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ORIGINAL ARTICLES

Does advertising promote smokeless tobacco use among adolescent boys? Evidence from California

Won S Choi, Arthur J Farkas, Bradley Rosbrook, John P Elder, John P Pierce

Abstract

Objectives – To assess trends in smokeless tobacco use and to identify risk factors that distinguish youths who use or who are at risk of using smokeless tobacco.

Design – Population based telephone surveys conducted in 1990, 1992, and 1993.

Subjects – Adolescent boys in California aged 12 to 17 years and men between the ages of 18 and 24. Sample sizes were 3912 in 1990, 883 in 1992, and 2814 in 1993.

Main outcome measures – Current use and susceptibility to use smokeless tobacco.

Methods – The predictor variables that were examined included exposure to other users of smokeless tobacco, exposure to advertisements, rebelliousness, peer norms, school performance, depression, cigarette smoking, involvement in competitive or organised sports, attending religious services, and peer use of alcohol and drugs. Age and race adjusted logistic regression analyses was used to identify important predictors of outcome measures of the 1993 data.

Results – Whereas 15% of adolescent males had experimented with smokeless tobacco, current use appeared stable at around 6% for males aged 16 to 24 years. Smokeless tobacco use in teenage boys was associated with having best friends who were users (odds ratio = 13.2, $p < 0.001$). This effect was compounded when family members were also users (odds ratio = 34.4, $p < 0.001$). Recall of smokeless tobacco advertisements was also strongly associated with use (odds ratio = 7.5, $p < 0.001$) and susceptibility to use smokeless tobacco (odds ratio = 1.6, $p < 0.001$). Cigarette smokers were at greater risk of being users (odds ratio = 3.3, $p < 0.001$).

Conclusions – Despite the large scale California Tobacco Control Program, adolescent use and susceptibility to use smokeless tobacco remained unchanged from 1990 to 1993. Exposure to other smokeless tobacco users was the largest predictor of both current use and susceptibility to use smokeless tobacco. However, peer approval and exposure to tobacco advertising were also both significant predictors for use and suscep-

ibility. Extending the ban of tobacco marketing practices to all mass media may be necessary if smokeless tobacco use is to be reduced.

(Tobacco Control 1995; 4 (Suppl 1): S57-S63)

Keywords: advertising; smokeless tobacco; adolescent boys

Introduction

The use of smokeless tobacco has been shown to pose health risks such as oral cancer, periodontal disease, leukoplakia, and altered cardiovascular function.¹ In 1986, a report of the Advisory Committee to the Surgeon General concluded that smokeless tobacco use represents a significant health risk, is not a safe substitute for cigarette smoking, can cause oral cancers, and can lead to nicotine addiction and dependence.² In addition, the American Cancer Society estimated 31 000 cases of oral cancer in the US in 1989 and identified smokeless tobacco as a major risk factor.³ Given these health consequences, information identifying adolescents at high risk of using smokeless tobacco is critical for formulating intervention and prevention programmes.

In 1988, \$68.2 million was spent on smokeless tobacco advertising and promotion in the USA and revenues were approximately \$900 million.⁴ Advertising and promotion expenditures, revenues, and smokeless tobacco sales increased each year from 1988 to 1991. By 1991 advertising and promotion expenditures had increased to \$104 million and revenues had increased to \$1.2 billion.⁴ We hypothesize that part of the increase in smokeless tobacco use during the 1970s to the mid-1980s might be attributed to smokeless tobacco advertising and marketing. Additional factors that might have contributed to the increase include the growing market of young males, the teaming of smokeless tobacco with sports and entertainment personalities, and the increased accessibility of smokeless tobacco products.⁵⁻⁸

The tobacco industry has long claimed that their advertising targets adults only.⁹ They also argue that they use tobacco advertising only to maintain market share and to influence brand selection among adult tobacco users. Evidence showing the targeting of cigarette advertisements towards children and adolescents and its effect on smoking continues to mount.¹⁰⁻¹⁵ If advertising encourages smoking uptake, we would expect it similarly to influence the uptake of smokeless tobacco.

