

## **Long-Term Follow-Up of a Pilot Project on Smoking Prevention with Adolescents**

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*Seventh graders (N = 353) in one junior high school received an experimental smoking prevention program aimed at teaching students to resist the social pressures to smoke cigarettes. Seventh graders (N = 217) in another school served as controls. Teams of high-school students trained in basic behavior change skills led seven classroom sessions of instruction in counter-arguing during the school year. Significant differences were found between groups in reported smoking at a 9-month posttest. Results were maintained at 21- and 33-month follow-ups.*

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### **INTRODUCTION**

Cigarette smoking is the single most important preventable behavioral factor contributing to illness, disability, and death in the United States

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(U.S. Department of Health, Education and Welfare, 1979a). Despite widespread knowledge of the harmful effects of tobacco use (Evans, 1976), adolescents continue to adopt the smoking habit. Smoking among adolescent increases fivefold between junior and senior high school (U.S. Department of Health, Education and Welfare, 1979b). An array of correlates has been identified as contributing to the onset of youth smoking. Social influences, particularly peer pressure, appear to be among the most important (Evans, 1976).

Numerous antismoking programs have been implemented in junior and senior high schools in attempts to dissuade adolescents from smoking. Traditionally, programs have employed a wide range of techniques including lectures, discussions, posters, and films aimed at increasing student awareness of the harmful long-term effects of cigarette smoking. While some studies have reported positive changes in knowledge and attitudes, most show little or no effect on students' reported smoking behavior (Andrus, 1964; Beckerman, 1963; Evans and Borgatta, 1970; Holland, 1968; Irwin *et al.*, 1970; Jeffreys and Westaway, 1961; Morrison, 1964).

Programs emphasizing the long-term health effects of cigarette smoking have shown little success. Recent research in youth smoking prevention has shown promising results with programs employing coping skills training to help adolescents resist social pressures to smoke from peers, media, and adult models (Evans *et al.*, 1978; McAlister *et al.*, 1979, 1980; Perry *et al.*, 1980a; Hurd *et al.*, 1980).

The present paper reports long-term follow-up data on the effectiveness of Project CLASP (Counseling Leadership About Smoking Pressures), a smoking prevention program for adolescents. Project CLASP employs high school students to guide younger peers in the development of counter-arguing skills to resist social pressures to smoke. Students learn of the variety of smoking inducements confronting them and, through modeling and guided practice, learn to devise counter-arguments which could be used across a wide range of social contexts to help resist temptations to smoke. Descriptions of Project CLASP and preliminary results have been reported elsewhere (McAlister *et al.*, 1979, 1980; Perry *et al.*, 1980b). This report presents longitudinal outcome data on the project.

## METHOD

*Subjects.* Participants were seventh-grade students from two junior high schools within a distance of 20 mi from Stanford University. All seventh graders in attendance at one school ( $N = 353$ ; 189 males, 164

females) received an experimental smoking prevention program (Project CLASP). All seventh graders in the second school ( $N = 217$ ; 110 males, 107 females) served as controls.<sup>5</sup> Both schools served middle-class and upper-middle-class populations. Schools were not randomly assigned to conditions. Selection of the treatment cohort was based on reports of high rates of smoking and drug abuse by school personnel. At baseline, 2.0% of the students in the treatment cohort and 0.9% of the students in the control cohort reported smoking in the previous week. The levels of parental smoking in the treatment and control cohorts were 41.9 and 41.5%, respectively. The percentages of parents attending college were 89.8% for the treatment cohort and 90.3% for the control. Reports of sibling smoking were 18.4% for the treatment cohort and 19.8% for the control. Nearly half (44.6%) of the treatment cohort reported that their friends were regular smokers. The corresponding figure for controls was 57.6%.

*Measures.* Self-reports of cigarette smoking served as the major dependent measures. Participants anonymously responded to the questions: Have you smoked during the past week? and Have you smoked during the past month? as part of a larger survey on cigarette smoking. Surveys were conducted three times yearly over the first 2 years in junior high school (seventh and eighth grade) and once during the third year in senior high school (ninth grade). For each survey, breath samples were collected from all subjects in both schools in an attempt to increase the accuracy of subjects' self-reported smoking. Subjects were first ensured anonymity to reduce the perceived threat of monitoring and to help them feel safe in providing truthful answers. Subjects were then given breath sample collection bags and informed that the bags would be used to collect breath samples which would be analyzed for carbon monoxide content by scientists in laboratories at Stanford University. Subjects were told that smokers had higher levels of carbon monoxide than nonsmokers and that laboratory analyses would reveal whether someone had responded to questions truthfully. Data collectors then demonstrated the procedures for blowing up and securing breath bags. Previous research has shown that such procedures markedly increase the number of students who report smoking (Evans *et al.*, 1977, 1980). Data collection was performed by Stanford University undergraduates blind to experimental conditions.

