

Preventing Teen Pregnancy and Academic Failure: Experimental Evaluation of a Developmentally Based Approach

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A true experimental evaluation was conducted of a national volunteer service program, Teen Outreach, that was designed to prevent adolescent problem behaviors by enhancing normative processes of social development in high school students. This evaluation addressed 2 problem behaviors in adolescence—teenage pregnancy and school failure—for which experimental evidence about successful preventive programs has been largely lacking. High school students ($N = 695$) in 25 sites nationwide were randomly assigned to either a Teen Outreach or Control group and were assessed at both program entry and at program exit 9 months later. Rates of pregnancy, school failure, and academic suspension at exit were substantially lower in the Teen Outreach group, even after accounting for student sociodemographic characteristics and entry differences between groups. Results are interpreted as suggesting the potential value both of the Teen Outreach Program specifically and also more generally of interventions that seek to prevent problem behaviors by addressing broad developmental tasks of adolescence rather than by focusing upon individual problem behaviors or micro-skills.

INTRODUCTION

Among the long list of social problems that can occur in adolescence, two problems—teen pregnancy and school failure—are of particular concern as a result of their persistent and costly consequences. When teen pregnancy leads to teen childbearing, long-term costs are often severe for the adolescents involved, for their offspring, and for the larger society, with estimates of total societal costs of teen parenthood ranging from \$9 to \$29 billion annually (Center for Population Options, 1992; Furstenberg, 1991; Maynard, 1996). Teen pregnancy also serves as a marker of sexual behavior that brings a substantial risk of contracting AIDS and other sexually transmitted diseases. Similarly, school failure and academic behavior problems are two of the best predictors of school dropout (Engel, 1994; Oakland, 1992; Powell-Cope & Eggert, 1994), which has immense lifetime consequences for both the individual and society (estimated at \$260 billion in lifetime lost income and taxes for each year's class of dropouts; Catterall, 1987). Both school failure and teen pregnancy have been the foci of intensive preventive intervention efforts, although evaluation of such efforts has often been sporadic and uneven in quality.

Several recent reviews of teen pregnancy prevention programs and their evaluations have noted how little positive evidence exists that any program can reduce teen pregnancy rates (Frost & Forrest, 1995; Kirby et al., 1994; Moore et al., 1994; Philliber & Namerow, 1995). Two recent reviews of the most rigorously evaluated programs targeting teen sexual be-

havior (Frost & Forrest, 1995; Philliber & Namerow, 1995) have identified a total of nine programs that targeted teen sexual behavior and that were evaluated with true random assignment designs (Philliber & Namerow, 1995). Among these, one program that provided contraceptive services to teens had a clear effect in reducing pregnancy rates (Winter & Breckenmaker, 1991), consistent with a line of quasi-experimental research suggesting the efficacy of programs that distribute contraceptives (e.g., Zabin, 1992; Zabin, Hirsch, Smith, Streett, & Hardy, 1986; Zabin et al., 1988a, 1988b). Several behavioral skills training programs and educational programs also have produced increased reported contraceptive use among selected groups of adolescents (i.e., those with no prior sexual experience, minority males, and so on; Barth, Leland, Kirby, & Fetro, 1992; Eisen & Zellman, 1992; Eisen, Zellman, & McAlister, 1990, 1992; Jemmott, Jemmott, & Fong, 1992; St. Lawrence, Jefferson, Alleyne, & Brasfield, 1995). And a community service/life options program reported effects in reducing birth rates by the end of the second year of the program, although pregnancy rates were not influenced and birth rates were not affected in the first year of the program (Hahn, 1994). Other than contraceptive distribution programs, the one other true experimental program with evidence of ability to reduce pregnancy rates was the Perry Preschool project, a comprehensive, developmentally focused program that demonstrated a trend toward significant ef-

fects (.10 > p > .05) 14 years after program implementation when former participants were age 19 (Schweinhart, Barnes, & Weikart, 1993).

Programs to prevent academic failure and dropout are also widespread, and evidence has been accumulating that several types of programs may have some impact on failure and dropout rates (Felner, Brand, Adan, & Mulhall, 1993; Oakland, 1992). Nevertheless, true experimental evaluations of such programs are also quite rare. Given the difficulty of implementing and evaluating preventive interventions for adolescents, questions are being raised both within the social sciences and in the larger policy arena about whether problems, such as teen pregnancy and academic failure and dropout, can be effectively addressed with psychologically focused interventions or whether harsher economic incentives must be implemented (Males, 1993; Personal Responsibility and Work Opportunity Act, 1995).

Although programs can apparently succeed by targeting highly specific skills and micro behaviors on the part of adolescents (e.g., condom use, homework completion, school attendance) or by targeting broader antecedent developmental factors that have been related to the risk of serious problem behaviors, the latter group of programs have the potential, at least in theory, to reduce the incidence of *multiple* problem behaviors. Numerous writers have acknowledged the common roots or causes of problem behaviors among adolescents and thus pointed to the need for multipronged and developmentally oriented programs dealing more comprehensively with young people (Carrera & Dempsey, 1988; Donovan & Jessor, 1985; Donovan, Jessor, & Costa, 1988; Schorr, 1988). Long-term outcome data from the Perry Preschool project (Schweinhart et al., 1993) suggest the potential advantage of developing programs that apply a broad developmental focus to preventing problems in *adolescence*, although few such programs targeting adolescents have had their effects carefully evaluated.

