indicates that, as predicted, exposure to cigarette advertising augments the effect of passive peer pressure on cigarette smoking. Regression lines have been plotted for the

Table 3. Results of the hierarchical regression ananlysis predicting cigarette smoking

	Beta	*P*	R^2
Step 1: control variables			.070
Grade	.06	.41	
Passive peer pressure	.24	.001	
Step 2: exposure variables			.105
Exposure	.11	.09	
Exposure × grade	−.13	.05	
Exposure × passive peer pressure	.13	.05	
Step 3: attention variables			.146
Attention	.16	.01	
Attention × grade	.08	.25	
Attention × passive peer pressure	.07	.29	
Step 4: exposure attention interaction			.146
Exposure × attention	.00	.96	

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relation between passive peer pressure and smoking at exposure values corresponding to the mean and one standard deviation above and below the mean. These plots are shown in Figure 1. These plots show that passive peer pressure is more strongly related to smoking for adolescents who have been exposed to above-average levels of magazine advertising for cigarettes.

Next, we examined the data for evidence of a mediating relation of positive views of smokers. The first step in testing for mediation is to establish a relation between the predictor (in this case advertising) and the outcome (cigarette smoking). This relation was significant for attention to cigarette advertising, but was only marginally significant for self-reported exposure. The negative value of the beta coefficient for the interaction between exposure and grade indicates, however, that exposure is more strongly related to smoking in younger adolescents than in older adolescents. Consequently, we performed separate regressions for seventh, ninth, tenth, and eleventh/twelfth graders to determine in which grades, if any, exposure was significantly related to smoking (the eleventh and twelfth grades were combined

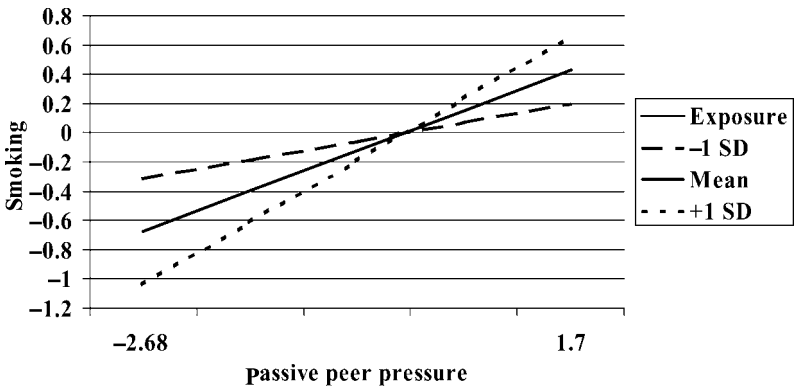

Figure 1. Regression plot: exposure × passive peer pressure.

due to small sample sizes). In each analysis, cigarette smoking was regressed on exposure, passive peer pressure, and their interaction. We found that exposure predicted smoking for the seventh graders only, $B = .43$, $p = .001$. As a result, tests of mediation were performed for the whole sample for attention to cigarette advertising and for the seventh graders only for exposure.

To test whether the relation between attention to cigarette advertising and smoking was mediated by a positive smoker image, we repeated the hierarchical regression that we had performed on smoking, but in this case the outcome variable was positive smoker image. As was the case for smoking, attention significantly predicted a positive smoker image, $B = .24$, $p = .001$, step 3 $R^2 = .096$. The next step in testing for mediation was to perform the hierarchical regression on smoking once again, this time with positive smoker image as one of the predictors (in the first step) to determine whether the predicted relation between attention and smoking was reduced. In this analysis, positive smoker image significantly predicted cigarette smoking, $B = .37$, $p = .001$; however, the relation between attention and cigarette smoking was no longer significant, $B = .06$, $p = .35$. A formal test of mediation was performed following the guidelines of Holmbeck (2002) and revealed that positive smoker image significantly mediated the relation between attention to cigarette advertising and adolescent cigarette smoking, $z = 2.92$, $p = .005$.

Given the fact that the current study is correlational, however, the direction of causality is not unambiguous. For instance, it is possible that self-reported attention is related to smoking and a positive smoker image because smoking causes the individual to (a) seek out information relevant to smoking (i.e., including paying attention to cigarette ads) and (b) attribute positive characteristics to smokers. In order to rule out this possibility, positive smoker image was regressed on self-reported attention to cigarette ads, grade, passive peer pressure, Attention × Grade, Attention × Passive peer pressure, and Passive peer Pressure × Grade *for nonsmokers only* ($N = 128$). This analysis revealed a significant effect of attention to cigarette ads on positive smoker image, $B = .21$, $p = .020$. Moreover, the R^2 for this analysis was .07 compared with .09 for the sample as a whole. This finding is important because it suggests that attention to cigarette advertising may help to create and reinforce positive views of smokers in nonsmoking adolescents, which has been shown to be a risk factor for smoking initiation.

Next, we examined the data for the seventh graders to determine whether the relation between exposure to cigarette advertising and smoking also was mediated by a positive smoker image. To test this, positive smoker image was regressed on exposure, passive peer pressure, and Exposure × Passive peer pressure. This model was not significant, $F(3, 46) = 0.72$, $p = .547$, $R^2 = .045$, and there were no significant effects in the model. Thus, the test for mediation in this case failed.

To summarize, the data supported the hypothesis that exposure to cigarette advertising in magazines would augment the effect of passive peer pressure on smoking. In contrast, the hypothesis that advertising influences smoking by creating a positive image of smokers was supported for attention to cigarette advertising.

Recognition of Cigarette Advertisements

In the final set of analyses, cigarette ad recognition was used as the measure of cigarette advertising. False recognition of the foils was entered into the model as a control variable. The model tested the relation of memory for cigarette ads to smoking, and also tested for moderation of passive peer pressure. This model was

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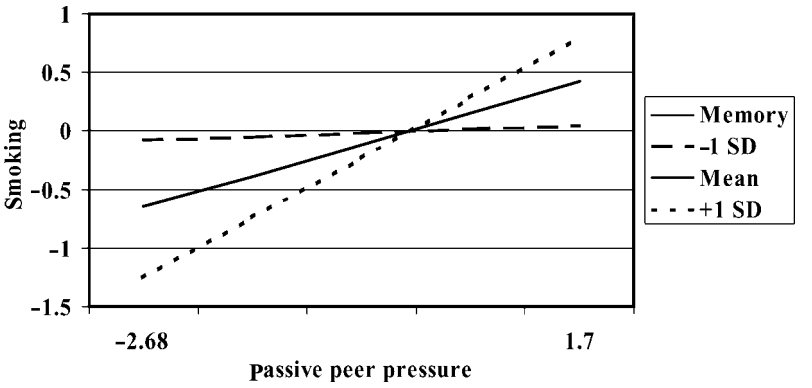

Figure 2. Regression plot: recognition × passive peer pressure.

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significant, F (7, 209) = 4.77, $p = .000$, $R^2 = .14$. Within the model, there were significant effects of recognition, $B = .21$, $p = .003$; passive peer pressure, $B = .21$, $p = .003$; and Recognition × Passive peer pressure, $B = .21$, $p = .003$. The positive value of the beta coefficient for the interaction indicates that, as predicted, recognition of cigarette advertising intensifies the effect of passive peer pressure on adolescent smoking (replicating the findings for exposure). Regression lines have been plotted for the relation between passive peer pressure and smoking at recognition values corresponding to the mean and one standard deviation above and below the mean. These plots are shown in Figure 2.

In the next analysis we tested whether the relation between memory for cigarette advertising and smoking was mediated by a positive smoker image. Positive smoker image was regressed on grade, recognition, passive peer pressure, Recognition × Grade, Passive peer pressure × Grade, and Recognition × Passive peer pressure. This model was not significant, F (7, 192) = 1.07, $p = .385$, $R^2 = .04$, and there were no significant effects in the model. Consequently, the test for mediation failed.

Discussion

The present study included several unique design features that have enabled us to obtain four important insights into the relation between magazine advertising of cigarettes and adolescent cigarette smoking: (1) exposure to cigarette advertising in magazines is as high for young adolescents as it is for adolescents approaching adulthood; (2) regardless of how advertising is measured, it is related to adolescent cigarette smoking (although self-reported exposure was significantly related only for the seventh graders); (3) exposure to cigarette advertising (measured through readership patterns) and recognition of cigarette ads both augment the effect of passive peer pressure on smoking; and (4) self-reported attention to cigarette advertising is positively related to smoking, and this relation is mediated by positive views of smokers. These findings are discussed in the sections below.

Adolescent Exposure to Magazine Advertising of Cigarettes

While the MSA addressed numerous forms of advertising and promotion, magazine advertising was left unregulated. According to the terms of the MSA, however, the

tobacco companies are not to engage in advertising aimed at minors. The present study has shown that adolescents, even 12- and 13-year-olds, are regularly exposed to cigarette advertising in the magazines they read. In the present study, students were asked about 46 different magazines. The 5 magazines with the highest levels of cigarette advertising were in the top quartile in readership in our adolescent sample. Between 30% and 60% of our sample reported having read each of these magazines, which contained substantial cigarette advertising during the previous year. The tobacco industry defends itself by claiming that these are magazines aimed at adult audiences. The level of exposure shown by our study and others, however, suggests that the majority of youth are being exposed to cigarette advertisements in these magazines. For example, King and Siegel (2001) found that between 75% and 95% of young people were reached by magazine advertising for "youth brands" of cigarettes. Whether this exposure is intentional or incidental it is clear that additional regulations are needed to further insulate America's youth from the effects of cigarette advertising.

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Relation of Advertising to Cigarette Smoking: Mediating and Moderating Processes

Given that adolescents are exposed to cigarette advertising in magazines, the relevant question then becomes, Is this exposure related to adolescents' behavior and attitudes? The present study included several measures of cigarette advertising: (1) exposure based on magazine readerships and the number of cigarette ads appearing in the magazines; (2) recognition of current cigarette ads; and (3) self-reported attention to cigarette advertising in magazines. All three measures of advertising were positively related to smoking (although exposure was only significantly related for seventh graders). Moreover, we examined whether reading magazines without cigarette ads was related to smoking and we found that it was not. These data provide converging evidence for a link between adolescent cigarette smoking and magazine advertising of cigarettes.

In order to advance our understanding of the link between cigarette advertising and adolescent cigarette smoking we explored two potential mechanisms—the development of a positive smoker image and augmentation of passive peer pressure. Evidence for both of these mechanisms was uncovered.

In the present study, adolescents who reported paying greater attention to magazine ads for cigarettes had a more positive view of smokers. This positive smoker image mediated the relation between attention and cigarette smoking. One interpretation of these data is that cigarette advertising exposure, in the presence of motivation to process the social information in cigarette advertisements, contributes to the formation of positive views of smokers. Then, the positive smoker image increases the probability of smoking by increasing the individual's willingness to be identified with smokers (Gibbons & Gerrard, 1995). This interpretation is supported by previous research showing that image factors longitudinally predict smoking onset during early adolescence (Aloise-Young, Hennigan, & Graham, 1996) and changes in smoking in young adults (Gibbons & Gerrard, 1995). Moreover, experimental evidence indicates that exposure to cigarette ads produces positive changes in adolescents' views of smokers (Pechmann & Ratneshwar, 1993). In addition, we presented empirical evidence showing that attention to cigarette advertising is related to a positive smoker image even in nonsmokers. This analysis was conducted to address the possibility of reverse causation, in which smokers might report greater exposure to cigarette advertisements simply because individuals typically are more likely to

attend to advertisements for any product that they care about and use (e.g., Kokkinaki & Lunt, 1999; Krugman, 1967; Sears & Freedman, 1967). Given the fact that our data are cross-sectional and correlational, however, other explanations are still possible.

First, there may be third variables that contribute to attention to cigarette ads and to the development of a positive smoker image. For example, membership in deviant peer clusters might be related to both of these variables. Members of deviant peer clusters often are rejected by the peer group as a whole and they have disengaged from traditional socialization agents such as school, family, and church (Oetting, 1999). Consequently, they are likely to turn to media that reinforce and validate their values and behavioral choices. In particular, they should be more likely to seek out media sources that directly or implicitly reinforce alternative lifestyles and more likely to attend to advertisements that endorse substance use.

Second, the attribution of positive qualities to smokers may encourage attention to smoking advertising as well as cigarette smoking. In this interpretation, the relation between attention to cigarette advertising and positive views of smokers may be conceptualized as an iterative reinforcement process whereby the media supports and validates the adolescent's deviant attitudes (Slater, Henry, Swaim, & Anderson, 2003). That is, in American culture most people attribute negative qualities to smokers (Aloise-Young et al., 1996; Gibbons & Gerrard, 1995); therefore, adolescents who view smokers positively may feel the need to seek out media sources consistent with that belief. In that way the media ensure that deviant attitudes will continue to be held, with resulting effects on deviant behavior. Longitudinal data are needed to track changes in the smoker image over time as a function of exposure to advertising to discriminate between these explanations.

Thus, there are still many questions to be answered to fully understand the psychological underpinnings of this finding. For instance, how might antismoking advertisements change the perception of smokers created by the cigarette industry's advertising? In addition, the fact that different measures of cigarette advertising evidenced different patterns of mediation and moderation warrants further discussion. First, it was surprising that recognition of cigarette ads was not related to positive views of smokers whereas attention to ads was related. There are several possible reasons why this pattern might have occurred. First, a more specific measure of positive views of smokers might be more successful in capturing the effect of advertising on adolescents' views of smokers. For instance, although recognition of cigarette ads was not related to the number of positive ratings of smokers, it was significantly related to ratings of smokers' attractiveness, $r\,(213) = .13$. This suggests that the best strategy for assessing the link between ad exposure and the smoker image may be to target the exact characteristics that a cigarette ad is trying to manipulate.

Other possible explanations center around the meaning of the attention measure. Although participants reported attention to magazine ads, individuals who pay attention to these advertisements are probably more likely to pay attention to other forms of advertising as well. Consequently, this measure spans different advertising media and is likely to have greater power to detect relations between exposure and resulting attitudes. In addition, it is likely that the attention measure is tapping more than just attention—it also is measuring motivation to some degree. Self-reported attention may have an element of information seeking and may be reflective of the adolescent being in a decision phase. Most adolescents report that they smoked the first time because they were curious (Hahn et al., 1990). That is, they smoked to

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get more *information*. Attention to relevant media sources may be a manifestation of this type of curiosity. For example, research on self-monitoring in young adults suggests that high self-monitors attend to and are influenced by social information in advertisements for socially salient products (Bagozzi & Schnedlitz, 1985; Shepherd, 1985). Thus, it may be that the relationship between attention and the smoker image is due to some respondents using advertisements as a source of social information. This could be tested in future research by examining the possible moderating effect of self-monitoring on the attention–image relationship.

Given that the mediating relation was obtained only for one of our three measures of cigarette advertising, it seems prudent to exercise some caution with respect to this finding. If this result could be replicated, however, is would be noteworthy from a policy point of view. Specifically, the smoker image measure asked for perceptions of "kids your age who smoke." That is, although cigarette advertising contains images of adults, attention to it is related to views of adolescent smokers. Current regulations require that cigarette advertising include only individuals who appear to be 25 years of age or older. The premise is that by doing so, adolescent viewers will be partially protected from the influence of the advertising. Our findings suggest that this premise may be unjustified.

The second mechanism explored, augmentation of passive peer pressure as a consequence of exposure to cigarette advertising, was supported for two of our three measures of advertising. Specifically, we found that when adolescents are exposed to greater amounts of magazine advertising of cigarettes, and when they remember the ads to which they are exposed, their smoking is more strongly related to their perceptions of peer smoking. It seems likely that exposure has this effect because it reduces inhibitions adolescents may have about smoking. This might be accomplished by suggesting to adolescent readers that the use of cigarettes among their peers in fact reflects larger social norms, which makes them more willing to accept peer norms that they observe in their immediate social environment. Another reason that cigarette ads may have this effect is that they depict individuals experiencing positive consequences of smoking. In some ads smokers are depicted as being relaxed, whereas in others smokers are shown in group settings giving the appearance of popularity and social success. The perception that smoking has these positive social outcomes could reduce adolescents' inhibitions about smoking, thereby increasing their vulnerability to passive peer pressure. Consistent with that explanation, research on exposure to alcohol advertising has revealed a significant relation to perceived consequences of drinking (Chen & Grube, 2002; Martin et al., 2002). Moreover, perceived consequences of drinking have been shown to mediate the effect of the drinker image on drinking (Ouellette, Gerrard, Gibbons, & Reis-Bergan, 1999). Future research should examine the relationship among cigarette advertising, the development of positive attitudes regarding the consequences of smoking, and perceptions of social descriptive and prescriptive norms to determine what psychological mechanisms are at work.

Once again these results show that despite depicting adults, cigarette advertising operates by affecting peer-related mechanisms for smoking onset. Peer influence is consistently identified as an important contributor to adolescent problem behavior, and each year millions of dollars are spent on prevention programs aimed at reducing its effect. The present study suggests that restricting cigarette advertising in magazines to which adolescents are exposed might be one cost-effective way to reduce the impact of passive peer pressure.

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Findings of this and previous studies clearly demonstrate that adolescents of all ages are frequently exposed to cigarette advertising in the magazines they typically read. This study provides new insight into mechanisms by which such advertising may increase the likelihood that adolescents will become cigarette smokers. There is evidence to suggest that attention to cigarette advertising may increase positive views of cigarette smokers, which increases the likelihood of cigarette uptake among teens. Moreover, exposure to cigarette advertising increases the impact of the belief that many of a teen's peers are smokers. Thus, the present study suggests that adolescent exposure to cigarette advertising is an important issue that should be addressed by policymakers and public health officials.

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TITLE: Influence of Tobacco Marketing and Exposure to Smokers on Adolescent Susceptibility to Smoking

AUTHOR: Nicola **Evans,** Arthur Farkas, Elizabeth **Gilpin,** Charles Berry, John P. Pierce<1>

ABSTRACT: Background: Today the uptake of smoking is primarily an adolescent pursuit. Awareness of tobacco advertising and promotion is high, and evidence suggests that it plays a role in adolescent smoking uptake. Purpose: We evaluated the influence of tobacco advertising and promotion and exposure to smokers on never-smoking adolescents' susceptibility to smoking. Methods: We used data on 3536 adolescent never smokers (those who had never even puffed on a cigarette) from the 1993 California Tobacco Survey. That survey questioned adolescents about smoking history and inclinations. For this analysis, we defined as susceptible to smoking those never smokers who said on the survey that they could not rule out independently deciding to try a cigarette soon or smoking one offered by a friend. Also for this analysis, we devised two indices: 1) a 5-point index of an individual's receptivity to tobacco advertising as determined by the number of positive responses to five survey items (recognition of advertising messages, having a favorite advertisement, naming a brand he/she might buy, owning a tobacco-related promotional item, and willingness to use a tobacco-related promotional item) and 2) an index classifying an individual's reported exposure to family and peer smoking into one of four levels. Using logistic regression, we assessed the independent importance of our indices in predicting susceptibility to smoking after adjustment for sociodemographic variables, including age, sex, and race/ethnicity, and for perceived school performance. Tests of statistical significance were two-sided. Results: Receptivity to tobacco advertising and exposure to smokers were independently associated with susceptibility to smoking, but the relationship appeared stronger for receptivity to advertising. Adolescents exposed to family members and peers (n = 489) who smoked were 1.89 (95% confidence interval [CI] = 1.30-2.74) times as likely to be susceptible, whereas adolescents who scored 4 or more on the Index of Receptivity to Tobacco Marketing (n = 361) were 3.91 (95% CI = 2.38-6.42) times as likely to be susceptible as those who scored 0. Even adolescents who scored 2 (n = 1090) were 2.03 (95% CI = 1.31-3.15) times as likely to be susceptible. There was no interaction effect between score on the Index of Receptivity to Tobacco Marketing and exposure to smokers. Conclusion: Our results support the hypothesis that tobacco marketing may be a stronger current influence in encouraging adolescents to initiate the smoking uptake process than exposure to peer or family smokers or sociodemographic variables including perceived school performance.

TEXT:

After 30 years of sustained public education about the health effects of smoking, adolescents are the only age group who continues to take up smoking in significant numbers. In the United States, more than one quarter of 17- and 18-year-olds are current smokers [n1]. Furthermore, recent research shows that smoking prevalence among adolescents in the United States declined through the mid-1970s to mid-1980s but has remained level in the last decade among whites, in contrast to blacks, among whom prevalence still appears to be declining slightly [n2]. A growing body of research suggests that tobacco advertising is a contributing factor to adolescent smoking uptake. Studies have consistently documented high awareness and recall of tobacco advertising among adolescents and even among young children [n3-n5]. Adolescents are known to be highly adept at decoding cigarette advertisements, and awareness of brand imagery and covert messages is already present in the preteen years [n6]. Furthermore, analyses of trends in the age of smoking initiation have demonstrated high correlations between the timing of particular advertising campaigns and increases in the rates at which adolescents take up smoking [n1,n7].

The tobacco industry asserts that their marketing effectiveness is limited to maintaining brand loyalty and that it has no role in encouraging adolescents to experiment with smoking [n8-n10]. They argue that incentives to start smoking come mainly from exposure to other smokers in the peer and family network. This article addresses the relative influence of tobacco marketing and exposure to other smokers on the susceptibility to take up smoking in adolescents who have never smoked.

Theories concerning the process of becoming a smoker identify a state prior to experimentation during which the never smoker is susceptible to take up smoking [n1,n11-n13]; we focus on susceptibility as a marker of which adolescents have started the uptake process. In previous research, we defined an adolescent as susceptible to smoke if he or she cannot definitely rule out the possibility of future smoking [n14-n16]. Data from the longitudinal component of the national Teenage Attitudes and Practices Survey indicate that never-smoking adolescents who could be classified as susceptible to smoking in 1988 or 1989 were two to three times more likely to have used cigarettes in the interim when surveyed again in 1993 than those who were originally classified as not susceptible. n1

This article analyzes data that we collected from the 1993 California Tobacco Survey [n14] regarding the extent of any possible association between 1) receptivity to marketing and 2) exposure to family and peer smokers on the susceptibility to smoking of adolescents who have never experimented with cigarettes. The present analysis is restricted to adolescents who never smoked, since any behavioral experience with cigarettes could introduce additional factors not sufficiently measured that might make such an association difficult to detect. Our assessment of the influence of tobacco marketing extends previous research to include information on adolescent response to products promoting tobacco use, such as clothing and toys bearing the brand logo. Questions about the use of such items were included on the 1993 California Tobacco Survey to reflect recent changes in the marketing strategies of the tobacco industry that increasingly focused on promotional activities, rather than advertising alone, to sell tobacco to the consumer [n10].

Subjects and Methods

Survey Sample

The data for this analysis were drawn from the 1993 California Tobacco Survey [n14]. Telephone interviews were conducted with 30910 households in California using a modified Mitofsky--Waksberg [n17] random-digit-dialing methodology (response rate, 70.0%). A screener interview with an adult in each household identified 6892 adolescents (aged 12-17 years), all of whom were scheduled for in-depth interviews lasting approximately 25 minutes. Completed interviews were obtained from 5531 adolescents, 80.3% of those identified in the responding households. The 1993 California Tobacco Survey was designed to provide representative estimates for the population of California. Household level base weights were assigned according to the probability a household was selected and an adjustment made for more than one telephone line as appropriate. The base weights were then ratio adjusted for age, education of head of household, race or ethnicity, and geographic region.

Sociodemographic and Smoking Experience Variables

All adolescents were asked questions on age, sex, and race or ethnicity. In addition, we asked them to rate their performance in school as "very much above average," "above average," "average," or "below average." The last two categories were combined for analytic purposes, since few respondents reported below average performance.

Adolescents were included in the analysis if they responded "no" to the following questions: "Have you ever smoked a cigarette?" and "Have you ever tried or experimented with cigarette smoking, even a few puffs?" Of adolescents surveyed, the majority (65.4% +/- 1.5%, mean +/- 95% confidence interval [CI]) reported that they had never smoked or even puffed on a cigarette before.

To determine if adolescents were susceptible to smoking, all those with no smoking experience were asked two questions designed to probe the likelihood of future smoking: "Do you think you will try a cigarette soon?" and "If one of your best friends were to offer you a cigarette, would you smoke it?" Following previous research, any answer other than "no" or "definitely not" to both questions was sufficient to classify an adolescent as susceptible to smoking [n11-n13].

The demographic distribution (unweighted) of the study sample of 3536 adolescent never smokers was 51.3% female (n = 1813) and 48.7% male (n = 1723); 43.9% 12- to 13-year-olds (n = 1550), 33.0% 14- to 15-year-olds (n = 1167), and 23.1% 16- to 17-year-olds (n = 819); 54.2% non-Hispanic white (n = 1918), 26.2% Hispanic (n = 925), 6.7% black (n = 238), and 12.9% Asian or other race/ethnicity (n = 455).

Index of Receptivity to Tobacco Marketing

For the current study, the influence of tobacco marketing on adolescents was investigated on a number of dimensions. These dimensions were then combined, as described below, into an Index of Receptivity to Tobacco Marketing.

First, to ascertain whether adolescents cognitively attend to and interpret the messages communicated by tobacco advertising, all adolescent never smokers who had seen a tobacco advertisement (87.9% +/- 1.6%) were asked whether any of the following nine messages were contained in the advertising: 1) Smoking is enjoyable, 2) it helps people to relax, 3) it helps people feel comfortable in social situations, 4) it is a pleasurable pastime, 5) it helps people stay thin, 6) it helps reduce stress, 7) it helps people when they are bored, 8) the "in" crowd are smokers, and 9) successful people smoke. For our index, any affirmative response was taken as a positive indication of at least a basic level of cognitive awareness of tobacco advertising.

Second, the existence of affective responses to cigarette advertisements was assessed by asking all adolescents, "What is the name of the cigarette brand of your favorite cigarette advertisement?" Those who could not name a brand were asked, "Of all the cigarette advertisements you have seen, which do you think attracts your attention the most?" For our index, being able to give a brand name was considered a positive response.

Third, to ascertain whether adolescents form preferences for brands before experimenting with cigarettes, we asked, "If you wanted to buy a pack of cigarettes tomorrow, what brand do you think that you would buy?" Again, for our index, naming a brand was considered a positive response.

As the fourth and fifth components of our index, we used two items from the California Tobacco Survey that assessed adolescent response to products promoting tobacco. We asked all adolescents, "Have you ever bought or received for free any product which promotes a tobacco brand or was distributed by a tobacco company?" We then asked, "Do you think that you would ever use a tobacco industry promotional item such as a T-shirt?." We considered an answer of "yes" to either of these questions to be a positive response.

We combined all five of the above items into a single Index of Receptivity to Tobacco Marketing. Scores ranged from 0 to 4+ based on the number of positive responses given to the five items.

Index of Exposure to Smokers

In accordance with extensive previous analyses, we constructed a second index designed to measure adolescent exposure to family and peer smokers. n1 All adolescents in the California Tobacco Survey were asked about the use of tobacco by parents, stepparents, guardians, older siblings, and best male and best female friends. For the current study, we used the responses to these questions to classify adolescents into four levels of exposure: 1) minimal exposure, 2) exposure only to family users, 3) exposure only to best friends (peers) who are users, and 4) exposure to both peers and family members who are users. The category for minimal exposure may include adolescents with acquaintances (but not best friends or family members) who used tobacco.

Statistical Analysis

All percentages are weighted and presented with 95% CIs that were derived using the jackknife procedure [n18]. This procedure is one method for variance estimation in the setting of large-scale population surveys that are not completely random. Chi-squared statistics were computed using Satterthwaite's approximation, another jackknife-based procedure [n19,n20]. We used logistic regression to identify the independent predictors of susceptibility to smoking among adolescents who had never tried a cigarette. Included in the regression were all variables analyzed univariately: sociodemographic factors, variables for each positive score versus a score of 0 on the tobacco-advertising index, and variables for each category of exposure to smokers versus minimal exposure. Again, we used the jackknife procedure to compute variance estimates for computation of 95% CIs for the risk ratios derived from the regression coefficients. All analyses were performed using the SAS system [n21]. All *P* values are from two-tailed statistical tests.

Results

Adolescent Susceptibility

Overall, one quarter (25.4% +/- 2.1%) of adolescent never smokers were susceptible to smoking. The distribution by age and sex is presented in Fig. 1. In each age group, more than one fifth of adolescent never smokers were susceptible to begin smoking. Although older never smokers of both sexes appeared less susceptible, this difference did not attain statistical significance ($P<.07$). Boys 12-13 years old were more likely to be susceptible to smoking than girls in

this age group ($P<.04$), but this sex difference disappeared among older adolescents, among whom approximately 21% of both boys and girls aged 16-17 years were susceptible.

Tobacco Advertising and Promotion

Fig. 2 presents the interpretation of cigarette-advertising messages by California adolescents. The figure shows the six messages most frequently identified as contained in cigarette advertising, although all nine messages mentioned (*see* "Subjects and Methods" section) were cited by large percentages. Overall, four fifths (84.0% +/- 1.7%) of adolescent never smokers agreed that cigarette advertisements promote at least one benefit of smoking. Although older adolescents agreed more than younger adolescents ($P<.005$), a high percentage (81.0% +/- 2.8%) of 12- to 13-year-olds believed that cigarette advertisements promote at least one benefit of smoking. Adolescents were most likely to agree that cigarette advertisements depict smoking as enjoyable and as helping people to feel comfortable in social situations, although 40% indicated that cigarette advertisements also promote smoking as helping people stay thin. The latter view was held by 43.9% +/- 3.3% of females and 39.0% +/- 3.2% of males.

Across all age groups, approximately 40% of adolescents who had never tried a cigarette could name a brand of cigarettes that they would prefer to purchase (Table 1). Marlboro was the brand most often nominated in all age groups. Two thirds more 12- to 13-year-olds named Marlboro than Camel, and this number increased substantially with age. By age 16-17 years, four times as many nonsmokers named Marlboro than Camel. Around 60% of adolescent never smokers could name a favorite cigarette advertisement. Across all ages, Camel advertisements were the most frequently nominated as favorite. Two and a half times as many 12- to 13-year-olds named Camel than Marlboro. This difference decreased markedly across age, however, so that by age 16-17 years, there was only a 35% difference in the rate of nomination of the advertisements as favorite. The popularity of the Marlboro advertisement and the Marlboro brand as the brand to buy increased with age ($P<.06$ and $P<.004$, respectively), whereas nomination of Camel as the favorite advertising or preferred brand to buy decreased with age ($P<.003$ and $P<.018$, respectively).

Table 1. Cigarette brand preferences and favorite advertisement by brand, by age (never puffers) n1

Cigarette brand	Aged 12-13 y: Would buy, %	Aged 12-13 y: Favorite advertisement, %	Aged 14-15 y: Would buy, %	Aged 14-15 y: Favorite advertisement, %	Aged 16-17 y: Would buy, %	Aged 16-17 y: Favorite advertisement, %
Marlboro	20.1 +/- 3.2	13.9 +/- 2.8	24.4 +/- 3.3	16.4 +/- 3.2	30.1 +/- 5.2	20.0 +/- 4.7
Camel	12.3 +/- 2.5	35.9 +/- 2.8	8.8 +/- 2.0	33.9 +/- 3.8	7.2 +/- 3.0	27.5 +/- 3.7
Other	8.1 +/- 2.4	8.3 +/- 2.3	13.0 +/- 3.4	9.6 +/- 2.3	8.0 +/- 2.1	9.9 +/- 2.6
None	59.6 +/- 3.6	41.9 +/- 3.5	53.9 +/- 3.9	40.0 +/- 3.8	54.7 +/- 5.4	42.7 +/- 5.3

n1 Values = means +/- 95% confidence intervals.

Fig. 3 shows the percentage of adolescent never smokers who had received a product promoting tobacco use and the percentage of those who would be willing to use such a product. Few of the 12- to 13-year-olds had received a promotional product, although 12.6% +/- 2.9% of this age group were willing to use one. Both product ownership and willingness to use promotional items increased with age ($P = .001$ and $P = .02$, respectively). Overall, 5.9% +/- 1.1% of adolescents who had never smoked had a product promoting tobacco use, and 15.2% +/- 1.8% of adolescent never smokers were willing to use a promotional product.

Of the 211 adolescent never smokers who had received a tobacco promotional item, 41.7% +/- 10.1% had received an item promoting Camel cigarettes, 17.3% +/- 7.3% had received an item promoting Marlboro cigarettes, and 10.5% +/- 5.2% had received an item promoting smokeless tobacco. The type of product most often received was a T-shirt or

other clothing item, which accounted for 50.9% +/- 7.9% of the items. The second most common item was a cigarette lighter (16.5% +/- 5.7%).

Fig. 4 shows, for each age group, the distribution of responses on the Index of Receptivity to Tobacco Marketing, which was produced from the above items. There were some similarities across age in this distribution, with more than half of adolescent never smokers in each age group scoring 2 or higher. Significant age differences, however, were noted at both extremes of the continuum (overall $P<.003$), with 12- to 13-year-olds being more likely to have a score of 0 (13.4% versus 8.7% for 16- to 17-year-olds) and less likely to have the higher score of 4 or more (7.8% versus 12.6%).

Exposure to Smokers

The percentage of adolescent never smokers exposed to smokers who were family members and/or best friends is presented in Fig. 5. Exposure to smokers differed markedly with age (overall $P<.0001$). More than half (54.6% +/- 3.6%) of 12- to 13-year-olds had no peer or family exposure to smokers, compared with only 37.1% +/- 4.4% of 16- to 17-year-olds. Among younger adolescents, exposure to smokers was most likely to occur in the family (35.6% versus 18.5%). The reverse was true for those older than 13 years, among whom best friends were a more common source of contact with smokers (37.0% versus 39.9%). Overall, 13.9% +/- 1.5% of those who had never smoked were highly exposed, having both best friends and family members who smoked; these adolescents were 1.9 (95% CI = 1.3-2.7) times as likely to be susceptible to smoking as adolescents with minimal exposure.

Predicting Susceptibility to Smoking Among Adolescent Never Smokers

To determine which variables increase the likelihood of smoking for adolescent never smokers, we performed a logistic regression with susceptibility as the dependent variable. The results are presented in Table 2. After adjustment for other sociodemographic factors, neither age nor sex was a statistically significant predictor of susceptibility to smoking. Black adolescents were less likely to be susceptible than non-Hispanic white adolescents, although this difference was not statistically significant. Hispanic adolescents were 70% more likely to be susceptible to smoking than non-Hispanic whites. Perceived performance at school was strongly associated with susceptibility to smoking; adolescents who self-rated their performance as "average" or "below average" were significantly more likely to be susceptible to smoking than those who indicated their performance at school to be "very much above average."

Table 2. Predictors of susceptibility to smoke among adolescent never smokers

	Sample size	Adjusted odds ratio	95% confidence interval
Age, y			
12	823	n1 1.00	
13	727	1.46	1.02-2.07
14	611	1.29	0.96-1.71
15	556	1.07	0.77-1.48
16	428	0.67	0.45-0.99
17	391	0.80	0.50-1.27
Sex			
Female	1813	n1 1.00	
Male	1723	1.08	0.86-1.36
Race/ethnicity			
Non-Hispanic white	1918	n1 1.00	
Black	238	0.76	0.48-1.19
Hispanic	925	1.73	1.32-2.27
Asian/other	455	1.23	0.91-1.66
School performance			
Very much above average	814	n1 1.00	
Above average	1395	1.31	0.94-1.85
Average or below average	1327	1.83	1.33-2.52

Table 2. Predictors of susceptibility to smoke among adolescent never smokers

	Sample size	Adjusted odds ratio	95% confidence interval
Exposure index			
Minimal	1645	n1 1.00	
Family only	755	1.31	1.00-1.72
Peer only	647	1.92	1.36-2.70
Family and peer	489	1.89	1.30-2.74
Index of Receptivity to Tobacco Marketing			
0	351	n1 1.00	
1	747	1.59	1.00-2.51
2	1090	2.03	1.31-3.15
3	987	2.81	1.89-4.16
4+	361	3.91	2.38-6.42

n1 Referent group.