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Among the more frequently invoked theories in health promotion and behaviour change are the Theory of Reasoned Action,¹⁶ the Health Belief Model,¹⁷ Operant Theory,¹⁸ and Social Learning Theory.¹⁹ Social learning theory dominates the field of smoking initiation research and is at the basis of most current interventions. The theory posits that the individual's susceptibility to perform a particular behaviour is based on expectations of the costs and benefits of performance. However, cognitions related to this expectation are subject to a variety of personal and environmental influences including exposure to other users, peer norms, and the impact of tobacco advertising in promoting smokeless tobacco use.²⁰ Smokeless tobacco advertising can influence an adolescent's expectations of the advantages of using smokeless tobacco. Like other products, smokeless tobacco is advertised as possessing certain utilities that may come to affect the individual's assessment of the costs and benefits of its use.

Many of these personal and social influences have been found to be predictive of both cigarette and smokeless tobacco use.²¹ Previous studies have found significant associations between peer or family use and adolescent adoption of smokeless tobacco.²²⁻²⁶ Personal influences including emotional stability, rebelliousness, and achievement at school also influence the expectations of the costs and benefits of using smokeless tobacco. Adolescence is a time of frequent conflict with parents and other authority figures. The tendency towards rebellious behaviour often compensates adolescents by reinforcing their position within peer groups. Smokeless tobacco use may be viewed by some teenagers as moderately deviant behaviour through which to improve their status in the peer group.²⁰ In some studies, participation in recreational or team sports has also been found to be related to smokeless tobacco use.²⁷ Adolescent boys strive to project machismo and emulate heroes, including athletes. Consequently, the use of smokeless tobacco by athletes and their participation in advertising is believed to promote use of smokeless tobacco by youths.²⁸

In this study, we use the California Tobacco Surveys to identify the size of the smokeless tobacco problem in California. Further, we investigate major predictors of use and susceptibility to use smokeless tobacco.

Methods

SAMPLING AND DESIGN OF THE CALIFORNIA TOBACCO SURVEYS

The California Tobacco Surveys, undertaken to evaluate the California Tobacco Control Program, were conducted by Westat Inc in 1990, 1992, and 1993. These surveys used a random digit dialled methodology developed by Waksberg²⁹ to contact an adult to obtain the household composition and the smoking status of each adult member. A stratified random sample of adults and all 12 to 17 year old adolescents were scheduled for an in-depth telephone interview. In this article, we report

data from the adolescent surveys in 1990 ($n = 7767$, response rate = 76.3%), 1992 ($n = 1789$, response rate = 77.8%), and 1993 ($n = 5531$, response rate = 80.3%). In addition, we report smokeless tobacco usage rates for 18 to 24 year old men surveyed in 1990 (total sample ($n = 24296$, response rate = 75.3%) and 1992 ($n = 8224$, response rate = 71.3%). The 1993 adult survey did not include questions on smokeless tobacco. Detailed methods for these surveys are published elsewhere.^{20,30} Because fewer than 0.3% of girls surveyed used smokeless tobacco and use among women was just as rare, this analysis is restricted to adolescent boys and men. The majority of the analysis is based on 2814 adolescent boys from the 1993 Youth Attitudes and Practices Survey.

DESCRIPTION OF VARIABLES AND QUESTIONS

Current use and susceptibility to use smokeless tobacco

Respondents who reported use of smokeless tobacco in the past month were classified as current users, "On how many of the last 30 days did you use chewing tobacco or snuff?" This measure of current usage may introduce a recall bias, particularly among young adolescents because it requires the adolescent to recall behaviour over a 30 day period. Another concern is that this measure may misclassify adolescents in the uptake phase, which is characterised by infrequent usage. The process of starting to use an addictive substance is usually prefaced by a period during which the person is predisposed to use.^{31,32} We have argued that such a predisposition or susceptibility can be identified by the absence of a determined decision not to be a user in the future.²⁰ Adolescents were classified as susceptible to use smokeless tobacco as follows:

- (1) All recent users (last 30 days)
- (2) Responses of "definitely yes," "probably yes," or "probably not" to either of the following two questions: (a) Do you think you will ever use chewing tobacco or snuff? (b) Do you think you will use chewing tobacco or snuff in the next year?

Current use of cigarettes

Adolescents were asked, "Think about the last 30 days. On how many of these days did you smoke?" Respondents who smoked a cigarette in any of the past 30 days were classified as a current cigarette smoker.