Such an approach would also be particularly promising in helping to better understand the common elements that may underlie different kinds of problem behaviors in adolescence. Our understanding of common underlying causes for multiple adolescent problem behaviors is based primarily on naturalistic observations and correlational data (Allen, Leadbeater, & Aber, 1994; Donovan & Jessor, 1985; Donovan et al., 1988; Yamaguchi & Kandel, 1987). Identifying an intervention that simultaneously affected multiple problem behaviors could provide *experimental* evidence about common underlying causes of these behaviors and also provide further

insight into the developmental antecedents that may underlie syndromes of problem behaviors.

To the extent that preventive interventions target broader developmental goals, they can also eliminate some of the stigma associated with programs that seek to address specific skill deficits (e.g., condom distribution programs). With particularly controversial adolescent problems (such as teenage pregnancy) for which community pressure may lead adults to select interventions that make them comfortable rather than those that have been shown effective (Philiber & Namerow, 1995), a broad developmental approach might make successful intervention politically and practically feasible where it would not otherwise be.

In summary, evaluation of broad, developmentally focused interventions targeting the prevention of multiple diverse problem behaviors can help (1) expand the variety and flexibility of preventive interventions targeting controversial problems of adolescents, particularly teen pregnancy; (2) inform the policy arena about the potential of psychological/educational interventions to truly alter critical outcomes for at-risk adolescents; and (3) highlight potential causal mechanisms and/or protective factors that are common to multiple problem behaviors and that are susceptible to intervention. Yet the true experimental evaluations of such interventions that would be needed to influence policymakers, practitioners, and researchers have been largely lacking.

This article describes an experimental evaluation of a nationally replicated program—Teen Outreach—directed toward reducing rates of teenage pregnancy, school failure, and school suspension. The primary focus of Teen Outreach is to engage young people in a high level of structured, volunteer community service that is closely linked to classroom-based discussions of future life options, such as those surrounding future career and relationship decisions. Volunteer service is increasingly being linked to positive outcomes for young people and is achieving substantial national attention (Clinton, 1996), although controlled experiments on the impact of volunteer service have thus far been lacking (Moore & Allen, in press). Volunteer service offers students a chance to see schools in a new role, and it allows them to begin to take on adult roles in ways that, unlike some work for pay, do not necessarily undermine parental or school authority structures (Steinberg & Dornbusch, 1991; Steinberg, Fegley, & Dornbusch, 1993). The Teen Outreach Program has an explicit developmental focus, helping teens understand and evaluate their future life options. This focus attempts to further teens' progress in the devel-

opmental task of establishing their competence and autonomy in a context that maintains their sense of relatedness with important adults (Allen, Hauser, Bell, & O'Connor, 1994; Connell & Wellborn, 1993). It provides an opportunity to be viewed in a positive role by program facilitators, adults at volunteer sites, and by other youths, while also reflecting about future roles as a competent, autonomous adult. Although several studies using nonexperimental designs have suggested the value of the program (Allen, Kuperminc, Philliber, & Herre, 1994; Allen, Philliber, & Hoggson, 1990; Philliber & Allen, 1992), these studies remain open to criticism about the influence of possible participant self-selection effects, particularly with a program that emphasizes *volunteer* community service.

Given promising initial evaluation data, the program has grown dramatically over the past decade, and in 1994-1995 was offered in 45 schools in 13 states. The program is now targeted primarily toward high school age students, as a result of preliminary evaluation efforts indicating that it was maximally effective within this age range. The current evaluation utilized a random-assignment design and data collected in the 1991-1995 school years at 25 sites nationwide to provide a true controlled experimental evaluation of the efficacy of this program. Specifically, the evaluation considered whether (1) the program had a demonstrable impact upon teen pregnancy rates of participants; (2) it had an impact upon school failure and suspension rates; and (3) the impact of the program appeared to vary depending upon student gender, parental education level, household composition, or racial/ethnic minority status.

METHOD

Settings

The high school version of the Teen Outreach Program was evaluated at 25 different random assignment sites nationwide from 1991 through 1995. Students were randomly assigned to either Teen Outreach participation or the control condition either at the student level (i.e., sites had more students sign up for Teen Outreach than could be accommodated in the program, and participants and controls were randomly selected by picking names out of a hat or choosing every other name on an alphabetized list) or, less frequently, at the classroom level (i.e., Teen Outreach was offered in lieu of regular curricular offerings in Health or Social Studies, and it was possible to randomly select, via a coin toss, which class

received Teen Outreach and which received the regular curricular offerings).

All sites known to the investigators to be running Teen Outreach were contacted in late spring of each school year and asked if they were interested in participating and potentially able to participate in the random assignment evaluation of Teen Outreach during the following school year. Approximately 10% of extant Teen Outreach sites participated in the random assignment evaluation of the program during the period of this evaluation. Sites that did not participate typically either found random assignment too awkward or unwieldy to implement, did not have enough interested students to fill both a treatment and a control group, or found random assignment objectionable because it would require turning away interested students.

Teen Outreach is a program for high school age students that consists of three interrelated elements: Supervised community volunteer service, classroom-based discussions of service experiences, and classroom-based discussions and activities related to key social-developmental tasks of adolescence.