Both exposure to smokers and score on the Index of Receptivity to Tobacco Marketing were independently related to susceptibility after adjustment was made for the effects of the sociodemographic variables. Almost one fifth of adolescents who were not exposed to family members or best friends who smoked were classified as susceptible to smoking. The proportion of those who were susceptible to smoking increased by approximately 30% if a member of the family smoked and nearly doubled if adolescents had best friends who smoked. For those adolescents who had best friends who smoked, exposure to smokers in the family as well did not increase any further their likelihood of being susceptible to smoking.

We observed a strong effect between susceptibility to smoking and scores on the Index of Receptivity to Tobacco Marketing. Of adolescents who scored 0 on this index, 13.5% +/- 4.6% were susceptible. A score of 2 doubled the proportion of those who were susceptible. Adolescents who scored 4 or more on the index were almost four times more likely to be susceptible, compared with adolescents who scored 0.

To investigate any possible interaction effect between exposure to smokers and score on the Index of Receptivity to Tobacco Marketing, we compared smoking-susceptibility rates among adolescents at two levels of exposure to smokers (minimal versus peer and/or family) and among adolescents at two levels of receptivity to tobacco marketing (zero receptivity score versus any positive receptivity score) (Fig. 6). In a separate logistic regression with specially coded interaction variables, we found no statistically significant interaction between score on the Index of Receptivity to Tobacco Marketing and exposure to smokers. The effects were simply additive: Compared with those having a score of 0 and minimal exposure to smoking, those with minimal exposure and a score of 1 or greater had 2.6 (95% CI = 1.6-4.2) times the likelihood of being susceptible to smoking; those with some exposure to other smokers and a score of 0 had 2.3 (95% CI = 1.0-5.3) times the likelihood; and those with some exposure and a score of 1 or greater had 4.5 (95% CI = 3.1-6.7) times the likelihood.

Discussion

Of adolescent never smokers surveyed, one quarter appeared to have started the smoking uptake process as measured by susceptibility to smoking. A higher score on the Index of Receptivity to Tobacco Marketing was strongly associated with susceptibility among adolescent never smokers. The association of the index score with susceptibility was independent of and appeared to be stronger than the association with susceptibility of exposure to other smokers. Whereas exposure to both family and best friends who smoked increased susceptibility to smoking by 90%, a score of 4 or more on the Index of Receptivity to Tobacco Marketing produced almost a fourfold increase in the likelihood of being susceptible to smoking, and a score of 2 increased the likelihood by a factor of 2.

Adolescent never smokers appeared to be receptive to tobacco marketing at an early age. Among 12- to 13-year-olds, nearly two thirds scored 2 or higher on the Index of Receptivity to Tobacco Marketing. Only 16% of adolescents did not perceive that cigarette advertising promotes at least one of the benefits queried. Possibly, if fewer benefits had

been listed, this percentage may have been higher, but positive responses were in the neighborhood of 70% for at least four of the individual items. These data indicate that adolescents are very aware of cigarette advertising.

Almost 60% of 12- to 13-year-old never smokers named a favorite cigarette advertisement, and just over 40% had a preference for the cigarette brand they would buy. Although few adolescent never smokers already possessed items promoting tobacco, 15.2% indicated that they would be willing to use such products, which suggests that there is a market for the promotion of tobacco to nonsmoking adolescents via clothing and other products bearing tobacco logos. Marlboro and Camel cigarettes showed the highest degree of market penetration among adolescent never smokers.

Because this analysis is restricted to never smokers, the demographic distribution of the sample is not representative of the overall adolescent population; for instance, it contained more younger than older adolescents. By the middle to late teens, many adolescents will have experimented with smoking, and some will have progressed to a full-fledged addiction. Personal experience with smoking, such as any direct physical sensation or the reactions of peers, will likely have considerable influence on whether an adolescent progresses from experimentation to addicted smoking. The emphasis of the present study is on the identification of the correlates of entering the first stage of the smoking uptake process, susceptibility.

Consistent with previous research, exposure to smokers and perceived school performance were strongly and independently associated with susceptibility to smoking [n1,n11-n13]. Adolescent never smokers were 30% more likely to be susceptible to smoking if they reported being exposed to a smoker only in the family and about 90% more likely to be susceptible if they had at least one best friend who smoked. No additional increased risk was observed for adolescents exposed to both family members and best friends who were smokers. The magnitude of this effect was similar to that observed for perceived school performance. Adolescents who rated their performance as "average" or "below average" were almost twice as likely to be susceptible to smoking as those who rated their performance higher.

The telephone modality of the California Tobacco Survey may lead to underreporting of both adolescent smoking behavior and the items defining susceptibility to smoking. An adolescent could be aware of a parent listening in on a phone extension. Most of the survey questions required "yes" or "no" or "agree" or "disagree" responses, so an adult in the same room would probably not influence the adolescent's answers. In order to maximize the chance for privacy, adolescents were called back on a later date, rather than being interviewed at the time of the initial household contact. Nevertheless, some of our never smokers may have had experience with cigarettes, and some actual never smokers may have denied any future intention because a parent was listening. It is likely that completely accurate data would have produced even stronger correlations among the variables of interest. Misclassified adolescents may have answered the questions on tobacco marketing and exposure to other smokers in a way more like those who are indeed susceptible.

Our index of receptivity to tobacco advertising and promotion is based on a series of survey questions in the 1993 California Tobacco Survey regarding adolescents' awareness and response to tobacco advertising and marketing. This index has been devised solely for use in this study. There may be many more aspects of adolescent cognition and experience that we have not considered that are relevant to receptivity. Research in this area is lacking, especially within the setting of population studies. Nevertheless, the degree of awareness and response that we capture with our index is related to susceptibility in a manner suggesting that the higher the receptivity, the greater the susceptibility to smoking (*see* adjusted odds ratios in Table 2).

The research literature indicates that marketing can encourage consumption of the general product category (such as cigarettes) as well as of the specific brand being advertised [n1,n22]. Tobacco marketing may be more effective in promoting the general product category than in promoting the particular brand of cigarettes. In our sample, the preferred brand of purchase was Marlboro, yet the cigarette advertisements most favored by adolescents were those for Camel. We hypothesize that the effect of tobacco advertising on brand purchase intentions is filtered through the brand preferences of the immediate peer network. Thus, brand preference among adolescents may lag behind advertisement preference by the time required for the peer group as a whole to adopt a new brand. Our interpretation of these data is also commensurate with the slow but steady growth in the market share of Camel cigarettes following the introduction of the Joe Camel campaign. In 1987, Camel cigarettes were virtually invisible in the illegal adolescent market. However, 18 months later, Camel cigarettes had acquired a market share of 8.1%, and national data from 1993 indicate that these cigarettes now represent a 13.3% share of the adolescent market [n23]. According to the Federal Trade Commission [n24], a total of $ 6 billion was spent marketing tobacco products in 1993, with more than half ($ 3.4 billion) spent on promotional items such as coupons, specialty, and value-added items.

Our results support the hypothesis that tobacco marketing may be a stronger current influence in encouraging adolescents to initiate the smoking uptake process than demographic characteristics, perceived school performance, or ex-

posure to other smokers in the peer or family network. The accumulated evidence supports the need for effective strategies to prevent adolescents from starting to smoke.

SUPPLEMENTARY INFORMATION: Correspondence to: John P. Pierce, Ph.D., Cancer Prevention and Control Program, University of California, San Diego, Cancer Center 0901, 9500 Gilman Dr., La Jolla, CA 92093-0901.
<1> Affiliations of authors: N. Evans, Department of Speech Communications, Indiana University, Bloomington; A. Farkas, J. P. Pierce (Cancer Prevention and Control Program, Cancer Center, and Department of Family and Preventive Medicine), E. Gilpin (Cancer Prevention and Control Program, Cancer Center), C. Berry (Department of Family and Preventive Medicine), University of California, San Diego, La Jolla.

Reprint requests to: Cancer Prevention and Control Program, University of California, San Diego, Cancer Center 0901, 9500 Gilman Dr., La Jolla, CA 92093-0901.

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Notes

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GRAPHIC: Figure 1, Percentage of male and female adolescent never smokers in California who were susceptible to begin smoking, stratified by age group: 12-13 years (n = 1550), 14-15 years (n = 1167), and 16-17 years (n = 819). Numbers in the bars give weighted percents, and the upper limits of the 95% confidence intervals are shown. CTS = California Tobacco Survey; Figure 2, Percentage of California adolescent never smokers aged 12-13 years (n = 1550), 14-15 years (n = 1167), and 16-17 years (n = 819) who perceived a benefit of smoking as being promoted by cigarette advertisements by the six messages most frequently identified: staying thin, boredom reduction, stress reduction, relaxing, social facilitator, and enjoyable. Numbers in the bars are weighted percents, and the upper limits of the 95% confidence intervals are shown. CTS = California Tobacco Survey; Figure 3, Percentage of California adolescent never smokers who had received and percentage who would be willing to use products that promote tobacco use, stratified by age group: 12-13 years (n = 1550), 14-15 years (n = 1167), and 16-17 years (n = 819). Numbers in the bar are weighted percents, and the upper limits of the 95% confidence intervals are shown. CTS = California Tobacco Survey; Figure 4, Percentage of California adolescent never smokers aged 12-13 years (n = 1550), 14-15 years (n = 819) according to their score of 0-4+ on the Index of Receptivity to Tobacco Marketing (see text for definition). Numbers in the bars are

weighted percents, and the upper limits of the 95% confidence intervals are shown. CTS = California Tobacco Survey; Figure 5, Percentage of California adolescent never smokers aged 12-13 years (n = 1550), 14-15 years (n = 1167), and 16-17 years (n = 819) who were exposed to other smokers according to their source of exposure: minimal, family only, peer only, or peer and family. Numbers in the bars are weighted percents, and the upper limits of the 95% confidence intervals are shown. CTS = California Tobacco Survey; Figure 6, Percentage of California adolescent never smokers 12-17 years who were susceptible to begin smoking according to their receptivity to tobacco marketing (none, a score of 0 on the index; some, a score of 1 or greater on the index), stratified by their source of exposure to other smokers: minimal or family and/or peers. Numbers in the bars are weighted percents, and the upper limits of the 95% confidence intervals are shown. CTS = California Tobacco Survey.

REVIEW

Industry sponsored anti-smoking ads and adolescent reactance: test of a boomerang effect

L Henriksen, A L Dauphinee, Y Wang, S P Fortmann

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See end of article for authors' affiliations

Correspondence to: Dr Lisa Henriksen, Stanford Prevention Research Center, Hoover Pavilion, Room N145, 211 Quarry Road, Stanford, CA 94305-5705, USA; lhenriksen@stanford.edu

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Objective: To examine whether adolescents' exposure to youth smoking prevention ads sponsored by tobacco companies promotes intentions to smoke, curiosity about smoking, and positive attitudes toward the tobacco industry.
Design: A randomised controlled experiment compared adolescents' responses to five smoking prevention ads sponsored by a tobacco company (Philip Morris or Lorillard), or to five smoking prevention ads sponsored by a non-profit organisation (the American Legacy Foundation), or to five ads about preventing drunk driving.
Setting: A large public high school in California's central valley.
Subjects: A convenience sample of 9th and 10th graders (n = 832) ages 14–17 years.
Main outcome measures: Perceptions of ad effectiveness, intention to smoke, and attitudes toward tobacco companies measured immediately after exposure.
Results: As predicted, adolescents rated Philip Morris and Lorillard ads less favourably than the other youth smoking prevention ads. Adolescents' intention to smoke did not differ as a function of ad exposure. However, exposure to Philip Morris and Lorillard ads engendered more favourable attitudes toward tobacco companies.
Conclusions: This study demonstrates that industry sponsored anti-smoking ads do more to promote corporate image than to prevent youth smoking. By cultivating public opinion that is more sympathetic toward tobacco companies, the effect of such advertising is likely to be more harmful than helpful to youth.

In 2003, the latest year for which expenditure data are available, the five largest US cigarette manufacturers spent $72.9 million to advertise themselves as proponents of youth smoking prevention.[1] In fact, Philip Morris was the single largest anti-smoking advertiser in the USA in 1999 and 2000, even in states with aggressive anti-tobacco campaigns.[2] The company's ''Think. Don't Smoke'' campaign, which premiered in 1998, marked the first tobacco company advertising on US television since the ban of televised cigarette advertising in 1971. The Lorillard tobacco company launched its youth smoking prevention campaign (''Tobacco is whacko if you're a teen'') in 1999, with advertising in teen magazines and on cable television, including the most popular teen shows on MTV, ESPN, and Warner Brothers.[3] Such advertisements are not unique to US television. In 2001, Philip Morris International, British American Tobacco, and Japan Tobacco International launched a youth smoking prevention campaign (''You can be cool and not smoke'') on MTV in Asia, Australia, Europe, and Latin America.[4]

The tobacco companies' current marketing strategy has been described as ''the most bizarre and extraordinary mixed message in commercial history: 'Buy our product. It will kill you'''.[5] This characterisation misses an important point, however. The tobacco companies' smoking prevention ads never say that their product will kill you. Indeed, references to negative consequences of smoking are noticeably absent from their messages. A fleeting appearance of a United States Surgeon General's warning is the sole mention of any health risks caused by smoking. The teenagers who populate the ads seem convinced that not smoking is ''cool'', but do little to persuade others of this viewpoint. These ''role models'' mention few advantages of *not* smoking and no specific reasons to reject it.[6–8]

Little is known about what happens when tobacco companies tell youth not to smoke. Despite numerous warnings that the tobacco industry's youth smoking prevention ads are counterproductive,[3 9–12] only one study to date has tested whether the ads do more harm than good. Using data from a nationally representative sample of adolescents (ages 12–17 years), Farrelly and his colleagues assessed attitudes toward smoking and intentions to smoke as a function of exposure to American Legacy's ''truth'' campaign and Philip Morris' ''Think. Don't Smoke'' campaign.[13] After controlling for social influences to smoke, home environment, and other sociodemographic characteristics, adolescents' exposure to Philip Morris ads was independently associated with more favourable attitudes toward the tobacco industry and greater odds of intending to smoke. Because evidence of this boomerang effect is based on cross-sectional data, it is also plausible that adolescents who held more favourable opinions toward cigarette companies or were more susceptible to smoking were more attentive to Philip Morris ads.

To address this concern, the current study tests the tobacco industry's youth smoking prevention ads using a randomised controlled trial. To test a boomerang effect, we sought to determine whether adolescents exposed to industry sponsored ads were more inclined to smoke than adolescents who saw no anti-smoking ads at all. Additionally, we examined whether a boomerang effect may be either greater for or limited to adolescents who score high on a trait measure of psychological reactance.

Psychological reactance

The theory of psychological reactance[14 15] explains why attempts to persuade adolescents not to smoke may have the opposite effect. According to Brehm's theory, messages

Abbreviations: HRS, Hong reactance scale; TRS, therapeutic reactance scale

that are perceived to reduce or threaten personal freedoms (for example, choosing to smoke) arouse a motivational state, reactance, which directs individuals toward re-establishing the lost or threatened freedom. This effect is illustrated nicely in a study that compared different types of alcohol prevention ads.[16] Undergraduates rated high threat ads that used phrases such as ''conclusive evidence'', ''any reasonable person must acknowledge these conclusions'' or low threat ads with parallel phrases such as ''good evidence'' and ''you may wish to consider these conclusions carefully''. As predicted by reactance theory, high threat messages were evaluated more negatively and prompted greater intentions to drink than low threat messages. In a follow up study, students consumed more beer in a taste test after exposure to high threat than to low threat ads.[16] Thus, exposure to some alcohol prevention ads actually increased alcohol consumption.

Psychological reactance also explains why threatened or eliminated freedoms seem more attractive.[17] Objects or behaviours perceived to be off limits for certain audiences are more attractive to audience members to whom the restriction applies. For example, warning labels have been shown to make violent movies and television more appealing to youth.[18 19] In addition, attributing the warning to a highly authoritative source increased this ''forbidden fruit'' effect. Violent films with a warning from the US Surgeon General were more attractive to adolescents than films with the same warning label attributed to no source.[18]

What characteristics of the tobacco industry's anti-smoking ads might invoke psychological reactance? One obvious difference between ads from the tobacco companies and other sources is the inclusion of a US Surgeon General's warning. However, even more threatening restrictions are found in the industry's slogans. Instead of communicating reasons not to smoke, ads from Philip Morris issue rules that teenagers will want to break (''Think. Don't smoke''), and the Lorillard slogan defines tobacco as off limits for teens. Indeed, some focus group participants especially disliked ads that ''sound like their parents'' by commanding teens not to smoke.[20] If the effect of the slogans or Surgeon General's warning is to motivate psychological reactance, then the industry's ''prevention'' messages may backfire.

The ability of persuasive messages to promote reactance is typically construed as a situational response.[16 21 22] However, the current study also examines reactance as a dispositional factor. Brehm[14] himself suggested that individuals may differ in their potential for reactance, which subsequent research confirms.[15 23–25] Although little is known about individual differences in psychological reactance among adolescents, other indicators of their oppositional attitudes toward authority are associated with tobacco use.[26] For example, adolescents who rejected parental authority over tobacco and alcohol use were approximately four times more likely to smoke and drink.[27] Similarly, adolescents' evaluations of and responses to proscriptions about substance use from other sources, such as advertisements, may be explained by individual differences in psychological reactance.[21 28]

Consistent with previous research,[13] we hypothesised that adolescents will rate industry sponsored anti-smoking ads less favourably than ''truth'' ads. Additionally, we hypothesised that adolescents exposed to industry sponsored ads will express greater intentions to smoke, more curiosity about smoking, and more favourable attitudes toward cigarette companies. Finally, we tested the prediction that all anti-smoking ads will be rated less favourably by adolescents with high reactance potential and that industry sponsored anti-smoking ads are most likely to backfire with these youth.

METHOD

Ninth and 10th graders (ages 14–17 years) attending a large public high school in central California were invited to participate in a study about health promotion advertising. A single factor, between subjects experiment compared participants who saw youth smoking prevention ads sponsored by either a tobacco company or a non-profit organisation, or health promotion ads unrelated to smoking.

Sample

Active parental consent and student assent were obtained following a protocol approved by Stanford University's institutional review board. Of the initial sample ($n = 1022$), 31 parents refused permission, 60 students did not return parental consent forms, and 96 were absent for data collection, yielding a response rate of 82%. After excluding three incomplete surveys, the final sample ($n = 832$) was 53% female and 37% white, 23% Hispanic, 13% Asian, 5% African American, $< 2\%$ American Indian or Pacific Islander, and 20% multi-ethnic.

Stimuli

Each experimental treatment consisted of five television commercials. Two treatments represented the youth smoking prevention campaigns sponsored by the Philip Morris and Lorillard tobacco companies. Five of 14 Philip Morris ads were selected to represent the ''Think. Don't Smoke'' campaign in which teen role models affirmed their decisions not to smoke. In one such ad, several young teens claim that they do not have to smoke to be cool or to prove themselves to others. At the time data were collected, Lorillard's youth campaign was comprised of five ads that used humour either to depict refusal skills or to portray smoking as gross or costly. Compared to the Philip Morris ads, Lorillard's role models were less ''clean cut''. For example, cigarette offers were refused by a boy who visits a piercing parlour and a girl who sneaks out of her house to a late night party. All five Lorillard ads featured the slogan ''Tobacco is whacko if you're a teen''.

A third experimental treatment was comprised of youth smoking prevention ads sponsored by the American Legacy Foundation (ALF), a non-profit organisation whose ''truth'' campaign is the largest national, youth focused anti-tobacco media campaign in the USA.[29] The ''truth'' ads dramatise the tobacco industry's deceptive marketing practices and its denials about the addictive and harmful nature of cigarette smoking. The current study examined ''truth'' ads because they were compared to industry sponsored ads in a previous study[13] and because the advertising has been shown to be effective in reducing adolescent smoking.[30–33] Five of seven ads were selected to represent the 2002–2003 ''Orange Curtain'' campaign, which juxtaposed outlandish statements from tobacco industry documents with factual information about the detrimental effects of smoking. In one ad, a male teen quotes the head of a major tobacco company who testified, ''I am unclear in my own mind as to whether anybody dies from cigarette smoking related diseases''. Showing viewers a larger-than-life mural of his father who died of throat cancer from smoking, the teen asks, ''Is that clear enough?''. In an ad that dramatises the effects of smoking on infant birth weight, a female teen compares a tobacco executive's statement that some women prefer smaller babies with the results of a poll in which women demonstrate an overwhelming preference for a baby of normal rather than low birth weight. All five ads featured the slogan ''Truth Behind the Curtain''.

The control condition consisted of five commercials that either dramatised the tragic consequences of driving drunk or used celebrity testimonials to discourage this behaviour. For

example, one ad depicted a male teen reading a poem that mourns the loss of his best friend who was killed by a drunk driver. All five ads included the slogan ''Friends don't let friends drive drunk'' and were sponsored by the Ad Council, the largest non-profit producer of public service announcements in the USA.

Procedures

Data were collected in biology or related science courses in May 2003, and 38 classes were randomly assigned to see either five youth smoking prevention ads sponsored by a tobacco company (Philip Morris or Lorillard), or five smoking prevention ads sponsored by a non-profit organisation (the American Legacy Foundation), or five ads about preventing drunk driving. Following a ''forced exposure copy test method'' that is recommended for ad evaluations,[8 34] each ad was shown twice in succession without extraneous ads or programming to ensure a strong manipulation. Before viewing, participants answered questions about their media use, favourite celebrity sponsors, and personality. Thus, psychological reactance was measured before advertising exposure was manipulated. After viewing each ad twice, the videotape was stopped while participants completed a brief evaluation. After viewing all five ads, participants responded to questions about smoking cigarettes and drinking alcohol as well as attitudinal items about tobacco companies. The data collection and debrief were completed in a single class period (approximately 50 minutes). For returning a parental consent form and completing a questionnaire, participants received a $1 coupon to redeem at the student store.

Outcome measures

Perceived effectiveness

After viewing each commercial twice in succession, participants responded to three items: (1) Was the message convincing? (Definitely no, Definitely yes); (2) Would it be helpful in keeping your friends from smoking cigarettes/drinking and driving? (Definitely no, Definitely yes); (3) After seeing the ad, would people your age who have never smoked cigarettes be more or less likely to smoke (Definitely more, Definitely less).[35] The third item was not asked of students in the control condition. All responses were measured on a four point scale and the perceived effectiveness of each treatment was calculated by averaging responses across the five ads with higher numbers indicating more favourable evaluations (Cronbach's $\alpha = 0.69$).

Intention to smoke

Three items asked respondents about their intentions to smoke in the future (at any time during the next year, if a best friend offered it, and one year from now).[36] Responses on a four point scale (Definitely no, Definitely yes) were averaged such that higher numbers indicated greater intention to smoke (Cronbach's $\alpha = 0.92$).[21 37]

Curiosity about tobacco use

A five item measure of curiosity about marijuana use[38] was adapted for this study. Using a seven point Likert scale, students responded to statements such as ''Smoking cigarettes might be fun. It would be interesting to know what smoking cigarettes feels like''. Curiosity was measured by averaging responses to the five items (Cronbach's $\alpha = 0.77$).

Tobacco industry sympathy

Using a five point Likert scale, participants responded to five statements such as ''Cigarette companies get too much blame for young people smoking'' and ''Cigarette companies should have the same right to make money as any other type of company''. The five items were adapted from the Legacy Media Tracking Survey II.[39] Responses were averaged such that higher numbers indicate more sympathetic attitudes toward cigarette companies (Cronbach's $\alpha = 0.73$).

Covariates

Psychological reactance

Items with wording that seemed most appropriate for adolescents were culled from the therapeutic reactance scale (TRS)[23] and Hong reactance scale (HRS).[25] Before viewing ads, participants responded to a five item TRS subscale that assesses resentment of authority figures[40] and a three item HRS subscale that assesses resistance to influence attempts.[41] Sample items are ''If I am told what to do, I often do the opposite'' and ''It makes me angry when another person is held up as a model for me to follow''. All eight items loaded on a single factor with loadings > 0.45 (Eigenvalue = 3.31, pct var = 0.41). The eight responses, measured on a five point Likert scale, were averaged to create a composite measure of psychological reactance (Cronbach's $\alpha = 0.79$). A mean split was used to compare adolescents with high reactance potential (above the mean) with a reference group (at or below the mean) and to test for interactions with the experimental treatment.

Ad familiarity

A single item asked participants to rate their familiarity with each commercial on a four point scale. This item was included to control for a priori differences in exposure to the commercials.

The following categories of factors that might be associated with the outcomes were also measured: current smoking (any cigarette smoking in the past 30 days), social influence (exposure to at least one parent or friend that smokes), and sociodemographic characteristics (sex, grade level, self reported grades in school).

Analyses

Because classrooms rather than participants were randomly assigned to ad exposure, all hypotheses were tested with multi-level modelling using PROC MIXED for SAS version 8.0.[42] For each dependent variable (perceived effectiveness, intention to smoke, curiosity, and tobacco industry sympathy) an analysis of covariance model specified classroom as a random effect and ad exposure as a fixed effect nested within classrooms. All models controlled for the same set of covariates: psychological reactance, current smoking, exposure to smoking by parents and peers, sex, grade level, and self reported grades in school. To determine whether industry sponsored ads were more likely to backfire with youth who scored high on psychological reactance, all models tested an interaction of this covariate with the experimental treatment.

Ad familiarity was included as a covariate in the model that tested perceived effectiveness of the ads. This analysis excluded participants in the control condition because it made little sense to compare ads about preventing youth smoking with ads about drunk driving.

As a check on random assignment, χ^2 tests compared the distribution of psychological reactance, smoking status, sex, and grade level across the four categories of ad exposure. Although there were fewer 10th graders in the Lorillard condition than in other groups, all multivariate models controlled for grade level. No significant relationships between assignment to condition and other variables were found.

RESULTS

Advertising evaluations

The ads used in this study were familiar to most adolescents: 94.1% had seen at least one of the Philip Morris ads, 83.7%

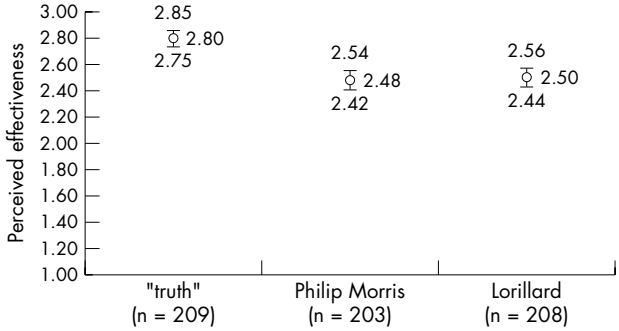

Figure 1 Adolescents' (n = 620) mean ratings of ad effectiveness for three youth smoking prevention campaigns. Graph portrays mean ratings and the 95% confidence interval.

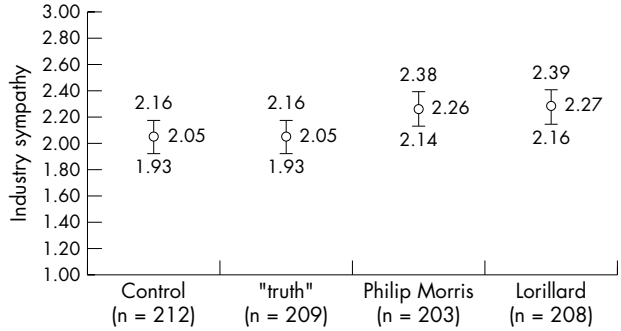

Figure 3 Average tobacco industry sympathy by ad exposure (n = 832). Graph portrays mean ratings and the 95% confidence interval.

had seen at least one Lorillard ad, and 92.3% had seen at least one ''truth'' ad. The three anti-smoking campaigns were not equally familiar to participants, as indicated by a significant main effect ($F_{3,34} = 11.7$, $p < 0.001$). According to post-hoc comparisons, adolescents were less familiar with Lorillard ads (M = 2.1, SD = 0.8) than ads sponsored by Philip Morris (M = 2.4, SD = 0.8) or ''truth,'' (M = 2.5, SD = 0.9).

As shown in fig 1, adolescents did not perceive the three anti-smoking campaigns to be equally effective ($F_{2,26} = 18.8$, $p < 0.001$). Even after controlling for mean differences in ad familiarity and all other covariates, post-hoc comparisons confirmed that Philip Morris and Lorillard ads were perceived to be less effective than ''truth'' ads ($p < 0.001$). Regardless of the ads they saw, participants with high psychological reactance rated youth smoking prevention ads less favourably (M = 2.47, SD = 0.45) than participants with low psychological reactance (M = 2.67, SD = 0.42, $F_{1,575} = 24.2$, $p < 0.001$). However, the interaction of reactance and ad exposure on perceived effectiveness was not significant.

Behavioural intent

Although intention to smoke was slightly greater among students who saw ads sponsored by ''truth'' (M = 1.8, SD = 0.9), Lorillard (M = 1.8, SD = 0.9), or Philip Morris (M = 1.7, SD = 0.9) than the control group (M = 1.6, SD = 0.7), these differences were not significant. Overall, adolescents who scored high on psychological reactance expressed greater intentions to smoke (M = 1.9, SD = 1.0) than adolescents who scored low (M = 1.4, SD = 1.0, $F_{1,778} = 31.9$, $p < 0.001$), but there was no significant interaction of this variable with ad exposure on intention to smoke.

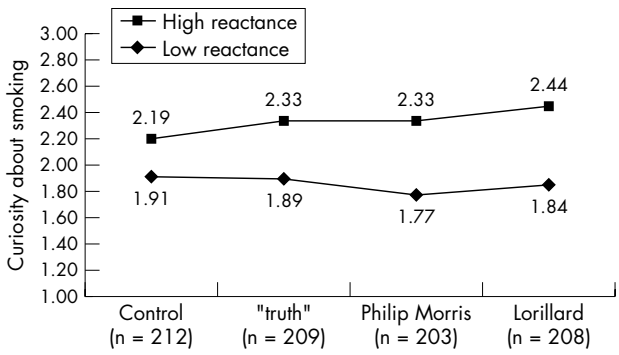

Figure 2 Average curiosity about smoking, by ad exposure and psychological reactance (n = 832).

Curiosity about smoking was slightly but not significantly higher among adolescents exposed to ads sponsored by ''truth'' (M = 2.1, SD = 0.9), Lorillard (M = 2.2, SD = 1.0), and Philip Morris (M = 2.1, SD = 1.0) than the control group (M = 2.0, SD = 0.8). High reactance youth expressed greater curiosity about smoking (M = 2.3, SD = 1.0) than low reactance youth (M = 1.9, SD = 0.8, $F_{1,779} = 40.7$, $p < 0.001$), and an interaction of this variable with ad exposure approached significance ($p = 0.09$). As shown in fig 2, exposure to industry sponsored youth smoking prevention ads increased the disparity between adolescents with low or high psychological reactance. Thus, curiosity about smoking was greatest among adolescents with high psychological reactance exposed to Lorillard ads.

Tobacco industry sympathy

As shown in fig 3, adolescents' sympathy toward tobacco companies differed as a function of ad exposure ($F_{3,34} = 3.0$, $p < 0.05$). After controlling for reactance and other covariates, a planned comparison confirmed that adolescents exposed to Philip Morris and Lorillard ads expressed greater sympathy for cigarette companies than the other experimental groups ($p = 0.006$). Regardless of which ads they watched, high reactance youth were more sympathetic toward cigarette companies (M = 2.3, SD = 0.8) than low reactance youth (M = 2.0, SD = 0.9, $F_{1,780} = 24.1$, $p < 0.001$), but the interaction of this variable with ad exposure was not significant.

DISCUSSION

This study is the first randomised controlled trial to test the effectiveness of youth smoking prevention ads sponsored by tobacco companies. The study examined whether adolescents exposed to such advertising expressed greater intentions to smoke, more curiosity about smoking, and more positive attitudes toward the tobacco industry than adolescents exposed to anti-smoking ads sponsored by ''truth'' or ads about drunk driving.

As predicted, adolescents perceived Philip Morris and Lorillard ads to be less effective than ''truth'' ads. Of course, perceived effectiveness of the ads may not accurately measure their actual effectiveness. However, the finding complements previous research in which young audiences rated Philip Morris anti-smoking advertisements less favourably than those from non-profit or government sponsors.[13 43 44] Although adolescents' reasons for disliking the industry sponsored ads are not well understood, one plausible explanation is that they fail to use content themes or executional styles of anti-smoking advertising that adolescents find most persuasive.[45 46] By systematically varying the source attribution, Surgeon General's warning,

and slogans, further experiments should determine what other features make the industry's ads objectionable to teenage audiences.

Adolescents' exposure to industry sponsored anti-smoking ads engendered greater sympathy toward cigarette companies. This finding extends previous research in two ways. Because random assignment ensures that exposure to industry sponsored ads cannot be explained by a favourable disposition toward cigarette companies, the current study eliminates a potential bias associated with previous quasi-experimental research.[13] More importantly, the current study demonstrates that the effect is not limited to the ''Think. Don't Smoke'' campaign. Lorillard's youth smoking prevention campaign appears to have been an equally effective public relations tool. Research is needed to understand adults' responses to such advertising. In 2004, Lorillard replaced its smoking prevention ads aimed at youth with ads aimed at parents—''the best thing between kids and cigarettes''.[47] A Philip Morris campaign that also promotes parental responsibility for talking to children about not smoking (''Talk. They'll listen'') has aired since 1999, and in 2003 the tobacco company began advertising its website as a resource for quitting smoking.[2 48] Research should address whether these shifts in target audiences represent a more effective strategy to garner public sympathy for tobacco companies and to forestall legislation that would restrict the industry's sales and marketing activities.

Interestingly, adolescents exposed to ''truth'' ads were no less sympathetic toward cigarette companies than the control group. This result is noteworthy in light of pending litigation about whether ads sponsored by the American Legacy Foundation violate the terms of the Master Settlement Agreement.[49] If, as Lorillard claims, the ''truth'' campaign vilifies the company and its employees, it would be logical to expect less sympathy toward the tobacco industry from adolescents exposed to ''truth'' ads than from the control group exposed to ads about drunk driving. A null finding contradicts Lorillard's claim. However, it is difficult to argue against the fact that the ''truth'' ads cultivate anti-industry attitudes and that changes in these attitudes are the underlying mechanism for observed reductions in adolescent smoking.[13 50 51] Inconsistent results may be attributed to different item wording: predominantly positive statements about cigarette companies used in this study and negative statements about cigarette companies used in other studies probably do not measure opposite ends of the same dimension or construct. Indeed, a growing body of evidence suggests that adolescents' attitudes and beliefs about the tobacco industry are multifaceted.[50 52] Scale development work is needed to understand better how adolescents think about the tobacco industry and its member companies, and to compare the effects of anti-smoking ads from various sources on these opinions.

Contrary to expectation, industry sponsored ads neither increased adolescents' intentions to smoke nor promoted curiosity about smoking. This boomerang effect, which has been demonstrated elsewhere,[13] may have been too difficult to demonstrate in the context of a controlled experiment. Indeed, the artificial nature of adolescents' exposure to advertising was a primary limitation of this study. Moreover, an experimental design is not ideally suited to studying the cumulative effect of such messages in the course of adolescents' everyday lives.

