THE TELEVISION, SCHOOL AND FAMILY SMOKING PREVENTION/ CESSATION PROJECT. IV. CONTROLLING FOR PROGRAM SUCCESS EXPECTANCIES ACROSS EXPERIMENTAL AND CONTROL CONDITIONS

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Abstract — A major issue in smoking prevention research is that no study has tried to equate program success expectancies across experimental and placebo control conditions. Equivalent overall program success expectancies should be established to help rule out the effects of extra-theoretical variables which influence program outcomes. The present study tested whether an attention-placebo (information based) smoking prevention program would produce equivalent expectancies about the likelihood of program success in comparison to an experimental social influences program. To try to equate program success expectancies, the design of the two programs differed in content but was similar in procedure. Fourteen middle schools were randomly assigned to the two conditions. As hypothesized, baseline expectancies were found to predict outcome measures, even after controlling for baseline smoking intentions, ethnic group, and gender. Second, the equivalence of program expectancies at posttest was tested. Youths held equivalent overall expectancies for success across conditions. This study suggested the need to control for program expectancies in prevention research, and showed that program expectancies could be controlled for by equating process of program delivery.

INTRODUCTION

Placebo programs are introduced in experimental research to control for influences of extra-theoretical effects on program outcomes (Kazdin & Wilcoxon, 1976; McGuire, 1969; Shapiro & Morris, 1971). Such program comparisons are an advance relative to use of no treatment controls. Extra-theoretical effects of a condition can be measured through assessments of subjects' program success expectancies (Hampton, 1973; Lick & Bootzin, 1975; Shapiro & Morris, 1971). The operation of expectancies in smoking prevention research has yet to be demonstrated.

Only a few smoking prevention researchers have used attention-placebo programs to control for extra-theoretical effects such as special attention (e.g., Flay et al., 1989; Schinke & Gilchrist, 1985; Schinke, Gilchrist, Schilling, Snow, & Bobo, 1986). Unfortunately, no prevention study has tried to equate subjects' program success expectancies across experimental and placebo conditions. Programs may provide equal time/attention to participants, yet participants may still differ in expectancies for success across conditions due to differences in other extra-theoretical variables. For example, Borkovec and Nau (1972) found that ratings of credibility were often lower in attention placebo than relatively successful therapy groups.

Creating parallel conditions except for theoretically relevant components allows for a high level of control over program success expectancies across conditions (Kazdin & Wilcoxon, 1976). Utilizing such carefully structured conditions would be especially useful in cigarette
Table 1. Social resistance curriculum

<table>
<thead>
<tr>
<th>Session</th>
<th>Normative expectations</th>
<th>Peer influences/assertive refusal techniques</th>
<th>Advertising health/social consequences</th>
<th>Communicating nonsmoking messages</th>
<th>Adult influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify youth/adult smoking prevalence rates</td>
<td>Identify peer pressure; practice assertive refusal techniques</td>
<td>Identify immediate/long-term health/social consequences of drug use</td>
<td>Identify effects of passive smoke; practice assertive resistance</td>
<td>Identify adult influences: function as cessation social support for adult quitters</td>
</tr>
<tr>
<td>2</td>
<td>Roleplay assertive peer pressure refusal techniques</td>
<td>Roleplay immediate health/social consequences</td>
<td>Roleplay assertive resistance to passive smoke</td>
<td>Roleplay parent cessation contract; Pos/Neg adult influences</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Normative expectations exercise: question box</td>
<td>Advertising non-depicted health/social consequences</td>
<td>Roleplay assertive resistance to passive smoke</td>
<td>Smoker interview; cessation contract</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Assertive refusal demonstration</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
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</tbody>
</table>

*All homework exercises require parent-student interaction and parent signature.

smoking prevention research, wherein the locus of program effects is unclear (Flay, 1985; Flay & Best, 1982; Johnson, 1982; McCaul & Glasgow, 1985). Ultimately, though, equivalent expectancy of conditions must be empirically established.

The current major experimental manipulation in smoking prevention research is whether or not students receive a social influences program. The social influences approach to cigarette smoking prevention relies heavily on social inoculation (McGuire, 1964) and social learning (Bandura, 1977) theories. Resistance to persuasion is hypothesized to be greater if one has learned arguments and skills to counter social pressures to use drugs (Evans, 1976; Flay, 1985). Social influence prevention programs have been found to reduce smoking onset by 50% on average (Flay, 1985). Yet, it is unclear whether or not social influence programs exert their effects by imparting knowledge and skills to resist social influences to use cigarettes or whether program effects are due to extra-theoretical reasons, such as instilling hope in the intervention, which lead to higher expectancies of success.