Teen Outreach participants, who were in grades 9-12, engaged in a range of volunteer activities supervised by trained staff often working in conjunction with staff and volunteers of local community organizations. Volunteer activities were selected by participants under the supervision of trained staff and adult volunteers to be sensitive to the needs and capacities of both participants and of local communities. These experiences varied substantially in their nature and in the amount of commitment they required of participants. Volunteer activities included work as aides in hospitals and nursing homes, participation in walkathons, peer tutoring, and a wide range of other types of work. Teen Outreach sites were required to provide a minimum of 20 hours per year of volunteer experience to participants. Participants in the program actually averaged 45.8 hours of volunteer service over the course of the program ($SD = 44.6$), with the median participant performing 35 hours of service.

In addition to volunteer service, students also participated in ongoing classroom discussions that occurred at least once weekly throughout an academic year. All classroom discussions and activities were based upon the Teen Outreach Curriculum (Edwards, Bell, & Hunter-Geboy, 1996), which is designed to engage students via structured discussions, group exercises, role plays, guest speakers, and informational presentations. Classroom discussions and activities focused either upon maximizing learning from the service experiences or upon helping teens

cope with important developmental tasks they faced. Service-learning discussions focused upon helping students prepare for and make plans about their service experiences (including dealing with a lack of self-confidence, social skills, assertiveness, self-discipline, and so on), think about what they have experienced while volunteering, and hear others do the same. In developmentally oriented classroom discussions and activities, a trained facilitator led small groups of students in activities and topics of particular interest and relevance to young people. Topic areas included understanding yourself and your values, life skills, dealing with family stress, human growth and development, and issues related to the social and emotional transitions from adolescence to adulthood. In covering these topics, facilitators encouraged students to discuss their feelings and attitudes about important developmental issues (e.g., managing family relationships, new academic and employment challenges, handling close friendships and romantic relationships, and so on). Facilitators were given considerable latitude in covering topics in the curriculum, and for each topic, the curriculum contains a wide array of activities and materials for discussion, so that facilitators may draw from the specific activities for a given topic those that appear most useful and relevant for their group. Most strikingly, the program placed very little direct emphasis upon the two target behaviors to be prevented. Specifically, material about sexuality comprises less than 15% of the written curriculum and was often not used (discretion is given to individual sites) when it overlapped with other material being offered in school or conflicted with prevailing community values.

Classroom discussions were led by trained facilitators, who were often school teachers or guidance personnel. Classroom sessions met at least once weekly during a full academic year, beginning in September and running through May or June (depending upon the school schedule of individual sites). Most sites held once-weekly meetings, although a few met two to three times per week. Prior nonexperimental research has found no evidence of differential program impact for sites varying in numbers of class sessions within this range (Allen et al., 1990).

Cost analyses of the program indicate that it can be offered for a full academic year to a class of 18–25 students for approximately \$500–\$700 per student. These figures include costs for facilitator and site-level coordinator time; when this time is provided as an in-kind contribution by schools and community volunteer service organizations, the direct costs of the program drop to under \$100 per student.

Participants

Participants in the experimental evaluation of Teen Outreach included 342 students who participated in the Teen Outreach Program and 353 control students. All students were in the ninth through twelfth grades (mean grade level = 10.1; $SD = 1.0$). Students sought to enter the program (prior to being randomly assigned to the participant or control conditions) as part of their "health" curricula, as an academic elective in response to teacher/guidance counselor suggestion, and as an after-school activity. A small number of participants (3.5%) had been previously involved with the Teen Outreach Program.

Attrition over the course of the study, as a result of student dropout from the program or from school or from failure to fully complete exit questionnaires, was 5.3% among Teen Outreach students and 8.4% among control students. Attrition analyses revealed that students who dropped out of the study did not significantly differ at program entry from those who remained in terms of history of class failure, membership in a racial/ethnic minority group, parents' education levels, or household composition (living with one versus two parents). Students who did not complete the study were more likely to have had or caused a prior pregnancy, been suspended, been younger, and been male. Although dropouts from the study differed from those who completed it, there was no evidence that these differences were in any way linked to treatment versus control group membership (i.e., there was no interaction of attrition with group membership). For example, previously pregnant students were less likely to complete the study, but among those students, previously pregnant Teen Outreach participants were no less likely to complete the study than were previously pregnant control group members.

Information on the demographic characteristics of both Teen Outreach and control students for whom both entry and exit data were available is presented in Table 1. These data indicate that the treatment and control groups were well matched demographically at entry, with no significant differences between groups on any measures. They also indicate that the program sampled an ethnically and socioeconomically diverse group of students. Females were highly overrepresented in the sample, probably as a result of increasing awareness among facilitators and others responsible for recruiting students of the program's potential impact on teen pregnancy.

Measures

Demographic characteristics. Students filled out a brief self-report questionnaire indicating their age,

Table 1 Sociodemographic Characteristics of Teen Outreach and Control Students at Entry

	Teen Outreach (N = 342) Mean (SD)	Control (N = 353) Mean (SD)
Age (years)	15.8 (1.13)	15.9 (1.24)
Grade in school (%):		
Ninth	35.1	36.0
Tenth	33.9	33.1
Eleventh	19.6	19.8
Twelfth	11.4	11.1
Gender (%):		
Females	86.0	83.3
Males	14.0	16.7
Race/ethnicity (%):		
Black	67.7	66.6
White	17.0	20.4
Hispanic	12.9	9.6
Other	2.4	3.4
Parent's education level	2.08 (.77)	2.16 (.79)
Live in two-parent household (%)	45.6	45.6

Note: No group demographics differences were statistically significant.

grade level in school, race, predominant household composition (one- versus two-parent), and parents' education levels (1, not a high school graduate; 2, high school graduate; 3, some college; 4, college graduate).