Exposure to other users of smokeless tobacco

Adolescents were classified as being exposed to family members who use smokeless tobacco from their responses to the following questions: "Do any of your parents, step-parents or guardians now use chewing tobacco or snuff?" and "Do you have any older brothers or sisters who use chewing tobacco or snuff?" Exposure to best friends who use smokeless tobacco was assessed through these two questions: "Of your best friends who are male, how many of them use chewing tobacco

or snuff?" and "Of your best friends who are female, how many of them use chewing tobacco or snuff?" This exposure variable was categorised into four levels: none, family only, best friends only, or both family and best friends.

Exposure to smokeless tobacco advertisements

Based on an analogous study on cigarette use,¹⁴ exposure to advertising was assessed by asking the adolescents, "What brand of chewing tobacco or snuff is the most advertised?" Youths were classified as being exposed to advertising if they were able to identify a specific brand of smokeless tobacco from the advertisement.

Rebelliousness

The rebelliousness items included liking for doing risky or dangerous things, being in physical fights, arguing with the family, seeking revenge, telling lies or getting in trouble to help friends, and getting nagged by family members. The reliability index of this scale was 0.66 (Cronbach's alpha).

Participation in team sports

Participation in team sports was determined from the question: "In the past year have you participated in any kind of competitive and organised physical activity, such as team sports?"

Depression

A six item scale previously validated by Kandel was used to assess depression.³³ Each question was introduced with the phrase, "During the past 12 months, how often have you...": "Felt too tired to do things?", "Had trouble going to sleep or staying asleep?", "Felt unhappy, sad, or depressed?", "Felt hopeless about the future?", "Felt nervous or tense?", "and "Worried too much about things?" For each item the adolescent indicated whether the symptom occurred "Often," "Sometimes," "Rarely," or "Never." The internal consistency of the scale for this sample was 0.70, as measured by the α statistic. Following Kandel, the 18% of respondents who scored 1 standard deviation above the population mean were classified as depressed.³³

Peer use of drugs or alcohol

Exposure to peer usage of drugs or alcohol was assessed by the questions, "How many people do you know, who are about your age smoke marijuana?" and "How many people do you know, who are about your age use drugs such as cocaine or crack?" Response categories included "None," "A few," "Some," and "Most." Any response other than "None" categorised the individual as exposed to peers who used that class of drugs.

Peer norms

The social network (peer) norm was assessed from an approve/disapprove response to the question, "How do you think your best friends would feel about you using chewing tobacco or snuff regularly?"

STATISTICAL ANALYSIS

All analyses were weighted to reflect the California population and to account for the design of the California Tobacco Surveys. We used a jackknife procedure to derive 95% confidence intervals in which 51 subsamples of the full file were taken and population estimates computed using the same procedures as for the full file.³⁴ Variance estimates were calculated from the deviations observed between these estimates and those obtained from the full file.

For the overall multivariate analyses, separate logistic regression models were used for each outcome measure, current use, and susceptibility to use smokeless tobacco. Following standard procedure, any independent variable where the univariate test had a p value < 0.25 was included in the multivariate logistic regression model.³⁵

Results

SUSCEPTIBILITY AND CURRENT USE OF SMOKELESS TOBACCO

Similar proportions of adolescents reported having ever experimented with smokeless tobacco across the three years of the study (1990 = 15.2% (confidence interval (CI) 1.5%) 1992 = 12.3 (CI 2.5)%; 1993 = 13.8 (CI 1.5)%).

Using smokeless tobacco was age dependent. The percentage of current users increased with age, with the 16 to 17 year olds having the highest rates, 6.6% (table 1). The percentage of 12 to 13 year olds who used smokeless tobacco, less than 1%, was minimal compared to the older age groups. The uptake of smokeless tobacco may be complete by age 17, as the proportion of users among the 16 to 17 year age group is equivalent to the proportion among the 18 to 24 year age group (fig 1).

Smokeless tobacco use also differed by race and ethnicity. Table 1 shows that white adolescent boys were the primary users of smokeless tobacco and that African-American boys had the lowest rates of current use, 4.5% and 0.2% respectively. Hispanic boys had the second highest use rates, followed by the Asian/Other group.