*Procedures.* High-school "peer-leader" teams composed of five to seven high-school students conducted all class sessions. All peer leaders were graduates of the treatment school and were recruited from a nearby

<sup>5</sup>The  $N$ 's at the different follow-up points varied slightly due to absenteeism and student transfers. They ranged from 172 to 217 in the control cohort and 307 to 353 in the treatment cohort.

high school by a popular teacher on the basis of their communication skills and judged attractiveness as popular, adventurous persons with healthy life-styles. Training consisted of three 2-hr sessions focusing on the use of basic behavior change skills (i.e., modeling, guided practice, and positive reinforcement). Manuals detailing class sessions and suggesting useful behavior change and communication skills were provided to aid effective teaching. One-hour booster training sessions were provided on a monthly basis by the experimenters to answer questions and provide feedback to the peer leaders.

The peer-leadership program consisted of seven sessions conducted over a 9-month academic period. Each session required a 45-min class period and was conducted in seventh-grade social studies classes. The regular classroom teachers did not attend the sessions in order to encourage the subjects to discuss openly with the peer leaders issues and feelings concerning smoking. The first three sessions were conducted on consecutive days during the first month of school (September 1977). In the first session, participants made public commitments not to become dependent on tobacco and learned some of the social influences which encourage young people to adopt the smoking habit. In session 2, slide shows and films presented promotional techniques used to encourage smoking. Peer leaders helped subjects to identify "selling strategies" and modeled a variety of responses to counter the effects of cigarette advertising. For example, covert rehearsal techniques were used to help participants learn to respond to advertising depicting women smokers as liberated (e.g., "She's not really independent if she is hooked on tobacco."). During the third session, group discussions evaluated peer influences on individual behavior. With the aid of the peer leaders, subjects created skits on peer pressure and then performed them in front of the class. This enabled subjects both to acquire and to practice ways to resist pressures to smoke from peers. For example, when called a "chicken" for not accepting a cigarette, they learned to respond with an effective counter-argument (e.g., "I would be more of a chicken if I smoked just to impress you."). Remaining sessions were conducted at 2-month intervals over the course of the academic year. These sessions repeated activities from previous classes with minor variations. Prizes (e.g., buttons, record albums, and T-shirts) were awarded for skits and slogans demonstrating effective coping with smoking pressures in order to help maintain interest and enthusiasm in the program.<sup>6</sup>

<sup>6</sup>Treatment manuals are available upon request.

## RESULTS

Thirty-three months of longitudinal data on subjects' reported smoking behavior are presented in Fig. 1. These data are based on the students in school at each follow-up point. Because respondents were guaranteed anonymity, it was not possible to discriminate between those who had been absent or who transferred from another school. However, dropout and transfer estimates were obtained in each year of the study. For the treatment cohort, 94% of the original sample were in school at the end of seventh grade, 87.1% were in school at the end of eighth grade, and 82.5% were in school at the 33-month follow-up. The corresponding percentage estimates for the control cohort were 93, 85.4, and 80.2%. At baseline, cohorts did not significantly differ in the percentage of students who reported smoking during the last week. However, as Fig. 1 illustrates, significant differences between cohorts emerged at a 9-month posttest, with 10.3% of the students in the control cohort reporting weekly smoking, compared to only 5.3% in the treatment cohort ( $X^2 = 4.02, P < 0.05$ ). Results after 21 months indicated an even greater discrepancy in reported smoking between the two cohorts ( $X^2 = 15.5, P < 0.001$ ). The treat-