Problem behaviors. Self-report questionnaires were used to assess students' problem behaviors. When sensitively collected, anonymous self-report instruments have been found to be among the *least* biased means of assessing adolescent problem behaviors such as teenage pregnancy, with substantial evidence available to support their overall reliability and validity (Elliott, Huizinga, & Menard, 1989; Farrington, 1973; Patterson & Stouthamer-Loeber, 1984). At entry, we asked students whether (1) they had ever been pregnant (females) or responsible for a pregnancy (males); (2) they had failed any courses during the prior year at school; and (3) they had been suspended in the prior year at school. At exit, we asked the same questions of students (except that the pregnancy question was modified to refer only to the academic year of the program).

Procedure

Both the Teen Outreach Program and its evaluation typically occurred as part of the regular school curriculum over a single school year, with participa-

tion usually occurring as part of a class (typically health or social studies) taken for credit. Students were assessed during the first several weeks of the school year (which typically began in late August or early September) and then again at program exit at the end of the school year in May or June. Questionnaires were administered by Teen Outreach facilitators during an early Teen Outreach class or in study halls and other school settings for control students. Students were told that the information they provided would be kept without identifying information, and they were specifically reassured that none of their answers would be available to program facilitators or to other school officials.

RESULTS

Preliminary Analyses

Consistent with prior research, student sociodemographic factors displayed numerous links to student problem behaviors at entry and exit. Specifically, relations were found between problem behaviors and students' gender, family composition (living with one versus two parents), racial/ethnic minority status, and grade in school. To minimize the likelihood that these factors could produce spurious results in analyses, each was entered as a covariate into all analyses of program outcomes, and the specific effects of each variable are reported along with those analyses below.

To ascertain whether our estimates of program effects would differ depending upon the sociodemographic characteristics of students, we also examined the statistical interaction of the effects of program participation with all of the entry demographic and problem behavior variables assessed. This interaction assessed whether the program was significantly more or less effective when it served different groups of students (e.g., racial/ethnic minority versus majority, male versus female, and so on) by adding the interaction of each demographic factor \times program participation in predicting outcomes in each of the primary analyses of program effects described below. We found such an interaction in only one case: The effect of program participation on pregnancy rates interacted with student gender. This effect was in the direction of indicating more positive program effects for females than for males, $\chi^2(1, N = 370) = 33.06, p < .001$. We examined student genders separately, but due to the small number of males and male reported responsibility for pregnancies, it was not mathematically possible to compute program effects for males in our logistic regression analyses. Thus, pregnancy data below are presented only for females.

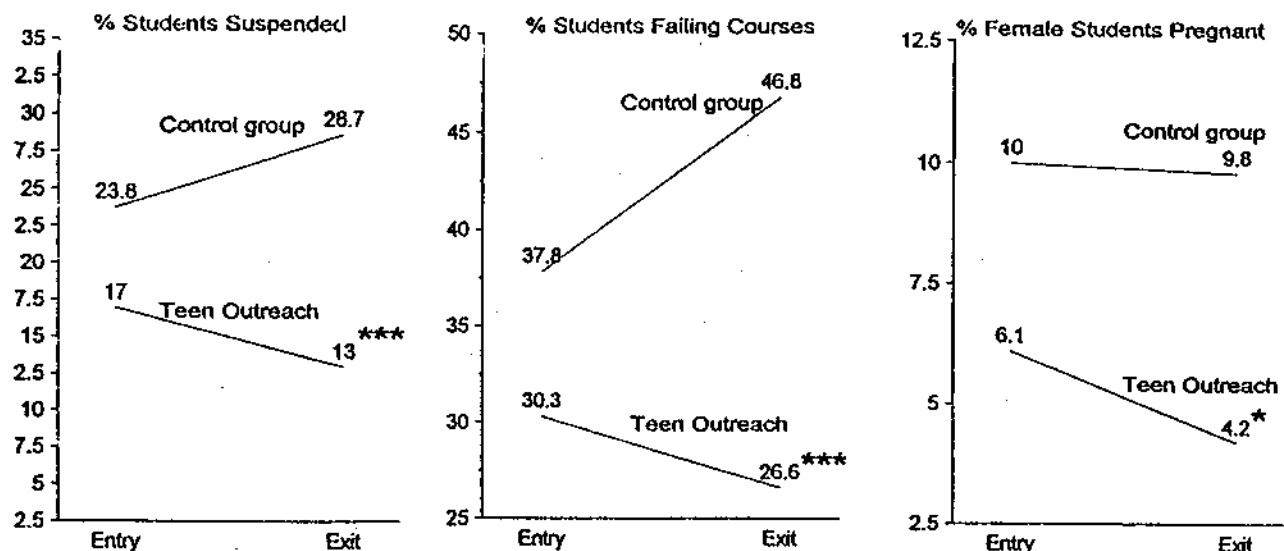


Figure 1 Entry to exit change in problem behaviors. *** $p < .001$; * $p < .05$. Tests are for difference between groups at exit after accounting for differences at entry and effects of sociodemographic characteristics. Pregnancy data at entry reflect percentages ever pregnant; exit data reflect pregnancies since program entry.

We found no interaction effects of program participation with household composition, parental education levels, racial/ethnic minority status, student grade in school or history of prior problem behaviors in predicting program outcomes. This indicates that the Teen Outreach program did not work significantly better or worse when it served students who varied along these dimensions.