The Television, School and Family Project (TVSFP) was designed as a true experimental field trial of the relative efficacy of classroom and mass media social influences smoking prevention programs (Flay et al., 1989). A social influences curriculum was developed for use in combined television/classroom, television only, and classroom only conditions. In addition, two types of classroom-only controls were included. In the "traditional" control condition, students received the health or smoking education curriculum provided by their school. In the "attention-placebo" condition, students were provided with an information-based curriculum designed to control for the effects of special attention. An appropriate attention-placebo for smoking and drug abuse prevention studies is the use of an information-based approach. Information programs have not been shown to have effects on smoking intentions or behavior in past studies with young adolescents (e.g., Durell & Bukoski, 1984; Thompson, 1978), and, more importantly, they do not impart social influences-related information.
The present study was conducted to test (a) whether baseline program expectations predict postprogram intentions to smoke, and (b) whether it was possible to create equal posttest expectancies of treatment success for social influence and information/fear curricula. As a manipulation check, we explored whether posttest expectancies which address “specific” information-based or social influences-based program content would be rated relatively favorably as a function of program condition. Program content should positively influence relevant specific posttest expectancy self-reports as an indication of program effectiveness. On the other hand, expectancies anchored to the content of both programs (“general” expectancies) should not favor one condition over the other.

The curriculum design will be described first. Curricula were developed to achieve equivalent expectancies for program success. Next, the ability of baseline treatment expectancies to predict program response (as an individual difference variable) will be shown. Finally, a determination of posttest expectancy equivalence will be presented.

METHOD

Curriculum design

Two classroom curricula, similar in the way prevention information was processed, but different in information content, were developed. Ten social resistance prevention classroom sessions were designed to identify peer, parent and media pressures to smoke, and to teach, through role-play, assertive social resistance skills in response to such pressures (Table 1). Ten information-based classroom sessions were designed to operate as an “active” attention control (Table 2). Curriculum strategies included roleplay and family interaction; however, neither social pressures to use tobacco nor social skills training were taught. Instead, short-term and long-term physiological effects of smoking, economic factors and safety issues were presented.
Table 2. Information-based curriculum

<table>
<thead>
<tr>
<th>Objective</th>
<th>Activities</th>
<th>Homework*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define drug-related terms</td>
<td>Trace history of tobacco and smoking</td>
<td>Word-search puzzle</td>
</tr>
<tr>
<td>Trace history of tobacco and</td>
<td>History of tobacco products and smoking</td>
<td>Financial costs exercise</td>
</tr>
<tr>
<td>smoking economics</td>
<td>discussion; Emphysema breathing demonstration</td>
<td>Upper respiratory effects quiz</td>
</tr>
<tr>
<td>Identify upper respiratory</td>
<td>Respiratory system discussion; Emphysema</td>
<td>Cardio-pulmonary effects exercise</td>
</tr>
<tr>
<td>effects</td>
<td>breathing demonstration</td>
<td></td>
</tr>
<tr>
<td>Identify cardio-pulmonary effects</td>
<td>Blood vessel restriction demonstration; Smoking-related disease symptoms roleplay</td>
<td></td>
</tr>
<tr>
<td>Identify passive smoke effects</td>
<td>Effects on unborn</td>
<td></td>
</tr>
<tr>
<td></td>
<td>discussion; Passive smoke environment</td>
<td></td>
</tr>
</tbody>
</table>

*aAll homework exercises require parent-student interaction and parent signature.

The classroom curricula shared a common internal activity presentation sequence. At the
beginning of each session after the first one, a ‘‘Previous Session Review’’ was accom-
plished through homework review and discussion. An ‘‘Objective Statement’’ presented the
behavioral objectives and related knowledge objectives of the session. Next, the class
discussed the objectives and the manner in which the session complemented other sessions
in the sequence. Finally, a ‘‘Bridge to Next Session’’ included a recapitulation of the session
objectives and an introduction to the content of the next session.

Homework exercises were assigned to be performed by student and parent together. Parent
signatures to that effect were required for homework to be recorded as complete. Homework
activities in both conditions were designed to require similar amounts of time to complete.
Social resistance curriculum homework assignments provided family-oriented social skill-
building exercises and assertiveness training in response to peer, adult and media pressures
to smoke. Information-based curriculum homework assignments were parallel to classroom
content, covering immediate and long-term physiological effects of smoking and illicit drug
use, as well as financial, environmental and legal issues.