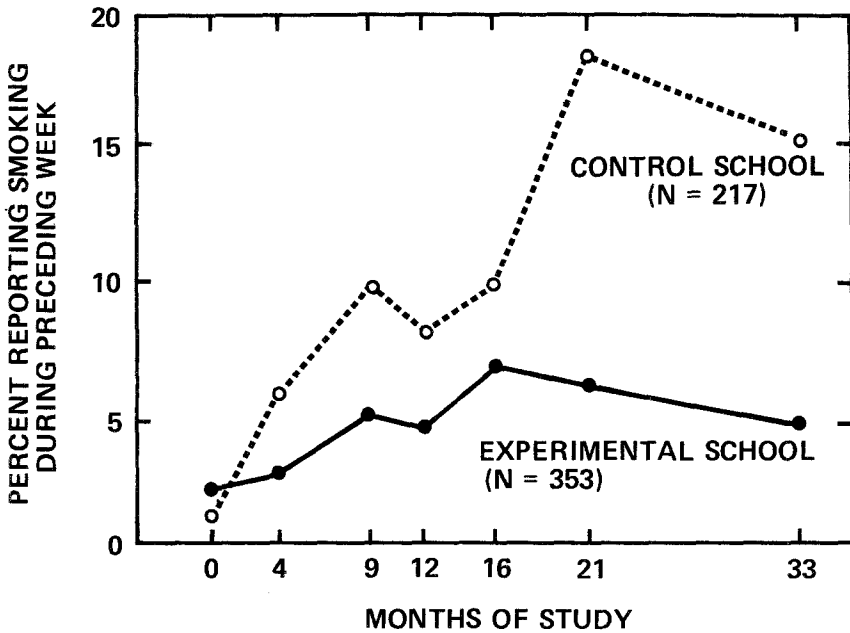


Fig. 1. Changes in the reported prevalence of weekly smoking from longitudinal observation of two study cohorts.

ment cohort showed a slight increase in smoking from the 9- to the 21-month follow-ups (5.3% to 7.1%). This difference was not significant. However, the control showed a marked increase (10.3% to 18.8%) in the smoking during the same period ( $X^2 = 5.93$ ,  $P < 0.02$ ). At the 33-month follow-up, there continued to be a considerable difference in reported smoking between the treatment and the control cohorts ( $X^2 = 12.2$ ,  $P < 0.001$ ). While both showed a slight reduction from the previous year, neither cohort's decrease was significant.

## DISCUSSION

Adequate data on the maintenance of health behaviors are generally lacking in the treatment literature. Few studies report follow-ups beyond 6 months. The present findings lend support for the long-term effectiveness of Project CLASP. Thirty-three months of longitudinal data showed untreated subjects reporting smoking at a level three times that of treated subjects. A comparison of these smoking rates with national statistics revealed that the percentage of reported weekly smokers in the treatment cohort at the 33-month follow-up (5.1%) is markedly lower than the national figures of 12.2% for weekly smokers of the same age (U.S. Department of Health, Education, and Welfare (1979b)). However, after 33 months, the percentage of weekly smokers among the control cohort (14.8%) was slightly higher than the national average.

Several explanations might account for the results. It is possible that the program simply created negative attitudes about smoking. Yet research suggests that attitude changes seldom produce changes in adolescents' smoking behavior (Thompson, 1978). An alternative hypothesis is that subjects acquired the necessary skills with which to resist the social pressures to smoke. Observations of subjects' performance during simulation exercises support this explanation. Studies are needed to determine the extent to which subjects employ these skills in their natural environments.

It is also possible that the program changed the social environment of the treatment cohort so that norms for smoking were altered. Perhaps the project's emphasis on training students to resist the pressures to smoke caused them to identify smoking as a symbol of weakness (i.e., inability to resist the pressures to smoke). Thus, a shift in smoking norms may have reduced the influence of smoking models within the peer group.

Factors other than the intervention may be partly responsible for the differential rate of onset within the two cohorts. For instance, pretreatment differences between subjects in the two cohorts may have influenced the findings. However, as mentioned earlier, the two cohorts were quite similar on measures of subjects' baseline reported smoking, parental

smoking, sibling smoking, peer smoking, and social class. It is also possible that deliberately choosing a population with reportedly acute problems as the experimental group and one with fewer reported problems as the control group influenced our findings. Experimental demand may have also been operating to bias the reported smoking of the subjects in the treatment group, despite efforts to encourage accurate responses. The increased use of physiological measures such as CO and saliva thiocyanate to indicate smoking is needed in future studies to assess adolescents' smoking behavior more reliably (Perry *et al.*, 1980a; Vogt *et al.*, 1979).

In spite of these methodological shortcomings, this study provides encouraging support for the hypothesis that cigarette smoking can be deterred by training adolescents to resist temptations and inducements from peers and others. A randomized, multisite experiment designed to measure both processes and long-term physiological outcomes among matched cohorts from widely diverse cultural and geographic populations is presently underway.

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