Entry Data

Initial analyses revealed that even given random assignment of students to groups and the well-matched nature of the sample in terms of demographic characteristics at program entry, by the time of initial data collection (which typically occurred 1–2 weeks into the program), the control group demonstrated higher levels of prior course failure, $\chi^2(691) = 4.3, p < .04$, school suspension, $\chi^2(693) = 4.9, p < .03$, and teen pregnancy, $\chi^2(690) = 6.6, p < .01$. Given these entry differences between groups, which are presented in Figure 1, we used several different approaches to assure that entry differences would not lead to spurious or artifactual findings.

First, we performed a site-by-site inspection of the entry data to determine if control groups at any site deviated from the Teen Outreach group in terms of entry characteristics or attrition at rates unlikely to be seen by chance after correcting significance tests to account for the large number of sites and behaviors examined (i.e., $p < .05$ after Bonferroni corrections).

One site was identified in which control group students were significantly more problematic than Teen Outreach students under this criteria. Further, two sites were determined to have prematurely given up their efforts to track their control groups by program exit (i.e., attrition rates between 80% and 90%). All three sites were dropped from the data set for further analyses, leaving 22 sites. Analyses of the effects of these decisions are described further below.

Figure 1 depicts raw data for both entry and exit levels of problem behaviors.

Primary Analyses of Program Effects

Our primary analytic strategy for considering the data presented in Figure 1 was to examine effects of program participation upon exit problem behavior levels after covarying prior levels of all problem behaviors and all demographic factors described above. Experimental designs provide one of the few places where such covariance is truly statistically appropriate (Campbell & Stanley, 1969; Cook & Campbell, 1979).

Results from logistic regression analyses conducted for each of the three problem behaviors are presented in Table 2. Examination of the odds ratios from logistic regressions produces an estimate of the relative risk of each problem behavior in the Teen Outreach group as compared to the control group, controlling for all other demographic factors and for any differences between groups at program entry.

Table 2 Logistic Regressions Predicting Exit Problem Behaviors from Demographic Factors and Program Participation

	Problem Behaviors Reported at Exit					
	Course Failure		Suspension		Pregnancy	
	Standardized Estimate (N = 665)	Odds Ratio	Standardized Estimate (N = 664)	Odds Ratio	Standardized Estimate (N = 560)	Odds Ratio
Demographics:						
Gender (1 = male, 2 = female)	-.08	.66	-.12*	.56
Grade in school	-.18***	.73	-.11	.82	.06	1.12
Racial/ethnic minority status (0 = no, 1 = yes)	.02	1.01	.13	1.82	.25	3.14
Live in single parent family	-.03	.90	.03	1.13	.03	1.12
Parents' education level	-.08	.83	-.04	.91	-.07	.84
Prior problem behaviors:						
Course failure	.37***	4.01	.12*	1.58	.04	1.18
School suspension	.11	1.66	.34***	4.70	.23*	3.06
Pregnancy (ever)	.18***	3.44	.14**	2.47	.52***	33.65
Program participation	-.24***	.42	-.26***	.39	-.24*	.41
Chi-square for model	143.2***		122.2***		102.0***	

Note: Odds ratios reflect relative odds of behavior for high versus low members (as dummy coded) of group (i.e., ratio of risk of course failure in Teen Outreach versus control group is .42 to 1). Pregnancy data are for females only.

Thus, an odds ratio approaching 1.0 reflects no difference in levels of risk across the levels of the variable being examined, whereas a ratio that is substantially above or below 1.0 indicates that the relative risks of the problem behavior differ across different levels of the independent variable.

The ratios presented in Table 2 indicate that, after accounting for demographic variables and prior problem behaviors, risk of school suspension in the Teen Outreach group was less than half the size (i.e., 42%) of the risk of school suspension for members of the control group (a null effect would be for the risk to be as large—i.e., 100%—as in the control group). Risk for course failure was 39% as large in Teen Outreach relative to the control group. Risk of teen pregnancy was only 41% as large as in the control group. Each of these program effects was statistically significant, even after removing effects of entry demographic and problem behavior variables. These effects indicate that Teen Outreach participants experienced significantly lower levels of course failure, school suspension and teenage pregnancy than students in the control group, even after accounting for baseline levels of these behaviors and for sociodemographic characteristics of students.

Effects of Group Differences at Entry

Although group differences at entry were controlled in the analyses above, one concern was that

these differences might have influenced results in a way that inflated the apparent effects of program participation. For example, it may have been easier to work with and achieve positive change in the less troubled Teen Outreach group than in the more problematic control group. Although such an effect in favor of the Teen Outreach Program would run counter to "regression to the mean" effects that are more typically a concern when groups differ at entry, we nevertheless wanted to examine this possibility.

We thus classified the final 22 program sites into those in which the control group was *more* problematic than the Teen Outreach group at entry versus sites where the control group was *less* problematic than the Teen Outreach group at entry. We made these classifications based upon the average number of the three possible problem behaviors that were exhibited by youths in Teen Outreach or control groups at a site. If observed program effects were merely an artifact of the control group participants being relatively more problematic at program entry than the Teen Outreach participants (and then deteriorating even more than would be expected thereafter), then we would expect that the sites that had the greatest level of problems in the control group relative to the Teen Outreach group would demonstrate this effect the most. That is, the sites that most reflected the overall pattern in the sample for the control group to be more problematic at entry should show the best outcomes for Teen Outreach relative to the control

group students, if these entry differences were in fact artifactually driving the results of analyses by capitalizing on an unusual degree of deterioration in functioning in the control group.