The demographic pattern of susceptibility to smoking broadly followed the pattern of current use, although at a much higher level. The single exception to this was age. Although the youngest adolescents (12 to 13 years) had the lowest usage rates, they appeared just as likely to be susceptible to starting to use smokeless tobacco – approximately 17% (table 1).

Table 1 Exposure to smokeless tobacco advertisement, current use, and susceptibility to use smokeless tobacco for adolescent boys in California, 1993

Demographic variables (n = 2814)	Current use of smokeless tobacco (%)	Susceptibility to use smokeless tobacco (%)	Exposure to smokeless tobacco advertising (%)
Age group (years)			
12-13	0.3 (0.1-0.5)	16.8 (13.7-19.9)	21.0 (17.4-24.6)
14-15	2.6 (1.0-4.2)	17.3 (14.8-19.8)	34.3 (30.3-38.3)
16-17	6.6 (4.1-9.1)	18.8 (14.6-23.0)	43.8 (38.8-48.8)
Race/ethnicity			
White	4.5 (3.1-5.9)	20.7 (17.9-23.5)	43.4 (39.8-47.0)
African-American	0.2 (0.0-0.6)	8.4 (2.3-14.5)	13.5 (7.9-19.1)
Hispanic	2.4 (0.4-4.4)	17.6 (13.3-21.9)	26.2 (21.7-30.7)
Asian/other	1.0 (0.3-1.7)	11.6 (6.7-16.5)	21.0 (14.4-27.6)
School performance			
Much better than average	1.1 (0.5-1.7)	16.5 (11.6-21.4)	26.5 (22.9-30.1)
Better than average	3.9 (1.8-6.0)	18.3 (14.4-22.2)	36.1 (31.1-41.1)
Average and below	3.2 (1.8-4.6)	17.5 (15.0-20.0)	32.1 (29.0-35.2)
Overall	3.1 (2.1-4.1)	17.6 (15.6-19.6)	32.6 (30.2-35.0)

(Percentages with 95% confidence intervals)

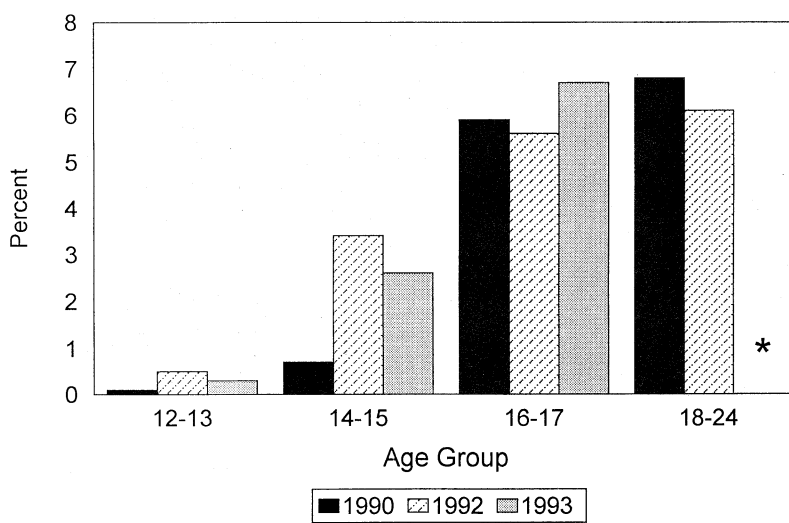


Figure 1 Smokeless tobacco use in males in the last 30 days by age.

*Data not available for 18 to 24 year olds for 1993.
(Source: California Tobacco Surveys, 1990, 1992, 1993)