The small size and nature of the sample are also limitations of this study. The participants lived in California, a state with the longest running anti-tobacco media campaign. Prior exposure to state sponsored ads that highlight the tobacco industry's deceptive marketing practices may have made the participants more sceptical of the industry to start and, thus, less susceptible to the effects this study investigated. Research is needed to gauge the impact of industry sponsored youth smoking prevention ads in media markets where the ads enjoy less competition from anti-smoking campaigns sponsored by non-profit or government sources. Although this study examined industry sponsored ads that no longer air in the USA, similar campaigns appear in Europe, Latin America, and Southeast Asia.[4 53]

What this paper adds

Little is known about the impact of youth smoking prevention ads sponsored by tobacco companies. In a previous cross-sectional survey, adolescents' exposure to such ads was associated with greater intentions to smoke and more favourable opinions of the tobacco industry. This is the first controlled experiment to examine adolescents' reactions to anti-smoking ads sponsored by Philip Morris and Lorillard. Results suggest the ads are, at best, ineffective and, at worst, counterproductive. The study provides empirical support for proposals to restrict tobacco industry involvement in youth smoking prevention.

This study is the first we are aware of to demonstrate associations between individual differences in psychological reactance and adolescents' evaluation of anti-smoking ads. Adolescents who scored high on a measure of psychological reactance expressed the strongest intention to smoke and were least responsive to anti-smoking ads from any source. The finding underscores the challenges in framing anti-smoking messages for this target group and in understanding their impact on smoking behaviour.[21 28] Future research should also examine whether psychological reactance is a unique risk factor for adolescent smoking or an indicator of other known risk factors like risk taking and rebelliousness.

This study provides empirical evidence of the tobacco industry's success in using tobacco education programmes to garner public sympathy—a result that is counterproductive for tobacco control. Advertisements that foster sympathy for tobacco companies may weaken support for anti-tobacco policies, an outcome that has negative consequences for adolescent smoking.[54] Although the study results did not demonstrate a boomerang effect of industry sponsored advertisements on adolescents' intention to smoke, there are other ways in which the messages may backfire. Future research should determine whether the tobacco companies' ads make audiences more resistant to criticism of the tobacco industry or otherwise dilute the impact of industry focused tobacco control campaigns. Specialised counter-advertising may serve to inoculate the public against the tobacco companies' claims that they are good corporate citizens.

ACKNOWLEDGEMENTS

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Authors' affiliations

L Henriksen, A L Dauphinee, Y Wang, S P Fortmann, Stanford University School of Medicine, Stanford, California, USA

Competing interests: none declared

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FDA Wades Into Social Media, Finally

2:29 pm

September 21, 2009

comments (4)

Recommend (4)

byline goes here

By Scott Hensley

Tweet this! Just in time for Web 3.0, the Food and Drug Administration has set a date this fall for a public hearing on how to deal with Web 2.0.

Time for FDA to enter Facebook? (Clar@bell/Flickr)

As is the modern fashion, the FDA wants *your* help in figuring out what to do about advertising and promotion of regulated products on the Internet. You can find the info on how to submit comments or attend the meeting, scheduled for Nov. 12 and 13, in the *Federal Register* here.

The announcement includes a helpful primer on such obscure terms as podcast, blog, and social network, where people with common interests can "create profiles and then invite people to join as 'friends.' " Oh, really?

Seriously, this *is* important stuff, so we figure the agency has to make sure everyone understands the basics.

Lots of folks have been wondering why it has taken so long for the agency to get around to laying down rules for the Internet road.

Critics say companies have exploited the regulatory void. While many in industry say the Internet is a minefield whose risks are compounded by unexpected agency crackdowns, like the flurry of warning letters on Google search ads in March.

At a meeting of lawyers who deal with FDA this morning, Janet Woodcock, head of the agency's drug center, said there's a renewed focus on policing advertising. Drugs, medical devices and so on, are more complex, and there have been enormous changes in the way people communicate, the use of social media, according to Mark Senek, who blogs at Eye on FDA.

So, what are the questions FDA has in mind? We paraphrase below:

1) What online messages and chatter are regulated companies responsible for? And what's not their problem?

2) How do companies comply with existing regulations, requiring such things as fair balance in ads, within the confines of, say, a 140-character tweet?

3) When does a company have to correct misinformation posted by third parties? Hello, Wikipedia! Some companies, the FDA said, haven't taken action on known problems, fearing they'd then be responsible for correcting everything anywhere online.

4) To link, or not to link? is the FDA's question. Specifically, FDA wants to know what sorts of linking is appropriate and when users find it misleading.

5) The bogeyman in the social media closet has long been chatter about side effects and other problems with products. When do companies have to report these bad experiences as recounted on the Web to FDA?

categories: FDA, Pharmaceuticals, Social networking

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2:29 pm - September 21, 2009

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Recent First

Karl Schwartz (KarlPA) wrote:

Interesting developments. Perhaps all sites providing information about drugs could be required to provide a prominent link to the full prescribing documents, which are not as easy to locate online as you might expect.

Would not be a cure, but at least it would provide an opportunity for the visitor to review reputable information regarding risks, benefits, indication, etc. It would be easier for FDA to regulate ... checking if the link is clearly provided.

Tue Sep 29 08:31:41 2009

Recommend (0)

Report abuse

Alex Fraser (AF_AcsysInteractive) wrote:

Last May I attended a presentation by Philips at the Health 2.0 conference in Boston where their marketing team spoke of a social initiative, however weren't really certain if they'd get in trouble with the FDA or not due to lack of regulations. We've been in direct dialog with the FDA on Social Media for several of our medical device clients and it has been amazing that after several months we still are awaiting answers to some very basic questions.

Healthseekers are overwhelmingly visiting social media sites/blogs to learn of experiences (good and bad) that patients like themselves have experienced. Several medical association sites have published accounts of the value of social media with respect to orthopaedic procedures. However a patient currently has no way of knowing the accuracy of information found on social sites (or many times the web itself), so there could be extreme value of having direct patient reports on a social platform that is "managed" by device/pharma entities assuming of course the reports are accurate and not edited.

Tue Sep 22 14:29:09 2009

Recommend (0)

Report abuse

Carl Anderson (Carl1anderson) wrote:

As someone who has a blog on FDA stuff (Carl's Blog on FDA Stuff) I routinely survey what is being said in the blogosphere. Unfortunately, there is a lot of hooey out there. Bloggers are primarily concerned with expressing a viewpoint or selling a product, not in carefully researching an issue. However, there is also a lot of very good information and that is something that should be encouraged.

FDA needs the resources to monitor the web for deliberately false information that is put on the web for commercial gain. People have the right to say what they feel and be completely wrong on an issue. They don't have a right to put misleading information that can cause public health problems so they can make a quick buck. Or to keep someone else from making a legitimate buck.

The devil is in the details. At least FDA is trying to get a handle on the situation. It is very much a case of better late than never. People, like myself, who are participating in online discussions about FDA have a responsibility to address this issue with FDA and submit comments or attend the public meeting. I intend to and I hope others do as well. It should be interesting.

Carl Anderson
Tacoma, WA

Tue Sep 22 01:23:28 2009

Recommend (3)

Report abuse

Cindy Findley (Regulation_Rita) wrote:

Just in case someone wants the Federal Register citation for the FDA's social media public meeting it is 74 FR 48083 -- Sep. 21, 2009. FDA source: http://www.FederalRegister.com

Mon Sep 21 20:11:04 2009

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For Global Business and Marketing Leaders

August 1, 2008

Hard of (Ad)hering

By George Koroneos, Online Content & News Editor

When your biggest products are going off patent, your biggest customers are pushing back hard on prices, and you don't have enough new products in the pipeline to make up the shortfall, what do you do?

There's more than one answer to that question—the key question facing pharma these days—but certainly one classic answer is: sell more to your existing customers.

At first blush, that's a solution that makes no sense for pharma. Patients get sick only so often, prescriptions cap utilization, and there are relatively few conditions for which add-on therapy—even when justified—can benefit the maker of the original therapy.

Of course, that assumes that patients actually take their medications, and there is ample evidence that they don't. Surveys have revealed that:
» Fifty percent of patients forget to take their meds and over 30 percent don't refill their drugs
» Twenty percent say they don't take the full course of treatment
» Fifty percent of patients don't take drugs as directed

This massive breakdown of adherence and compliance has big impacts for both patients and pharma. It's been estimated that as many as half of all prescriptions fail to have the proper effect because of failures to take the drug or to follow instructions. And according to IMS, compliance issues cause the industry to lose $177 billion a year—a remarkable figure in a $700 billion a year industry, and one that still may actually underreport the effect of noncompliance.

These are patients who have already been diagnosed and prescribed. The question for pharma is how to keep them on therapy and taking their medication correctly—for their sake and the sake of the business.

"We're looking at a third of prescriptions not being filled at all, and an average of 50 percent non-compliance for chronic ailments," says Stanley Wulf, vice president and CMO at Infomedics. "The focus hasn't been on [adherence] because there has been enough activity in the drug pipeline to fill the cup consistently —disregarding the fact that there are holes in the cup."

Pharma is now implementing new technologies and programs—both high tech and old school—to help patients adhere to their drug regimens and to recover the money that it has been hemorrhaging in lost prescriptions.

Tools such as reminder messaging, nurse services, and disease-state compliance programs are at the top of pharma's list of compliance tricks. And while many of these tools are still unproven, the fact remains—pharma is trying.

Tech Savvy Outreach

"One challenge," says Ian Wolfman, senior vice president of IMC^2 , "Is that not all products—and not all disease states—are created equal."

At one end of the spectrum are products for chronic, asymptomatic conditions such as high blood pressure or elevated cholesterol. They're low-priced and widely distributed. Their compliance challenge is that benefits aren't apparent day-to-day.

It's at the other end of the spectrum that pharma has seen success, in disease states that have specialty-distributed products (such as human growth hormones)—high-price, high-value drugs that have a big impact.

Years ago, for example, Serono decided to boost compliance of its HGH product Saizen, which features a needle-free device geared toward younger patients. This was a small segment comprising thousands of patients, but Serono realized that there was a huge benefit in getting the patients to stay on the product and take it properly.

Barriers to Adherence

The company brought in IMC^2 to work on the project. "We learned from their research that one of the big barriers to compliance was children who weren't aware of how to manage their conditions," says Wolfman. IMC^2 developed a Web site with multimedia educational materials and used Serono's sales force to promote it to physicians. With a hip name (www.coollearnings.com) and youth-oriented content, the site taught kids how to take Saizen properly, rewarding them with MP3 music downloads when they answered a quiz correctly.

Merck took a similar tack with its human papilloma virus vaccine, Gardasil. Ads featuring young "tweens" caught on with the audience, and Merck built upon them by dabbling in a technology almost all of today's youth know—text messaging.

"We knew from other vaccines that compliance with the second and third dose historically wasn't terrific," says Dave Schechter, US marketing leader for Gardasil. "With Hepatitis B, it took years for them to get to a point where 75 percent of the people who got their first dose got their second, and 56 percent of the total got their third."

Merck surveyed physicians to find out what they needed to ensure Gardasil compliance. Using the slogan "Three is key," the company offered an opt-in reminder system on the branded Gardasil Web site. The system sends mailings, emails, or text messages to patients remind them to get their second and third doses. To encourage enrollment, Merck sent kits to doctors to get patients to sign up in the office immediately after receiving the first dose.

"We target two main groups, 18- to 26-year-olds and moms of 10- to 26-year-olds," Schechter says. "Moms were more interested in email and snail mail, but young adult females were more apt to be reached by text messaging."

Because Merck does not collect patient data, it has no way of knowing if or when patients in the program receive their doses. Nonetheless, it seems to be working.

"Seventy-five percent of the people who got the first dose got the second, and 50 percent have completed all

three," Schechter confirms. "Those are numbers that took years to achieve with other vaccines. We were able to achieve them at launch, and we've continued to achieve them."

Disease Management, Not Drug Management

Companies contemplating a patient compliance program have many options: ad campaigns, health information programs, and online patient tools, to name just a few. One attractive alternative is to work with an outside content provider to establish a health-management program. "Pharma compliance programs are a fantastic use of technology for the small group of patients who are willing to provide data directly to a pharma company," explains Rich Benci, president of the health-oriented Web site RealAge. "However, I have yet to see a pharma company with more than 5 percent of its patients in its CRM [customer relationship management] system."

RealAge has 20 million users, and compliance is built into its basic business strategy. Consumers come to the site to learn their "real age" by completing an online questionnaire of 150 lifestyle and health questions. RealAge, in turn, creates a health management plan for them. The site accepts advertising, and users can opt to receive information from pharmaceutical companies, tailored to their health issues and the treatments they already receive. So far, nine million customers have opted in.

Even the advertising on RealAge is targeted. For example, ads for both Lipitor and Vytorin run on pages for patients with high cholesterol. "A person that's motivated to go to the doctor after seeing material sponsored by Lipitor is more than likely to talk to the doctor about that drug," Benci says. He notes that RealAge does not publish ads for switch campaigns and ensures that consumers who say they already take a particular drug don't receive ads for competitors.

Pharma companies can license RealAge's educational content to use with their own CRM system. But to Benci, that misses the advantages of the site. It's hard to get patients to sign up and provide personal information, he says, and companies are regulated about what they can say on Web sites. A patient with asthma who signs up for a compliance program on a brand.com can only receive so much information, and the company can't engage the patient about other health issues.

"The ability of a content provider like RealAge to provide content across an entire therapeutic category makes it easier to target a broad persistency program," Wolfman says.

Positive Reinforcement

That's not to say that pharma companies aren't doing their best to create compliance programs. Six months ago, AstraZeneca launched "Measures of Success," an online program for its respiratory drug Symbicort. Patients can register online and access a trio of disease management tools, including reminder messages and patient testimonials.

One of the more interesting tools on the site is a program by HealthHonors that encourages patients to log in or telephone each day to let AZ know they have taken their drug at the prescribed time. When patients connect, they see or hear a short message about the importance of taking the medication. In exchange, they receive points that can be redeemed for books on asthma and other medically beneficial merchandise.

Pharma incentive programs have been avoided in the past, but AZ feels that it's a good fit in this case. "There are always hurdles, but we are an ethical company and it's all about making sure you have appropriate rewards that are in line with medical practice, and that are benefiting patients in the right way and aren't seen as inducements," explains Carolyn Fitzsimons, executive director for Symbicort.

HealthHonors declined to provide specific numbers, but said that it was achieving results similar to those seen in recent clinical trials of the program. There, 100 percent of registered users continued using the program throughout a five-month period, leading to a 34 percent boost in adherence.

"The ROI can be significant depending on the brand and how they go about measuring it," explains HealthHonors founder Murat Kalayoglu. The company's approach is steeped in research on behavior modification—the technique of increasing (or decreasing) the frequency of a behavior through the right reinforcement at the right time and frequency.

The AZ program is geared toward patients with chronic diseases such as hypertension, hypercholesteremia, COPD, and asthma—in which drugs may not provide perceptible benefits. "For those diseases, whether or not you take your medication today makes you feel absolutely no different today," Kalayoglu says. "The reward for taking a statin today is not felt for months or years down the line in the form of avoiding an ER visit. This system allows you to bring that benefit from the distant future to the here and now."

The Patient Struggle

"I think it's time to put the words *compliance* and *adherence* and *persistence* in the grave," says Michael Devlin, managing director of the consumer division at healthcare agency Concentric RX. "All those words imply that the patient is the recipient of healthcare as opposed to being an active participant. It's not a semantic debate—it's about patient commitment."

But how to get that commitment? According to IMS Health, five common themes emerge when patients are asked why they discontinued a medication or failed to comply:
» Unconvinced of the need for therapy
» Unconvinced of the effectiveness of the medication
» Side effects of the medication
» Difficulty with administration
» Out-of-pocket cost

Pfizer recently created a disease management program for patients with chronic conditions. The target audience was Medicare patients—arguably the poorest, least educated, least motivated patients.

"It took an unconventional approach to show them they needed to be more committed, rather than tell them that they needed to comply," Devlin says. "We sent nurses into the community to speak to them in their own language. We created educational material in Haitian and Creole and different dialects of Spanish. Patients were taken aback that these people spoke to them, that they came back a second time. That was the key: showing them that we were committed to them and they weren't just going to get a brochure."

On the marketing side, Pfizer made a documentary film that followed people as they struggled with their disease, showing a mix of successes and failures—some patients improving in diabetes while others were unable to complete anti-smoking programs.

"Some conditions are acute and people want to know everything about it," says Mark Klapper, vice president of strategic planning at Micromass Communications. "For asymptomatic conditions like hypertension, part of the challenge is convincing people that they need to pay attention. You are going seeing a lot of DTC messaging extended to the compliance area."

A Patient Ally

One place pharma is turning for inspiration is the over-the-counter world. One of the most talked-about OTC patient programs is the My Alli plan for GlaxoSmithKline's weight loss drug.

"When you're dealing with wanting to lose weight, it is about modifying behavior," says Karen Scollick, GSK's vice president of behavioral sciences. "Behavioral support tools are an important part of how the program works."

Included in the Alli starter pack is a comprehensive introductory print piece with a code that allows the user to

register online. The 12-month program includes dietary information, a food journal, eating programs, and tools to monitor weight loss.

Additionally, GSK just launched the Alli Circles, a program run through the product's Web site that focuses on real success stories from users. "The word-of-mouth facilitation is very important," Scollick says. "We have a message board facility online where individuals can talk about their treatment. We don't get overly involved on the board. The stories are real testimonies, so we just use moderators to make sure there is authenticity and integrity."

Is the program working? Of the 4 million Alli users in the world, 375,000—more than 10 percent of unique starters—have enrolled. That might sound low, but considering that less than five percent of prescription drug users enroll in compliance programs, 10 percent isn't bad.

Scollick says GSK is interested in adapting some of these tools to prescription drugs. "We are open to new ideas and new technologies to enable to us to communicate better with our consumers," he says. "The end-users have an insatiable thirst for education and information, so any technology that can enable that is worth considering."

Alli was one of the first drugs approved by FDA as both a pill and a program, and some experts think this is going to be a trend. "You're seeing FDA look at categories where behavioral change is necessary to go beyond the benefits of the bottle," says Link.

Nursing a Wounded Campaign

While many companies are reaching to the Internet to boost compliance, others are going back to an old standby—nurse-delivered patient education. Take, for example, Diabetes Interactive Network (DIN), established early in the decade to educate patients about its new insulin pens. "We thought it was our obligation that patients knew how to use the pens, and we wanted to offer general diabetes tips and education," says Lilly spokesperson Scott MacGregor.

Now in its eighth year, DIN employs approximately 500 diabetes educators across the US who teach classes on how to manage the disease, how to use the pen, and on the importance of nutrition, exercise, and taking the medication—Humalog and Byetta.

"There's a lot more that goes into taking insulin drugs than just taking the prescription to the pharmacist and taking one pill a day," MacGregor says. "Particularly with insulin and the complexity around dose penetration and carbohydrate intake, it's a complex regimen.

"In terms of compliance, insulin is an interesting medicine because if someone needs it and doesn't take it, you'll notice," MacGregor continues. "There is a huge opportunity to help these patients because healthcare providers are limited in what they can do to provide this kind of education. It's a service luxury that an office can't always offer."

So far, more than 44,000 patients have completed DIN program. In a survey, 90 percent reported that they felt confident that they knew how to take their medication, while 85 percent said they would continue the therapy post-training.

Lilly is now working on a pilot program with the Joslin Diabetes Center in Harvard to help primary-care physicians and staff better understand diabetes. The goal: to show meaningful clinical differences in diabetes management. Results are not in yet, but Lilly is hopeful.

"With consumer advertising being less than what it once was, pharma companies are looking for new ways to reach patients and affect patient compliance," explains Abby Mallon, vice president VMS Medical, which serves as an outsource for the DIN program. "In the last few years, we've seen nurse programs double. There's nothing better than having a live healthcare professional walking you through your questions."

Connecting at the Pharmacy

One place where pharma is still trying to reach patients is at the pharmacy, either through staggered couponing or through informational inserts included with prescriptions. "It really frustrates me as a pharmacist to see patients not realize the implication of not taking their medication or not understanding how to take it properly," says Reen Nouh, director of client services at the marketing firm Koroberi. "It's low-hanging fruit. Patients who are already diagnosed and prescribed the medication are easier to keep and maintain on therapy, which translates to faster dollars than trying to get a patient diagnosed."

Package inserts offer an opportunity for customization for the needs of the individual customer. Catalina Marketing, for example, develops custom inserts that are printed out at the point of sale. The inserts vary by what stage of therapy the patient is at. And the company will work with pharmaceutical companies to create sponsored messages.

"The messaging can't be a simple reminder," explains Joe Meadows, vice president of marketing and creative services at Catalina. "It has to be a message continuum—a patient starting a therapy is in a very different place, with very different needs than a patient two to three months in, and that patient is in a different place than someone who has been on therapy for 18 months and is thinking about jumping off."

From Payer to Payee

Managed care providers are realizing that they may waste their investment in getting patients diagnosed and on therapy if patients don't continue to take their medication. "They take the hit on both ends," says Jonothan Tierce, general manager and center of excellence leader for IMS Health. "They pay for the diagnosis, pay for the first dose or two, and then the patient still gets the disease."

Meadows believes payers will have to become more involved in compliance than they are today. "It does little good if you are spending $4,000 on a patient and the patient is taking their medication four out of ten times," he says. "What you've done is spend a lot of money on what's likely to be a poor outcome."

Pharmacy benefit management firm (PBM) Medco Health Solutions has begun to analyze claims, looking for instances of drop-off and long term compliance. The company is conducting plan-specific analyses to identify compliance issues and opportunities. "[P]lan averages don't reflect any one person. They reflect averages of lots of people," an IMS Health report explains. "By stratifying individuals within medication possession ratio (MPR) ranges that are fairly granular, a whole different picture emerges on what's happening in the population."

Changing Techniques

What happens to compliance programs when a drug goes off patent, or the manufacturer stops promoting it? In some cases, they continue. MacGregor says that Lilly has invested heavily in patient education programs for drugs that have been around for more than 12 years. "The number of people who need this support is growing, but beyond the numbers, we believe that part of our role is education," he says.

"Today more than ever, Big Pharma has a huge economic incentive to stand behind compliance and adherence," says David B. Nash, chair of the department of health policy at Jefferson Medical College. "Pharma is supporting compliance and adherence technology by spending directly on these kinds of programs. They're also contributing to the literature about compliance, and they are changing aspects about the detailing story to focus on compliance."

That said, Nash notes that compliance is still at about 50 percent across all drug indications. "In spite of the technology, understanding, and efforts, we still only succeed about half the time," he says. "That means we have to change our approach. New technology, disease management, Internet-enabled reminder systems, nurse educators—every single thing has been evaluated, and still the rates are dismal."

One possible approach might be to change the way doctors discuss drugs with patients and improve behavioral teaching techniques, starting in the first year of medical school.

"I would not put all the blame at pharma's feet. I'd put the blame at primary care doctors because in the absence of an economic incentive to promote compliance, it will not be promoted," Nash says. "The only payment system that promoted compliance was capitation."

"New technology sounds exciting because it gets people right at the moment that they might be thinking of taking their medication," Tierce says. "We view those as the means of communication separately from the messages. The different channels of communication themselves don't make the difference you would think they would. It sounds great if you send a text message, but I don't think the research shows those as being any more effective as any other way of delivering a message."

Most experts agree that some patients will never be compliant. "The point that we emphasize is that the top people are always going to be compliant," Wulf says. "It's the low 20 percent that you're never going to change. If you make a program for all, you will affect none. You want to help those who want to get better but have something blocking them."

BARRIERS TO ADHERENCE

		New Rx Prescribed and Given to Patient	Rx Initially Filled by Patient	Medication Taken by Patient as Directed	Rx Refilled by Patient	Rx Renewed by Patient
		THE PATIENT CARE CONTINUUM ➡				
POTENTIAL BARRIERS TO ADHERENCE	EDUCATIONAL	Awareness of treatment gap	Pharmacy access	Sense of importance	Forgetfulness	Forgetfulness
		Health literacy	Health literacy	Health literacy	Health literacy	Health literacy
		Provider access	In denial	Forgetfulness		
	FINANCIAL		Cost-share		Cost-share	Cost-share
	CLINICAL			Side effects		
				Dosing complexity		
				Perception of ineffectiveness		

Source: tk

Barriers to Adherence

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Pharmalot.com

More Kids Are Taking More Meds Than Ever Before

By Ed Silverman // November 3rd, 2008 // 8:41 am 24 Comments

More American children are taking pills for diabetes, high blood pressure and cholesterol than ever before, reflecting a rise in chronic diseases related to obesity. The use of drugs for type-2 diabetes, in particular, doubled in children ages 5 to 19 and statins rose by 15 percent between 2002 and 2005, according to a study published in the journal of the American Academy of Pediatrics.

The study tracked the prescription records collected by Express Scripts, the pharmacy benefits manager, for about 3 million children a year. The use of drugs for asthma rose 47 percent and high blood pressure meds rose 2 percent, the study found (here it is).

"Ten or 15 years ago we weren't even discussing these conditions, which were mainly in adults," Emily Cox, a senior director of research at Express Scripts, tells Bloomberg News. "Now, we are seeing a growing number of children being treated for chronic conditions that they are going to take into adulthood."

Drug use was especially high among girls, who were more than twice as likely to be taking a diabetes med as boys, even though girls aren't more likely to have the disease, the researchers said. Cox suggests this may be because girls visit the doctor twice as much as boys.

There was also a 40 percent rise in drugs for attention deficit hyperactivity disorder with the increase for girls, at 63 percent, rising faster than for boys, at 33 percent. And ADHD drug use rose in among 15 to 19 year olds, an age group for which use typically declines as teenagers are taken off the meds. That may be a sign that ADHD drugs are being used more as stimulants to help teens keep up with schoolwork or for recreational use, Cox posits.

Doctors may be also prescribing more medicines to children after a 1997 law encouraged drugmakers to study the effects of their medicines in adolescents, Bloomberg notes.

Comments

Salmon
November 3rd, 2008
9:03 am

Let's not forget antipsychotics.

Already Grassley has demonstrated that it's 1% of all kids 6 - 18 yo. Even if it's a valid use early onset is concentrated in the 16 and 17 year olds this clearly indicates blatent over use.

Even though Beiderman's Zyprexa study in adolescents showed efficacy in bipolar it was only in kids with hypermania (i.e. YMRS (Young Mania Ratign Score) > 30, mania so severe that most were probably psychotic). Yet NIMH wants docs to treat at YMRS's of 4 - 7. But of course Lilly is on NIMH's science advisory board.

By the way did anyone notice that the recently reported Zoloft and Cognitive behavior Therapy resulted in suicides in the Zoloft arm but not in the none Zoloft Arms.

For the incremental amount of improvement I'm not sure it's worth the risk.

Salmon

atlex
November 3rd, 2008
9:31 am

Salmon,

"By the way did anyone notice that the recently reported Zoloft and Cognitive behavior Therapy resulted in suicides in the Zoloft arm but not in the none Zoloft Arms." (sic)

I'm not going to let your statement go unchallenged. It is a clear lie! Here is a quote from the study: "Rates of adverse events, including suicidal and homicidal ideation, were not

significantly greater in the sertraline group than in the placebo group. No child in the study attempted suicide."

Atlex

sadteacher
November 3rd, 2008
10:36 am

Isn't anyone curious about why all these kids need these drugs? I don't believe doctors are overprescribing or pharma is marketing to kids/doctors/parents, these kids are REALLY sick.

LILLI
November 3rd, 2008
10:41 am

To sadteacher—-What about Ritalin? I know there are children that need medications—-Pharma must make sales!

Lisa Van S
November 3rd, 2008
11:04 am

Sadteacher,

Would you like to provide the Pharmalot readers with your Name and Medical License Number. I feel sorry for your students.. students deserve a kind, compassionate, efficient, and upbeat educator, not a self proclaimed "Sadteacher".

Dan A.
November 3rd, 2008
11:06 am

Pharma is marketing to kids vicariously through front groups, such as CHADD.

Psych doctors are paid the most by pharma compared with other medical specialties.

Other reasons may exist as well, yet put these two together, and it's simple math that allows such unreasonable and unnecessary prescribing that ultimately is harming our children in the U.S. Apathy allows this behavior to continue.

Lisa Van S
November 3rd, 2008
11:20 am

Atlex,

The Zoloft Study failed to include the number of dropouts, and those lost to followup. Numbers that should be

considered significant.

Dr March was the Clinical trial investigator for the famous TADS Study. FDA's reviewer Dr. Mosholder, a Child and Adolescent Phsychiatrist, testified under oath before the Energy and Commerce's Subcommittee on Oversight and Investigations, that the TADS Study did not meet FDA's standard for approval, this study is no different than that of the TADS.

12 year old Candace Downing was prescribed zoloft for the treatment of test anxiety. She hung herself from her canopy bed. Side Note, she was a friend of FDA's, Dr. Thomas Laughren.
When Candace's mother testified before the FDA, Dr Laughren didnt have the dcency to look into her eyes, He bowed his head in shame.

Lisa Van S
November 3rd, 2008
11:27 am

Parents of Daughters should be alarmed and concerned in regards to this study. "YOUR DAUGHTERS" have a 147% chance of being "drugged". Im surprised at the lack of outrage on this issue.

atlex
November 3rd, 2008
11:34 am

Lisa,

Your comments, while of note, isn't relevant to my point regarding Salmon. He blatantly lied and all I did was point that out.

I'll save my comments on your other statements for another day.

Atlex

atlex
November 3rd, 2008
11:48 am

Above should read "Your comment ...."

Salmon
November 3rd, 2008
11:57 am

The increase was in suicidality which is a predictor of suicide.

Atlex

By the way I did not lie. I was simply quoting another blog. A lie would mean that I mistated facts intentionally which I did not do.

Honest mistakes happen, and assuming what you said about me is also an honest mistake I think you owe me an apology.

Salmon

Salmon
November 3rd, 2008
12:05 pm

PS

Let's all get away from an honest mistake and look at the real issue here. The overprescribing and misuse of drugs in children.

This article will probably be used to push off label use without adequate safety information in children. Right now we have a signal for the potential for increased suicide risk from a drug which is we already know is labeled to increase suicide in children, but which only happened after congress got involved.

So is the slight increase in efficacy for OCD really worth the risk of a child killing themselves?

Don't we usually reserve drugs that commonly cause death to illnesses that have an even greater liklihood of death?

Salmon

atlex
November 3rd, 2008
1:20 pm

Salmon,

I'll take you at your word regarding an "honest mistake." However, in your response, you made almost the same "honest mistake" again. The study does not show an increase in suicidality as you state. Here a direct quote from the study: "Adverse events, including suicidal and homicidal ideation, were no more frequent in the sertraline group than in the placebo group."

I have some disagreements with your second response, but do agree that prescribing of medication in children should be done with great care and should be regularly examined for unintended negative consequences.

Atlex

Marilyn Mann
November 3rd, 2008
3:16 pm

A recent post I wrote on ezetimibe use in kids seems relevant:

http://www.gooznews.com/archives/001233.html

Salmon
November 3rd, 2008
4:07 pm

Atlex,

I stand by my remarks regarding suicidality.

Suicidality includes not only suicidal and homocidal ideation and suicide attempts but actions such as self injury and even thoughts of self harm. These are metrics that Columbia University used when they verified the conclusions of two different groups of FDA reviewers on suicidality with antidepressants in adolescents.

The rate of suicidality was approximately 2 out of 300 on Zoloft. I've seen raw data on suicide and suicidality rates in other studies and the rate of completed suicide for other drugs is typically around double the rate of suicidality. Based on the sample size for the entire study and the rates of completed suicide for other drugs I would have to say that

even before the study began it should have been obvious to anyone familiar with the expected rates for antidepressants that there was a very low chance of seeing any completed suicides.

It's very important that companies include enough subjects in these studies to properly evaluate the risk, otherwise it's likely to be entirely missed in practice. This is simply because of the numbers.

A typical child psychiatrist can only see about 500 patients a year and fewer are going to be on any particular drug. Thus a child psychiatrist might see 1 suicide every several years and they are likely to think that it's the underlying disease and not think it's the drug. Only companies and the maybe the FDA are likely to collect sufficient postmarketing safety information to make the connection.

Salmon

---

atlex
November 3rd, 2008
4:59 pm

Salmon,

Be my guest to stand by completely made up data. Go look at the study itself. Your data is incorrect. See Table 3 at this link.

http://content.nejm.org/cgi/content/full/NEJMoa080463 3#T3

Atlex

Salmon
November 3rd, 2008
6:43 pm

Thank you for referring me to the data table. I stand corrected. Based on what is presented in this table I have to agree, that in this study report there was no greater amount of suicidality reported on Zoloft as compared to placebo.

I was simply sloppy and thought that the 2 cases were both

on Zoloft.

Salmon

Lisa Van S
November 3rd, 2008
6:47 pm

Atlex,

One only has to ask two questions in regards to the Zoloft Study...

Does this Study meet the requirements for FDA approval?

Why was this study not!.. presented to FDA approval.

These are the only two questions that matter!... Who the Hell cares what the Media or the Industry apologists have to say.

Lisa Van S
November 3rd, 2008
6:51 pm

Salmon and Atlex,

Do the two of you really care about the validity of this study? Then tell the NIMH and Pfizer to release the "RAW DATA"..... Its just that simple!!!

Lisa Van S
November 3rd, 2008
6:53 pm

One more thought!! It was Pfizer who combined two negative studies to form one positive. Pretty Sad... Kindergarten Math... Ouch!!!!

atlex
November 4th, 2008
8:36 am

LVS,

First, this is not a Pfizer sponsored study. Based on the stusy's write-up, Pfizer was only asked to supply study medication and nothing more. There is no reason for Pfizer to sponsor a study for Zoloft since the product has lost exclusivity (almost all use of sertraline is in its generic form and not branded Zoloft). For that same reason, there is no entity with any interest in taking this study to the FDA for

"approval." Your speculation has no basis in reality or logic; it amounts to nothing more than baseless conspiracy theory.

Atlex

An FDA Reviewer
November 4th, 2008
9:32 am

Lisa,

If you really want to do something useful.

See the comments from the following post about the FDA reviewer who is being fired

(http://www.pharmalot.com/2008/10/preemption-the-business-case-of-the-century/#comments)

and get people to have Congress look into it.

The person is a pediatric psych drug reviewer.

An FDA Reviewer

Lewis
November 4th, 2008
10:54 am

Has anyone noticed that the data used for this study came from Express Scripts - a PBM? Based on their business model, they don't get paid if the drugs don't get dispensed. What is their incentive to curb this trend and what policies are they implementing to ensure appropriate prescribing? Who are they really working for?

Trolla
November 5th, 2008
4:34 am

Interesting - focus of comments is on the anti-psychotic drugs, and not the others being rx for kids: diabetes, hypertension and cholesterol meds. The main contributor - obesity. Our kids eat too much take out junk (sweets, designer beverages, fried foods) and portions are too big. Too little exercise. Nutrition needs to be addressed as well.

Leave a Comment

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The effect of alcohol advertising, marketing and portrayal on drinking behaviour in young people: systematic review of prospective cohort studies

Lesley A Smith* and David R Foxcroft

Address: School of Health and Social Care, Oxford Brookes University, Oxford, OX3 0FL, UK

Email: Lesley A Smith* - lesleysmith@brookes.ac.uk; David R Foxcroft - david.foxcroft@brookes.ac.uk

* Corresponding author

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Abstract

Background: The effect of alcohol portrayals and advertising on the drinking behaviour of young people is a matter of much debate. We evaluated the relationship between exposure to alcohol advertising, marketing and portrayal on subsequent drinking behaviour in young people by systematic review of cohort (longitudinal) studies.