We examined this possibility statistically by creating a dichotomous variable for whether each student's site contained more problematic Teen Outreach versus control students at entry. We then tested the interaction of this variable with program participation (i.e., do program participation effects change depending upon differences between groups at entry?) in predicting outcomes for each of the analyses described above. Essentially, this approach asks whether differences between groups at entry were statistically related to the program effects observed at a given site. This interaction effect did not approach significance ($p > .20$) for any of the three analyses above. This indicates that lack of equivalence between Teen Outreach and control groups at sites was not significantly linked to any observed program effects by program exit.

We then further inspected data along the same lines to consider whether an effect such as that described above may have been enhancing the apparent effects of participation, even though it was not large enough to reach statistical significance. We examined the percentage change in incidence of each problem behavior from entry to exit for the Teen Outreach group relative to the control group. Although not statistically significant, we found that for those sites where Teen Outreach students were *more* problematic at entry, they appeared to make relatively greater changes from program entry to exit than did control students. Thus, because most sites had Teen Outreach students who were *less* problematic at entry, the overall differences between the Teen Outreach and control groups would have tended to have a small effect of reducing our estimates of program effectiveness, if they had any effect at all.

In addition, we also examined the effect of our a priori decision to drop three sites from analyses, due to either significantly nonrandom entry data or to overwhelming difficulties in recontacting control group students at exit. All primary analyses described above were rerun with these sites included. In these alternative analyses, all effects of program participation remained at the same significance levels as reported above. This indicates that the decision to drop three sites did not significantly alter the findings reported.

We also reexamined the data by dropping additional sites in which the control group was most different from the Teen Outreach group until the entry differences in problem behaviors between treatment

and control groups were no longer significant (i.e., all ps for entry-level differences $> .10$). In effect, this approach forces the groups to be statistically indistinguishable by deleting from analyses those sites that were creating differences between groups. Four additional sites, containing a total of 103 students, were deleted using this procedure. Even with the reduction in sample size from this approach, all of the findings regarding effects of program participation remained at the same level of significance as reported above. In other words, had the sites that contributed to the entry differences between our treatment and control groups not been included in the study, our results would have been unchanged.

Reconsideration of Self-Report Data

Finally, we also wanted to consider whether there might be a tendency of Teen Outreach students to bias their reports of problem behaviors in a way that could inflate estimates of program effects. We sought to examine this possibility even though self-reports are widely used and accepted as valid means of assessing problem behaviors in adolescence (Elliott et al., 1989; Farrington, 1973). We assessed a sample of all students from one of our nonrandom sites which made archival data available regarding history of course failure and school suspension. Results are presented in Table 3. These results indicate that most students were accurate in reporting both suspensions and course failures. Further, there were no significant differences between groups in accuracy of reporting at either program entry or exit. Finally, as Table 3 indicates, even the slight differences that did exist between groups in accuracy of reporting would not have resulted in a bias in favor of the Teen Outreach program.

Dosage Effects

Two indices of program intensity, the number of classroom sessions attended and the number of hours of volunteer service, were examined in logistic regression analyses predicting outcomes within the Teen Outreach group. These analyses assess whether variations in program intensity (within the range of variation that actually occurred among evaluated sites) were related to program outcomes. The same logistic regression strategy outlined above for primary analyses was used, except that the number of sessions attended and the number of hours of volunteer service were entered as predictors (along with demographic factors and levels of problem behavior at program entry) in lieu of a dummy variable for

Table 3 Comparison of Percentages of Students with Accurate versus Inaccurate Reports of Failure and Suspension (%)

	School Failure		School Suspensions	
	Teen Outreach (N = 58)	Control (N = 35)	Teen Outreach (N = 58)	Control (N = 35)
Entry data:				
Fully accurate	76	74	72	71
Overreports	19	23	7	9
Underreports	5	3	21	20
Net overreporting	+14	+20	-14	-11
Exit data:				
Fully accurate	64	71	85	82
Overreports	26	24	7	12
Underreports	9	6	7	6
Net overreporting	+17	+18	+0	+6
Entry overreporting minus exit overreporting	-3	+2	-14	-17
Net "advantage" to Teen Outreach program due to inaccurate reporting		-5		+3

Note: No differences between groups approached statistical significance (all $ps > .50$). Net advantage of Teen Outreach group was calculated as: (Teen Outreach entry - exit overreporting) - (Control entry - exit overreporting).

program participation, and all analyses were performed within the Teen Outreach sample. No significant effects were found from either measure of program intensity to predictions of either pregnancy or academic suspension. A significant effect was found for prediction of course failure by the number of volunteer hours worked (standardized estimate = $-.216$, $p < .04$), indicating that Teen Outreach students who performed more volunteer service were at lower risk for course failure during the program.

DISCUSSION

Teen Outreach, a program combining volunteer community service opportunities with classroom discussions about life options, was found to substantially reduce rates of teen pregnancy, course failure, and school suspension during the year of the program. Even after accounting for the effects of differences among students at entry to the program, the risk of all three problem behaviors among students assigned to participate in Teen Outreach was less than half the risk in a control group of students. These findings appeared in random assignment data obtained from 25 sites nationally over a 5 year period, and thus they appear to represent a broad sampling of the program's impact that is not limited to the skill of any single program facilitator nor to artifacts of events at any single site.