Socratic instruction, modeling and roleplay were instructional strategies used in delivery
of both curricula. Informational content was provided by a socratic process. Modeling and
roleplay were used to demonstrate and to practice social resistance skills in social influences
classrooms. In attention-placebo classrooms, demonstrations of physiological effects and
role-play of symptoms of smoking and smoking-related diseases were used to provide similar
amounts of instructor attention, class interaction, and role-playing/play-acting. For example,
in the role-plays one student would act out a patient with the symptoms of bronchitis,
emphysema, or lung disease, and another student would act out the role of a doctor who
would diagnose the condition, its severity, and its consequences if the patient continued to
smoke.

The final ‘‘Decision-Making and Commitment’’ session content was similar across
conditions, with the exception that the decision-making and commitment content were based
on physiological, economic, environmental and legal implications of choosing to smoke in
the attention-placebo condition, rather than on the peer, parent and media-related social and resistance skills, which was the focus in the social influences condition.

Subjects and procedures

The study was conducted in all seventh grade classes at 14 middle schools in the Los Angeles, California, area. The schools were randomly assigned to two conditions and, consequently, did not differ in terms of school size, demographics (e.g., gender, ethnic group, socioeconomic status), school performance (California Assessment Inventory and self-report of grades), drug use, or drug use intention variables (Dent et al., 1989). Ninety percent of all students participated in the study at pretest. Posttest-pretest attrition was 12% in the social influences condition and 11% in the attention-placebo condition. Seventy percent of all attrition was due to student absence at posttest. All analyses utilized the longitudinal sample (n = 640 for the social influences condition and n = 740 for the information-based condition).

At pretest, 42% percent of the students had tried cigarettes, 5.5% were weekly smokers, and 9.4% intended to smoke in the future in each condition. The students were 50% male and 50% female, 32% White, 36% Hispanic, 16% Black, and 16% Asian, and were primarily from skilled working class families.

Students were not informed, prior to receiving their curriculum, of the curriculum content. In each classroom, a pretest was conducted within two weeks prior to the first day of program implementation (which took place in February of 1986). Data collectors did not teach the curriculum. All 10 sessions of each curriculum were implemented concurrently for five consecutive school days, for each of two weeks, one month apart. Fidelity of implementation was assured through curriculum delivery by trained health educators. Health educators were randomly assigned to conditions. The posttest was administered within two weeks of the last implementation day. Both the pretest and posttest questionnaires took one class period to complete and assessed a variety of constructs including demographic variables, smoking

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<table>
<thead>
<tr>
<th>Session</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term physiological effects</td>
<td>Identify effects on senses and nutrition</td>
<td>Identify hazards of smokeless tobacco/clove cigarettes</td>
<td>Identify environmental/legal consequences</td>
<td>Review physiological, economic, legal safety issues</td>
<td>Identify five-phase decision-making process; Commit to drug-free lifestyle</td>
</tr>
<tr>
<td>Nutritional effects discussion; Effects on taste/smell demonstration</td>
<td>Nutritional effects story-writing exercise</td>
<td>Smokeless tobacco/clove cigarettes discussion; Smokeless tobacco effects videotape</td>
<td>Physical/psychological addiction; Environmental hazards; Legal implications</td>
<td>Question/Answer; Team Review; Game</td>
<td>Decision-making exercise; Public commitment contract</td>
</tr>
</tbody>
</table>

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attitudes, beliefs, behavior and intentions, social environmental smoking, knowledge, and program expectancy.

Measures

The expectancy items were designed to measure whether: (a) Pretreatment expectancies predict posttest outcome and evaluation variables in the cigarette smoking prevention context; (b) the two curricula produced equivalent overall expectancies for success at posttest; and (c) posttest expectancy items that relate to specific program content will be rated more favorably within their respective program condition. The expectancy items consisted of 11 responses. The items shared a common stem but varied in item-ends. The common stem was, ‘‘How likely is it that anything you learn about smoking in school this year will help you to . . .’’