Methods: studies were identified in October 2006 by searches of electronic databases, with no date restriction, supplemented with hand searches of reference lists of retrieved articles. Cohort studies that evaluated exposure to advertising or marketing or alcohol portrayals and drinking at baseline and assessed drinking behaviour at follow-up in young people were selected and reviewed.

Results: seven cohort studies that followed up more than 13,000 young people aged 10 to 26 years old were reviewed. The studies evaluated a range of different alcohol advertisement and marketing exposures including print and broadcast media. Two studies measured the hours of TV and music video viewing. All measured drinking behaviour using a variety of outcome measures. Two studies evaluated drinkers and non-drinkers separately. Baseline non-drinkers were significantly more likely to have become a drinker at follow-up with greater exposure to alcohol advertisements. There was little difference in drinking frequency at follow-up in baseline drinkers. In studies that included drinkers and non-drinkers, increased exposure at baseline led to significant increased risk of drinking at follow-up. The strength of the relationship varied between studies but effect sizes were generally modest. All studies controlled for age and gender, however potential confounding factors adjusted for in analyses varied from study to study. Important risk factors such as peer drinking and parental attitudes and behaviour were not adequately accounted for in some studies.

Conclusion: data from prospective cohort studies suggest there is an association between exposure to alcohol advertising or promotional activity and subsequent alcohol consumption in young people. Inferences about the modest effect sizes found are limited by the potential influence of residual or unmeasured confounding.

Background

The influence of alcohol marketing and advertising on the drinking behaviour of young people is a matter of much debate, mostly focused on the question of whether advertising increases consumption and risky drinking by young people. On the one hand the International Center for Alcohol Policy (ICAP) reported in 2003 to a World Health Organisation (WHO) meeting [1] that there is no compelling evidence of an association between advertising and drinking patterns or rates of abuse among young people, noting that:

> *"The industry does not condone promotion and advertising of beverage alcohol to those under the legal minimum purchase age. Yet it should be acknowledged that young people are inevitably exposed to beverage alcohol advertising, as they are to advertising for any other consumer product. They are aware of it, and are able to identify and distinguish between alcohol brands, just as they are able to discern brands of other consumer goods. However, the evidence does not support the notion that such awareness increases consumption by young people."* (point 30, page 9)

On the other hand, healthcare researchers and workers have shown associations between exposure to alcohol advertising and drinking behaviour in cross-sectional surveys [2-5], and it has been argued that an increased awareness of alcohol messages amongst young people might lead to earlier drinking, higher consumption and increased harm, and should be addressed through stronger marketing regulation [6]. Alongside this, macro-level analyses comparing advertising coverage with drinking consumption has been used to provide a rationale for imposing limits on alcohol advertising. One study, drawing on data from Organisation for Economic Co-operation and Development (OECD) countries, reported that total expenditure on alcohol advertising is linked to higher consumption and argued that advertising bans could result in significant reductions in consumption [7]. Similarly, an economic analysis in the United States assessed the effects of alcohol advertising on youth drinking behaviours by comparing federally reported levels of youth drinking with detailed reports on alcohol advertising in local markets during the same years. The analysis concluded that a complete ban on alcohol advertising could reduce monthly levels of youth drinking by 24% and youth binge drinking by about 42% [8]. Correspondingly, in the United States the Institute of Medicine has called for stronger regulation of alcohol marketing [9].

However, causal relationships cannot be directly inferred from these studies and this limits the conclusions that can be drawn about the potential impact of advertising bans. Moreover, the alcohol and advertising industry have used data from econometric studies to argue that advertising bans have little impact on overall alcohol consumption [10-13].

Whether young people are directly targeted by alcohol advertisers or not, they are exposed to alcohol advertising on television, in print media, and on radio. A first question to be answered through rigorous research, therefore, is whether alcohol advertising does have an impact on alcohol consumption amongst young people. This question is best addressed through large prospective cohort studies that examine the relationship between baseline early exposure to alcohol advertising and subsequent consumption and misuse. Helpfully, several such studies have recently been published [14-22].

The aim of our systematic review was to evaluate the likelihood that exposure to alcohol advertising, marketing and portrayal of alcohol increases self-reported alcohol use in young people. We have specifically focused on substantive behavioural outcomes – alcohol use – rather than surrogate outcomes such as brand awareness, or attitudes or intentions towards drinking as the exact causal relationship between surrogate outcomes and subsequent drinking behaviour is unclear. Substantive outcomes provide a more robust basis for evidence based decision making.

Several reviews of the literature on the association of advertising exposure and drinking in young people or, more generally, the effects of media on the behaviour and lifestyles of young people have previously been published [23-31]. However, none use explicit, transparent methodology and they generally lack critical appraisal of individual study weaknesses in relation to any likelihood of bias. These reviews also tend to include weaker study designs, do not clearly distinguish cross-sectional and longitudinal study evidence [4,5,32], focus on clinical/public health aspects rather than methodological detail, and draw major conclusions based on predominantly cross-sectional studies. Our review differs in aim from previous reviews which focused on evaluating the association between media effects and expectancies of drinking or drinking behaviour. Another important difference in our review is the detailed description of our systematic and rigorous approach to the topic, consistent with best methodological practice in systematic reviews of prospective cohort studies, in particular an assessment of the likelihood of bias of reviewed studies [33]. Furthermore, although previous reviews have referenced some of the studies we have included in our review, none have covered all the studies that we have included. Therefore, we provide an update to previous reviews focusing on findings from longitudinal study designs.

Methods

Eligibility criteria

We considered studies that evaluated the relationship between alcohol advertising or marketing and alcohol use in young people. We included prospective cohort (longitudinal) studies where young people's exposure to alcohol advertising or attitudes to alcohol advertising and alcohol drinking behaviour were evaluated at baseline and alcohol drinking outcomes were again evaluated after a given period of time. The rationale for restricting the review to prospective cohort studies is that they provide the highest level of evidence that is available for evaluation of advertising and marketing exposure and subsequent drinking behaviour. If such studies are well designed, conducted and analysed they can provide supportive evidence for a causal association between a particular exposure and an outcome. Randomised controlled trials (RCTs), the best design for inferring causality, have not been conducted in this area and are unlikely to be in the future as they are impractical, and it may be unethical to randomise participants or communities to specific advertising and/or marketing strategies in order to evaluate potentially harmful effects.

We excluded experimental studies which evaluated a single exposure to advertising of one form or another and examined immediate effects on either attitude or liking for the advertisements or drinking behaviour. Whilst experimental studies have advantages in that they offer better control over the intervention that participants are exposed to so that the intervention can be more accurately described and causality more confidently inferred; they do not reflect the complexity of the advertising and commercial milieu that people are exposed to in their daily lives, and only evaluate effects post-exposure at a single timepoint, so results are not applicable to a broader context. We have also excluded cross-sectional, time-series and econometric studies. Cross-sectional surveys measure the association between a particular exposure such as alcohol advertising and drinking behaviour, but do not show whether the exposure preceded the outcome. Reverse causality cannot be ruled out, whereby young people who drink or misuse alcohol are more receptive to alcohol advertising. Time-series studies are also not ideal for showing temporal relationships due to a greater risk of confounding. One other weakness of the time-series studies is that they measure exposure and outcomes at a population level, rather than in individuals, and therefore include all age groups and are not exclusively focused on young people. Variation in effects in different age groups may be obscured when looking at aggregate population data. Econometric or ecological studies, which may also use time-series data, use data from different sources and statistical modelling to examine relationships between exposure (advertising expenditure) and outcome (alcohol sales). Again these studies are not ideal for this review as they do not specifically look at drinking behaviour in young people but report aggregate alcohol consumption across the population. The observed effect is also highly dependent on the choice and source of factors that are used for the statistical model.

To be included in our review, cohort studies were required: (i) to evaluate young people of school or college age. Studies of participants including young people were excluded if results were not presented separately by age groups or if young people constituted less than 75% of the overall sample; (ii) to evaluate conventional advertising and marketing practices including above and below the line activity, as well as alcohol portrayal in broadcast and print media, for example product placement and depiction of alcohol use. This includes advertising appearing on television, radio, newspapers, billboards, posters, or depiction of alcohol use in movies, TV programmes, music videos and song lyrics, promotional activities including give-aways such as t-shirts and other items bearing alcohol brand logos. Portrayals of alcohol use are particularly prevalent in prime-time programming [34], music videos [35], and during television coverage of sports events [36]; and (iii) to evaluate any alcohol consumption outcome which included: self-reported alcohol use; frequency quantity measures; and self-reported use of specific brands of alcohol or type of alcohol e.g. beer, wine or spirits. We excluded studies reporting only intention to drink as an outcome, or attitude to drinking. Studies only reporting awareness and that did not measure any effects on drinking were also excluded.

Identification of studies

Electronic databases searched were Medline and Embase from their inception to October 2006. Search terms included free text and MESH terms for drinking behaviour and advertising and marketing. The exact search strategies are shown in Table 1 (see Additional file 1) Reference lists of retrieved reviews and primary studies were also scanned for additional relevant studies. There was no restriction to language of publication.

Study selection and synthesis

Potentially relevant studies were identified by screening titles and abstracts of retrieved references from the electronic databases. Articles were not selected unless the title or abstract focused on effects of alcohol advertising, marketing or portrayals and on drinking behaviour in young people. Where this was not clear, the full text of the articles was retrieved for further screening. Each retrieved article was screened for review inclusion according to the eligibility criteria described above. Data from included studies were extracted and summarised as a narrative synthesis. Threats to internal and external validity were

appraised for each study using the Newcastle-Ottawa Quality Assessment Scale for cohort studies adapted for this review [37]. Quality components assessed were:

External validity

1. Was the sample a consecutive sample or a random sample of the population?

2. Did at least 80% of all eligible participants agree to participate?

Internal validity

3. Performance bias – was ascertainment of exposure by structured interview?

4 Detection bias – a) was ascertainment of outcome by structured interview? b) Were investigators blind to exposure status or data collected independently?

5. Attrition bias – a) were all participants followed up for the same length of time? b) Were at least 80% of participants included in the final analysis or was the description of those not included unlikely to introduce bias?

6. Control of confounding: a) age or school grade; b) gender; c) ethnicity; d) social influences;

e) social bonds; f) attitudes and behaviour; g) treatment group (participants in an RCT of drug prevention programme); h) TV or other media use; i) parental education; j) school performance; k) self esteem; l) rebelliousness; m) sensation seeking; n) parenting style 0) smoking; p) drinking at baseline q) puberty; r) alcohol sales per capita; s) school status; t) propensity score (accounts for attrition); u) team sport participation; v) = school; w) = living situation; y) = socioeconomic situation.

Studies were awarded an asterix if the component was adequately addressed. For the confounding factors a-y in the selection bias/control of confounding factors section, an asterix indicates that the groups were either balanced or matched for at study start or the variable was adjusted for in an analysis.

Studies not eligible for inclusion were tabulated with reason for exclusion. Screening, selection, data extraction and narrative synthesis were undertaken by one systematic reviewer.

Results

The electronic searches identified 915 potentially relevant articles. After screening the titles and abstracts, 115 potentially relevant articles were obtained as full text publications. An additional six articles were identified from screening the reference lists of retrieved articles. After screening each full text article for review eligibility, 112 were excluded leaving nine articles reporting on seven studies for review inclusion, Figure 1. Many studies were excluded mainly because they were secondary reports: reviews, letters or editorials on media effects. We found five foreign language publications without English abstracts requiring translation to determine eligibility but this was beyond the scope of this systematic review. Other articles were excluded mainly due to ineligible study designs: cross-sectional surveys, experimental, time-series or econometric studies. We excluded three articles because although data were taken from a prospective cohort study, these data were from a cross-sectional analysis focusing on just one time point [4,5,38].

Description of included studies

Nine publications reporting on seven prospective cohort studies were identified that met the review inclusion criteria [14-22]. The seven studies provided data on 13,255 participants aged 10 to 26 years old. Characteristics of the included studies are shown in Table 2 (see Additional file 2). Five were conducted in the USA [16-19,21], one in Belgium [20] and one in New Zealand [14,15,22]. In one study [16] the cohort was part of an RCT of a school-based drug prevention programme, and in another [15] the cohort was a sub-set of a larger cohort study recruited in 1972 and followed through childhood to early adulthood evaluating growth and development.

The age of participants at baseline interview was 12 to 13 years (7th grade) in three studies [15,16,18], 14 to 15 years (9th grade) in one [19], one study [17] recruited a broader age group of youth, 15 to 26 year olds, one [20] used a mixed age group of first (aged 11 to 12 years) and fourth year (aged 14 to 15 years) secondary school students and one [21] used 10 to 14 year olds (5th to 8th grade).

In five studies participants were followed up once after baseline. Time to follow-up was one year [18,20], 18 months [19], 30 months [16] and 13 to 26 months [21]. One study reported outcomes at multiple time-points, six years and nine years and 14 years [14,15,22]. One study evaluated participants at four time points and present results for follow-up after 21 months taking the multiple time points into account in the analysis [17].

Each study used disparate measures of exposure; all relied on self-reported measures. One generated a composite score to reflect the amount of exposure to TV beer advertising, magazine alcohol advertising, beer concession stands and in-store advertising displays [16]. One measured exposure to any alcohol advertising in the past month on each of four media, TV, radio, billboards and magazines [17]. Another classified exposure as watched TV show index to quantify exposure to alcohol ads in spe-

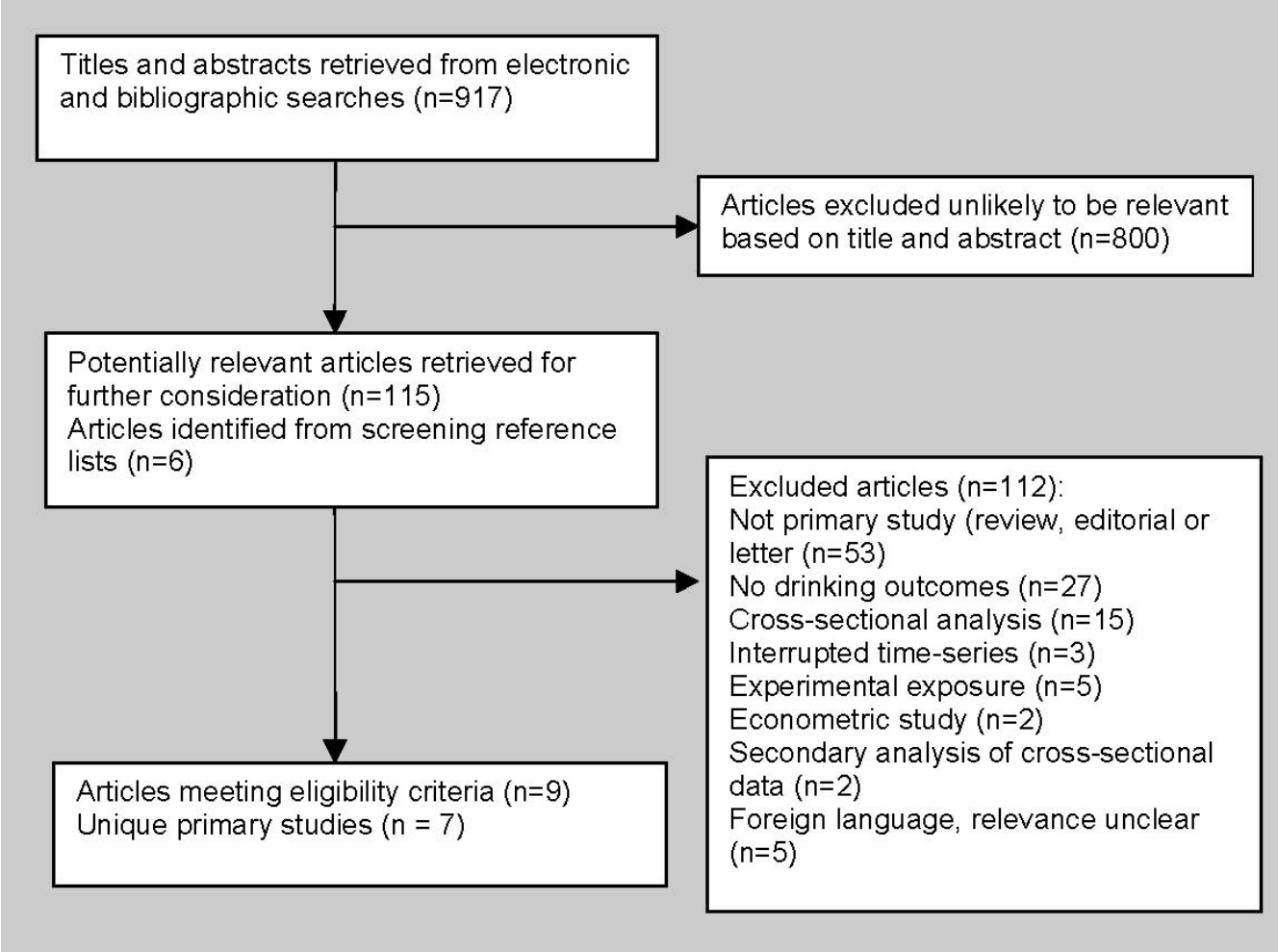

Figure 1
Results of searches of electronic databases and hand searching.

cific TV shows in addition to self-reported exposure to alcohol ads [18]. In the study by Connolly [15] recall of alcohol advertisements from different media, TV, radio, magazines, newspapers and films was evaluated. Two studies measured exposure as hours of TV and music video viewing [19,20], and one exposure to alcohol use in popular movies [21].

Drinking status was measured in all studies at follow-up. Two studies reported any alcohol use in the past month [17,18], one study reported alcohol use in the past year [16], one reported frequency of drinking at specific locations and average and maximum amount alcohol consumed on an occasion [15], one reported lifetime and past 30 days alcohol use [19], one alcohol use whilst going out [20], and one incident alcohol use without parental knowledge [21].

Methodological quality

One study used a random sample of youth [17] three randomly selected schools and all participants at those schools were invited to participate [18,20,21]; in one study [19] all participants at six schools were eligible to participate but how schools were selected was not described; one study used the original sample of participants selected for participation in an RCT but excluded those with missing data [16]; and one study consisted of a sub-sample of children who had exposure and outcome data available at all follow-up periods [15].

Ascertainment of exposure and outcome data were by self-reported questionnaires in four studies [16,18-20], by face-to-face interview in one [15] and computer-aided telephone interview in two [17,21]. None of the studies explicitly reported that interviewers were unaware of the exposure status of participants when outcome assess-

ments were conducted, however with participants independently reporting drinking outcomes via self-reported questionnaires there is little scope for detection bias on the part of the investigators. Not all children were non-drinkers at baseline. Two studies reported results for baseline drinkers and non-drinkers separately [16,19].

All studies suffered, to a greater or lesser extent, from potential attrition bias. Attrition rates were 33% [21] and 69% [17] in two surveys where data were collected by telephone; 18% [16], 25% [18], 39% [19] and 36% [20] in surveys conducted in schools, and 35% [15] for the survey with face-to-face interviews and questionnaires.

One study used imputation to account for missing data [16]; all other studies excluded participants with missing data from the analyses.

Statistical adjustments for measured confounding factors were performed by each study, but the number and type of confounders varied from study to study. The results of the overall quality assessment of each study are shown in Table 3 (Additional file 3).

Study findings

Connolly [15] investigated the relationship between alcohol consumption at 18 and alcohol-related mass media communications recalled at ages 13 and 15 years in a New Zealand cohort of young people. Among men, those who recalled more alcohol advertisements at age 15 drank significantly more beer at 18 years (average amount of beer consumption $p = 0.047$; maximum amount of beer consumption $p = 0.008$). In women a negative association of alcohol advertisement recall at age 13 years and frequency of drinking beer was found ($p = 0.029$). Multi-variate analyses were adjusted for potential confounders which were: media exposure, gender, current occupation, living situation, socio-economic status and peer approval of drinking. There was no significant effect on wine or spirit consumption in either women or men. Whilst significant relationships were detected, we cannot rule out the possibility they occurred due to chance. The authors reported results for more than 35 statistical tests and significant findings would be expected to occur due to chance. This coupled with the small sample sizes, 251 men and 184 women, cast some doubt on these findings being true effects. Longer follow-up from this same sample at age 21 and 26 years have been published [14,22]. In the group that were beer drinkers at 18 years, liking of alcohol advertising and brand allegiance had a positive impact on beer consumed at age 21 years; standardised coefficients were 0.26 and 0.36, respectively. At 26 years, those showing a liking for alcohol advertising at 18 years were more likely to be in a group of heavier drinkers.

Stacy [18] assessed the impact of exposure to TV alcohol advertisements on alcohol use in 2,250 12 to 13 years old school children in California followed up for a year. At baseline, 16% reported drinking beer in the past month, 15% reported drinking wine in the past month, and 8% reported three-drink episodes in the past month. At follow-up, prevalence was 18% for beer, 20% for wine and 12% for three-drink episodes. At one-year follow-up, each standard deviation increase in TV viewing of programmes with alcohol advertisements at baseline was associated with a significant increase (44%) in risk of beer use ((odds ratio (OR) 1.44 95% Confidence Interval (CI): 1.27 to 1.61)), wine/liquor use (OR 1.34; 95% CI: 1.17 to 1.52) and three-drink episodes (OR 1.26; 95% CI: 1.08 to 1.48), controlling for general TV viewing frequency, participation in team sports, perception of peer alcohol use, perceived peer approval of alcohol use, intentions to use alcohol, perceptions of adults alcohol use, gender, ethnicity and school, exposure memory covariates and a propensity score to adjust for differential risk profile of those lost to attrition. A watched TV sports index was only positively associated with beer drinking, (OR 1.20; 95% CI: 1.05 to 1.37) with adjustment for confounders, and self-reported frequency of exposure was significantly associated with increased risk of beer drinking, (OR 1.21; 95% CI: 1.14 to 1.41). Other exposure measures, cued-recall memory test and draw-an-event memory test, did not show significant relationships with any of the outcomes, though most showed effects in the direction of positive associations with one exception, participants scoring one standard deviation above the mean for draw-an-event memory test were significantly less likely to drink beer one year later (OR 1.14; 95% CI: 1.01 to 1.25).

Ellickson [16] examined the relationship between a range of advertisement exposures and subsequent drinking among US adolescents age 12 to 13 years. Forty-eight per cent non-drinkers at baseline (n = 1,905) initiated drinking by two-year follow-up. For baseline non-drinkers, exposure to in-store beer displays predicted drinking onset at follow-up, OR 1.42 ($p < 0.05$) adjusted for general TV viewing, social influences, social bonds, gender, ethnicity and attitudes and behaviour. Exposure to TV beer advertisements, magazines with alcohol advertisements, and in-store advertisement displays all showed positive associations, though none were significant in adjusted analyses, OR 1.05, 1.12 and 1.06, respectively. Confidence intervals were not reported for any of the ORs. Among baseline drinkers (n = 1,206), 77% reported alcohol use in the past year at follow-up. Exposure to magazines with alcohol advertisements and to beer concession stands at sports or music events predicted frequency of drinking at follow-up, regression coefficient 0.10 and 0.09, (p-value < 0.05), respectively. Exposure to TV beer advertising or in-store advertisement displays were not

significant predictors of drinking frequency in analyses adjusted for baseline drinking and multiple control variables regression coefficient -0.01 and 0.02, respectively.

Snyder [17] evaluated the relationship between self-reported advertising exposure to four media (TV, radio, billboards and magazines) and the prevalence of advertising in the same media sources and alcohol consumption in 15 to 26 year olds in 24 media markets in USA. Participants were followed up at four time-points over a 21 month period. Sixty-one per cent had at least one drink in the past month at baseline and consumed an average of 38.5 drinks a month. Participants reported seeing an average of 22.7 alcohol advertisements per month. For each additional advertisement seen, the number of drinks consumed increased by 1% Event Rate Ratio (ERR) 1.01 (95% CI: 1.01 to 1.02). Also for each additional dollar per capita spent on advertising the number of alcoholic drinks consumed per month increased by 3% ERR 1.03 (95% CI: 1.01 to 1.05). In the sub-group of participants aged less than 21 years (60% of sample), who were below the legal drinking age, similar patterns were seen, ERR 1.01 (95% CI: 1.0 to 1.02) and 1.03 (95% CI: 1.0 to 1.06) increase in number of drinks consumed per month for self-reported advertising exposure and advertising expenditure, respectively. All analyses were adjusted for gender, age, ethnicity, school status and alcohol sales per capita, however the high degree of attrition in this study (more than 50% for two of the four follow-up assessments) precludes firm conclusions on the basis of these findings.

Two studies evaluated exposure to TV and music videos and alcohol use in adolescents [19,20]. In the study by Robinson et al[19] the association between hours of TV, music video and videotape viewing, computer and video game use and subsequent alcohol use at 18 months follow-up was investigated in 1,533 14 to 15 year olds from six public high schools in California. During follow-up, 325 (36.2%) baseline non-drinkers began drinking and 322 (50.7%) drinkers continued to drink. In baseline non-drinkers (n = 898), onset of drinking was significantly associated with hours of TV viewing at baseline. For each additional hour of TV viewing per day the average increased risk of starting to drink during the next 18 months was 9% OR 1.09 (95% CI: 1.01 to 1.18), for each additional hour of music video viewing OR 1.31 (95% CI: 1.17 to 1.47). For each additional hour of videotape viewing the average risk decreased, 11% OR 0.89 (95% CI: 0.79 to 0.99) in analyses controlling for age, sex, ethnicity and other media use. Computer and video game use was not significantly associated with subsequent onset of drinking, OR 0.94 (95% CI: 0.84 to 1.05). In baseline drinkers (n = 635), there were no significant associations between baseline media use and maintenance of drinking. For each additional viewing hour per day the risk, OR (95% CI), of maintenance of drinking was: 1.01 (0.93, 1.11) for television, 1.05 (0.95, 1.17) for music videos, 0.97 (0.86, 1.10) for videos and 1.00 (0.89, 1.12) for computer or video games.

Van Den Bulck [20] examined the relationship between television viewing and music video exposure and subsequent alcohol consumption while going out one year later in 2,546 first and fourth year secondary school students in Flanders, Belgium. Only 65% of the original sample with complete data at both time-points was analysed. The majority of students (63.6%) watched music videos at least several times a week, about a third watched daily. Overall television viewing and music video viewing at baseline significantly predicted the amount of alcoholic beverages adolescents consumed while going out at follow-up. Results of a regression model controlling for gender, school year, smoking and pubertal status were reported: $R^2 = 0.568$ ($F = 230.374$; $df = 7$; $p < 0.0001$).

Sargent [21]evaluated the exposure to alcohol use in popular contemporary movies in a cross-sectional survey with prospective follow-up of never drinkers and recorded incident alcohol drinking 13 to 26 months later. Adolescents, 10 to 14 years old, were recruited from 15 randomly selected schools in New Hampshire and Vermont, USA. Never-drinkers at baseline were followed up (n = 2,406). Baseline median exposure to alcohol use in 601 movies was 8.6 hours, (inter-quartile range (IQR): 4.6 to 13.5). At follow-up, 14.8% reported having tried alcohol, which was significantly associated with alcohol exposure (viewing hours). For each additional hour of movie alcohol exposure the risk of initiating alcohol use was increased by 15%, OR 1.15 (95% CI: 1.06, 1.25) adjusted for school grade, school, gender, parent education, sensation seeking, rebelliousness, self-esteem, school performance, parenting style and smoking experimentation.

Discussion and conclusion

This systematic review of seven cohort studies on over 13,000 participants shows some evidence for an association between prior alcohol advertising and marketing exposure and subsequent alcohol drinking behaviour in young people. All seven studies demonstrated significant effects across a range of different exposure variables and outcome measures. These included exposure to direct advertising using broadcast and print media and indirect methods such as in-store promotions and portrayal of alcohol drinking in films, music videos and TV programmes. The consistency of effect across a heterogeneous group of studies may be considered a strength.

Notably, three studies showed that onset of drinking in adolescent non-drinkers at baseline were significantly associated with exposure. Robinson [19] showed that for

each additional hour of TV viewing per day the risk of starting to drink increased by 9% during the following 18 months. Sargent [21] found that for additional hour of exposure to alcohol use depicted in popular movies there was a 15% increase in likelihood in having tried alcohol 13 to 26 months later. Ellickson [16] showed that exposure to in-store beer displays significantly predicted drinking onset two years later. Effects were less clear in baseline drinkers, whilst greater exposure predicted greater drinking frequency, analyses adjusting for possible confounding factors failed to detect significant relationships.

In studies on mixed groups of drinkers and non-drinkers, increased frequency of TV viewing and music video viewing was highly significantly related to the amount of alcohol consumed while going out [20]. In the study by Snyder [17] of US individuals aged 15 to 26 years, for each additional advertisement seen the number of drinks consumed increased by 1%.

Of interest, to our knowledge, at least two more prospective cohort studies meeting our inclusion criteria have been published since our review was completed [39,40]. Since updating our searches for all new studies is beyond the original scope of the project, we have not incorporated these two studies into the main body of the review. Nevertheless, it is important to note that both of these studies also showed significant relationships between receptivity to alcohol marketing or alcohol advertising in young people. Eleven year olds in the highest centile of exposure to TV beer advertisements, alcohol ads in magazines, in-store beer displays and beer concessions, radio listening time and ownership of beer promotional items were 50% more likely to be drinkers than youth in the lowest centile of exposure one year later controlling for demographic and psychosocial factors and prior drinking [39]. In a sample of non-drinkers aged 11 to 15 years, those reporting high receptivity to alcohol marketing defined as owning or wanting to own alcohol branded promotional items were 77% more likely to initiate alcohol use one year later compared with youth reporting minimal receptivity adjusted for demographic and psychosocial factors and social influences to drink [40].

There are several limitations that should be considered when interpreting the results of this review. Whilst we made an *a priori* decision to only include and review cohort studies which potentially are less likely to suffer from systematic bias than less robust study designs such as cross-sectional surveys or interrupted time series studies, it is nonetheless important to note that cohort studies are also susceptible to bias if not designed and executed using rigorous standards. One of the biggest threats to the validity of observational studies such as cohort studies is the issue of confounding, whereby the outcome of interest is influenced by some other factor or factors in addition to the exposure of interest. Whereas all of the studies controlled for a variety of confounding factors possibly related to alcohol drinking behaviour, unmeasured or unknown confounders cannot be adjusted for and it is not possible to know if residual confounding influenced the analysis. For example, alcohol expectancies, family history, peer influence and personality characteristics may act as confounders in the relationship between exposure to advertising and marketing and subsequent alcohol use. Given the magnitude of the effect sizes shown in these studies, we cannot rule out the possibility that they were due to the effects of residual and unmeasured confounding [41]. However, previous work evaluating smoking exposure in movies and smoking behaviour in adolescents using a simulation model showed that effects of unknown or unmeasured confounders would need to be large in order to overturn the results [42]. Given that no observational study can control for all unmeasured or unknown confounders, researchers may wish to consider using similar approaches to determine the potential impact of such confounders.

Whilst these studies suggest that exposure to advertising and alcohol portrayal in the media increase likelihood of later alcohol consumption, they are unable to inform us how exposure brings about these changes, or what aspects of advertising and marketing are the active components. The extent to which psychological factors determine subsequent behaviours is a worthwhile topic for further study. One study [43] has examined how persuasive alcohol media messages were associated with concurring beliefs and behaviours among youth, concluding that existing exposure based studies do not adequately account for the complex psychological causal mechanisms that may moderate or mediate the relationship between exposure and outcome. However, this analysis is based on cross-sectional data; further studies with longitudinal analyses are desirable. If a better understanding of the relationship of the intermediate steps between exposure and subsequent behaviours can be obtained, then our understanding of the mechanisms of action of alcohol advertising and marketing would be improved. This question, together with lessons learned from the collective experiences of conducting cohort studies [44], should inform the design of future cohort studies.

One other serious threat to the validity of these studies was the degree of attrition in some of the studies. Losses to follow-up between assembly of the cohort and follow-up are inevitable but the aim is to keep this to a minimum as attrition bias may be introduced if reasons for missing data or loss to follow-up are related to exposure or outcome. If adolescents who were lost to follow up were more likely to be drinkers, or at high risk of drinking as

found in three of the studies [17,19,21], then this may then lead to underestimating the relationship between advertising and drinking. Generalisability of the results is also affected if losses are in one specific subgroup of participants, and the subsequent loss of power is also a problem with attrition. Of note, none of the studies reported how they estimated sample sizes required. In general, assessment of the design and conduct of the cohort studies reviewed was hampered by the lack of important methodological detail, and fell short of the current recommendations as set out in the STROBE statement [45].

We cannot rule out the possibility of publication bias, whereby studies failing to detect significant relationships were not published, or studies for which selective reporting of only positive associations were published. Of course it is also possible that studies showing positive associations, if sponsored by the alcohol industry or other commercial organisations with a vested interest in advertising or marketing of alcohol, have not been published. Therefore, it is not possible to predict the likely impact of unpublished data on the results of this review. It is also possible that published studies were not found by our search as a fully comprehensive search of databases other than Medline and Embase and other sources only covering the social science literature was not possible within the scope of the limited funding for this review. Attempts, however, were made to locate all available studies by supplementing searches of databases with hand searching reference lists of key reviews and primary studies, which identified many articles published in journals not covered by Medline and Embase.

The results of these cohort studies are supported by findings in cross-sectional surveys which consistently report associations between increased exposure to alcohol advertising or marketing and drinking behaviour [2-5], intentions to drink [46] or advertising awareness and liking [2,47-49]. Although, in one interrupted time-series study countries with advertising bans had lower levels of alcohol consumption and road traffic fatalities [50], others failed to demonstrate significant effects [51,52]. The rationale for the exclusion of these studies is outlined in the methods, and their exclusion would only be a concern if they generally showed a strong effect in the opposite direction.

One question that remains is whether early drinking behaviour shown in these cohort studies is predictive of risky or harmful drinking or alcohol-related problems in the future. Drinking onset at an earlier age has been shown to be associated with a greater likelihood of alcohol dependence in several cross-sectional studies [53-55]. More recently, prospective cohort studies have also shown clear and significant associations between age of onset of drinking and subsequent heavy drinking and alcohol-related problems [56-59].

Given the large budgets allocated to advertising and promotional activity by the alcohol industry, a paucity of research exists evaluating the effects of this advertising. Further research exploring the potential causal impact is warranted; the role of mass media as a potential source of influence on alcohol related knowledge and behaviour of young people has been neglected in many countries [60].

The data from these studies suggest that exposure to alcohol advertising in young people influences their subsequent drinking behaviour. The effect was consistent across studies, a temporal relationship between exposure and drinking initiation was shown, and a dose response between amount of exposure and frequency of drinking was clearly demonstrated in three studies [17,20,21]. It is certainly plausible that advertising would have an effect on youth consumer behaviour, as has been shown for tobacco [61] and food marketing [62].

Does this systematic review provide evidence that limiting alcohol advertising will have an impact on alcohol consumption amongst young people? Not directly: as we noted earlier we can not rule out that the effects demonstrated in these studies is due to residual confounding. Counter-advertising [30], social marketing techniques [63] or other prevention options such as parenting programmes [64], price increases and limiting availability may offer more potential to limit alcohol problems in young people. Nonetheless, we now have stronger empirical evidence to inform the policy debate on the impact of alcohol advertising on young people, and policy groups may wish to revise or strengthen their policy recommendations in the light of this stronger evidence [1,9].

Competing interests

Foxcroft has received funding from Diageo for a project to develop and evaluate a family-based prevention programme. Smith has not directly received funding from the alcohol industry although has benefited indirectly from the funding to Foxcroft.