These data are quite consistent with analyses of

nonrandom assignment data obtained on this program over the past 10 years that have yielded similar findings and effect sizes (Allen et al., 1990; Allen, Juperminc, Philliber, & Herre, 1994; Philliber & Allen, 1992), further suggesting the efficacy of the program. These prior nonexperimental studies actually had somewhat closer matches between treatment and comparison groups, possibly because the samples were far larger, allowing random variations in the data to average out. The treatment and control groups in the current study were well matched demographically at entry, but the treatment group displayed lower initial levels of problem behavior. One possible explanation of this effect was that it reflected an early spurt upward, toward better adaptation in the Teen Outreach group, an interpretation consistent with findings from psychotherapy outcome research that substantial benefits from therapy often are seen in the first weeks after it begins (Howard, Kopta, Krause, & Orlinsky, 1986). Given that entry data were typically collected in the first few weeks of the program and that, in some cases, students had learned at the end of the prior school year that they had been selected to be in the program, it may be that an early response to the program, or possibly an effect of knowing one was accepted into a selective program (albeit randomly; Shapiro & Morris, 1978), was being manifest in the entry data. It is important to note that any such effect would actually tend to reduce the apparent effect of the program in produc-

ing change in levels of problem behavior from entry to exit by reducing apparent levels of entry problem behavior in the Teen Outreach group.

The observed program effects were quite robust with respect to initial differences between treatment and control groups, although no analytic strategy can fully ensure that such differences did not in some way create artifactual programmatic effects. Nevertheless, the effects remained consistent when data were subjected to multiple analytic strategies, including analyses that (1) covaried out initial group differences, (2) examined whether initial differences could account for program effects at the site level, and (3) excluded sites contributing to treatment versus control group differences at entry. In addition, analyses that considered whether biases in students' self-reports of problem behaviors could have artifactually created apparent program effects found no evidence supporting this possibility, although this possibility can only be conclusively ruled out with studies that rely primarily upon data from other sources. No interactions of student demographic characteristics with program effects were found with the exception of student gender: the program had a greater effect in reducing reported pregnancies or responsibility for pregnancies in female than in male students. The lack of interactions with student race/ethnicity, socioeconomic status, household composition, or grade level indicates that the program was not significantly more or less effective across these demographic groups. In sum, these findings provide a degree of evidence of the effectiveness of the Teen Outreach program that is infrequently found among widely disseminated, national prevention programs and that is virtually without parallel among teen pregnancy prevention programs not explicitly focused upon distributing contraceptives.

One of the more striking features of the Teen Outreach program is that it does *not* explicitly focus upon the problem behaviors it seeks to prevent but rather seeks to enhance participants' competence in decision making, in interacting with peers and adults, and in recognizing and handling their own emotions. Particularly in the field of teen pregnancy prevention, this focus has important practical implications, because it means the program may be politically acceptable in communities where programs that explicitly focus upon sexual behavior may not be feasible to implement. Given that most pregnancy prevention programs with at least quasi-experimental evidence of success focus explicitly upon sexual behavior (Kirby et al., 1994), these results suggest the presence of an alternative avenue for intervening to prevent teenage pregnancies.

The effectiveness of the program in preventing two very different types of problem behaviors with an approach that does not explicitly target either behavior also is informative about the nature of these behaviors. Several lines of prior research based upon correlational data have suggested that adolescent problem behaviors often co-occur as part of a syndrome, raising the possibility that they share common underlying causal agents (Allen, Leadbeater, & Aber, 1994; Donovan & Jessor, 1985; Donovan et al., 1988). These studies have sometimes diverged, however, as to whether sexual behavior was part of this syndrome (Gillmore et al., 1991). The present study advances this line of research by indicating that behaviors leading to academic and sexual difficulties do not just co-occur but also *all change* in response to the same intervention. This provides further evidence that these behaviors share a common underlying causal agent or, alternatively, that they share a common protective factor that is enhanced by program participation.

Knowing that the Teen Outreach program is effective in reducing problem behaviors naturally leads to the question of *why* it has this effect. Analyses of dosage effects provided some evidence that higher levels of volunteer service (within the Teen Outreach group) were associated with reduced risk of course failure. Although the causal direction of this association cannot be determined, it is consistent with previously published data at both the individual and site level indicating that volunteer service is associated with program efficacy (Allen et al., 1990; Allen, Kuperminc, Philliber, & Herre, 1994). Notably, the program has increasingly emphasized volunteer service as a core component of the program, which makes it increasingly difficult to ascertain the impact of high versus low levels of such service because very few sites offer low levels of service to students. Thus, the lack of observed relation between volunteer service and pregnancy and suspension rates may well be attributable to the restricted range in levels of volunteer service in the sample.

Given that collection of comprehensive process data was not feasible in the current round of evaluation, results from extensive process studies conducted in prior nonexperimental evaluations of Teen Outreach may be of use in suggesting interpretations of the present data (Allen et al., 1990; Allen, Kuperminc, Philliber, & Herre, 1994). These prior studies assessed naturally occurring variations in the implementation of Teen Outreach across different sites as potential predictors of student outcomes (after covarying student characteristics at program entry). Although this prior research does not directly account

for the present findings (because it was based on a different sample and a nonexperimental design), it can complement the present study by providing a rich source of empirically grounded hypotheses about the mechanisms by which the Teen Outreach program works.