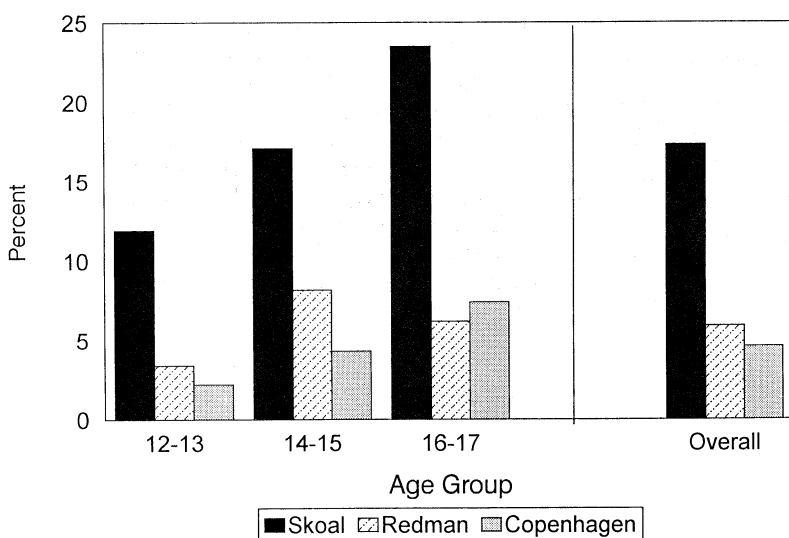


Figure 2 Most advertised smokeless tobacco brands nominated by adolescent boys.

(Source: California Tobacco Survey, 1993)

EXPOSURE TO SMOKELESS TOBACCO ADVERTISING AND SMOKELESS TOBACCO USE CONTINUUM

Table 1 also presents the demographic data for exposure to smokeless tobacco advertising. Overall, approximately 33% of the adolescent boys were able to identify a specific brand in an advertisement for a smokeless tobacco product. The reported exposure was twice as high in the oldest compared to the youngest adolescents (44% v 21%). Race/ethnicity and educational differences in recall of a specific advertisement followed the same pattern as susceptibility to use, although the rates were slightly higher for advertising exposure.

Skoyal was the most popular brand of smokeless tobacco advertising named by adolescents, and recall increased with age: from 12% for 12 to 13 year olds to almost one quarter of 16 to 17 year olds (fig 2). Redman was the next most identified brand of advertising and nomination peaked in 14 to 15 year olds (average 5.9%), followed by Copenhagen. Over half of current users nominated Skoyal as the most advertised brand, followed by Copenhagen (15%) and Redman (3.3%).

Figure 3 shows the proportion of adolescent boys exposed to smokeless tobacco advertising by categories of use. Among current users of smokeless tobacco, over 90% were able to nominate a smokeless tobacco advertisement. Adolescents who had experimented with smokeless tobacco had higher levels of exposure compared to those who had never experimented. Within each category of experimentation, boys who were susceptible to use had higher levels of exposure to smokeless tobacco advertising compared to boys who were not susceptible, approximately 13%.

RELATIVE IMPORTANCE OF EXPOSURE TO USERS AND ADVERTISING

Figure 4 presents the impact of advertising and exposure to users on susceptibility to use smokeless tobacco. Exposure to advertising increased the probability of an adolescent being susceptible at each level of exposure to users. This effect appeared stronger at the higher levels of exposure such as when peers

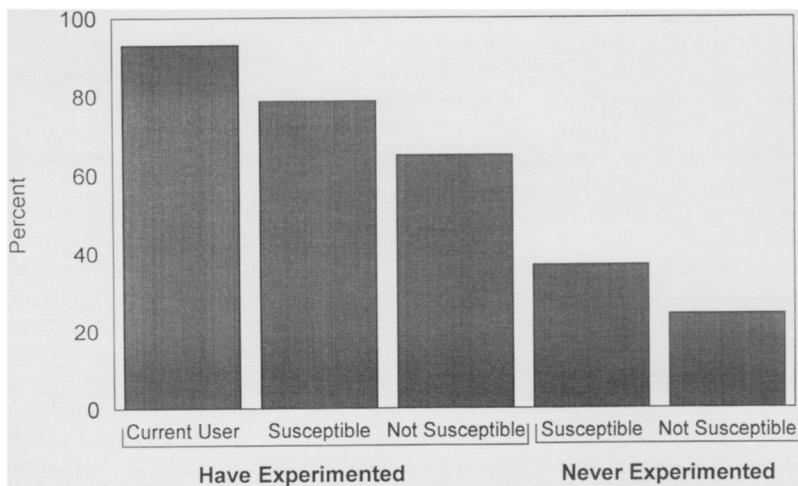


Figure 3 The effect of smokeless tobacco use on recall of smokeless tobacco advertising. (Source: California Tobacco Survey, 1993)