Authors' contributions

DF helped frame the research question and scope of the systematic review. LS developed the protocol, undertook searching, study appraisal, data extraction and synthesis. LS drafted the paper and DF contributed additional material to the Introduction and Discussion sections. Both authors act as guarantors.

Additional material

Additional file 1

Table 1. *Systematic review search strategies.*
Click here for file
[http://www.biomedcentral.com/content/supplementary/1471-2458-9-51-S1.doc]

Additional file 2

Table 2. *Characteristics of prospective cohort studies included in the systematic review.*
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[http://www.biomedcentral.com/content/supplementary/1471-2458-9-51-S2.doc]

Additional file 3

Table 3. *Assessment of likelihood of bias of included prospective cohort studies.*
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Effects of Pro- and Anti-Tobacco Advertising on Nonsmoking Adolescents' Intentions to Smoke

DIANE M. STRAUB, M.D., M.P.H., NANCY K. HILLS, M.A., PAMELA J. THOMPSON, M.P.H., AND ANNA-BARBARA MOSCICKI, M.D.

Purpose: **To determine the effects of pro- and anti-tobacco advertising on nonsmoking adolescents' intention to smoke in a single cohort.**

Methods: **All ninth graders at seven public high schools were invited to participate in a study on adolescent tobacco use; 59.0% participated (n = 1229; active positive parental consent required). Adolescents who self-identified as never having smoked even a puff of a cigarette (n = 512) completed a self-administered questionnaire that included questions on intention to smoke in the near future and tobacco advertising. Independent variables used to predict intention included exposure to, recognition of, and receptivity and attitudes toward pro-tobacco and anti-tobacco advertising. Potential confounding variables included gender, race/ethnicity, smoking influences (adult household members, siblings, and friends), socioeconomic status, stress, and depression. Data analysis used logistic regression.**

Results: **Demographics: 50.5% female, average age 14.9 ± 0.4 years old at baseline, and varied race. Those variables found to be significant predictors of intention to smoke included: (positive, or increased intention) recognition of brand of favorite advertisement, willingness to use or wear tobacco-branded products, stress, and having friends who smoke and (negative, or decreased intention) agreement with anti-tobacco advertising and having a live-in father who smokes.**

Conclusions: **Although anti-tobacco advertising has a protective effect, it was unable to counteract the effects of pro-tobacco advertising in the same cohort. © *Society for Adolescent Medicine, 2003***

KEY WORDS:
Adolescents
Advertising
Anti-tobacco
Media
Pro-tobacco
Smoking
Tobacco control

Although smoking rates in adults have declined in recent years, rates among adolescents have continued to rise [1]. Because 90% of adult smokers started as adolescents, the teenage years comprise the most crucial time for the implementation of effective strategies to prevent adult smoking.

Tobacco companies have long been known to design marketing strategies aimed at young potential smokers, targeting them not only with pro-tobacco messages but also with sales promotional features [2–4]. Cigarette brands popular among adolescents are more likely than adult brands to be advertised in magazines with high youth readerships [5]. Several studies have found these marketing strategies to be effective in increasing adolescent smoking [6–10]. Receptivity to tobacco advertising has been shown to be associated with intention to smoke in adolescents in several cross-sectional studies [11–15]. Recent longitudinal studies by Biener and Siegel [16] and Pierce et al. [17] have shown that receptivity to tobacco advertising is strongly linked to smoking initiation.

The potential power of the media was also recognized by anti-tobacco coalitions. It was thought that because media messages can enhance initiation of adolescent smoking, they might also be effective in educating adolescents about its inherent dangers.

From the Division of Adolescent Medicine, University of California, San Francisco, San Francisco, California.

Address correspondence to: Dr. Diane M. Straub, Department of Pediatrics, University of South Florida, 17 Davis Blvd., Suite 308, Tampa, FL 33606.

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Public service announcements, in general, have been shown to have a positive effect on adolescent sensibility and behavior [18]. Unfortunately, studies examining the effects of media campaigns on adolescent smoking initiation rates have had mixed results [19–30]. There is evidence to support that strong anti-smoking attitudes are inversely linked to smoking behavior in teens [31,32]. However, much of this work focuses primarily on messages related to the long-term effects of smoking and predates the newer, hopefully more effective tobacco control messages and the current charged tobacco-related political climate.

To our knowledge, no studies to date have looked at the influence of both pro- and anti-tobacco advertising and intention to smoke in a single cohort. We therefore undertook this study with the objective of evaluating (a) the effects of current anti-smoking advertising messages on adolescents' intentions to smoke in a longitudinal high school cohort, and (b) the potential relationship between the simultaneous effects of both pro- and anti-tobacco advertising on nonsmoking adolescents' intentions to smoke.

Methods

Sample

All ninth graders at seven ethnically/racially diverse public high schools in the San Francisco Bay Area were invited to participate in a longitudinal study on adolescent tobacco use. Of the 2199, 75.9% ($n = 1668$) returned signed parental consent forms, of which 78.8% granted consent, for an overall participation rate of 59.8%. Data for this cross-sectional study were obtained from the second data collection (6 months after the baseline survey) owing to a higher completion rate (95%) at that time for questions pertaining to tobacco advertising.

Of the 1229 participants completing the first follow-up survey, 885 were nonsmokers, as defined by having smoked <10 cigarettes in their lifetime. For this study, 373 participants who reported *any* experimentation with cigarette smoking were excluded from the analysis. Of the remaining 512 nonsmokers who self-identified as never having smoked even a puff of a cigarette, 260 were female (50.8%) and 242 were male (49.2%), with an average age of 14.9 ± 0.4 years. The racial distribution of participants was 43.1% ($n = 218$) white, 17.0% ($n = 86$) mixed ethnicity, 11.7% ($n = 59$) Filipino, 11.1% ($n = 56$) Asian/Pacific Islander, 10.7% ($n = 54$) Hispanic, 1.8% ($n = 9$) African-American, and 4.7% ($n = 24$) other ethnicity. Twenty-six percent of the participants' mothers had a high school diploma or less, 40% had at least some college education, and 13% had completed some postgraduate education.

Procedures

Parent(s) and each subject gave informed consent and assent, respectively, for participation in the study according to the guidelines set forth and approved by the Committee for Human Research, the Institutional Review Board for the University of California, San Francisco. At the outset of the study, participants completed a form providing information about their smoking experience to classify them into one of three categories of smoking status ("nonsmoker", "smoker", "ex-smoker"). Questionnaires specific to smoking status were then distributed, and were completed by students during one regular class period.

Measures: Pro-Tobacco Predictor Variables

Exposure to Pro-Tobacco Advertising scale was adapted from the National Youth Tobacco Survey and includes additional items from the Youth Attitudes and Practices Survey, which analyzes tobacco use in California. The seven individual items questioned the frequency with which respondents saw or heard smoking advertisements in various types of media and locations (i.e., movies, internet, convenience stores). Responses were coded on a four-point Likert scale ranging from "never" to "most of the time." The score was coded as an average of all responses and entered into the analysis as a continuous variable. Sample questions included: "How often do you: See ads for cigarettes or tobacco products on billboards or signs? See famous people smoking when you watch TV?" (Cronbach alpha = 0.74).

Recognition of Pro-Tobacco Advertising scale was adapted from the receptivity scale from Pierce et al.'s California Tobacco Survey [11]. To assess respondents' cognitive attention to messages contained in tobacco advertising, respondents were asked if any of the tobacco advertisements they had seen contained any of nine messages. Responses were coded as "yes" or "no." Positive responses were summed for a continuous variable. Sample questions included "Did any of the tobacco ads [that you have seen or heard] contain messages that: Smoking is an enjoyable experience? Smoking helps people relax?" (Cronbach alpha = 0.86).

Receptivity to Pro-Tobacco Advertising scale was also adapted from Pierce et al.'s receptivity scale [16]. To assess respondents' affective response to tobacco advertising, a receptivity score was computed based on four items: (a) indication of having a favorite brand tobacco advertisement (subjects were given a list of 11 brands from which to choose, including "other"); (b) selection of a preferred brand if one were to purchase cigarettes (subjects were given the same choices as those listed for item a); (c) possession or receipt of tobacco promotional items (sample question included "Have you ever purchased an item with a tobacco brand name or logo on it?"); and (d) willingness to use items with a tobacco company logo (answers ranged from "definitely yes" to "definitely no"). Because of the highly significant ($p < .0001$) correlation between the first two items, we combined them into one item, and responses on each of the three items were then standardized to ensure equal weighting and summed for the final continuous receptivity score. In our analysis, the resultant scale was both predictive and significant, however our Cronbach alpha was 0.37. Omitting the first item increased the Cronbach alpha to 0.46, a score we felt was not high enough to warrant combining them. Consequently we elected to examine each item separately in the final analysis. The subscale examining possession/receipt of tobacco promotional items (item (c), above) was comprised of five separate questions and had a reliability coefficient of 0.66.

Anti-Tobacco Predictor Variables

Because anti-tobacco campaigns increase in effectiveness when their messages are geared specifically to adolescents [33], focus group studies have been used to identify the most salient messages for teenagers [34]. As part of the development of the California, Massachusetts, and Michigan anti-smoking advertising campaigns, the following messages were found to be effective with adolescents: (a) exposure of the tobacco industry's predatory, manipulative marketing, which angered youth seeking to act independently; (b) messages about secondhand smoke, which provoked outrage and a "sense of injustice for the little guy," and (c) addiction advertisements emphasizing both the addictive nature of nicotine and the industry's use of this knowledge to hook smokers. Other less-effective messages included short-term effects, long-term health effects, and romantic rejection [34]. Items used as part of our anti-tobacco predictor variable scales were based upon this research [34], with some additional messages identified from various other anti-smoking campaigns.

Exposure to anti-tobacco advertising. To assess respondent's exposure to tobacco control messages, an eight-item scale corresponding with the exposure to pro-tobacco advertising scale was devised to query how often respondents saw tobacco control messages in various types of media. Corresponding four-point Likert scales were used; responses (ranging from "never" to "most of the time") to the eight items were averaged and entered into the analysis as a continuous variable. Sample questions included: "How often do you: See anti-smoking commercials on TV? See anti-tobacco messages on billboards or outdoor signs?" (Cronbach alpha = 0.81).

Recognition of anti-tobacco advertising. To assess whether respondents cognitively attend to tobacco control messages, participants were asked if any of the tobacco control advertisements they had seen contained any of 10 anti-tobacco messages. Positive responses were summed for a continuous variable. Sample questions included: "Did any of the anti-tobacco ads you've seen contain the following messages: Smoking cigarettes can kill you? Smoking cigarettes is harmful to babies and children?" (Cronbach alpha = 0.82).

Agreement with anti-tobacco advertising. To determine their affective responses to the messages contained in the tobacco control advertising, respondents were asked their opinions on 12 messages, using a four-point Likert scale ranging from "strongly agree" to "strongly disagree." Responses were averaged for a continuous variable. Sample questions included: "How much do you agree or disagree with the following statements: Tobacco companies lie or mislead young people about the effects of tobacco. Tobacco is addictive?" (Cronbach alpha = 0.87).

Outcome Variable: Intention to Smoke

Prior studies have validated an "intention to smoke" scale as a valid predictor of smoking initiation [35–37]. Our expanded version of this scale, with its seven items, queried respondents regarding their intentions to smoke. A four-point Likert scale, with responses ranging from "definitely yes" to "definitely not," was summed for a continuous variable. Sample questions included: "Do you think you will try a cigarette soon?" and "If one of your best friends

offered you a cigarette, would you smoke it?" (Cronbach alpha = 0.90). Unlike the binary or similarly limited outcome used by previous studies, our continuous outcome variable allowed for a broad range of intention (from a low of 0 to 21 of a possible 21).

Potential Confounding Variables

To examine the role of confounders in the relationship between intention to smoke and both pro- and anti-tobacco advertising, we evaluated several other variables that have been associated with smoking initiation in the literature. These included gender, race/ethnicity, smoking influences (adult household members, siblings, and close friends), socioeconomic status (maternal education level), stress (based on the 14-item Abbreviated Perceived Stress Scale [38]), and depression (based on the 8-item Center for Epidemiologic Studies Depression Scale [39]) [40–56].

Data Analysis

To investigate the relationship between intention to smoke and various measures of recognition of, and response to, pro- and anti-tobacco messages in the media, regression analysis was performed using the continuous intention score as an outcome variable, and the following as possible predictors: exposure to pro-tobacco advertising, recognition of pro-tobacco advertising, receptivity to pro-tobacco advertising (defined as brand recognition/favorite pro-tobacco advertisement, receipt of tobacco-branded products, and willingness to use/wear tobacco-branded products), exposure to anti-tobacco advertising, recognition of anti-tobacco advertising, and agreement with anti-tobacco advertising. Each predictor was entered into the analysis individually, and those significant in univariate analysis at an alpha level of 0.05 were entered into a multivariate analysis.

To explore the potential association between pro-tobacco receptivity and professed agreement with anti-tobacco messages in terms of how their relationship with each other might influence their ability to predict intention to smoke, a path analysis was done. The pro-tobacco variable used for this analysis was willingness to use and/or wear products bearing a tobacco logo. Although recognizing tobacco brands was also highly significant in univariate analysis, we chose not to use this variable because a large majority of the students cited a favorite cigarette ad, a brand preference, or both, thus limiting the usefulness of this variable as a predictor. A correlation analysis confirmed a significant negative correlation between the pro-tobacco receptivity and agreement with anti-tobacco ads; we therefore performed path analysis as described by Baron and Kenny [57] to test whether either of these predictors might mediate the relationship between smoking intention and the other predictor.

Potential confounders were analyzed in univariate analysis; those shown to be significant were then examined using correlation analysis to determine their relationships to the relevant predictors. Those related both to the outcome and to at least one of the predictors were adjusted for in multivariate analysis.

Table 1. Predictors of Intention (Univariate Analysis)

Variable	Parameter Estimate	*p* value
Pro- and anti-tobacco advertising variables		
Agreement with anti-tobacco advertising[a]	−2.81	.0001
Receptivity to pro-tobacco advertising: Brand recognition/favorite pro-tobacco advertisement[a]	1.16	< .0001
Receptivity to pro-tobacco advertising: Receipt of tobacco-branded products[a]	0.27	.12
Receptivity to pro-tobacco advertising: Willingness to wear/use tobacco-branded products[a]	1.11	< .0001
Exposure to pro-tobacco advertising[a]	0.52	.09
Exposure to anti-tobacco advertising[a]	.38	.23
Recognition of anti-tobacco advertising[a]	−.054	.48
Recognition of pro-tobacco advertising[a]	0.02	.82
Potential Confounding Variables		
Having friends who smoke	1.62	< .0001
Stress	0.13	< .0001
Depression[b]	0.19	< .0001
Stepfather in household who smokes[c]	3.77	.002
Father in household who smokes[c]	−1.05	.04
Having any adults in the household who smoke	−0.42	.30
Stepmom smokes[c]	−1.02	.55
Total siblings in household who smoke (per sibling)	0.29	.57
Total adults in household who smoke[c] (per adult)	−0.11	.69
Mother in household who smokes[c]	−0.10	.86
Socioeconomic status as measured by maternal education	0.03	.94

[a] Variables as explained above.
[b] Based on Center for Epidemiologic Studies Depression Scale.
[c] Does *** both live with you and smoke?

Results

Table 1 displays the results of univariate analysis. Those variables found to be significant predictors of intention to smoke include: (negative predictors)

Table 2. Predictors of Intention (Multivariate Analysis)[a]

Variable	Parameter Estimate	p value
Agreement with anti-tobacco advertising	−1.94340	< .0001
Receptivity to tobacco advertising: recognition of brands, favorite ads	0.75788	.01
Receptivity to tobacco advertising: willingness to wear/use tobacco products	0.74714	.0008
Stress	0.08500	< .0001
Friends who smoke	1.00767	.0018
Live-in dad smokes	−1.31109	.0065

[a] Gender and race were not significant in multivariate analysis and were not included in the final model.

agreement with anti-tobacco advertising and living with a father who smokes, and (positive predictors) brand recognition/favorite pro-tobacco advertisement, willingness to wear/use tobacco-branded products, having friends who smoke, stress, depression, and living with a step-father who smokes. Table 2 represents those predictors that remained significant in multivariate analysis: (negative predictors) agreement with anti-tobacco advertising and living with a father who smokes and (positive predictors) brand recognition/favorite pro-tobacco advertisement, willingness to wear/use tobacco-branded products, stress, and having friends who smoke.

Path Model Results

In path analysis, receptivity to pro-tobacco advertising, as defined by willingness to wear/use tobacco products, and agreement with anti-tobacco advertising are significant predictors of smoking intention even when both are included in the regression equation. We therefore found no evidence that either functions as a mediator of the relationship between intention and the other; rather, each exerts its own strong independent effect ($p < .0001$ for each).

Discussion

Independent of known influences on adolescents' intentions to smoke, we found that both receptivity to pro-tobacco advertising and agreement with anti-tobacco advertising were strong predictors of intention to smoke. The literature shows intention to smoke as a valid predictor of subsequent behavior; therefore the use of intention as an outcome measure is important in this study because it represents the first step in the decision-making process to smoke. Because adolescents are most likely exposed to the effects of both pro- and anti- tobacco advertising simultaneously, studying their independent effects in the same cohort is clearly important. To the best of our knowledge, this is the first study to do so.

The association between receptivity to tobacco advertising and intention to smoke is well-demonstrated in the literature [11–15,17], with several constructs used to represent "receptivity." Our initial scale sought to incorporate the concepts of affective response to tobacco advertisements and both passive and active involvement with sales promotional items. The first item, recognition of brands/favorite pro-tobacco advertisement, has been used as part of a broader receptivity scale in telephone surveys. Although the variable was a significant predictor of intention, the majority (92%) of our respondents did indicate a brand of their favorite advertisement, and we may have prompted responses by providing a list of possible brands in our pencil-and-paper questionnaire rather than asking an open-ended question. The second item on the original receptivity to tobacco advertising scale, receipt of tobacco-branded products, represents a passive role on the part of the respondent. In our study, this item was not predictive of intention to smoke. The third question, related to willingness to wear/use tobacco-branded products, was significantly associated with intention to smoke. Feighery et al. [12] illustrate the interrelationships among these constructs when they discuss the marketing strategy of using promotions to allow the consumer to "try on" an identity and thus move him or her closer to trying the product. Those adolescents attracted to the images seen in tobacco advertisements are then more likely to use or wear the corresponding tobacco products and finally are more susceptible to subsequent smoking behaviors. Our findings support this theory, and further confirm the relative strength of promotional goods as an advertising strategy.

Several studies have evaluated attitudes toward smoking and knowledge of and beliefs regarding health consequences, but not in the context of corresponding media messages [31,32,51,52,58,59]. No studies to date have directly examined the association between agreement with the messages presented in anti-tobacco advertising and intention to smoke. Flynn et al., during an evaluation of media and school-based intervention, found that the interventions positively affected students' attitudes toward and perceptions of advantages and disadvantages of smoking, but did not report on the relationships of these variables with either intention or subsequent smoking behaviors [19]. Siegel and

Biener looked at specific knowledge and attitude variables as possible mediators in an anti-smoking campaign; they report that exposure to the campaign was not associated with subsequent differences in these variables, but they do not comment on these variables' interactions with either intention or smoking behaviors [27]. In our study, agreement with anti-tobacco advertising showed an independent strong inverse association with intention to smoke. That is, agreement with anti-tobacco messages is protective. Our scale inquired about specific anti-tobacco advertising messages, including long- and short-term health effects, secondhand smoke, manipulatory practices of the tobacco industry, and others. Unfortunately, owing to the high degree of collinearity, we were unable to ascertain which messages were the most effective.

As expected, receptivity to pro- and agreement with anti-tobacco advertising were inversely correlated. When we investigated this relationship further with path analysis, neither variable was found to mediate the relationship between intention and the other predictor. Clearly, youth are being simultaneously exposed to both pro- and anti-tobacco advertising, and it appears that each exerts an independent effect on their intention to smoke.

Other predictors of intention to smoke included experiencing stress, having friends who smoke, and living with a father who smokes. Stress as an independent predictor is consistent with other studies [55,56]. Interestingly, stress was also correlated with receptivity to pro-tobacco advertising and inversely correlated with anti-tobacco advertising. Those individuals with higher stress levels may be more vulnerable to the messages contained in pro-tobacco advertising, and those with lower stress levels may be receptive to anti-tobacco advertising. Depression did not maintain significance in multivariate analysis, probably owing to its high correlation with stress. As expected, having friends who smoke was predictive of intention to smoke. This finding continues to support the important contribution of peer influences on intention to smoke. It is interesting to note that in our sample, living with a father who smokes was inversely correlated with intention to smoke. One could theorize that firsthand exposure to the adverse effects of smoking and to secondhand smoke may make smoking less appealing to the adolescent. This is contrary to results found in other studies and may represent changing attitudes regarding smoking (e.g., it is not as socially acceptable as in the past), or changing motivations to smoke (e.g., it is no longer rebellious to smoke if your father smokes).

Exposure to, and recognition of, both pro- and anti-tobacco advertising were not significant in our analysis. This has been borne out by the literature. Feighery et al. found that 99% of respondents reported seeing tobacco advertising and promotions in a variety of venues [12], suggesting that exposure is universally high. Brown et al. showed that there is a high degree of recognition of anti-tobacco advertising, even in areas serving as controls for anti-smoking campaigns; only messages differing significantly from other campaign messages were not likely to be falsely recognized [60]. High exposure and recognition may be owing to general awareness of tobacco as a current political topic.

The historical context and political climate of tobacco during the time of our study warrants further discussion. The media messages we used for our agreement with anti-smoking advertising scale were taken largely from the focus groups used to design the California campaign, which has been ongoing (with a brief hiatus) since 1990. Thus, our analysis of attitudes toward anti-smoking messages should be reflective of the tobacco control messages to which adolescents were actually exposed. Regarding pro-tobacco advertising, the political climate at the time of these studies was influenced by the national debates on settlement money from the tobacco industry to former smokers and the aggressive tobacco control legislation enacted with the passage of California's Prop 99 in 1988, including tobacco taxes and limitations on pro-tobacco advertising. Given these seeming setbacks for the tobacco industry, the fact that receptivity to pro-tobacco advertising was strongly predictive in our study continues to underscore its strength. Finally, Philip Morris's national youth smoking prevention campaign, with its message that smoking is an "adult" behavior, seems a tantalizing dare designed to further enlist adolescent smokers. In fact, preliminary data from California in 1999 (1 year after its initiation) suggest that it is ineffective, and may even promote adolescent smoking [61], so it is difficult to determine the effect of the campaign on our current study.

Because our data are cross-sectional, generalizability regarding intentions to smoke is limited, and causal relationships cannot be determined. Although there is now support for the causal relationship between receptivity to pro-tobacco advertising and intention in the literature [16], the relationship between agreement with anti-tobacco advertising and intention is not so clear. It is possible that decisions

regarding a refusal to smoke precede agreement with anti-tobacco advertising. Longitudinal analyses will help to further investigate this relationship. Specifically, the use of smoking behavior as an outcome will contribute significantly to understanding these relationships.

In conclusion, the ultimate influence of the tobacco company strategies is clear. Although anti-tobacco advertising has a protective effect, even with current tobacco control messages it was unable to counteract the effects of pro-tobacco advertising in the same cohort. Further studies to determine the most effective anti-tobacco messages for adolescents will continue to refine our media campaigns.

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FDA Gets Social: Considers Regulating Social Media for Drugs and Devices

By Robin Strongin | September 24th, 2009

Big news: The FDA is holding a public hearing to discuss online promotion of FDA-regulated medical products – including prescription drugs, prescription biologics, and medical devices. The hearing will be November 12 and 13, 2009 in Washington, DC (registration closes October 9 – see also registration instructions from Eye on FDA), but public comments can be submitted in writing or electronically now through February 28, 2010. *View the docket details and full Federal Register notice*.

A common reaction around the Web has been "Finally!" – with remarks like "This is NOT a Hoax!" and "Just in time for Web 3.0," the FDA has set a date to start figuring out "how to deal with Web 2.0." (NPR Health Blog).

But after the initial shock and sarcasm subsides, the potential significance of the FDA's (albeit long overdue) move forward this week starts to sink in – this could result in the most significant set of regulations since the FDA's guidelines for broadcast direct-to-consumer (DTC) advertising in the late 1990s. We're talking industry-changing stuff here – or rather, *industries-changing*, because you can be sure that pharmaceutical companies, physicians, consumers, Internet and social media companies, the advertising and public relations industries, and everyone whose revenue includes online advertising are all major stakeholders in this public policy debate.

So what has the FDA highlighted as the key elements for discussion of this issue? *(List below drawn from the 9/21/2009 FR notice)*

1. For what online communications are manufacturers, packers, or distributors accountable?
    - (paraphrased) What communications and discussions should be considered "by, or on behalf of" versus independent of influence from these companies – and when and how should companies "disclose their involvementor influence," particularly "on third-party sites"? Should different types of online media platforms and different intended audiences of these platforms be considered differently when addressing these questions – if so, how?
2. How can manufacturers, packers, or distributors fulfill regulatory requirements… in their Internet and social media promotion, particularly when using tools that are associated with space limitations and tools that allow for real-time communications (e.g., microblogs, mobile technology)?
    - (paraphrased) How should product information be presented on these platforms so that users have appropriate access to both risks and benefits?
3. What parameters should apply to the posting of corrective information on Web sites controlled by third parties?
4. When is the use of links appropriate?
    - (paraphrased) Should there be rules about the use of "links to and from Web sites," including links to or from unbranded websites to or from clearly branded company websites? And what research and data exists about the click-rates in different contexts of users seeking information about medical products?
5. Questions specific to Internet adverse event reporting

- (paraphrased) How are companies that are obliged to report adverse effects of products using online media tools, if at all, to monitor information about adverse effects of their products? Should these companies be obliged to monitor and/or report information from online communications concerning adverse effects of their products?

We – and the FDA – want to know what ***you*** think. What are your gut reactions to all of this – do you find anything particularly worrying, are there any potential outcomes you're especially hoping for?

If you submit any comments to the FDA – and we hope you will – **come by and tell us about it in our comment section here** (and we promise to do the same). More information about the public hearing and submitting comments is available here.

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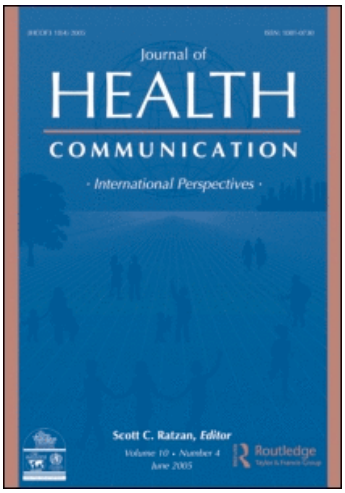

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The Effect of Antismoking Advertisement Executional Characteristics on Youth Comprehension, Appraisal, Recall, and Engagement

Yvonne Terry-Mcelrath [a]; Melanie Wakefield [b]; Erin Ruel [c]; George I. Balch [c]; Sherry Emery [c]; Glen Szczypka [c]; Katherine Clegg-Smith [c]; Brian Flay [c]
[a] University of Michigan, Ann Arbor, Michigan, USA [b] The Cancer Council Victoria, Melbourne, Australia [c] University of Illinois at Chicago, Chicago, Illinois, USA

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The Effect of Antismoking Advertisement Executional Characteristics on Youth Comprehension, Appraisal, Recall, and Engagement

YVONNE TERRY-MCELRATH

University of Michigan, Ann Arbor, Michigan, USA

MELANIE WAKEFIELD

The Cancer Council Victoria, Melbourne, Australia

ERIN RUEL, GEORGE I. BALCH, SHERRY EMERY, GLEN SZCZYPKA, KATHERINE CLEGG-SMITH, AND BRIAN FLAY

University of Illinois at Chicago, Chicago, Illinois, USA

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This article examines how two executional characteristics of antismoking advertising may interact with other relevant advertising features to affect youth comprehension, appraisal, recall of, and engagement with antismoking ads. Fifty antismoking ads made by tobacco control agencies, tobacco companies, and pharmaceutical companies were appraised by 268 youth using an audience response methodology with a follow-up component. Analyses show that thematic and executional characteristics varied both across and within ad sponsor, and that executional characteristics of ''personal testimonial'' and ''visceral negative'' clearly had the strongest and most consistent effect on appraisal, recall, and level of engagement. Antismoking advertisements are not alike in their ability to engage youth. Advocates attempting to develop increasingly successful antismoking campaigns should consider the executional characteristics of proposed ads.

Introduction

Research has shown that antismoking advertising may help reduce youth smoking (Siegel & Biener, 2000; Wakefield, Flay, Nichter, & Giovino, 2003b). Such research also has examined which antismoking advertising characteristics are most strongly related to decreased protobacco beliefs, attitudes, and actual smoking behaviors.

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Address correspondence to Yvonne Terry-McElrath, Institute for Social Research, University of Michigan, P.O. Box 1248, Ann Arbor, MI 48106-1248, USA. E-mail: yterry@isr.umich.edu.

Advertising research offers various models to explain how advertising affects purchase intentions. For example, De Pelsmacker, Dedock, and Geuens (1998) identified three ad dimensions: emotional content, informational content, and format. De Pelsmacker and colleagues posited that these three dimensions influence both affective and cognitive response to ads that, in turn, affect brand attitude, which then influences purchase intentions. Their model suggests variables of interest in antismoking advertising research such as recall, comprehension, emotional reaction, thematic content, executional characteristics, cognitive appraisal, level of engagement showing increasing attention to advertising (e.g., thinking about an ad or discussing it with peers), target audience (youth or general adult), and ad sponsor. Relevant outcomes include both (a) attitudes and beliefs regarding smoking behaviors (the equivalent of attitude toward brand), and (b) intentions to smoke and smoking behaviors (the equivalents of purchase intentions and behaviors).

Executional characteristics refer to the ways in which an ad has been produced to deliver a specific message. For example, a message focusing on the health effects of smoking may be delivered via a simple text message, via a personal testimonial of an individual whose health has been harmed by smoking, or via a repellent health-related image such as the graphic images now found on Canadian cigarette packs. More than one executional characteristic can be used within a single ad; for example, a personal testimonial can be combined with a repellent health-related image. Such executional characteristics may be especially relevant to antismoking advertising due to the nature of health-related harm and risk messages. Youth often perceive themselves to be invulnerable to future harm or risk; messages about smoking risks may be easily dismissed as irrelevant by adolescents. Mass communication theory suggests that highly emotional appeals may be most appropriate when the target audience has low interest in the subject matter, or when the available information is considered "old news" (Hafstad et al., 1997). Hafstad and colleagues note, "provocative and dissonance arousing appeals that create affective reactions and lead to interpersonal communication should be given more attention in campaigns designed to influence adolescent smoking" (p. 227). Advertising executional characteristics such as personal testimonials or repellent images may help to break through to youth and engage them with antismoking messages, a critical step in the causal chain between media message and behavior change (Flay, 1987; Flay & Burton, 1990).

Available research has focused primarily on antismoking advertising emotional and informational content. In addition, some studies have highlighted the cognitive appraisal of such advertising, while others have focused on measures of recall (Beaudoin, 2002; Beltramini & Bridge, 2001; Biener, 2000, 2002; Biener, McCallum-Keeler, & Nyman, 2000; De Pelsmacker et al., 1998; Farrelly et al., 2002; Goldman & Glantz, 1998; Hafstad et al., 1997; Henriksen & Fortmann, 2002; Hill, Chapman, & Donovan, 1998; Homer & Yoon, 1992; Pechmann & Reibling, 2000; Pechmann, Zhao, Goldberg, & Reibling, 2003; Shadel, Niaura, & Abrams, 2002; Teenage Research Unlimited, 1999; Wakefield, Flay, Nichter, & Giovino, 2003a, 2003b; Wakefield et al., in press; White, Tan, Wakefield, & Hill (2003)). Little research is available, however, that examines such outcomes when also considering executional characteristics and their relationships with emotional and cognitive reactions to antismoking advertising, as well as levels of engagement with such ads. Furthermore, studies that use an audience response methodology to specific public health ads rarely involve a follow-up component, which might provide

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additional insight into audience ad processing. Indeed, follow-up components have long been common in commercial advertising research (DDB Needham Worldwide, 1988).

The majority of studies also have focused on a limited number of ads or ad sponsors or both. Antismoking television advertising has had three main sponsors: tobacco control programs, the tobacco industry, and pharmaceutical companies. Since 1998, tobacco companies have advertised on television with the ostensible message of persuading youth not to smoke. Both Lorillard and Philip Morris have had such campaigns; however, the majority of tobacco industry antismoking advertising has been purchased by Philip Morris through the youth-targeted "Think. Don't Smoke" campaign, and the parent-targeted "Talk. They'll Listen" campaign.

Farrelly and colleagues (2002) examined population survey data comparing youth confirmed recognition of Philip Morris advertisements with confirmed recognition of the American Legacy Foundation's truth® campaign. They found that confirmed recognition of Philip Morris advertisements generally was not associated with increased antitobacco attitudes and beliefs, whereas exposure to truth® ads showed such associations. Those who confirmed their recognition of Philip Morris ads also were more likely to be open to the idea of smoking.

There has been little study of the advent of direct-to-consumer advertising for nicotine replacement therapies and Zyban® (hereafter referred to collectively as pharmaceutical ads). Because such high volume mass-reach advertising reaches more than the primary target group (adult smokers), it is important to consider the responses of those at risk of taking up smoking, especially teenagers, to the advertising. For example, teens exposed to such ads may perceive that it is easier to quit smoking or that there is a reduced risk of addiction, and thus conclude that there is less of a problem with taking up smoking (Bloom, Bolton, & Cohen, 2000). This is consistent with research that finds optimism about quitting is a major predictor of trial and subsequent progression to heavier smoking among young people (Hanson & Kysar, 2001).

This article seeks to add to the literature by focusing on antismoking advertising executional characteristics and how these characteristics may interact with other advertising features (such as target audience, thematic content, and ad sponsor) to affect youth comprehension, appraisal, recall of, and cognitive engagement with antismoking ads. This study is the first on antismoking advertising that we are aware of to use an audience response methodology with a follow-up component.

Methods[1]

Ad Selection and Preparation

Ads eligible for inclusion were produced and aired from 1997 to 2001 and were sponsored by tobacco control programs (including state campaigns and the American Legacy Foundation truth® campaign), tobacco companies, or pharmaceutical companies. In total, 50 ads representing a range of advertising messages and sponsors were included. Videotaped reels of 10 ads each were produced, with each reel also being produced in reverse order (for a total of 10 reels). As indicated in Table 1, each

[1]For detailed information on the project methodology, including the ads used, please see Wakefield et al., 2002.

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Table 1. Ad reel preparation

	Reel number*					
	1, 2	3, 4	5, 6	7, 8	9, 10	Total
Total ads per reel	10	10	10	10	10	50
Audience						
General	3	6	4	4	7	24
Youth	7	4	6	6	3	26
Executional characteristic						
Personal testimonial	1	2	1	2	2	8
Visceral negative	0	0	2	0	1	3
Neither of the above	9	8	7	8	7	39
Theme						
Cessation	2	1	1	2	2	8
Secondhand smoke	1	1	1	1	1	5
Family guidance	1	1	0	0	1	3
Health benefits	0	2	0	1	0	3
Health effects	2	2	2	2	2	10
Industry manipulation	2	2	3	3	2	12
Uncool	2	0	2	1	1	6
Other	0	1	1	0	1	3
Sponsor						
Pharmaceutical company	1	1	1	1	1	5
Tobacco control	7	7	8	8	7	37
Tobacco industry	2	2	1	1	2	8

*Each set of 10 ads was shown on two reels; ads on even-numbered reels were presented in reverse order of odd-numbered reels.