Prior studies of Teen Outreach have indicated that presence of volunteer community service is closely linked to the programs' success (Allen et al., 1990; Allen, Kuperminc, Philliber, & Herre, 1994). This finding is consistent with nonexperimental data from evaluations of other programs that suggest the potential value of volunteer service and with helper-therapy theory, which suggests that serving in a helping role will often be therapeutic for the helper (Riesmann, 1965). In contrast, variations in amount of classroom time and exact fidelity to the Teen Outreach curriculum have not been found to be related to program outcomes (Allen et al., 1990).

Prior studies of Teen Outreach have also found that the most successful program sites were those that aided students in the task of establishing autonomy in the context of positive relationships with peers, with program facilitators, and with persons at volunteer sites (Allen, Kuperminc, Philliber, & Herre, 1994), a task that has frequently been identified as critical to adolescent social development (Allen, Hauser, Bell, & O'Connor, 1994). For example, although many characteristics of volunteer work have been previously assessed, the one characteristic that has been most linked to positive program outcomes is students' perception that they had a great deal of input in selecting the work they would do (Allen, Kuperminc, Philliber, & Herre, 1994). Although students engaged in a huge range of volunteer activities in the program, this does not mean that "anything goes" with respect to volunteer work. Quite the opposite. Volunteer service that is effectively tailored to the needs and interests of young people as determined by those young people has previously been found to be most closely linked to program success (Allen, Kuperminc, Philliber, & Herre, 1994).

Effective sites not only provide for student autonomy, they also do so in a manner that allows students to become increasingly connected to others. For example, within both the classroom and volunteer components of the program, feeling safe, listened to, and respected were linked to positive student outcomes (Allen, Kuperminc, Philliber, & Herre, 1994). Volunteer service and linked classroom activities may thus offer young people (particularly those who are struggling in their social development) a relatively non-threatening opportunity to see themselves as competent individuals who can be both autonomous and

successful in relating to adults in their lives. Rather than leaving students to question whether their strivings for autonomy will undermine relationships with adults, volunteer service and classroom discussions led by sensitive facilitators may help students establish themselves as autonomous, capable individuals while interacting closely with other adults and young people. Such findings raise the question of whether other programs or modifications of current educational practices that seek to reduce pregnancy and failure rates might benefit by incorporating these principles into their approaches.

One potential additional explanation for the program's impact is that of a "Hawthorne effect" in which the attention given students as a result of their participation in the program produced changes having little to do with the content of the program. Although such an effect cannot be definitively ruled out without an attention-placebo control condition (and may help account for group differences that emerged prior to the initial assessment of students but after they were selected into the program), the existence of such an effect appears unlikely as a primary explanation for the programs' efficacy in these analyses. Numerous intervention programs with goals similar to Teen Outreach that provide a great deal of attention to young people have been found to be unsuccessful, particularly with respect to preventing teen pregnancies (Frost & Forrest, 1995). Also, in this study, control group students were receiving substantial attention from trained educators in their regular classrooms—Teen Outreach was simply an alternative class for most participants.

There are some significant limitations in this study. The entry differences between treatment and control groups are the clearest example of the complexity inherent in large-scale program evaluation. Future studies would do well to strive to collect entry data before students knew of their assignment to Teen Outreach or control groups, even if this involved collecting data at the end of the prior school year. It should be reiterated, however, that when examined from multiple possible analytic perspectives, no evidence could be found that entry differences either produced or inflated the observed effects of program participation. The slightly (although not significantly) higher rates of attrition in the control group could also have produced spurious effects in the data, although only if students lost from the control group experienced lower rates of problem behavior than those who remained would this attrition lead to overestimating the efficacy of Teen Outreach. An additional caution in interpreting these data is that the sites participating in this experimental evaluation

of Teen Outreach were not a random sample of all sites implementing the program and may very well represent the better established sites. Thus, these data support the efficacy of the program for students in the specific sites examined, but whether and how these findings would generalize to other unexamined Teen Outreach sites cannot be assessed from these data. The reliance of the study primarily upon self-report data was necessitated by the logistical difficulty of obtaining data from student records from diverse schools and school districts. Although data from other reporters would be optimal, a great deal of evidence suggests the validity of self-report data regarding problem behaviors (Elliott et al., 1989), and in any case, a small empirical examination of this issue within this study turned up no evidence that use of self-report data artifactually enhanced the apparent effects of the Teen Outreach program.

Finally, long-term follow-up data would be highly desirable to determine whether the program's effects persist after it ends. It should be noted, however, that truly long-term effects in preventing pregnancy and academic difficulties are somewhat less relevant for high school students for whom the critical risk period for these problems is time-limited. Academic difficulties need only be surmounted through twelfth grade to minimize dropout risk, and pregnancies need not be delayed indefinitely. Thus, delay of these problems for a year with a program requiring a relatively modest investment of time and resources in itself represents a significant accomplishment with enduring positive effects for young people. The lifetime cost of teen parenthood *just to the teen* has been estimated at \$109,000, even after accounting for the effects of observable preexisting risk factors affecting teen parents (Maynard, 1996), with similar, if not larger, costs to school dropouts (Catterall, 1987). Although not all pregnancies or course failures lead to parenthood or to dropping out of school, the costs of even single instances of these problems are clearly of such a magnitude as to warrant attention to programs such as Teen Outreach that offer a realistic hope of preventing them at a very modest cost.

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