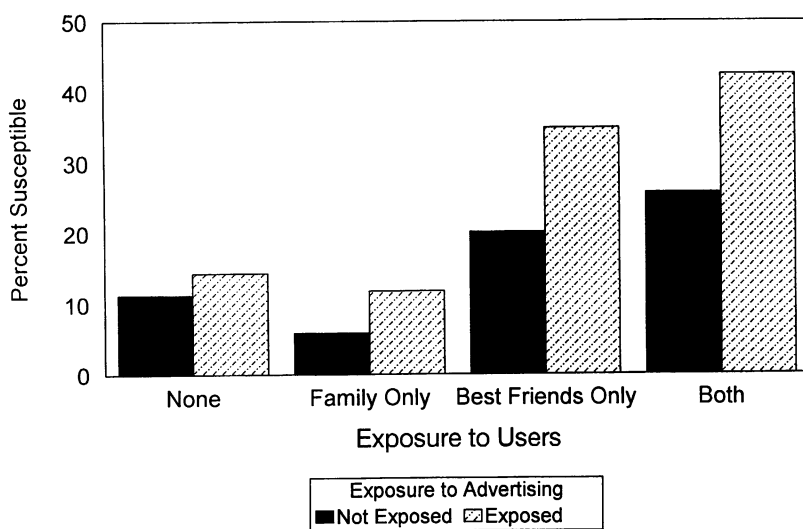


Figure 4 Impact of exposure to other users of smokeless tobacco and smokeless tobacco advertising on susceptibility. (Source: California Tobacco Survey, 1993)

Table 2 Predictors of smokeless tobacco use and susceptibility among adolescent boys in California, 1993

Predictors	Current use of smokeless tobacco Adj OR (95% CI) (n = 2814)	Susceptibility to use smokeless tobacco Adj OR (95% CI) (n = 2814)
Exposure to other users of smokeless tobacco		
None	1.0	1.0
Family only	3.2 (0.3-58.2)	0.5 (0.2-1.1)
Best friends only	13.2 (3.4-50.8)	2.2 (1.7-2.8)
Both family and best friends	34.4 (7.8-150.7)	3.1 (1.8-5.2)
Exposure to smokeless tobacco advertisements		
Not exposed	1.0	1.0
Exposed	7.5 (3.1-18.1)	1.6 (1.2-2.0)
Peer norms about using smokeless tobacco		
Best friends disapprove	1.0	1.0
Best friends approve	5.2 (3.0-9.0)	1.9 (1.5-2.4)
Cigarette smoking		
No	1.0	1.0
Yes	3.3 (1.9-5.7)	1.3 (1.0-1.8)
Participation in team sports		
No	1.0	1.0
Yes	1.2 (0.6-2.2)	1.7 (1.3-2.2)

Adjusted odds ratios (Adj OR) and 95% confidence intervals. (Adjusted for age, race, and the variables in the table)

were already users (73% increase in probability) and when both family and peers were users (65% increase in probability).

Table 2 presents the results from the multivariate analyses for current use and susceptibility to use smokeless tobacco. Exposure to smokeless tobacco users was strongly related to both current usage and to susceptibility to use. The existence of a smokeless tobacco user in the family but not in the peer network did not predict either current use or susceptibility to use smokeless tobacco. Having a best friend who was a user increased the chances of an adolescent being a user 13-fold and doubled the likelihood of an adolescent being susceptible to using smokeless tobacco. Exposure to family and best friend users further increased these odds ratios (OR): OR = 34.4 for current use and 3.1 for susceptibility (table 2).

The next most important predictor of current use was exposure to smokeless tobacco advertising, which had a sevenfold effect on current use and increased the proportion who were susceptible by 60%. Other predictors included peer norms and cigarette smoking. Adolescents who had best friends who approved their use of smokeless tobacco were more than five times as likely to be a current user as adolescents with best friends who disapproved using smokeless tobacco. This effect was similar for susceptibility, although the magnitude of the effect was smaller, OR = 1.9. Cigarette smoking was also significant in predicting current use of smokeless tobacco. Boys who smoked cigarettes were over three times as likely to be a current user of smokeless tobacco as youths who did not smoke. Finally, boys who participated in team sports were 70% more likely to be susceptible to the use of smokeless tobacco than non-participants, although this effect was not significant for current use of smokeless tobacco.