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reel contained ads produced by the three ad sponsors and represented a range of 8 themes (cessation methods or strategies, health effects of smoking, health benefits of quitting, secondhand smoke, exposing tobacco industry manipulation, parental or sibling guidance about tobacco, ads portraying tobacco as uncool, and "other"[2]). Each ad was coded for its primary target audience (youth vs. a more general audience), and for the presence or absence of two executional characteristics (ads could have both characteristics): (1) personal testimonial, and (2) negative visceral image (see Table 2 for coding definitions and exemplars). Personal testimonial executions rely on emotional appeals (sadness, fear, empathy) that may enhance message relevance and credibility (Biener & Taylor, 2002). Recording the presence of negative visceral images was suggested by the literature on fear appeals (Hill et al., 1998; Witte & Allen, 2000) and by the hypothesis that such inherently emotional imagery may strongly reinforce message relevance, credibility, and recall. Although it would

[2]Previous research, such as that by Goldman and Glantz (1998), has provided categories of themes relevant to antismoking advertising. All themes used in these analyses, however, emerged from a study of the ads themselves. Thus while our themes include several of those used by Goldman and Glantz (cessation, health effects, industry manipulation, and secondhand smoke), we also found themes not previously reported on in the literature, including family guidance, health benefits of quitting, and uncool.

Table 2. Coding categories for ad executional characteristics

Executional characteristic description	Exemplar ads: Short title	Creative description
Personal testimonial		
This type of story is presented in the first person, often with a person directly addressing the camera. These ads portray real people telling how smoking has affected their life and/or the lives of their families. The story must be from personal experience, but it does not have to be about health effects.	1. Teen addiction to cigarettes (MA State Campaign)	Teen girl talks about her addiction to cigarettes.
	2. Wife ETS victim (CA State Campaign)	Older man talks about his wife who was a victim of his own secondhand smoke.
Visceral negative		
These ads use a message that elicits a visceral "ugh!" response from the viewing audience, such that the reaction endures through at least the end of viewing the ad (for example, it is not relieved by humor). The visceral negative element of the ad may or may not convey the main point of the ad.	1. Bowl cleaner (FL State Campaign)	Two teens in restroom stall; one puts head in toilet; various shots of diseased body parts; skulls.
	2. Artery (Australia/MA State Campaign)	Man lights cigarette from stove-top; surgeon squeezes fatty deposits from a young smoker's aorta. Tag line: "Every cigarette is doing you damage."

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be possible to code ads for the presence of a variety of other executions, for this article, we limited the executional characteristics to the two noted based on the theoretical literature cited above as well as the relative availability of characteristics in the ads in our reels. Audience, theme, and executional characteristics were coded by agreement among five members of the research team.

Study Participants and Recruitment Methods

Youth were eligible for participation if they were in the eighth, tenth, or twelfth grade; and were neither confirmed nonsmokers nor regular smokers (Pierce, Choi,

Gilpin, Farkas, & Merritt, 1996). Thus, the sample was based on youth who were willing to consider smoking in the future, or were currently experimenting with smoking, but who had not yet smoked more than 100 cigarettes in their lives, or both groups. By eliminating youth unlikely to take up smoking and those who had already committed to smoking and perhaps had become addicted, we eliminated those whose smoking behavior was least likely to be affected by anti-smoking advertising. Although recently reported data on national smoking rates among youth do not include an exactly equivalent measure, in 2001, the national proportion of in-school eighth, tenth, and twelfth graders who reported some level of smoking experimentation but had not yet progressed to smoking 10 or more cigarettes daily was 34% for eigth graders, 47% for tenth graders, and 51% for twelfth graders (Johnston, O'Malley, & Bachman, 2002). These numbers underestimate the proportions from our population, since we also included non-smokers who did not consistently reject the idea that they would accept an offer of a cigarette, as well as youth who reported having smoked only 1–9 cigarettes in their lifetime. Additional eligibility requirements were that all youth were literate in English and had not participated in a focus group within the last 6 months.

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Youth were recruited by two market research agencies in sites representing long-term (Boston) and short-term (Chicago) broadcast exposure to antismoking advertising. Agencies began recruitment with families who expressed interest in participating in market research. Recruitment also involved up to two referrals by youth of peers who might be willing and eligible to participate. Recruitment goals were set at 15 youth per rating session with 10 sessions planned for both Chicago and Boston (150 youth per site), with equal quota sampling for gender and school grade. One hundred thirty youth attended the Chicago rating sessions, and 150 for the Boston sessions, for a total of 280 youth. Two of the Boston youth, however, were excluded from analyses due to their being nonsusceptible nonsmokers based on self-reported smoking status, bringing the *N* for the rating sessions to 278. Of these youth, 268 (96.4%) participated in follow-up calls (127 youth in Chicago; 141 in Boston). Youth were paid $50 for participation ($35 following the ad rating session and $15 after completion of a follow-up call 1 week later). The Internal Review Board at the University of Illinois at Chicago approved the study protocol.

Participants were distributed equally by location (47% in Chicago) and gender (49% male). The majority were White (76%); 11% were African American, 10% Hispanic, 2% Asian, and 1% other. School grade was evenly distributed (eighth grade, 33%; tenth grade, 36%; twelfth grade, 32%). Overall, 43% were susceptible nonsmokers; 57% were early or advanced experimenters.

Data Collection Procedure and Measures

Data collection took place from March to May 2001. Each youth attended a rating session at the research agencies' offices with 10–18 other youth in which they appraised one of the 10 prepared reels (each containing 10 ads) in a 75-minute period. Study personnel facilitated each session, explaining the purpose and format of the session and emphasizing the importance of each participant providing honest evaluation of the ads. Each ad was shown twice, after which the youth completed a one-page rating form per ad.

Outcome variables for this study included measures of comprehension, appraisal, recall, and engagement. *Comprehension* was assessed by coding responses to the following open-ended questions: "What is the main point that this ad is trying to make?" followed by "What else is it trying to say?" Coding focused on agreement with the ad's presumed advertising strategy (Balch, 1999; Sutton, Balch, & Lefebvre, 1995). Two senior study personnel scored responses as "1" (generally understood the main point of the ad) or "0" (clearly did not understand the main point). Overall level of agreement for scoring was 86%.

Appraisal included two measures obtained during the rating sessions: *how good* and *most thought provoking*. Youth were asked to rate each ad via the question, "Overall, how good was this ad as an antismoking advertisement?" (response scale of 1 = not good at all, to 7 = very good). *Most thought provoking* refers to the one ad that each youth selected at the end of the session to answer the question, "Which one of these ads will most make you stop and think?"

Measures of recall and engagement were obtained during a follow-up call with each youth held one week after that youth's rating session. During follow-up calls, interviewers asked youth to identify which, if any, of the ads they could recall from the rating session. *Recall* was determined by comparison of the youth's open-end description of each ad that the youth claimed to have recalled with a written description of the ad provided to the interviewers by the researchers (all interviewers had seen all of the ads). For each confirmed recalled ad, two measures of *engagement* were asked: (1) *thought about* (coded as yes for youth who, upon recalling an ad at follow-up, reported having thought about the ad between the rating session and follow-up), and (2) *discussed* (coded as yes for youth who, upon recalling an ad at follow-up, reported having discussed the ad between the rating session and follow-up with someone not in the rating session).

The focus in this article on comprehension, appraisal, recall, and engagement is predicated on communication effectiveness research that has highlighted the outcome of recall and the importance of other variables indicating higher-order-cognitive processing (Donohew, Lorch, & Palmgreen, 1998; Keller & Block, 1996; Lang, Dhillon, & Dong, 1995). This article does not investigate actual behavior change. As Floyd, Prentice-Dunn, and Rogers (2000) note in their meta-analysis of research on protection motivation theory, however, studies examining disease prevention and health promotion have shown that for both threat- and coping-related variables, moderate effects can be expected for both intentions and behaviors (although behavior effect sizes likely will be somewhat lower than those observed for intentions).

Statistical Analysis

For the analyses reported in this article, the ad is the unit of analysis. To compare the 50 ads by response effects, original data at the youth level ($n = 268$) were aggregated up to the ad level ($n = 50$), meaning that the responses of all youth who viewed and rated a particular ad were summed and averaged for that ad. These responses should be interpreted as the proportion of youth responding to a particular outcome. For example, for ad comprehension, the variable reflects the mean proportion of youth exposed to an ad who comprehended its main message. This technique treats the aggregated ratings of the ads as characteristics of the ads themselves. This kind of analysis is common in commercial advertising research to select ads for

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broadcasting; advertisers, advertising agencies, and research agencies have developed "norms" on such aggregated measures.[3]

Preliminary analyses examined whether responses differed by location (Chicago or Boston), ad order, respondent gender, race/ethnicity, grade, or whether youth reported previously seeing particular ads. No significant rating differences were observed (Wakefield et al., in press). Thus, reels and sites were collapsed for analysis purposes. Analyses were conducted using SAS v.8, specifying OLS regression models. Prior exposure, or the extent to which a specific ad had been seen before the rating session, was included in models examining comprehension, *how good*, and *most thought provoking*. Intervening exposure, indicating if any television antismoking advertising had been seen between the rating session and follow-up, was included in models examining *recall*, *thought about*, and *discussed*. Comprehension also was included in models examining follow-up variables. Target audience, executional characteristics, and themes are dichotomous yes/no measures. Comprehension, prior exposure, and intervening exposure are proportions representing the proportion of youth who comprehended an ad, or reported either type of exposure.

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Results

Ad Characteristics and Outcome Measures

On average, 65% of youth understood the main message of any given ad they viewed. Further, 57% of youth were likely to rate any given ad as above 4 in the 7-point Likert response scale for *how good*. An average of 40% of youth recalled a specific ad. Only 17% reported they had thought about any specific ad, and only 13% had discussed a specific ad with individuals who were not in the rating session.

Independent variables of target audience, executional characteristics, and theme varied significantly by ad sponsor, as did prior exposure to such advertising (see Table 3). The five pharmaceutical company ads targeted only general audiences, encompassed only cessation themes, and showed no use of the executional characteristics examined. The eight tobacco industry ads strongly targeted youth, featured three themes, and included neither executional characteristic studied. The 37 tobacco control ads showed the greatest variation, targeting youth and general audiences approximately equally, including seven of the eight themes, and both personal testimonial and visceral negative executional characteristics. Tobacco industry ads were most likely to have been seen before the rating session, followed by pharmaceutical company ads, followed, in turn, by tobacco control ads. Intervening exposure to any television antismoking advertising was substantial. The mean proportion of youth reporting exposure to any ads between the session and the follow-up call was 0.57 (standard deviation = .08; not shown in table).

Bivariate Model Relationships

When comparing outcome mean proportions by ad sponsor (Table 4), we found that pharmaceutical ads were significantly less likely to be *thought about* or *discussed* than

[3]This method is frequently used in advertising research systems (DDB Needham, 1998), as well as in ecological social stratification research (for example, see Warren, Sheridan, & Hauser, 1998).

Table 3. Characteristics of ads by sponsor[a,b]

Characteristic	Pharmaceutical company ads ($N = 5$)	Tobacco control ads ($N = 37$)	Tobacco industry ads ($N = 8$)
Youth target audience	0%	54%	75%
Executional characteristic			
Personal testimonial	0%	24%	0%
Visceral negative	0%	8%	0%
None of the above	100%	68%	88%
Theme			
Cessation	100%	8%	0%
Secondhand smoke	0%	14%	0%
Family guidance	0%	0%	38%
Health benefits	0%	3%	25%
Health effects	0%	27%	0%
Industry manipulation	0%	32%	0%
Uncool	0%	8%	38%
Other	0%	8%	0%
Prior exposure	.36 (.16)	.17 (.22)	.55 (.25)

[a]Data presented with percentages are the total percent of the ad type that exhibits the noted characteristic. Data for prior exposure represent the mean proportion of youth who viewed an ad sponsored as noted who reported having seen the ad before the rating session (standard deviations in parentheses).

[b]Description of all ads used in this study is presented in Wakefield and colleagues (2002).

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tobacco control ads. Further, pharmaceutical ads were also less likely than tobacco control ads to be rated highly on *how good*. There were no significant differences between pharmaceutical ads and tobacco industry ads on any variables, nor were there significant differences between tobacco control ads and tobacco industry ads. In addition, no significant differences by ad sponsor were observed for comprehension, *most thought provoking*, or *recall*. For almost all outcomes, the standard deviations for ad sponsor were quite large, indicating considerable variation within sponsor as to how youth evaluated and cognitively engaged with antismoking advertising.

To investigate what may be driving such variation, executional characteristics, target audience, thematic content, comprehension, and prior or intervening exposure were modeled with outcome variables. As noted in Table 1, only tobacco control ads contained examples of both relevant executional characteristics as well as most themes. Thus, all further analyses included only the 37 tobacco control ads (see Table 5).

In bivariate analyses, comprehension appeared to be unrelated to any of the identified predictors. Both appraisal measures—*how good* and *most thought provoking*—were significantly related to executional characteristics as well as themes. The mean proportions of both *how good* and *most thought provoking* were significantly higher for ads with personal testimonial (.34 and .18) and visceral negative (.25 and .20) executions. The mean proportions for *how good* and *most thought provoking*, however, were significantly lower for ads with cessation, industry manipulation, and uncool themes when compared with the theme of health effects.

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Table 4. Cognitive appraisal and level of engagement measures by sponsor: mean proportions and standard deviations

Outcome	Pharmaceutical company ads (ad sponsor 1) ($N = 5$)	Tobacco control ads (ad sponsor 2) ($N = 37$)	Tobacco industry ads (ad sponsor 3) ($N = 8$)	ANOVA statistics examining outcomes by ad sponsor			
				Overall	1 vs. 2	1 vs. 3	2 vs. 3
Comprehension[a]	.61 (.21)	.64 (.21)	.73 (.19)				
How good[b]	.34 (.11)	.61 (.23)	.56 (.07)	*	*		
Most thought provoking[c]	.01 (.01)	.12 (.14)	.05 (.04)				
Recall[a]	.32 (.28)	.42 (.17)	.35 (.19)				
Thought about[a,d]	.03 (.04)	.20 (.14)	.13 (.09)	*	*		
Discussed[a,d]	.03 (.01)	.15 (.12)	.10 (.06)	*	*		

[a]Data presented represent the proportion of youth who viewed an ad, were followed up, and who responded "yes" to the outcome variable (standard deviations in parentheses).

[b]Data presented represent the proportion of youth who viewed an ad who rated it as 5–7 on the original 1–7 scale (standard deviations in parentheses).

[c]Proportion of youth that chose a given ad as the most likely to make them stop and think.

[d]Denominators are the sum of those who recalled the ad at follow-up, vs. those who participated in the rating sessions.

*$p < .05$.

Recall and measures of engagement (*thought about* and *discussed*) were also significantly related to personal testimonial and visceral negative executions. Mean proportions for *recall* were higher by .25 and .14 for personal testimonial and visceral negative, respectively; for *thought about* by .17 each; and for *discussed* .16 and .18, respectively. Mean proportions for *recall* were also higher among youth who reported seeing any television antismoking ads between the rating session and follow-up (.30). In comparison with health effects, mean proportions for *recall* were lower for ads with cessation, industry manipulation, or "other" themes (−.24, −.15, and −.23, respectively). *Thought about* showed a negative relationship with ads with cessation messages (−.22) compared with ads with a health effects theme; *discussed* was negatively related to ads with cessation (−.16), industry manipulation (−.13), and uncool (−.18) themes.

In summary, results from bivariate analyses showed that personal testimonial and visceral negative executions were significantly and positively related to all outcomes other than comprehension, while cessation themes were negatively related to all outcomes other than comprehension. Target audience and comprehension were not significantly related to any outcome measures.

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Multivariate Relationships for Tobacco Control Ads

Full multivariate models were specified for the 37 tobacco control ads (see Table 6). As these analyses included a relatively small N, we indicate if relationships were observed at the $p < .10$ level, as well as conventional significance levels of $p < .05$.

Within a multivariate context, ads with a youth target audience had significantly higher ad comprehension (.18). Comprehension was also somewhat higher for ads with the secondhand smoke theme. The multivariate model examining ratings of *how good* showed that the personal testimonial execution remained significant (with .23 higher proportion of youth rating an ad as above average); however, the visceral negative execution, as well as industry manipulation and uncool themes, dropped to marginal significance levels ($p < .10$). In contrast to the bivariate model, the proportion of youth reporting previous exposure to an ad also showed a significant positive relationship with ratings of *how good* (.38). Multivariate results for nominations of *most thought provoking* ad continued to be significantly and positively related to personal testimonial executions (.16). Results also indicated that a visceral negative execution was associated with marginally higher ratings of *most thought provoking*.

In multivariate analyses, engagement variables continued to be strongly related only to executional characteristics. The mean proportion of youth recalling a given ad was .20 higher for ads with a personal testimonial. Both *thought about* and *discussed* were significantly higher for personal testimonial (.13) and visceral negative executions (.17 and .15, respectively).

Discussion

Our findings clearly show that thematic and executional characteristics varied significantly both across and within ad sponsor, with tobacco control ads having the most variation. Within tobacco control ads (the only group with substantive variation allowing multivariate analyses), executional characteristics (personal testimonial and visceral negative) had the strongest and most consistent relationships

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Table 5. Bivariate models examining youth cognitive engagement with tobacco control antismoking advertising ($N = 37$)

	Dependent variable											
	Comprehension		How good		Most thought provoking		Recall		Thought about		Discussed	
Independent variable	b[†]	p	b	p	b	p	b	p	b	p	b	p
Youth target audience	0.13		−0.08		−0.09		−0.05		−0.05		−0.07	
Personal testimonial execution	0.04		0.34	*	0.18	*	0.25	*	0.17	**	0.16	**
Visceral negative execution	−0.13		0.25	*	0.20	*	0.14	*	0.17	*	0.18	**
Comprehension score[a]	–		0.27		−0.01		0.14		0.10		0.03	
Prior exposure	0.14		0.33		0.02		0.18		0.15		0.09	
Intervening exposure	N/A[b]		N/A[b]		N/A[b]		0.30	*	0.22		0.08	
Theme												
Health effects (referent)	(ref)		(ref)		(ref)		(ref)		(ref)		(ref)	
Cessation	−0.03		−0.40	**	−0.20	*	−0.24	*	−0.22	*	−0.16	*
Secondhand smoke	0.17		−0.14		−0.03		−0.07		−0.02		−0.03	
Health benefits	0.14		−0.12		−0.17		−0.06		−0.04		−0.13	
Industry manipulation	−0.09		−0.27	**	−0.12	*	−0.15	*	−0.09		−0.13	**
Uncool	−0.08		−0.45	**	−0.19	*	−0.17		−0.14		−0.18	*
Other	−0.27	*	−0.18		−0.06		−0.23	*	−0.10		−0.12	

*$p < .05$; **$p < .01$

[†]Unstandardized regression coefficient.

[a]Comprehension is included as an independent variable only in noncomprehension models.

[b]Comprehension, *how good*, and *most thought provoking* were asked in the original ad rating sessions. Thus, exposure between the rating session and follow-up is nonapplicable for these regression models.

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Table 6. Multivariate models examining youth cognitive engagement with tobacco control antismoking advertising (N = 37)[a]

	Dependent variable											
	Comprehension		How good		Most thought provoking		Recall		Thought about		Discussed	
Independent variable	b[†]	p	b	p	b	p	b	p	b	p	b	p
Intercept	0.53	***	0.57	***	0.10		0.23		−0.00		0.14	
Youth target audience	0.18	*	−0.06		−0.05		−0.03		−0.05		−0.03	
Personal testimonial execution	0.07		0.23	**	0.16	**	0.20	**	0.13	*	0.13	**
Visceral negative execution	−0.03		0.20	+	0.16	+	0.15		0.17	*	0.15	*
Comprehension score[a]	–		–		–		0.09		0.12		−0.02	
Prior exposure[b]	0.03		0.38	*	0.07		–		–		–	
Intervening exposure[b]	–		–		–		0.22		0.20		0.06	
Theme												
Health effects (referent)	(ref)		(ref)		(ref)		(ref)		(ref)		(ref)	
Cessation	0.11		−0.20		−0.11		−0.12		−0.15		−0.08	
Secondhand smoke	0.22	+	0.03		0.05		0.00		0.03		0.04	
Health benefits	0.03		−0.17		−0.20		−0.16		−0.09		−0.15	
Industry manipulation	−0.07		−0.14	+	−0.04		−0.04		0.00		−0.05	
Uncool	−0.12		−0.22	+	−0.05		−0.02		−0.00		−0.07	
Other	−0.18		−0.01		0.00		−0.13		−0.04		−0.09	

$+p < 10$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

[†]Unstandardized regression coefficient.

[a]Family guidance theme not included as no tobacco control ads utilized this theme. Due to concerns about time of measurement endogeneity, comprehension is included as an independent variable in follow-up variable models of *recall*, *thought about*, and *discussed*.

[b]Measures of prior exposure and intervening exposure are highly correlated, and thus cannot be entered into models simultaneously. Thus, prior exposure is used in models examining outcomes measured during the rating session itself, while intervening exposure is used in models examining measures obtained at follow-up.

with appraisal (*how good* and *most thought provoking*), *recall*, and level of engagement (*thought about* and *discussed*). Although bivariate models also showed significant relationships with theme, these became nonsignificant when executional characteristics were entered into the models, likely resulting from the fact that the personal testimonial and visceral negative executions usually involved a limited number of themes. Specifically, in our ad sample, personal testimonial executions were predominantly related to ads with themes of health effects (55%) and industry manipulation (22%), and were not used in ads with cessation, family guidance, uncool, or "other" themes. Visceral negative characteristics were found only in ads with themes of health effects and "other."

Pharmaceutical ads clearly were less likely to engage youth than tobacco control ads, with lower mean proportions for *how good*, *thought about*, and *discussed*. It is interesting to note that we found no significant differences between pharmaceutical and tobacco industry ads, or between tobacco industry and tobacco control ads. The overall *N* for each sponsor is quite low, which may have limited observable effects. A larger sample size would assist in exploring this area further, especially in regard to *most thought provoking* (data in Table 4 indicate that tobacco control ads *may* be more likely to be nominated for *most thought provoking* than either pharmaceutical or tobacco industry ads).

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One possible explanation for the lack of observed difference between tobacco control and tobacco industry ads is the substantive variation of tobacco control ads in our sample. These analyses indicate that youth appraisal of and engagement with the ad is not a foregone conclusion simply because an ad has one of these sponsors versus another. Sponsors clearly differ, however, in the likelihood of having certain executional characteristics and themes. Pharmaceutical ads had neither of the executional characteristics studied here, and only a cessation theme (which significantly lowered appraisal and engagement outcomes in bivariate models). Tobacco industry ads had neither personal testimonial nor visceral negative executions, and provided a limited number of themes (none of which included health effects). To the extent that the current analyses indicate that these ad characteristics are related to higher appraisal, recall, and engagement, they are consistent with Farrelly and colleagues' (2002) conclusion that tobacco industry ads were less effective than truth® ads in promoting desirable smoking-related attitudinal or behavioral change.

This article is an initial exploration of executional characteristics. We have investigated only two of the executional characteristics that might be possible to examine, and we were limited by the 50 ads chosen for use in the rating sessions. It is highly likely that not all personal testimonials would be effective in increasing youth appraisal of or engagement with antismoking advertising. For example, the comparative effects of a personal testimonial dealing with serious health effects or the death of a loved one versus a personal testimonial dealing with social acceptance are unknown. Further, the same executional characteristic can be executed more or less fully within the same ad campaign and can have differential effects on viewers. Donovan and colleagues (2003) found that antismoking ad memorability in the Australian National Tobacco Campaign varied with the relative prominence of the same kind of visceral negative image. Future research identifying relevant executional characteristics and examining their interrelationships among themselves and thematic content is needed to help further the understanding of how to make effective public health-related advertising.

This study is consistent with other research that has highlighted the importance of personal testimonials in communicating convincing antismoking messages (Biener, 2000, 2002; Biener et al., 2000). Our findings also reinforce the use of negative visceral images, such as those used in fear appeals, as a potentially effective format (Donovan, Boulter, Borland, Jalleh, & Carter, 2003; Hill et al., 1998; Witte & Allen, 2000). Further, results suggest that many ads made with a nonyouth target audience in mind are processed favorably by youth. Although we found that ad comprehension was higher for ads targeting youth, all other outcomes were unrelated to target audience. As discussed by Hill (1999), there are good reasons why many of the antismoking messages aimed at adults may be equally successful with youth.

Clearly, all antismoking advertisements are not alike in their executional characteristics, their thematic content, the level to which they engage youth, or how youth are likely to respond. Advocates attempting to develop increasingly successful antismoking campaigns should consider the executional characteristics of proposed ads. Use of personal testimonials or visceral negative executions or both that include themes of health effects may increase the likelihood that fewer youth will be smoking in the future.

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Attachment # 1

Roche

ACCUTANE

(isotretinoin capsules)

R_x only

CAUSES BIRTH DEFECTS

DO NOT GET PREGNANT

CONTRAINDICATIONS AND WARNINGS

Accutane must not be used by female patients who are or may become pregnant. There is an extremely high risk that severe birth defects will result if pregnancy occurs while taking Accutane in any amount, even for short periods of time. Potentially any fetus exposed during pregnancy can be affected. There are no accurate means of determining whether an exposed fetus has been affected.

Birth defects which have been documented following Accutane exposure include abnormalities of the face, eyes, ears, skull, central nervous system, cardiovascular system, and thymus and parathyroid glands. Cases of IQ scores less than 85 with or without other abnormalities have been reported. There is an increased risk of spontaneous abortion, and premature births have been reported.

Documented external abnormalities include: skull abnormality; ear abnormalities (including anotia, micropinna, small or absent external auditory canals); eye abnormalities (including microphthalmia); facial dysmorphia; cleft palate. Documented internal abnormalities include: CNS abnormalities (including cerebral abnormalities, cerebellar malformation, hydrocephalus, microcephaly, cranial nerve deficit); cardiovascular abnormalities; thymus gland abnormality; parathyroid hormone deficiency. In some cases death has occurred with certain of the abnormalities previously noted.

Accutane Lawsuit

http://www.accutane-side-effects.net/side_effects/news.html

Accutane lawsuit news has been a pertinent topic to families and patients everywhere ever since the acne medication's entrance to world markets. Receiving FDA approval in 1982, Accutane has been linked to deadly and serious Accutane side effects from the start. A lucrative drug for manufacturer Hoffmann-La Roche, an estimated five million people in the U.S. have taken Accutane alone, making it the highest profitable drug the company has. Roche appears to have a high number of Accutane lawsuits to battle in the future as insider information has surfaced, indicating the Accutane manufacturer was aware of the deadly effects that could occur but failed to adequately inform the FDA, physicians, and patients of them.

It took almost twenty years for Roche to put into place a safety program to adequately warn women of the birth defects and fetal deaths that occur when using Accutane while pregnant even though the company knew of the serious risk of birth defects since 1971. It was not until the FDA first recommended "active consideration of removal of Accutane from the market" that Roche responded. Even in 2001, research showed women were still not receiving the message that using Accutane drastically increases chances of birth defects.

Roche had denied the connection between Accutane and certain psychiatric disorders, including depression leading to suicide. After French health officials ordered that Roche include warnings of suicide attempts to the Accutane side effects sections in 1997, the company failed to notify the FDA of these developments. Roche could have chosen to warn Accutane users that suicide has been observed in Accutane patients, however they did quite the opposite in attempts to continue promoting the popular medication.

When the FDA told Roche to include warnings of psychiatric disorders, including suicide on Accutane labels, the company advertised nearly the opposite. Roche tried to use the argument that acne causes people feelings of depression and since Accutane is used to treat acne, Accutane was lessening feelings of depression. The FDA responded by issuing a warning letter, finding Roche's Accutane advertisements to be false and misleading, in addition to being "particularly troublesome."

When Michigan Rep. Bart Stupak's son committed suicide while on Accutane, it struck a personal chord, resulting in an aggressive attempt to gain more information on the extent of Accutane side effects. Stupak has not yet taken any individual steps toward an Accutane lawsuit but hopes other Accutane lawsuits will bring more attention to the Accutane side effects to people hearing about the Accutane legal news. Families that have suffered suicide losses linked to Accutane have had similar stories as Stupak in that their children failed to show any signs of depression prior to the suicide act.

A December 11, 2002 hearing on Accutane focused on Accutane birth defects, depression, and 173 suicides. The SMART program was designed to prevent birth defects from occurring with women using Accutane. Roche claimed that only 2,300 pregnancies have occurred since Accutane's entrance to the market, however Stupak has found that according to a 1990 Roche

Accutane report it indicated in a three-month period alone during 1999 there were 93 unwanted pregnancies reported and 42 abortions occurred.

A 1990 FDA report stated 11,000 to 13,000 Accutane Accutane related abortions and 900-1,1000 Accutane birth defects had been suffered. In 2001, reports indicated that women were still ill informed of dangers of birth defects and Accutane use and after the SMART program was strengthened at the start of 2002, a national group that tracks prenatal birth defects exposures says reports are showing women are still becoming pregnant while taking Accutane.

While Roche has maintained that there is a lack of scientific evidence showing proof of depression or suicide resulting from the use of Accutane, a 1997 FDA memo indicates Roche agreed with the agency that there was in fact a problem. Roche officials have denied this memo reference. Despite any scientific evidence or not, this does not change the fact that the FDA has confirmed 173 suicides amongst Accutane users since 1982. Based on evidence alone, a medical officer with the FDA back in 1998 stated that it was hard to avoid concluding that Accutane can affect the human brain and is associated to serious psychiatric disorders in some patients.

Due to under reporting, some people fear the actual number of Accutane patients affected by Accutane side effects is much higher. The actual figure of suicides associated to Accutane use could be as high as 20,000, according to an FDA official that says only 1% of suicide adverse events are ever even reported. Now, in addition to links between Accutane and birth defects and psychiatric disorders, reports of possible connections between Accutane and inflammatory bowel disease and lupus have been made as well.

As more Accutane lawsuit news become available following the December 2002 U.S. House of Representatives Energy and Commerce Committee Oversight and Investigation Subcommittee, the future of Accutane will unfold. The number of Accutane lawsuits to be filed and settled will soon tell what type of future Hoffmann-La Roche is in store for.

More Accutane Lawsuit Articles...

October 9, 2003, "Accutane Maker Accused of Contributing to Suicide of Teenage Boy"

May 23, 2003, "Accutane Sparks Worldwide Concern"

Attachment #2

HarrisInteractive®

A Generation Unplugged

Research Report

September 12, 2008

Methodology

- The study was conducted online among a nationally representative sample of 2,089 teenagers across the U.S. who have cell phones (ages 13-19). More than 100 questions were asked on mobile phone usage, attitudes, behaviors, and teens' desires and aspirations for the future including mobile communications and entertainment. The study was conducted in July 2008 among teenagers who are part of the Harris Interactive Online Panel.

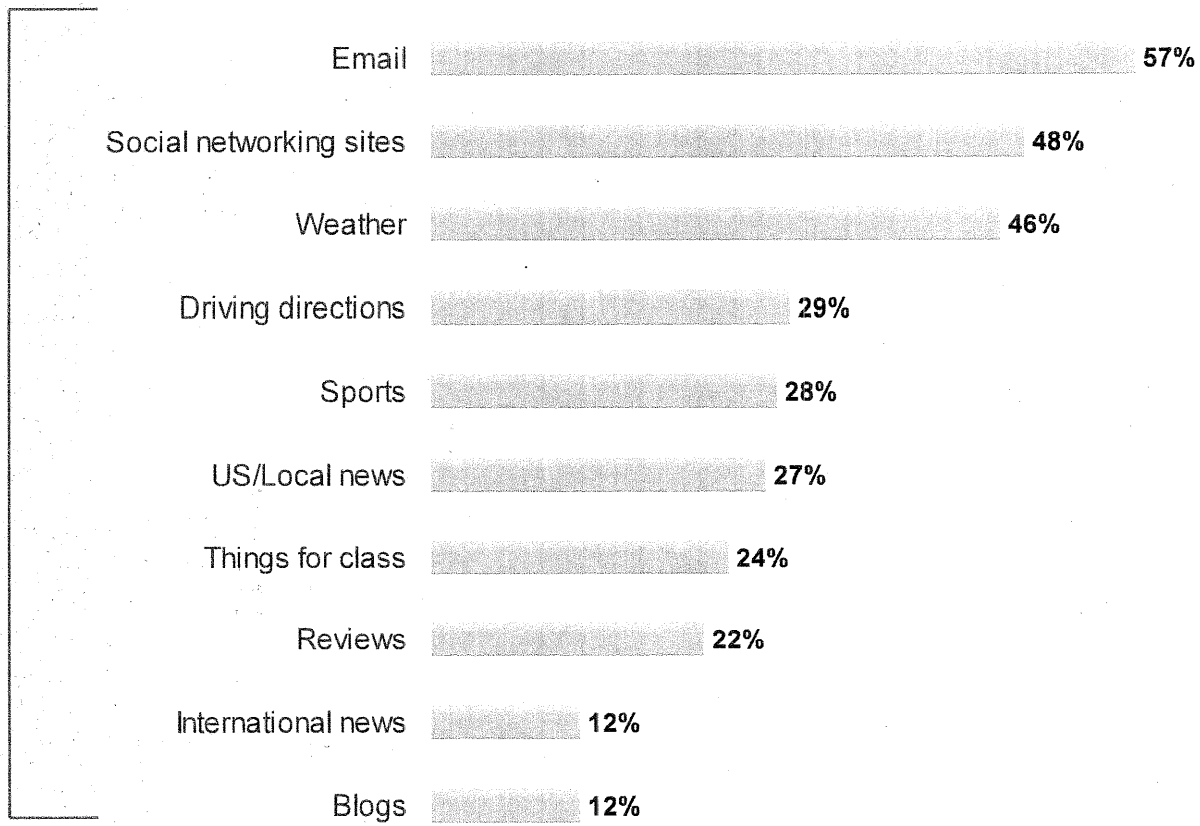
Social and Personal Information Browsers

Almost 1 in 3 teens is browsing the web on their phone

Do you browse the web on your cell phone?