Four of the item-ends addressed general expectancies: ‘‘not start smoking,’’ ‘‘quit smoking if you ever started,’’ ‘‘make your own decisions about smoking,’’ and ‘‘help your household to become or remain a nonsmoking place.’’ Four of the item-ends addressed social influence-specific expectancies: ‘‘learn to resist peer pressures to smoke,’’ ‘‘learn to resist media pressures to smoke,’’ ‘‘learn to resist family pressures to smoke,’’ and ‘‘learn more ways to refuse cigarette offers.’’ The three remaining item-ends addressed attention-placebo-specific expectancies: ‘‘learn about the effects of smoking on one’s senses of taste and smell,’’ ‘‘learn in detail about the diseases caused by smoking,’’ and ‘‘learn about the legal and environmental effects of smoking.’’ The response categories for all 11 items consisted of 5-point anchored scales which varied from ‘‘Very likely’’ (1) to ‘‘Not at all likely’’ (5).

The 11 expectancy items were moderately-to-highly inter-correlated (all rs > .4) at pretest. Cronbach’s alpha coefficient was .92 at pretest, indicating high internal consistency. Thus, these items were aggregated to form a baseline expectancy index. We expected that posttest item subsets (i.e., the four general items, the four social influence-specific items, and the three attention-placebo-specific items) would be differentiated due to different information imparted in the two conditions. To fully explore expectancies at posttest, analyses were done on both the aggregated and individual items.

A two-item index of pretest intentions was calculated by averaging responses over the items ‘‘Do you think you will ever smoke cigarettes in the future?’’ and ‘‘Do you think you might ever ask anyone to let you try a cigarette?’’ (Response categories ranged from ‘‘Yes, definitely’’ (1) to ‘‘Definitely not’’ (6).) These items showed a .50 ($p < .0001$) inter-correlation, indicating adequate shared variance to combine them.

Program outcome variables included posttest measures of each of the two smoking intention items, lifetime smoking (response categories ranged from ‘‘None at all’’ (1) to ‘‘More than 5 packs’’ (7)), and personal concern regarding the possibility of dying if the person were a smoker (a smoking attitude item; response categories ranged from ‘‘Not at all worried’’ (1) to ‘‘Extremely worried’’ (5)). Posttest program evaluation variables included personal effort put into learning the program material (response categories ranged from ‘‘I didn’t try to learn the program material; it’s not for me’’ (1) to ‘‘I tried as hard as I could to learn the material’’ (5)), program helpfulness to not become a cigarette smoker (response categories ranged from ‘‘Not at all’’ (1) to ‘‘Extremely’’ (5)), and how well-liked the program was (response categories ranged from ‘‘Not at all’’ (1) to ‘‘Extremely’’ (5).

R E S U L T S

The first set of analyses examines whether baseline program expectancies predict program response, after controlling for the effects of ethnic group, gender, and baseline intention to
Table 3. Predicting program outcome and evaluation from ethnic group, gender, baseline smoking intentions, and baseline program expectancies

<table>
<thead>
<tr>
<th>Posttest item</th>
<th>Model $F$</th>
<th>Pretest effects $F$s</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many cigarettes have you smoked in your whole life?</td>
<td>121.80***, $R^2 = .25$</td>
<td>Ethnic group: 19.25***</td>
</tr>
<tr>
<td>Do you think you will ever smoke cigarettes in the future?</td>
<td>179.27***, $R^2 = .33$</td>
<td>Ethnic group: 22.16***</td>
</tr>
<tr>
<td>Do you think you might ever ask anyone to let you try a cigarette?</td>
<td>167.40***, $R^2 = .31$</td>
<td>Ethnic group: 23.72***</td>
</tr>
<tr>
<td>If you were to smoke cigarettes, how worried would you be about the possibility of dying?</td>
<td>13.91***, $R^2 = .09$</td>
<td>Ethnic group: 6.33***</td>
</tr>
<tr>
<td>How much did you like the program?</td>
<td>19.84***, $R^2 = .13$</td>
<td>Ethnic group: 21.67***</td>
</tr>
<tr>
<td>How much effort did you put in to learning the program material?</td>
<td>21.91***, $R^2 = .14$</td>
<td>Ethnic group: 18.95***</td>
</tr>
<tr>
<td>How much will this program help you to not become a cigarette smoker?</td>
<td>22.16***, $R^2 = .12$</td>
<td>Ethnic group: 16.24***</td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01, ***p < .001; model $F$ df = 1, 1380. Whites and females gave the most favorable responses on the items that obtained significant gender or ethnic group effects.

Controlling for program success expectancies

This must be established to assert that it is important to equate expectancies across conditions in the smoking prevention context. The second set of analyses examines whether posttest program expectancies differ across conditions. The programs were designed to be of equal overall expectancy for program success.$^1$

Predicting program response

Seven multiple regression models employing ethnic group, gender, smoking intentions, and the baseline program expectancy index as predictors were tested to confirm whether baseline program expectancies predicted program dependent variables after the other predictors had been placed in the models (i.e., covariation among the predictors was controlled). All multiple regression models were significant (Table 3).