Discussion

Our results indicate that experimentation and current use of smokeless tobacco among adolescent males in California have not changed significantly between 1990 and 1993, despite the large scale Tobacco Control Program. Smokeless tobacco use was highest among white boys, followed by Hispanic boys. Much lower levels were observed in Asians and smokeless tobacco use was almost non-existent in African-Americans.

Usage rates were highest among adolescents who described themselves as better than average students although not in the top student group. This pattern differs from cigarette consumption patterns which have shown a marked educational gradient for a number of years.³⁶

This study once again emphasises the importance of exposure to peer users as a predictor of susceptibility to use and actual use. Peer users may provide a convenient access to the product for experimentation purposes. Further, these best friends may proselytise the benefits associated with usage

in an attempt to normalise a potentially deviant behaviour. As in a number of studies, we find evidence linking advertising and promotion of the product with illicit use by minors.^{14, 37-39} However, because of the cross-sectional nature of the data, any conclusions related to the directionality of the relationship between the risk factors and use of smokeless tobacco should be viewed with caution. The effect of advertising on the likelihood of an adolescent being susceptible to start using smokeless tobacco appears independent of the effect of peer or family usage increasing the probability in the higher usage categories. As with studies of cigarette use, the more a brand is perceived by adolescents as most advertised, the greater the market share of that brand. Although this association is commonly found, in itself it does not provide evidence suggesting a causal link. Time-trend data showing a close temporal match between the start of a targeted advertising campaign and smoking uptake in minors of that population subgroup strengthen the case that advertising and promotion encourages uptake.⁴⁰ Further evidence can be seen in the relationship between advertising and susceptibility among never-users. Among never-users, 22 (CI 3.9)% of the adolescents who were exposed to smokeless tobacco advertising were susceptible whereas only 13 (CI 2.1)% of those who were not exposed to smokeless tobacco advertising were susceptible to use smokeless tobacco.

Since adolescence has been characterised as a period in which youths begin to favour the norms of their peers over the norms of their parents,^{41, 42} it is not surprising that we found peer norms be an important predictor of current use of smokeless tobacco. These unspoken norms may be conceptualised as one of the benefits or costs of using smokeless tobacco by the adolescent boy.²⁰

In previous studies, involvement with baseball as a team sport has been associated with higher usage rates for smokeless tobacco. Because the survey question did not differentiate the type of team sport that adolescents practised, any baseball specific effect might have been diluted. This may explain why this study identified an effect of participation in team sports on susceptibility to use smokeless tobacco but not on current use. That this study identified any effect emphasises the promoting power of athletes either as conspicuous users or as advertising agents for this tobacco product.

The anti-tobacco interventions of the Tobacco Control Program include school programmes and media campaigns aimed at adolescents, in addition to other programmes involving local lead agencies, medical care programmes, and the competitive grants programme. Since the anti-tobacco interventions were not specifically targeted for adolescent boys and their use of smokeless tobacco, the campaign may not have had a major impact on preventing smokeless tobacco use. Furthermore, the tobacco industry's own advertising campaign directed toward youth, in addition to the other social influences, may have counter-

balanced the effect of the California Tobacco Control Program on these adolescent boys.

Adolescents do not have an understanding of how the long term consequences of smokeless tobacco will affect them. Primary prevention programmes should target elementary school age children before they develop a regular pattern of use. These prevention efforts should stress the negative effects associated with smokeless tobacco use and emphasise the maintenance of present health and physical competence.⁴³ Interventions for older children might best be implemented with peers in school, and with athletic and youth groups.

Advertising and promotion of smokeless tobacco products must be considered in any prevention programme, especially because the tobacco industry attributes much of the increase in smokeless tobacco consumption to marketing and advertising strategies.⁴⁴ Tobacco companies that advertise smokeless tobacco products use specific themes, such as portraying smokeless tobacco as an acceptable alternative to cigarette smoking and that it is easy to use.⁴⁵ Other messages that are stressed include that it is convenient in places where you can't light up, and that a pinch is all it takes. Some advertisements provide explicit instructions (written or through the use of athletes) on how to use smokeless tobacco and also suggest that it could be used without parents' awareness.^{5, 8} Tobacco related prevention programmes geared towards adolescents should address these youth oriented advertisement themes to prevent adolescents from trying smokeless tobacco.

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