Yes 28%

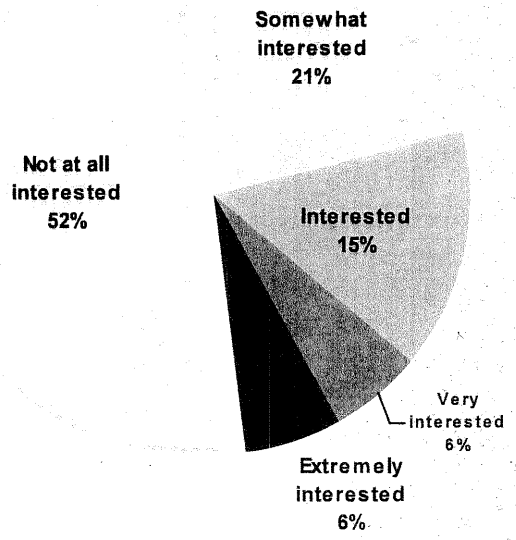
No 72%



Q835 - What types of information do you browse for on your cell phone? (n=2189)

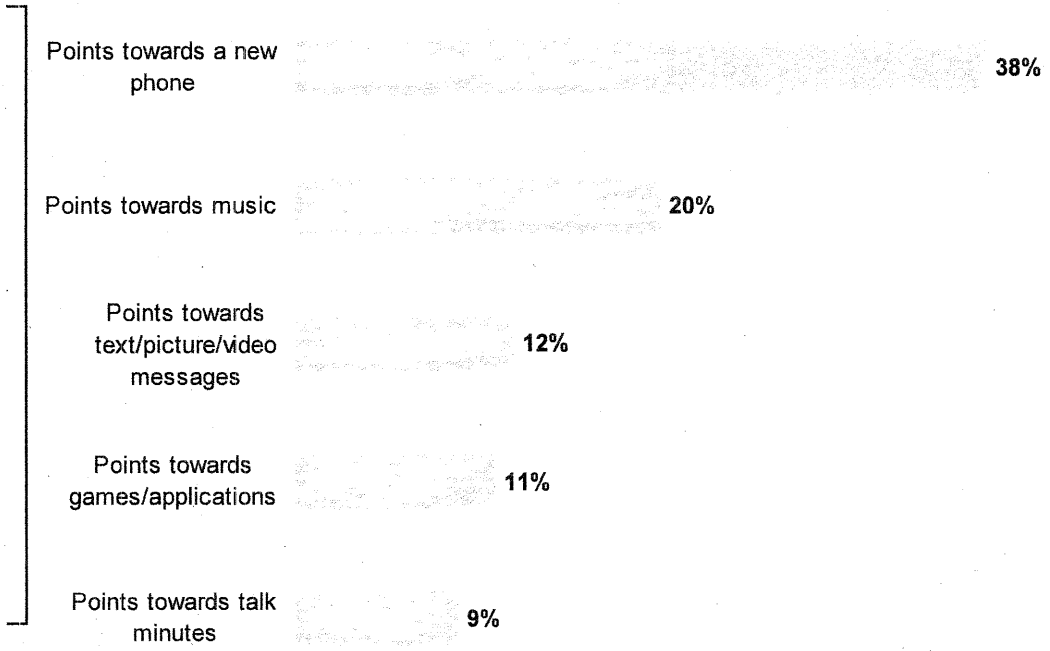
Mobile Advertising

General Mobile Ads Interest



Teens have a higher acceptance rate than adults (64% - Not at all interested)

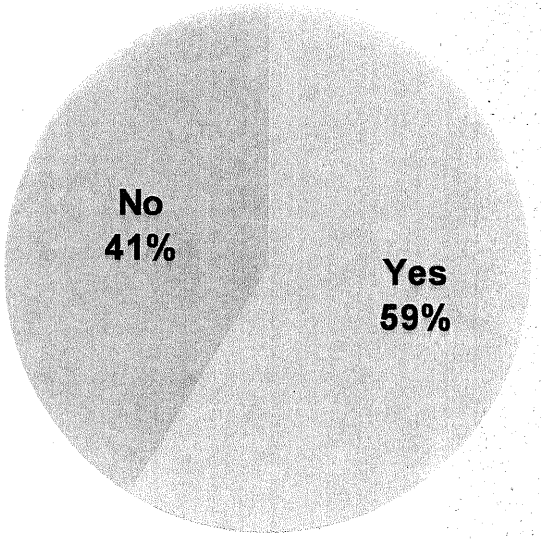
Of those with some interest in mobile ads …



Q1130 - How interested would you be to receive advertisements on your cell phone if some incentives were offered by the cell phone provider in return? (n=2189)
Q1135 - I would be more interested in receiving ads on my cell phone in exchange for reward points that can be used towards . . ? (n=1021)

Great News For Mobile Advertising
6 in 10 Teens Willing Provide Personal Information

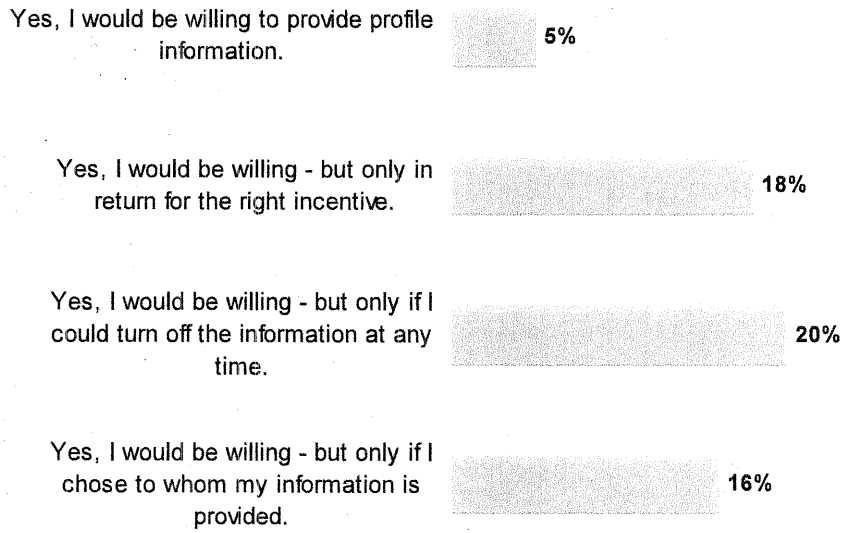
Willingness to Provide Profile Information



Teens have a lower willingness to provide profile information than adults (9% - Not at all interested)

Trust to Keep Profile Info. Safe:

28% Cell Phone Provider
11% 3rd party company that deals w/ personal info security
2% Cell Phone Manufacturer



Q1150 - Which of the following best describe your willingness to provide profile information about yourself to your wireless provider so that ads could be custom tailored to your needs? (n=2189)
Q1155 - Who would you be willing to trust to keep your profile information safe? (n=2189)

Attachment #3

From the website "YPulse Research: Research about generation Y for Media and Marketing Professionals"

http://research.ypulse.com/2008/06/17/teen-topix-teens-internet-spring-2008-otx-and-intelligence-group/

Teen Topix Teens & Internet, Spring 2008 | OTX and Intelligence Group

New Research from OTX and Intelligence Group Looks at **Teens' Online Behavior**. We know that teens are spending more time on the Internet, but what are they doing there? Are they spending money and paying attention to advertising? Are they continuing to do the same things every year or are some online activities becoming more popular than others? OTX and their Teen Topix Partners, eCrush and Intelligence Group, interviewed 751 teens 13-17 that use the Internet more than one hour a week to find out what's happening online - what's hot and what's not – what will be the new trends? This report includes a 20-page Executive Summary with charts, plus two, 302-page files containing data tables.

The study found that teens are spending an average of 11.5 hours per week online, doing everything from instant messaging and visiting social networking sites to shopping and listening to music, but dispels myths that this group wants to do everything online. When asked a series of "would you rather" questions, teens chose reality over virtual reality in many aspects of their lives. Given the choice, teens prefer real friends (91%) to online friends (9%), date someone from school (87%) over someone from the Internet (13%), and shop in a store (82%) to shop online (18%). Interestingly however, teens would rather get their locker vandalized (63%) than their homepage (37%), and IM a friend (54%) over calling (46%).

"Teens are not a 'one size fits all' market and the Teen Topix reports show this group to be complex, sophisticated consumers and media users, just as we all are," says Jane Buckingham, President, The Intelligence Group. The study did find that 24% of teens are spending more than 15 hours a week online and when all teens were asked how frequently they do typical online activities, instant messaging came up as the most frequent activity, followed by visiting social networking sites, email, searching, and visiting virtual community sites.

"Many of these online activities take place simultaneously; for example, teens are IM-ing and searching the web at the same time," says Bruce Friend, President Media and Entertainment Insights for OTX. "Teens like the rest of us live in a world of increasing media and technology options, and our Longitudinal Media Experience (LMX) study confirms that teenagers are often heavy simultaneous media users."

The study also found that 58% of teens have made a purchase online. On average teens who make purchases online are spending $46 per month, and 26% of teens are spending $50 or more. Clothes and music are the two most popular online purchases, followed by books, electronics and DVDs. The bedroom (36%) and living room (24%) are the places teens are most likely to have their primary computer. Teens with their primary computer in their bedrooms are more likely to be heavy internet users (15+ hours per week) and spend money online.

Teens are however aware of the risks associated with online life: 78% of teens are concerned about computer viruses while online, followed by identity theft (67%), unauthorized access to personal information (65%), Scams (60%), and Spam (60%).

The study also confirms the popularity of social networking sites, with 95% of teens saying they have belonged to a social networking site at some point. The average teen has signed up for over four social networking sites and currently belongs to two. Teens report learning about music, other websites, movies, TV shows, and new trends from social networking sites. Teens are receptive to advertising on these sites, where the majority of teens learn about financial services (63%) movies in theaters (59%), mobile services and accessories (58%), travel (57%) and other websites (53%) from ads on these sites.

Posted June 17, 2008

Attachment # 4

Monday, June 25th, 2007 by Jordan McCollum

Marketing to Teens: Social Networking

Stop hunting for the perfect search marketing firm...
...Andy Beal will bring them to you...for FREE! .::: SEM Vendor

If you're trying to reach teenagers online, you probably already know that social networks should be a part of your Internet campaign. Both the BBC and MarketingSherpa have stories out that can help improve your social network marketing to teenagers.

Using existing social sites

If you're segmenting your campaign based on profiles, income or aspirations, the BBC covers a study that could help you. The UC-Berkeley study that finds a completely different "class" of American teenagers on MySpace versus those on Facebook. MySpace users, according to the BBC, tend to be minorities and get jobs straight out of high school, while Facebookers tend to be white, go to college and come from wealthier homes, being part of a more "aspirational class."

While the study doesn't comment on the correlation between parents' wealth and college attendance, it does acknowledge that "class" in the US doesn't necessarily correlate with income. (If you want to examine the class system in the US–heresy to say there is one, I know–read *Class* by Paul Fussell.)

Danah Boyd, PhD student at UC-Berkeley and researcher on the project, commented that "MySpace has most of the kids who are socially ostracised at school because they are geeks, freaks, or queers." She also concluded, "This division is just another way in which technology is mirroring societal values."

However, you also have to wonder if the larger subscriber base on MySpace (57M to Facebook's 25M) mitigates the effects of the studies.

BusinessWeek

Attachment #5

VIEWPOINT November 7, 2007, 5:27PM EST

Marketing to Teens Online

Online marketing not only invades privacy; it often misses the mark. An "opt-in" system would protect kids and help advertisers target customers

by Anastasia Goodstein

With Facebook's decision to allow advertisers to display ads based on information users post on their profiles, the debate over online privacy has gained new momentum, especially since today's teenagers are living out a big chunk of their lives on social networking sites. Advertisers can now target underage consumers with relative ease, raising obvious ethical questions. But even if there were no such worries, marketers would need to be aware of pitfalls in trying to reach young consumers online.

Privacy advocates fret about marketers abusing the rich treasure trove of very personal data being posted by teens these days. At present, the only law that regulates online marketing to children is COPPA, the Children's Online Privacy Protection Act, which requires parental permission before any commercial entity can collect personal information from a child under 13. But there's no law that governs marketing to older teens.

Privacy groups are also advocating for a "Do Not Track List." This would give consumers of all ages the right to opt out of marketing efforts wherein a Web site places "cookies" on a user's computer to monitor their surfing habits and deliver ads deemed appropriate to that behavior. But again, there are no special protections here for teens.

Yet while there's little to stop marketers from targeting the young, there are practical reasons why these efforts may backfire with teens. And with these in mind, there are practical ways for marketers to find and target a more receptive audience of young consumers.

THE LYING GAME

First and foremost, marketers need to grasp one basic reality that can turn their "targeted" ads into scattershot: Lying on the Internet is rampant. Just ask Tom Anderson, a MySpace (NWS) founder who was recently outed for lying about his age to make himself a couple of years younger. Adults lie on Internet dating sites all the time to make themselves a few pounds lighter or a few inches taller.

There are many reasons kids and teens lie when they go online. Here are just a handful:

• Kids are exploring their identities. This is a natural part of growing up—you try on different identities as a way to see how people respond and see what fits. Part of it is just playing, too. Remember pretending you were someone else and acting out different scenes in the backyard or playing Dungeons & Dragons in the basement? Likewise, the ease with which anyone can open multiple accounts on a Web site or create different avatars makes this type of exploration and play a natural part of a teen's digital life, just as it remains a stage of growing up in the offline world.

• Children yearn to join "cool" sites even if they're too young. Take a quick poll of middle schoolers (without their parents around) and ask if they have a MySpace or Facebook profile. Many will say yes —and that they've

listed their age as 100, or at least much older than 11 or 12. Know any teens who buy or sell on eBay (EBAY), where you're supposed to be 18 to do so? I thought so. Tweens are aspirational. They want what older teens have, and if it's as easy as fudging their ages online to get it, they're going to lie.

• Children also don't want to be forced to make their social network profiles private. By default, MySpace makes private all profiles of users age 15 and under as a protective safety measure. Naturally, since some 14- and 15-year-olds want their profiles visible to the world (and don't realize they can go into their default settings and override this), they'll lie to change the default setting.

• Kids also lie on the Web to avoid creepy predators. One parent told me her 13-year-old son's MySpace profile says he's 26 and married with two kids. Teens, sometimes with parental encouragement, will give this type of false information because they don't want to be bothered by adults looking to chat it up with children.

• Since they've grown up being marketed to since birth, many children like to mess with marketers. Teens are pretty savvy about the reality that registration information they give online will be used for marketing purposes. Some of them will intentionally provide false information just to thwart those efforts.

Remember that since most teens use social networks to hang out virtually with the same friends they see at school all day, it doesn't matter if they lie because their friends are all in on the conceit. It's just something teens do for the reasons stated above.

With all this lying going on, there will be a lot of behavioral targeting of ads that completely misses the mark, with hordes of teenage "100-year-olds" getting pitches for cholesterol drugs and incontinence products.

TEENS WANT MORE CONTROL

While teens may mess with advertisers as a way to fight back against the onslaught of marketing they are exposed to, they are not averse to all marketing. This is especially true if they love a product, the marketing offers some extra value, or it's simply funny and creative. As they're used to controlling their online experience, they strongly dislike pop-up ads or spam in the form of instant messages and text messages—particularly when the communications are out of context.

When Facebook first launched its newsfeed feature, allowing your entire network to see your every action, its users were outraged. Facebook remedied the situation by allowing users to control exactly who gets to see the newsfeed, photos, or other aspects of your profile.

Notably, in addition to its new targeted marketing effort, Facebook also announced on Nov. 6 that it plans to let advertisers create their own profile pages so that users can identify themselves as fans of a product. MySpace has been doing this for a while now , and the response has been strong. Droves of teens have "friended" the MySpace page set up by Wendy's (WEN) for a square hamburger named "Smart." Similarly, Condé Nast's teen site Flip.com asks its users which ads they want to be displayed on their profiles when they register.

Approaches like these offer multiple benefits: They make teens understand that advertising pays for a Web site, get them to think about the products being offered, and let them consciously choose to align themselves with a specific brand. By giving younger users more control and choice over what ads they'll see, they may have more respect for the service and for the advertisers. This in turn may lead to word-of-mouth recommendations, a major force behind teen purchasing decisions.

The lesson here is that the real way to reach younger users on social networking sites is to be transparent about the need for advertising to support a free service. Then allow them to actively participate in determining

what kinds of advertising they receive through a series of questions. Reward them for filling out the whole survey with a cool prize.

Instead of scraping their profiles and hoping your ads hit the right target, are noticed, and then actually clicked on, why not engage users to find out what kinds of ads would appeal to them? By allowing them to deliberately opt in and share information with you, they can maintain a comforting sense of control, and you can serve ads that will hit their target.

Goodstein is the publisher of Ypulse.com. Her book, Totally Wired: What Teens and Tweens Are Really Doing Online, was published by St. Martin's Press in March, 2007 .

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Advertisers in touch with teens' cellphones

Youths are signing up to have pitches, photos and links to websites sent to their multifunction mobile devices.

LA Times, By Alana Semuels, May 23, 2008

Some teens do mind, however, if advertisers bug them too overtly, said Alyson Hyder, media director for California at Avenue A/Razorfish, a digital marketing firm.

"They will be quick to turn on the backlash," Hyder said. That's why "brands that target the teen audience are looking at more authentic ways to insert themselves into the conversation, as opposed to advertising."

For a Nintendo Co. campaign, rather than send teens an ad about a new Nintendo game, mobile-phone marketing firm Hyperfactory published a brain teaser relating to it in game magazines. Users sent a text message to get the answer, and they received a message back with a link to sign up for alerts about the game and download free wallpaper and mobile games. The company declined to say how many consumers participated.

When Kiwibox.com, an online teen magazine, launches a service to send teens text messages with horoscopes and celebrity alerts this year, they'll include a short advertisement at the end sponsored by different brands such as Sparq Inc., a company that designs workout training programs for aspiring athletes, and Paramount Pictures.

But it can be a thin line between the type of product pitches that teens will accept on their mobile phones and those they won't.

Quentin Brown, an 18-year-old high school senior from Santa Monica, said he texted to vote during the National Basketball Assn.'s slam-dunk competition at this year's All-Star game. In return, he received a flurry of text messages with offers to buy jerseys and other basketball-related stuff. He didn't mind the texts for the jerseys, since he's interested in them and always looking for deals. But he didn't like getting ones about things he didn't care about, such as asking him to join an NBA fantasy draft or go to NBA summer camp.

"They were kind of stalking me," he said. "But then they stopped and I was glad."

alana.semuels@latimes.com

Tuesday, February 20, 2007

Marketing Drugs to Teens Online - So Wrong!

Society recognizes that teens don't have the judgement required to evaluate messages related to alcohol, tobacco, etc. So why are some pharmaceutical companies getting away with beaming Insomnia and ED Rx drugs ads to teens on the Web?

James Gardner, a Boston-area marketer who follows online pharmaceutical advertising at his hobby website -- adverlicio.us/pharma, an archive of online pharma ads -- brought the practice to my attention.

"This awakens in me memories of watching the Super Bowl 4-5 years ago and having Bob Dole uncomfortably intrude on a *family* moment with a discussion of ED," says James. (Actually, the first DTC ads appeared during the Super Bowl game 2 years ago. It was Cialis -- see "Super Bowl DTC Debut: Was It Good for You?" But you get the point.)

James showed me an unbranded FREE OFFER ad for AmbienCR on the site of Seventeen Magazine, but he was particularly concerned about a branded ad for Levitra that he found on the family -- ie, rated E for Everyone -- section of miniclip.com, "an awesomely fun game site." The screen shot is shown below.

This follows a recent Wall Street Journal article that suggests that TV ads for impotence drugs again are crossing the line (see "New Impotence Ads Draw Fire -- Just Like Old Ones").

"In December alone," reports the WSJ, "an ad for impotence drug Viagra aired at around 9 p.m. during 'Prancer,' a G-rated movie about a young girl who nurses one of Santa's reindeers back to health; another spot for rival medicine Levitra appeared during an afternoon showing of the comedy 'Pee-wee's Big Adventure;' and another for Cialis graced an early-evening presentation of the holiday classic 'Miracle on 34th Street.'

"Despite a pledge from the pharmaceutical industry to be more careful with prescription-drug advertising, impotence-drug makers are sliding back to tactics that drew widespread criticism from patients, doctors and regulators. A pediatricians' organization is calling for no impotence ads during hours when children are likely to be watching, and a major AIDS group has expressed concern that ads have become too suggestive again, encouraging people who aren't suffering from erectile dysfunction to use the drugs recreationally."

Blaming the Medium, Not the Message

Pfizer and other advertisers claim that ad placement isn't always under their control, especially on cable channels, where unlike network TV, they cannot purchase time on specific shows.

You would think, however, that it would be much easier on the Web to put ads exactly where you want them.

"Levitra has no business on a family gaming site," says Gardner. "Unless miniclip.com is some kind of exception to the rule, every site offers the ability to buy only certain 'channels' (i.e. not the family one), and the ability to predict visitor demographics."

I admit he's got a point.

NOTE: FDA is concerned about unsafe drugs purchased through the Internet (see "FDA Alerts Consumers to Unsafe, Misrepresented Drugs Purchased Over the Internet"). Maybe they should also worry about drugs being advertised to teenagers on the Internet, especially drugs like ED medications and sleep aids, which have not been tested in children under 18.

"Advertisers often have an option to alert cable channels in advance when a specific program isn't appropriate for their ads," notes the WSJ. They could do the same thing on Web sites like miniclip.com -- just flag the family section as off limits.

You might defend GSK/Bayer -- the companies responsible for the Levitra ad -- and claim that the agency that does their media buying is responsible. Gardner, however, doesn't buy that defense. He who pays the piper is ultimately responsible.

"Blindly buying media through advertising networks without know **exactly** where your ads are being placed is not only foolish, it's just plain wrong!" he says.

I second that thought and ask PhRMA again, **where are your principles for online DTC advertising?**

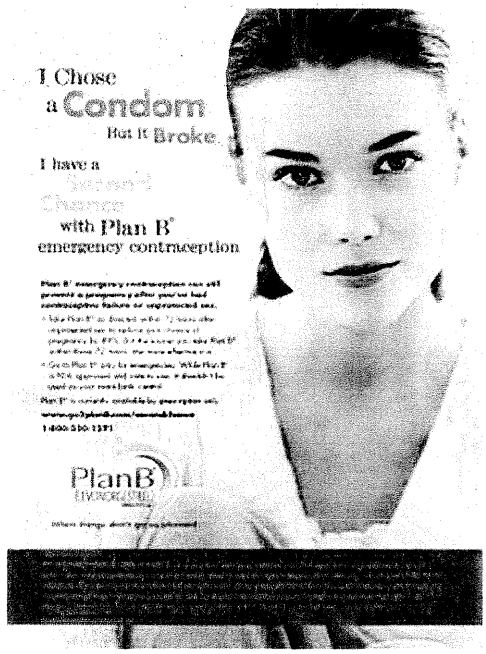
Dr. Paul Antony, a reserve officer in the U.S. Navy Medical Corps, PhRMA's Chief Medical Officer and Director of its Office of Accountability, may be reading this blog. After all, he did write me to acknowledged my concern over other violations of PhRMA's DTC principles (see "PhRMA Responds to My Rozerem Ad 'Concern'"). If you are reading this Dr. Antony, I invite you to submit a comment in response to my question.

Posted by John Mack at 7:24 AM

Marketing plan A for Plan B

Now that Plan B is approved for sale OTC and by prescription, Barr Pharmaceuticals is faced with the task of marketing it. What's their marketing "plan A" for Plan B?

A few insights to Barr's thinking can be found in a recent Wall Street Journal article ("A Subtle Method for Selling Plan B").



Contrary to the title of the WSJ article, the evidence so far hints at a not-so-subtle approach. For example, the ad shown on the left has run recently in Lucky and Cosmopolitan magazines. It plays upon the fear of "contraceptive failure" -- "I Chose a Condom, But it Broke." Have no fear, Plan B is here!

Of course, we all know that accidents can happen, although I have never experienced a condom breaking.

Planned Parenthood provides these condom statistics: "Of 100 women whose partners use condoms, about 15 will become pregnant during the first year of typical use. Only two women will become pregnant with perfect use."

We could argue if that is an acceptable risk or not. But just like drugs with side effects, I wouldn't want to be among the two percent that suffers the problem.

But if the same fear campaign tactics were used with other drugs -- like statins -- we might protest. "I exercised and ate right, but I still got a heart attack. Next time, take Pravachol!" is different than "Along with exercise and diet, Pravachol can help you prevent a heart attack."

That's one reason why you won't see broad-based Plan B TV ads that talk about "contraceptive failure." "...playing up the sexual factor rather than medical information makes some regulators uncomfortable," according to the WSJ article. TV is just too visible, politically speaking.

"You won't see that from us," says Amy Niemann, Barr's vice president of proprietary marketing. "We have been and will continue to be committed to responsible marketing with this product."

So, what will we see?

Plan A: Internet-based Behavorial Marketing
"The Internet and other, more subtle marketing methods could prove very effective in promoting Plan B, says Anne Devereux, chief executive of TBWA World Health, an Omnicom Group network of health-care marketing agencies. [WSJ]

The most subtle Internet Marketing technique I know of is behavioral targeting (see "Behavioral Targeting: RJ vs JP").

Behavioral marketing, which categorizes users based on their previous Internet searches and then serves them relevant ads no matter where they are on the Internet, may be just the ticket for Plan B Internet marketing. I have dissed the technique elsewhere (op cit), but think it is a perfect idea for Plan B! No, really! The main advantage to Barr is the stealthiness of behavorial targeting -- behavorial-targeted Plan B Internet ads will simply be invisible to Senators and Congressmen!

Here's how it could work.

Let's assume the demographic is a female teen between the ages of 14 and 19.

BTW, Barr shouldn't worry about the 18-year minimum for OTC purchase -- I assume, just as with underage boys and beer, underage girls can get the help they need for an OTC purchase of Plan B. Besides, I've heard that an old marketing maxim says to direct your ads at a younger target audience than your typical user. This maxim has been applied with a vengence in the erectile drug market (see, for example, "Pushing the Envelope is Bad for DTC"). Of course, Barr will have to keep its marketing strategy very confidential -- they may need a bunker like the one in which Pfizer's Kindler relaxes.

Instead of the old-fashioned approach, where you place ads on Web sites and pages where these girls hang out, why not let Yahoo! develop a targeted category of teenage females based on their recent searches and deliver ads to them *whenever they are* on the Internet?

You could, for example, categorize users by searches on topics related to music, brands, cosmetic procedures, etc. that are popular with young women -- anything that would put them into a "female sexual promiscuity" category. (I know...fiendish, isn't it?)

"You are no longer targeting people you think will be interested in your product," said Les Kruger, a senior marketing manager at Cingular. "We know based on your behavior that you are in the market, and we can target you as you bounce around the Internet." (See "Marketers Trace Paths Users Leave on Internet".)

Ads run within context on relevant pages may be ignored whereas behaviorally-targeted ads are "less expected and [are] playing to your subconscious," says Lydia Snape, the director of online marketing at Renegade Marketing, Panasonic"s Internet advertising agency.

So, when there's a contraceptive emergency, you know right away about Plan B, because you've been seeing the ads for some time in a lot of the places you go on the Internet -- and not just places that talk about emergency contraception.

Internet Marketing through Facebook: Influencing Body Image in Teens and Young Adults

http://www.selfhelpmagazine.com/article/facebook

by Michele Foster, BA

Many parents of today's teenagers are uncertain about what social networking websites, such as Facebook, involve. One mother I interviewed guessed that adolescents and young adults use Facebook primarily to "chat online and share pictures". She is certainly correct about these features being part of Facebook's ever-expanding activity list. However, Facebook is also a place where young women can access dieting tips, search for "thinspiration", join pro-anorexia discussion boards, and take part in competitions for the thinnest bodies. This article provides parents with information about the negative influence that Facebook internet marketing can have on young, impressionable teens and on women who are suffering from body image concerns or disordered eating. There are also many practical tips for immediate action to counteract negative effects of online marketing in Facebook and other social networking website advertising.

Facebook and Advertising

Facebook is the world's largest social networking website (Holahan, 2008), and it is also the most popular site amongst 17 to 25 year olds. Ironically, this is the most common age range for the development of eating disorders such as Bulimia Nervosa and Anorexia Nervosa in women (Cavanaugh & Lemberg, 1999). Facebook seems to recognize that many of its female users suffer from body image concerns, and it uses this information to appeal to advertisers. For example, it is no secret that exposing women to images of thin celebrities causes them to feel dissatisfied with their own appearance (Grabe, Ward & Hyde, 2008). By featuring advertisements with pictures of actresses boasting "The Supermodel Diet", Facebook's advertisers hope that viewers will feel badly enough about their own physiques to click on the ad for a solution. Facebook capitalizes on the psychological research findings by allowing advertisers to select their audiences based on the demographics and information written in the user profiles. As such, all female users are bombarded by weight-loss ads featuring celebrities and promoting diets, and women who are listed as engaged see an ad that says "Do you want to be a fat bride?"

Many of Facebook's users have complained about the increasing number of dieting ads featured on the site. With disordered eating plaguing more and more of North American females, the last thing women seem to want is a reminder of their perceived imperfections. In fact, there are several Facebook groups dedicated to stopping dieting ads on the popular social networking site. In July 2008, Facebook responded to public pressure and decided that advertisements would no longer portray specific body types in a "negative light". Although users no longer see advertisements featuring large bellies that say "DISGUSTING", users are still exposed to messages informing them that they could be (and apparently should be) thinner. More recently, Facebook also embraced an application that allows users to rate advertisements, which makes it easier for individuals to edit those to which they are subjected. Nonetheless, Facebook has

ensured that each "Supermodel Diet" ad features a different celebrity image to prevent the advertisement from completely disappearing from the pages of vulnerable female users. As such, if, for example, viewers deem Miley Cyrus' image offensive, they will then be shown an ad promoting the "Supermodel Diet" with another celebrity image instead. It seems that abandoning dieting advertisements all together would cost Facebook too much revenue. This is just one of many examples of how Facebook preys on the vulnerability of its female users, placing their business before the well being of their subscribers.

Wiki'd World

The term "Wiki'd" describes websites which allow consumers to control content with little or no limitations. This term originated as a descriptor for the popular website Wikipedia, which permits anyone to submit word definitions and information for public consumption. Of course, one can argue that Facebook has also been "wiki'd". Unlike mainstream film and television media, which screens messages sent to the public for appropriateness, Facebook is reluctant to censor content, including that which supports eating disorders. Facebook spokeswoman Caely Cusick argued that "Many Facebook groups relate to controversial topics; this alone is not a reason to disable a group. Facebook supports the free flow of information". Nonetheless, many user groups continue to glorify disordered eating despite violating Facebook's terms of use, which suggest that the administration can remove groups or pages "which might...harm, or threaten the safety of users or others".

Fortunately, Facebook has slowly begun to reply to pleas from doctors and eating disorder specialists who have suggested that pro-eating disorder pages are encouraging women to refrain from seeking treatment. Although Facebook has begun to more willingly crack down on groups that disobey the website's terms of use, there still remain an abundant number focused on glorifying disordered eating and extreme dieting, as well as groups which argue that average-sized or heavier women are unattractive and unfavourable as partners. Despite Facebook's new willingness to shut down some of these groups, they seem to be popping up much faster than they can be eradicated. This is a testament to the fact that many of Facebook's users suffer from eating disorders and are committed to resurrecting groups that have been shut down, and to starting new ones as quickly as possible. And although Facebook is asserting that groups adhere more appropriately to their terms of use, Facebook seems to be ignoring these terms by publishing dieting ads to users they know are suffering from body image concerns, and by therefore acting in a way that might harm people.

So What Can Parents Do?

It is my hope that those who read this article will not simply ban their children from using Facebook or enforce rigid rules for use. Instead, it is important for parents to have open conversations with their children about how they can protect themselves from Facebook's negativity. There are several actions that parents can take to help safeguard their children and teenagers:

- **Direct your children** to websites that encourage the growth of positive body image and self-esteem, such as the National Eating Disorder Information Centre's Real Me Experience, created with the support of Dove (www.realme.ca).
- **Keep computers in high-traffic areas** when your children first begin experimenting with the internet. For example, by placing the computer in the kitchen or family room, children are less likely to visit controversial pages, and you can keep a watchful eye on the sites they view.
- **Teach your children** how to use the "thumbs down" icon located underneath ads on Facebook to report them as offensive, misleading, or repetitive.
- **Offer your children compliments** not only about their appearance, but also about their character to help strengthen their self-esteem and to inoculate them against potentially damaging information.
- **Encourage media literacy** in your home by helping your children understand that images portrayed on the internet and in advertisements are air brushed.
- **Prevent passive media viewing** by asking questions and encouraging **critical thinking** ***(deep thought.)***
- **Spend more time together** as a family so that you can have the dominant role in teaching and supporting your children.
- **Check your own biases** and try to regard all body types (including your own) as beautiful and acceptable.
- **Speak with your children** about the dangers of dieting.

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About the Author:

Michele Foster is completing a Master's degree in Counselling Psychology at the Ontario Institute for Studies in Education of the University of Toronto. She has worked as a clinician and researcher in the field of disordered eating for the past three years. She plans to pursue a Doctoral degree, and will continue to focus on issues pertaining to body image.

10/6/08

The Washington Post

What Teens Are Hearing About Drugs

Some Messages Help, Others Are Troubling

By Francesca Lunzer Kritz
Special to The Washington Post
Tuesday, September 9, 2008; HE01

Here's a multiple-choice question for parents of tweens and teens.

You're monitoring your child's cellphone and come across a text message encouraging her to try a prescription drug. Could the message be coming from:

A. a drugmaker trolling for a new customer.

B. an adolescent friend urging a raid on your medicine cabinet for a "pharm" party.

C. a trusted physician, offering a reminder to the 25 percent of teenagers who take a daily prescription for conditions ranging from allergies to cancer.

D. any one of the above.

The answer? D. These days, messages aimed at drawing teens' attention to drugs are being televised, e-mailed, texted and even downloaded with music every day.

"These new media choices create a buzz and certainly a perception of a rising trend toward targeting teens," says Jim Joseph, executive vice president of Saatchi & Saatchi Consumer Health+Wellness, a Manhattan advertising agency.

The challenge for teens, and for adults who care for them, is to figure out "how to wade through the clutter of messages they're getting about drugs -- both prescription and nonprescription ones -- in order to make safe and appropriate choices," says Wayne Snodgrass, a professor of pediatrics and pharmacology at the University of Texas Medical Branch in Galveston and chair of the American Academy of Pediatrics Committee on Drugs.

"There's been a demystification of prescription medications for teenagers," says Sharon Levy, director of the adolescent substance abuse program at Children's Hospital Boston. According to a survey published last month by the National Center for Addictions and Substance Abuse, a growing number of teenagers say it's easier to illegally obtain prescription drugs than to buy beer.

Experts blame a cavalier attitude toward drugs for a growing incidence of prescription drug abuse by teens. Every day, 2,500 kids ages 12 to 17 abuse a prescription painkiller for the first time, according to John Walters, head of the White House's Office on National Drug Control Policy; the number of

teen patients treated for prescription painkiller abuse grew threefold between 1995 and 2005.

"Teens are abusing prescription drugs because many believe . . . these drugs provide a 'safe' high," Walters says.

At the same time, many teens fail to stick with a prescribed drug regimen for a chronic condition such as asthma, depression or diabetes. "Parents have a crucial role to play in all this," Snodgrass says, "by making it clear that drugs are only safe and effective when they're specifically prescribed, and when taken appropriately."

Drug Ads Just for Teens

When it comes to direct-to-consumer advertising for prescription drugs, permitted by the Food and Drug Administration since 1997, there are no specific rules for marketing to kids and teens, says Robert Temple, director of the Office of Medical Policy at the FDA's Center for Drug Evaluation and Research.

"Appropriate situations for drug companies to specifically address teens include those where the teen could benefit from a medication but might not necessarily start the conversation with an adult," says Meredith Ressi, vice president of research at Manhattan Research, a health-care market research firm in New York. She cites drugs for acne or birth control as examples.

Acne, Ressi says, is a very good example because "a parent might not bring up treatment for fear of making their child feel bad but would likely be delighted to have the teen start the conversation and then be able to help."

Tazorac, an acne drug made by Allergan, is the subject of a back-to-school ad campaign featuring situations such as high school graduation and the prom in which teens might feel particularly self-conscious about their acne. Incentives to register on the site and learn more about the drug (teens 13 to 18 need a parent's permission) include a $5 Starbucks card and a chance at winning a Nintendo Wii console, a video camcorder or a laptop computer.

Ads meant to get a teen's attention typically feature cool clothes, hip music and other teen draws. Bayer Healthcare Pharmaceuticals, the maker of Yaz, a birth control pill, hired the Veronicas, a group popular with teen girls, to record a song for one of the drug's commercials. The Web site of Galderma, the maker of Differin, another acne drug, offers teens a quiz called "The Truth About Zits."

"When marketing directly to teens, you need to be able to speak to and otherwise engage them very differently from adults," says Elizabeth Izard Apelles, CEO of digital marketing agency Greater Than One, whose clients include Novartis, which makes ADHD drug Focalin XR. "Otherwise, they won't pay a lick of attention."