In all models, as expected, the baseline program expectancy index emerged as a significant predictor. The pretest intentions index was by far the strongest predictor of posttest smoking

$^1$Analyses were done at the individual level of analysis, because significant differences between the conditions would be most likely to be found. In other words, we chose a means of analysis most biased against our hope to create conditions of equal expectancies.
intentions and behavior. On the other hand, the pretest expectancy index was almost as strong a predictor as the pretest intentions index regarding (a) effort expended in learning program material and (b) program helpfulness to not smoke in the future, and it was a stronger predictor than intentions regarding (c) personal fear of dying if the person were to become a smoker and (d) liking of the program.

**Posttest expectancies**

Almost three-fourths of the subjects responded "Very likely" or "Pretty likely" to the expectancy items averaged across conditions and items at posttest. To calculate an overall expectancy difference between the two conditions, all 11 items were summed. A between-groups *t* test indicated no overall difference between conditions (*t* = −0.95, *p* > .1).2

To discern whether or not program-specific posttest expectancies differed between the two conditions, three multivariate analyses of variance (MANOVAs) were calculated, one using the 4 general items, one using the 3 items specific to what was taught in the attention-placebo program, and one using the 4 items specific to what was taught in the social influences program as dependent variables, respectively. As expected, the general items MANOVA model was not significant (*F* = 0.52, *p* > .1), whereas the separate MANOVAs for the attention-placebo-specific items and the social influences-specific items were significant (attention-placebo *F* = 3.02, *p* < .03, and social influences *F* = 6.89, *p* < .0001). The attention-placebo-specific items were more favorably rated in the attention-placebo condition, and the social influences-specific items were more favorably rated in the social influences condition (see pattern of means in Table 4). In summary, posttest expectancies specific to a condition were relatively higher for that condition, whereas general expectancies regarding program success, and expectancies summed across general and program-specific items, did not differ across conditions.

**DISCUSSION**

The results are consistent with the clinical psychology research literature regarding the potential for expectancies to influence program results. First, we found that baseline expectancies predicted all outcome measures, even after controlling for baseline smoking intentions, ethnic group, and gender. Thus, it is important to take into account baseline program expectancies in smoking prevention research. Second, we demonstrated equivalent general expectancies at posttest. There are several implications of this finding. The fact that it is possible to equate expectancies on an information-based program, which had not been found to be effective in preventing smoking development, with a social influences program, which has been found to be successful, suggests that previous social influence program findings could have been potent above and beyond Hawthorne effects. At minimum, Project TVSFP’s future outcomes could more confidently be attributed to program content. If the information-based program achieves effects, it would serve as an "active" placebo because it does not provide social influences-relevant information.

The programs did create differential specific expectancies at posttest based on the material provided in the programs. This is not surprising, and indicates that each program exerted an impact on students unique to its content. The fact that the overall expectancy index, which considers all items together, and the four general expectancy items, were not different across conditions suggests further that neither program was considered more credible and

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2 A MANOVA on all 11 items was significant (*F* = 7.71, *p* < .0001) due to differences, which we report, between program-specific items by condition. The use of a simple composite in the *t* test analysis is an appropriate way to demonstrate that, summed over all expectancy domains, the two conditions are equivalent.
potentially effective overall than the other. The results on program-specific items indicated that the two programs did impart different material to students, and suggests that future differential program results found could be attributed to the specific material taught in the programs and probably not to nonspecific (general expectancy) effects.

We achieved expectancy equivalence through a variety of curricula development techniques including equated amounts of instructor attention, student homework and discussions of material, and family involvement, and equated classroom strategies and techniques used to transmit material. It is not clear which techniques were most important in that endeavor. Still, it illustrates a principle useful in developing programs of equal expectancies, namely that one will maximize the chance of achieving equal program expectancies if one keeps the classroom process constant across conditions while manipulating only material content. It is useful to know that one can develop health education programs with equivalent expectancies; the development of experimental versus attention-placebo conditions can be rather difficult in less standardized contexts, such as in psychotherapy (see review by Parloff, 1986).

In summary, this study indicated the need to control for program expectancies in prevention research. We demonstrated that program expectancies can be controlled by creating alternative programs with the same structure. Even if different programs' structures are not the same, it is imperative for future prevention programs to assess program expectancies at multiple waves to control for preprogram and posttest program extra-theoretical effects.
REFERENCES