Other advertising execs agree.

"We use a combination of media, trying to reach" teens, says Kathy Magnuson, executive vice president of Brand Pharm, whose clients include Galderma. In June, Galderma launched a Differin ad on ABC Family and MTV and has also bought space for the ad at movie theaters and on the Internet.

Drugmaker Sanofi Aventis used a low-tech but novel approach to reach teen girls. The company placed a full-page ad (plus another page of FDA-required consumer information) for acne drug

Benzaclin in the fall catalogue of Delia's, a teen-girl clothing chain.

Msg frm yr drg cmpny

Merck is moving beyond TV ads for Gardasil, which protects against human papillomavirus infection and is recommended for adolescent girls. Because the vaccine is given in three doses, each months apart, Merck is sending out reminders by mail, e-mail and text message -- "REMIND" to "GARSL" -- telling those who got the first shot to come back for shots two and three.

Kathy Woodward, a pediatrician at the adolescent health clinic at Children's National Medical Center in Washington, worries that ads aimed at adolescents often create an inappropriate sense of fun, fostering the idea that there's a pill for every ill. Woodward believes taking drugs might seem hip, for example, when Antonio Banderas, whose voice is well known from the "Shrek" movies, narrates TV commercials for the allergy drug Nasonex.

Woodward says she has been overwhelmed by the number of teenage boys who come in asking for a prescription for Lamisil, an antifungal drug. TV ads that stopped airing about a year ago said dark-colored toenails might be a fungal infection that the drug can clear up.

"It's only an infection 10 percent of the time," says Woodward, "and leaving the nail as it is poses no health risk." What's more, because of a slight risk of liver damage, Woodward notes, anybody who takes the drug needs monitoring.

"When teenage boys make [a drug they've seen advertised] the focus of their yearly office visit," she explains, "it takes away time I need to talk about crucial health issues including safe driving, alcohol and prescription drug abuse."

Francesca Lunzer Kritz is a freelance writer. Comments: health@washpost.com.

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Effect of Televised, Tobacco Company–Funded Smoking Prevention Advertising on Youth Smoking-Related Beliefs, Intentions, and Behavior

Melanie Wakefield, PhD, Yvonne Terry-McElrath, MSA, Sherry Emery, PhD, Henry Saffer, PhD, Frank J. Chaloupka, PhD, Glen Szczypka, BA, Brian Flay, PhD, Patrick M. O'Malley, PhD, and Lloyd D. Johnston, PhD

Objective. To relate exposure to televised youth smoking prevention advertising to youths' smoking beliefs, intentions, and behaviors.

Methods. We obtained commercial television ratings data from 75 US media markets to determine the average youth exposure to tobacco company youth-targeted and parent-targeted smoking prevention advertising. We merged these data with nationally representative school-based survey data (n = 103 172) gathered from 1999 to 2002. Multivariate regression models controlled for individual, geographic, and tobacco policy factors, and other televised antitobacco advertising.

Results. There was little relation between exposure to tobacco company–sponsored, youth-targeted advertising and youth smoking outcomes. Among youths in grades 10 and 12, during the 4 months leading up to survey administration, each additional viewing of a tobacco company parent-targeted advertisement was, on average, associated with lower perceived harm of smoking (odds ratio [OR] = 0.93; confidence interval [CI] = 0.88, 0.98), stronger approval of smoking (OR = 1.11; CI = 1.03,1.20), stronger intentions to smoke in the future (OR = 1.12; CI = 1.04,1.21), and greater likelihood of having smoked in the past 30 days (OR = 1.12; CI = 1.04,1.19).

Conclusions. Exposure to tobacco company youth-targeted smoking prevention advertising generally had no beneficial outcomes for youths. Exposure to tobacco company parent-targeted advertising may have harmful effects on youth, especially among youths in grades 10 and 12. (*Am J Public Health.* 2006;96: 2154–2160. doi:10.2105/AJPH.2005.083352)

The tobacco industry has actively attempted to remake its public image in response to evidence that it marketed products to youth and misled the public about smoking health risks.[1,2] This effort has included public education campaigns to communicate that youths should not smoke.[3] In December of 1998, Philip Morris launched a national $100 million television campaign the company described as targeted to youths aged 10–14 years.[4] The primary message was that youths do not need to smoke to fit in socially with their peers, and the campaign delivers the slogan "Think. Don't Smoke." Although this campaign ended on US television in January 2003, the ads continue to be broadcast in other countries.[5] In October 1999, and with a budget of around $13 million,[6] Lorillard Tobacco Company also launched a US-televised youth smoking prevention campaign with the slogan, "Tobacco is Whacko if You're a Teen."[4]

In mid-July 1999, Philip Morris launched a campaign that emphasized parental responsibility for talking to children about smoking; the slogan was "Talk. They'll Listen."[7] This parent-focused youth smoking prevention campaign has featured a variety of television ads and continues today. The overt message of these ads is that parents should talk to their children about not smoking.

Few studies have examined the potential effect of youth-focused tobacco company–sponsored advertising. Of those, most have only assessed immediate appraisals of the advertisements by youths,[8,9,10] or the relation between ads and attitudes thought to be predictive of smoking behavior change,[11] rather than smoking behavior itself. No studies have examined the effects of tobacco company parent-focused advertising on youth. Because advertising that may influence youth smoking has also been broadcast at various times and intensities by tobacco control programs,[12] it is a complicated matter to establish the relative influence of tobacco company-sponsored advertising.

The objective of this study was to assess the relation between exposure to tobacco company youth smoking prevention advertising and youth smoking-related beliefs, intentions, and behavior in a representative sample of American secondary school students. The study includes youth-targeted and parent-targeted advertising. The study sample included the primary target age group of the youth-targeted ads (grade 8, mean age 14 years), as well as older youths in grades 10 and 12 (mean ages 16 and 18 years, respectively). We used objective media monitoring data to measure potential exposure of youths to different sources of advertising, as opposed to self-reported measures of exposure that can be correlated with openness to change in smoking behavior.[13]

METHODS

Advertising Data

Nielsen Media Research provided data on the occurrence of all smoking-related advertisements that appeared on network and cable television across the largest 75 US television media market areas during 1999–2002. These 75 markets accounted for 78% of American viewing households.[14] A media market is defined by a group of nonoverlapping counties forming a major metropolitan area. Data are on the basis of individual ratings of television programs obtained by monitoring household audiences across media markets. Ratings provide an estimate of the percentage of households with televisions that watch a program or advertisement in a media market

over a specified time interval.[15] The advertising exposure measure used in our study is based on Target Rating Points (TRPs) for the population aged 12–17 years. In these analyses, TRPs were aggregated each month; 100 TRPs are equal to an average of 1 potential advertisement exposure per month for all youth aged 12–17 years within a media market. TRPs represent potential average exposure; actual exposure for any given individual would vary on the basis of actual television viewing. In this study, all the tobacco company parent-targeted advertising was from Philip Morris. However, tobacco company youth-targeted advertising was broadcast by Philip Morris and Lorillard; Philip Morris made up 90.8% of the total TRPs in 1999, 93.0% in 2000, 85.2% in 2001, and 37.5% in 2002.

Monthly TRP data were merged with nationally representative data collected during 1999–2002 from the Monitoring the Future school survey.[16] Data were collected from February to June each year from samples of students in grades 8, 10, and 12, drawn to be representative of all students in the specified grade for the 48 contiguous states. All surveys were self-completed and group-administered in school settings.

Dependent Variables

Separate analyses were conducted for each of the following self-reported dependent variables: recall of antitobacco advertising at least weekly (1 = seeing antitobacco commercials on television or hearing them on the radio at least once a week in recent months); approval of smoking (1 = don't disapprove of people smoking ≥ 1 pack a day (grades 8 and 10), or don't disapprove of people (aged 18 years or older) smoking ≥ 1 pack a day (grade 12); perceived enjoyment of life by smokers (1 = no disagreement with the statement that smokers know how to enjoy life more than nonsmokers); preference for dating nonsmokers (1 = no preference for dating nonsmokers); perceived exaggeration of smoking harm (1 = no disagreement with the statement that the harmful effects of smoking have been exaggerated); perception that being a smoker reflects poor judgment (1 = do not agree that being a smoker reflects poor judgment); perception that smoking is a dirty habit (1 = do not agree that smoking is a dirty habit); perceived harm of smoking (1 = believe people risk "great harm" to themselves by smoking ≥ 1 pack of cigarettes a day); intentions to be smoking in 5 years time (0 = definitely will not be smoking cigarettes in 5 years; 1 = other[17]); smoking in the past 30 days (1 = any cigarette smoking in the past 30 days); and consumption among current smokers, as measured by a 6-point scale: less than 1 cigarette/day (0.5), 1–5 cigarettes/day (3.0), about .5 pack/day (10), about 1 pack/day (20), about 1.5 pack/day (30), and 2 or more packs/day (40). The natural log of this scale was used in all models.[18]

The school survey randomly allocates students to several different forms of survey questionnaires to maximize the number of questions asked of students. Although all students are asked about smoking behavior (current smoking and consumption), only some forms contain questions on recall of advertising, and smoking-related attitudes and intentions. For this reason, different numbers of students respond to each outcome measure. The total number of students included in each model is specified in table footnotes.

Independent Variables

Advertising exposure for each student was calculated to reflect the cumulative effect of repeated potential exposure to tobacco industry advertising and gave greater weight to more recent exposure.[19–21] Thus, in analyses, individual student potential exposure to tobacco industry advertising was reflected by the sum of TRPs for the month in which the school survey was completed, plus the sum of depreciated TRPs from the 3 previous months. On the basis of the work of Pollay and colleagues,[21] a depreciation value of 0.3 was specified as noted in the equation

$$(1)\quad \text{Adstock}_t = \text{Ad}_t + \lambda\text{Ad}_{(t-1)} + \lambda^2\text{Ad}_{(t-2)} + \lambda^3\text{Ad}_{(t-3)}$$

where Adstock is the total effective advertising, λ is set at the specified value of 0.3 as noted above, and Ad indicates ad sponsor TRPs for time periods *t*, *t*–1, *t*–2, and *t*–3. A range of values for λ were examined. Because results were highly similar, λ was set at 0.3, consistent with previously published data by Emery and colleagues [22] on the effect of state tobacco control ads. The depreciated sum was scaled by dividing by 100. The resulting TRP exposure value represents the depreciated average number of times that advertising from a particular sponsor was potentially seen by 100% of the youth aged 12–17 years in each media market over the 4 months leading up to each specific school's date of survey participation. Thus, students within the same media market were assigned different advertising exposures, depending on the month in which their school was surveyed. However, within media markets, students in each school were assigned the same advertising exposure values, because they completed the survey on the same date. Smoking-related outcomes were modeled using continuous versions of depreciated TRPs for youth-targeted and parent-targeted advertising.

Statistical Analyses and Covariates

Our analyses used survey commands in Stata, version 8 (Stata Corp, College Station, Tex) for descriptive population estimates and multivariate regression models (SVYLOGISTIC for dichotomous outcomes; SVYREG for the models of cigarette consumption using the natural log of the consumption scale). The complex multistage sample design was accounted for by using sampling weights to adjust for differential selection probabilities, and by using Taylor linearization-based variance estimators to adjust for clustering by school and compute robust standard errors.

Initially, for each type of tobacco company advertising, we tested several functional forms, including quadratic and threshold models, to explore whether the relations between exposure and outcomes were nonlinear. The linear models fit the data best, and are reported here. Thus, odds ratios refer to change in the likelihood of each outcome measure, on the basis of each additional advertisement viewed, on average, in the 4 months leading up to the date of survey administration.

For tobacco company youth-targeted advertising, we first ran models for all students combined and controlled for (1) competing advertising exposure from 2 types of

campaigns: tobacco control (including state and national American Legacy Foundation campaigns) and tobacco company parent-targeted advertising; (2) individual sociodemographics: gender, race/ethnicity, average parental education, dual parent household, grade point average, 3 or more evenings out a week for fun/recreation, past-month truancy, year, region, and student-earned income; and (3) state tobacco policy variables: average real price per pack of cigarettes[22] and a smoke-free air index measuring the comprehensiveness of state smoke-free laws. The smoke-free air index values depended on the number, type, and level of protection for smoke-free locations, and whether the state had the authority to preempt local smoke-free regulations.[22] On the basis that the primary target group of the tobacco company youth-targeted advertising was youths aged 10–14 years and that middle- (grade 8, mean age 14 years) and high-school (grades 10 and 12, mean ages 16 and 18 years, respectively) students are at very different developmental stages, we ran separate models for grade 8 versus grades 10 and 12. In the model for grades 10 and 12, a dummy variable for grade 12 was also included. This analysis process was repeated to examine the relation between tobacco company parent-targeted advertising and youth smoking outcomes (with the exception that competing advertising exposure for tobacco company youth-targeted advertising was included as a covariate).

We conducted sensitivity analyses to explore the robustness of findings for outcomes of greatest concern. Because advertising and policy variables were correlated, we excluded each tobacco policy variable and tobacco control campaign exposure, to explore if observed relations changed in a systematic way. In addition, we were able to include information on student-reported frequency of television watching as a covariate in models of smoking prevalence and consumption, because these questions occurred on the same survey form as television watching questions for all 3 grades. In this set of analyses, the school survey item measured self-reported average weekday television viewing as a continuous variable (a 7-point scale ranging from 0 to 5+ hours).

RESULTS

After retaining cases that had no missing data for covariates and at least 1 of the specified dependent variables, 103 172 students remained in the analytic sample; 36% were students in grade 8 and 64% were students in grades 10 and 12. Table 1 shows that 20.8% of the sample population had smoked in the last 30 days and average daily consumption for these smokers was 5.43 cigarettes.

On average, students had been exposed to 4.77 depreciated potential viewings of tobacco company youth-targeted advertising and 1.13 potential viewings of tobacco company parent-targeted advertising in the 4-month period leading up to the survey. As expected from the diverse timing and intensity of these campaigns, there was variation between students, with a range of 0 to 14.51 viewings of tobacco company youth-targeted ads, and a range of 0 to 4.13 viewings of tobacco company parent-targeted ads. There was also variation in exposure to tobacco control campaigns (mean 6.88 viewings; for state antitobacco campaigns, mean=1.66 [range=0–19.14]; for the American Legacy Foundation, mean=5.23 [range=0–21.85]).

After we controlled for covariates, increased exposure to tobacco company youth-targeted advertising among all students was generally unrelated to recall of televised antitobacco advertising or to smoking beliefs or behavior (Table 2). However, on average, each additional ad viewed was associated with a 3% stronger intention to smoke in the future (OR=1.03; CI= 1.01, 1.05). When analyzed separately for middle- and high-school students, higher exposure to tobacco company youth-targeted advertising was unrelated to any outcome for students in grades 10 and 12. For students in grade 8, higher exposure was associated with stronger intentions to smoke in the future (OR=1.04; CI=1.01, 1.08). Inclusion of self-reported frequency of television watching as a covariate did not change the finding that there was no relation between increased tobacco company youth-targeted advertising and smoking in the past 30 days, or consumption among smokers. (Data for students who smoked in the past 30 days: all students OR=0.99; CI= 0.96, 1.01; grade 8 OR=0.99; CI=0.95, 1.04; grades 10 and 12 OR=0.99; CI=0.96, 1.01. Data for consumption among smokers: all students Parameter estimate=–.008, $P>.05$; grade 8 Parameter estimate=–.014, $P>.05$; grades 10 and 12 Parameter estimate=–.004, $P>.05$.)

After adjusting for covariates, Table 2 shows that among all students combined, each additional tobacco industry parent-targeted ad was associated with a lower likelihood of recalling antitobacco advertising (OR=0.87; CI=0.82, 0.92), lower perceived harm of smoking (OR=0.95; CI=0.92, 1.00), stronger intentions to smoke in future (OR=1.12; CI=1.05, 1.19), and a greater likelihood of smoking in the past 30 days (OR=1.10; CI=1.03, 1.17).

Separate models for middle- and high-school students indicated that, among students in grade 8, greater tobacco company parent-targeted advertising exposure was related to lower odds of recalling antitobacco advertising (OR=0.86; CI=0.78, 0.94), a greater likelihood of perceiving the harms associated with smoking have been exaggerated (OR=1.07; CI=1.01, 1.13), and stronger intentions to smoke in the future (OR=1.10; CI=1.00, 1.21). Among students in grades 10 and 12, higher advertising exposure was also associated with less likelihood of recalling antitobacco advertising (OR=0.86; CI=0.80, 0.94), stronger approval of smoking (OR=1.11; CI=1.03, 1.20), lower perceived harm of smoking (OR=0.93; CI=0.88, 0.98), stronger intentions to smoke in future (OR=1.12; CI=1.04,1.21), and a greater likelihood of smoking in the past 30 days (OR=1.12; CI=1.04, 1.19). Each additional ad exposure during the 4 months leading up to survey administration, on average, was associated with a 12% increase in the likelihood that students in grades 10 and 12 had smoked in the past 30 days.

In sensitivity analyses among students in grades 10 and 12, where relations of most concern were found, exclusion of cigarette price or strength of smoke-free air index generally did not systematically influence the relation between increasing tobacco company parent-targeted advertising and stronger approval of smoking, lower perceived harm of smoking, stronger intentions to smoke in the future, or greater likelihood of smoking in the past 30 days (Table 3). When tobacco-control

TABLE 1—Sample Characteristics of US School Students in 8th, 10th, and 12th Grade: 1999–2002

	Weighted No.	Percentage	Mean
Independent control variables (N = 103 172)[a]			
Middle school (grade 8)		36.0	
High school (grades 10 and 12)		64.0	
Male		47.3	
Race/ethnicity			
White		71.6	
African American		12.0	
Hispanic		10.9	
Other		5.5	
Lives with both parents		75.0	
Regularly out ≥3 nights/wk		44.5	
Skipped or cut school in the past month		19.4	
Earned income, $			1–15/wk (median)
Parental education (range: 1–6)[b]			3.99
Average school grade (range: 1–9)[c]			6.22
Real price/pack of cigarettes, $ (range: $1.32–$2.86)			1.92
Smoke-free air index (range: –22.50–51.00)			13.15
Region			
Northeast		21.5	
Midwest		28.0	
West		18.8	
South		31.7	
Independent variables (N = 103 172)[a]			
Average tobacco industry parent-targeted exposure[d] (range: 0.00– 4.13)			1.13
Average tobacco industry youth-targeted exposure[d] (range: 0.09–14.51)			4.77
Average tobacco control exposure[d] (range: 0.00–23.90)			6.88
Dependent variables[e]			
Recall antitobacco ads on TV or radio at least weekly (1 = yes)	28 768	62.4	
Approve of others/adults smoking ≥1 pack per day (1 = yes)[f]	65 388	22.7	
Do not prefer to date nonsmokers (1 = yes)	37 645	22.6	
Feel that smokers know how to enjoy life more than nonsmokers (1 = yes)	37 685	16.2	
Feel the harmful effects of cigarettes have been exaggerated (1 = yes)	37 240	34.2	
Do not feel that being a smoker reflects poor judgment (1 = yes)	37 343	39.6	
Do not feel that smoking is a dirty habit (1 = yes)	37 320	27.5	
Perceive great harm in smoking ≥1 packs/day (1 = yes)	95 952	69.6	
Intend to smoke in 5 years (1 = yes)	34 047	39.1	
Smoked in the past 30 days (1 = yes)	101 720	20.8	
Consumption frequency among current smokers (.5, 3, 10, 20, 30, 40)[g]	19 581		5.43

[a]Number of students was obtained by retaining only cases with valid data for all independent control variables, and valid data on at least 1 of the specified dependent variables.
[b]Parental education was a scaled value ranging from 1 to 6, and was a combined average of mother's and father's highest level of education, where 1 = grade school or less, 2 = some high school, 3 = high school completion, 4 = some college, 5 = college completion, and 6 = graduate school.
[c]Average school grade was a 9-item scale where 1 = D and 9 = A. A mean of 6 indicates a B.
[d]Exposure to specific ads during the 4 months before the school survey. Advertising exposure data reported at the student level and not at the media market level, because students within the same media market will have different average exposures on the basis of their school survey date.
[e]Possible Ns for dependent variables varied, because not all items were asked of all students.
[f]Students in grades 8 and 10 were asked about disapproval of others' smoking; students in grade 12 were asked about disapproval of adults' smoking.
[g]Consumption was measured by a 6-point scale: less than 1 cigarette/day (0.5), 1–5 cigarettes/day (3.0), about 0.5 pack/day (10), about 1 pack/day (20), about 1.5 pack/day (30), and 2 or more packs/day (40). The natural log of this scale was used in all models.

ad exposure was removed, relations persisted between increasing tobacco company parent-targeted ad exposure and stronger approval of smoking as well as smoking in the past 30 days, but were weakened for perceived harm of smoking and intention to smoke in the future.

When self-reported frequency of television watching was included as a covariate, the relation between tobacco company parent-targeted ad exposure and current smoking was unchanged for students in grade 8 (OR=1.11; CI=0.99, 1.25, not significant) but was strengthened among students in grades 10 and 12 (OR=1.14; CI=1.05, 1.25, $P<.01$). Control for television watching did not change the previously nonsignificant results for cigarette consumption (grade 8: Parameter estimate=–.068, $P>0.5$; grades 10 and 12: Parameter estimate=–.016, $P>.05$).

In models of students in all 3 grade levels, higher cigarette price was associated with lower consumption among current smokers (Parameter estimate=–.002, SE=0.001, $P<.05$), and stronger smoke-free laws were associated with a lower likelihood of smoking in the past 30 days (OR=0.99; CI=0.99, 1.00, $P=.01$ [data not shown]). In addition, consistent with previous studies,[11,22] we observed expected relations between increasing exposure to tobacco control campaign advertising and higher recall of antitobacco advertising (OR=1.04; CI=1.03, 1.04, $P<.001$), more protective beliefs about smoking (e.g., increased perceived harm of smoking) (OR=1.01; CI=1.00, 1.02, $P<.01$), weakened intentions to smoke in future (OR=0.98; CI=0.97, 0.99, $P<.001$), and a lower likelihood of smoking in the past 30 days (OR=0.99; CI=0.98, 1.00, $P<.01$).

DISCUSSION

Overall, we found no systematic associations between increased exposure to tobacco company youth-targeted smoking prevention advertising and smoking outcomes among American youths. We found that increased exposure to tobacco company parent-targeted smoking prevention advertising was associated with lower recall of antitobacco advertising and stronger intentions to smoke in the future for all students. Among students in grade 8,

TABLE 2—Odds Ratios for Each Unit Increase in Number of Ads Viewed, With 95% Confidence Intervals (CIs), for Smoking-Related Beliefs and Behavior and Tobacco Industry Smoking Prevention Advertising Exposure: 1999–2002

	Exposure, All Students[a]		Exposure, 8th Grade Students[b]		Exposure, 10th and 12th Grade Students[c]	
	Youth-Targeted[d]	Parent-Targeted[e]	Youth-Targeted[d]	Parent-Targeted[e]	Youth-Targeted[d]	Parent-Targeted[e]
Recall antitobacco ads on TV or radio at least weekly	1.00 (0.98, 1.02)	0.87*** (0.82, 0.92)	0.99 (0.96, 1.02)	0.86** (0.78, 0.94)	1.01 (0.98, 1.03)	0.86** (0.80, 0.94)
Approve of others/adults smoking ≥1 pack/day[f]	0.98 (0.95, 1.00)	1.06 (0.99, 1.13)	0.98 (0.95, 1.01)	1.03 (0.96, 1.12)	0.98 (0.96, 1.01)	1.11** (1.03, 1.20)
Do not prefer to date nonsmokers	1.00 (0.97, 1.02)	1.04 (0.97, 1.11)	1.00 (0.96, 1.04)	1.05 (0.94, 1.18)	0.99 (0.97, 1.02)	1.03 (0.96, 1.11)
Feel that smokers know how to enjoy life more than nonsmokers	1.00 (0.98, 1.03)	1.00 (0.94, 1.07)	1.02 (0.98, 1.06)	1.07 (0.96, 1.19)	0.99 (0.97, 1.02)	0.94 (0.87, 1.01)
Feel the harmful effects of cigarettes have been exaggerated	1.00 (0.98, 1.02)	1.03 (0.99, 1.08)	1.01 (0.98, 1.03)	1.07* (1.01, 1.13)	0.99 (0.96, 1.01)	0.99 (0.93, 1.06)
Do not feel that being a smoker reflects poor judgment	0.99 (0.97, 1.01)	0.99 (0.94, 1.04)	0.98 (0.95, 1.01)	1.02 (0.95, 1.09)	0.99 (0.97, 1.02)	0.96 (0.90, 1.03)
Do not feel that smoking is a dirty habit	1.00 (0.98, 1.02)	1.00 (0.94, 1.07)	1.00 (0.96, 1.03)	1.01 (0.92, 1.10)	1.01 (0.98, 1.03)	0.99 (0.91, 1.07)
Perceive great harm in smoking ≥1 packs/day	0.99 (0.98, 1.01)	0.95* (0.92, 1.00)	0.99 (0.97, 1.01)	0.98 (0.93, 1.04)	1.00 (0.98, 1.02)	0.93** (0.88, 0.98)
Intend to smoke in 5 years	1.03** (1.01, 1.05)	1.12** (1.05, 1.19)	1.04* (1.01, 1.08)	1.10* (1.00, 1.21)	1.01 (0.99, 1.04)	1.12** (1.04, 1.21)
Smoked in past 30 days	0.99 (0.97, 1.01)	1.10** (1.03, 1.17)	0.99 (0.95, 1.04)	1.11 (0.99, 1.25)	0.99 (0.97, 1.01)	1.12** (1.04, 1.19)
Consumption frequency among current smokers,[g] parameter estimate (SE)	–.014; (.008)	.019 (.025)	–.014 (.015)	.069 (.044)	–.012 (.009)	.018 (.028)

Note. All models controlled for tobacco control advertising exposure, either tobacco company parent-targeted or youth-targeted advertising exposure, year, gender, race/ethnicity, earned income, average parental education, whether both parents live in the home, grade point average, evenings out, truancy, region, state cigarette price, and state smoke-free air index values.
[a]All students model Ns (weighted): smoked in last 30 days 101 720; perceived harm 95 952; disapproval 65 388; recall 28 768; consumption 21 138; remaining perception models range from 34 047 to 37 685.
[b]Grade 8 model Ns (weighted): smoked in last 30 days 36 382; perceived harm 36 236; disapproval 23 305; recall 12 136; consumption 4621; remaining perception models range from 12 287 to 16 688.
[c]Grades 10 and 12 model Ns (weighted): smoked in last 30 days 65 338; perceived harm 59 716; disapproval 42 083; recall 16 632; consumption 16 517; remaining perception models range from 20 827 to 21 760. A dummy variable identifying students in grade 12 was included in these models.
[d]Tobacco company youth-targeted ads sponsored primarily by Philip Morris, and by Lorillard Tobacco Company.
[e]Tobacco company parent-targeted ads sponsored by Philip Morris.
[f]Students in grades 8 and 10 asked about disapproval of others' smoking; 12th grade students asked about disapproval of adults' smoking.
[g]Consumption measured by a 6-point scale: less than 1 cigarette/day (0.5), 1–5 cigarettes/day (3.0), about 0.5 pack/day (10), about 1 pack/day (20), about 1.5 pack/day (30), and 2 or more packs/day (40). The natural log of this scale was used in all models.
*P < .05; **P < .01; ***P < .001.

TABLE 3—Odds Ratios and 95% Confidence Intervals for Tobacco Company Parent-Targeted Advertising Exposure and Selected Smoking Outcomes Among Students in Grades 10 and 12: 1999–2002

Model[a]	Weighted No.	Excluding State Cigarette Price	Excluding State Smoke-Free Air Index Value	Excluding Tobacco Control Ad Exposure
Approve of others/adults smoking ≥1 pack/day[b]	42 083	1.10*(1.02, 1.18)	1.11** (1.03, 1.21)	1.10** (1.04, 1.17)
Perceive great harm in smoking ≥1 packs/day	59 716	0.95 (0.90, 1.01)	0.93** (0.88, 0.98)	0.97 (0.93, 1.01)
Intend to smoke in 5 years	21 760	1.12** (1.04, 1.20)	1.13** (1.05, 1.22)	1.04 (0.98, 1.10)
Smoked in past 30 days	65 338	1.10** (1.03, 1.18)	1.12** (1.05, 1.20)	1.07** (1.02, 1.12)

[a]Tobacco company parent-targeted ads sponsored by Philip Morris. All models controlled for year, gender, race/ethnicity, earned income, average parental education, whether both parents live in the home, average school grade, evenings out, truancy, region, and dummy variable for students in grade 12. Unless specified above, models also controlled for tobacco control advertising exposure, either tobacco company parent-directed or youth-targeted advertising exposure, state cigarette price, and state smoke-free air index values.
[b]Students in grade 10 were asked about disapproval of others' smoking; students in grade 12 were asked about disapproval of adults' smoking.
*P < .05; **P < .01.

tobacco company parent-targeted advertising was related to stronger beliefs that the harms associated with smoking have been exaggerated, and among students in grades 10 and 12, was associated with lower perceived harm of smoking, stronger approval of smoking, and a higher likelihood of having smoked in the past 30 days. Importantly, the results for smoking prevalence among students in grades 10 and 12 were not systematically influenced by correlations between price and strength of smoke-free air laws, or tobacco control advertising exposure, although some models were less robust when tobacco control ad exposure was removed as a covariate.

Our study did have limitations. Our use of cross-sectional survey data reduced our ability to make direct causal inferences about whether potential exposure to tobacco company parent-targeted advertising resulted in changes to youth smoking behavior, or whether an unmeasured factor may better explain the relations we observed. However, our ability to adjust for competing advertising exposures, our use of regional and year dummy variables, our sensitivity analyses, and the fact that we observed results for tobacco policy[23,24] and other advertising covariates[11,22] that were largely consistent with those found in previous studies, lead us to believe that it is unlikely that we are misrepresenting the relation between exposure to tobacco company youth-targeted or parent-targeted advertising and youth smoking outcomes. An alternate hypothesis is that tobacco companies may have purposefully purchased parent-targeted advertising in media markets that have higher youth smoking rates. This seems unlikely, however, given that the vast majority of their television time was bought through national network and cable channels and was not supplemented by the purchase of local media market television time. In addition, although the study had a large sample size, which makes differences between groups more likely to achieve statistical significance, the overall consistency in the pattern and robustness of findings leads one to conclude that the detected relations are real.

As previously mentioned, another study limitation is that because TRPs measure average exposure for the overall population in a media market, individual youths may have more or less actual exposure, depending upon their own viewing habits. However, when we adjusted for self-reported television watching, the relations between tobacco company youth-targeted and parent-targeted advertising and smoking in the past 30 days did not change for students in grade 8 and strengthened for students in grades 10 and 12. Previous studies of antitobacco and antidrug advertising have found a strong correlation between advertising recall and TRP measures.[22,25]

Studies that use controlled exposure have indicated that tobacco company youth-targeted advertisements are less likely than those from state tobacco control programs to make youths stop and think about smoking[10] and are of less interest to youths.[26] In 1 national study, Philip Morris "Think. Don't Smoke" advertisements were associated with increased intention to smoke and more favorable feelings towards the tobacco industry.[6] Massachusetts youths aged 14–17 who recalled seeing Philip Morris' "Think. Don't Smoke" ads perceived them to be less effective than ads that featured the serious consequences of smoking.[8] Our finding of no relation between tobacco company youth-targeted advertising and youth smoking substantiates these previous results. Although tobacco company youth-targeted advertising was withdrawn from US television in early 2003, ads continue to be broadcast in other countries, contributing "clutter" to other public health–sponsored advertising efforts[12] that have been shown to be effective.[11,22,27]

Our finding of potentially harmful relations between tobacco company parent-targeted smoking prevention advertising and youth smoking is a source of concern. Our observation of adverse relations associated with parent-targeted advertising is not simply an artifact of our methodological approach: we have previously reported beneficial relations between exposure to state-sponsored antitobacco advertising and youth smoking beliefs and behavior using the same methods.[22]

Why might such advertising have harmful relations, especially for older teens? Although parents are the overt target group of tobacco company parent-targeted advertising, youths are exposed to them, on average, at levels almost equivalent to those of state-sponsored antitobacco campaigns. The overt message of the parent-targeted campaign is that parents should talk to their children about smoking, but no reason beyond simply being a teenager is offered as to why youths should not smoke.

Theories in developmental psychology suggest that authority messages specific to teenagers invite rejection by those who have migrated to a dominant peer group orientation as they make the transition to adulthood, typically between ages 15 to 17 years.[28,29] As adolescents age toward adulthood, they are more inclined to perceive themselves as independent and self-reliant and less likely to report that they rely on their parents for guidance or assistance.[28] Evaluations of the US National Anti-Drug Media Campaign, which used messages encouraging parents to talk to their children about illicit drugs, have also reported unfavorable effects on adolescents.[30,31] Facilitating productive interaction between parents and adolescents about substance use may require more intensive intervention approaches than simple encouragement through the mass media, which may do more harm than good.

During depositions and testimony in US-based tobacco trials, tobacco company witnesses put forward their youth smoking prevention efforts as evidence that they are concerned about youth smoking and that the campaigns are part of efforts to reduce youth smoking.[32] However, during questioning at such a trial, Carolyn Levy, director of Philip Morris youth smoking prevention programs, admitted that the aim of their programs was to delay smoking until age 18.[32] This contrasts with the aims of public health-funded programs, which are to encourage people to never take up smoking.

In summary, our analysis suggests that tobacco company youth- and parent-targeted smoking prevention advertising campaigns confer no benefit to youths, and especially for older teens, parent-targeted advertising may have harmful relations. In the United States, youths have the benefit of the national American Legacy Foundation antitobacco campaign, as well as state antitobacco campaigns. The Legacy Foundation's budget cuts will force it to advertise less in the future,[33] and state antitobacco campaign advertising has begun to decline as a result of reduced state tobacco control funding.[12,34] Many other countries of the world have limited or no public health-sponsored televised antitobacco advertising. Given a media environment that has fewer demonstrably beneficial advertising messages, it is conceivable that tobacco company smoking prevention ads could have even greater adverse effects on youth smoking behavior than suggested by this study. ■

About the Authors

Melanie Wakefield is with the Center for Behavioral Research in Cancer, The Cancer Council Victoria, Melbourne, Australia. Yvonne Terry-McElrath, Patrick M. O'Malley, and Lloyd D. Johnston are with the Institute for Social Research, University of Michigan, Ann Arbor. Sherry Emery, Frank J. Chaloupka, and Glen Szczypka are with the Institute for

Health Research and Policy, University of Illinois, Chicago. Henry Saffer is with the Department of Economics, Kean University, Union, NJ. Brian Flay is with the Department of Public Health, Oregon State University, Corvallis.

Requests for reprints should be sent to Melanie Wakefield, PhD, Center for Behavioral Research in Cancer, The Cancer Council Victoria, 1 Rathdowne Street, Carlton, Victoria, Australia, 3053 (e-mail: melanie.wakefield@cancervic.org.au).

Contributors

M. Wakefield conceived and led the study and the writing of the article. Y. Terry-McElrath conducted the analysis and assisted with writing. S. Emery, H. Saffer, F. Chaloupka, B. Flay, P.M. O'Malley, and L.D. Johnston contributed to conception of the study and the analysis and assisted with writing. G. Szczypka undertook data management for the study and assisted with writing.

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Human Participant Protection

This study was approved by the University of Illinois, Chicago, institutional review board. Use of data from the Monitoring the Future school surveys received ethical approval by the University of Michigan Behavioral Sciences institutional review board.

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