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in New York City Schools

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Long-Term Outcomes of an Abstinence-Based, Small-Group Pregnancy Prevention Program In New York City Schools

By Lisa D. Lieberman, Heather Gray, Megan Wier, Renee Fiorentino and Patricia Maloney

Context: *Despite drops in U.S. teenage birthrates, questions continue to arise about how best to reduce the country's adolescent birthrate. School-based programs continue to be considered one of the best ways to reach adolescents at risk of early sexual activity.*

Methods: *A total of 312 students completed a pretest, a posttest and a follow-up one year after the posttest: 125 who had participated in a 3–4-month-long abstinence-based small-group intervention led by trained social workers, and 187 in a comparison group that received no special services.*

Results: *There were few significant differences between the intervention and comparison groups at posttest. At the one-year follow-up, however, intervention students had significantly better scores on locus of control, their relationship with their parents and (among males only) their attitudes about the appropriateness of teenage sex. Measures of depression, self-esteem, intentions to have sex, attitudes toward teenage pregnancy and various behaviors did not differ significantly between groups. By the time of the one-year follow-up, there was no difference between study groups among females in the initiation of sexual intercourse. Among the males, initiation of sexual intercourse appeared to be higher in the intervention group than in the comparison group, but the difference was not statistically significant. Positive outcomes were especially limited among students who were already sexually active at the start of the study, a finding that emphasizes the difficulties of reaching adolescents who are already at high risk for pregnancy.*

Conclusions: *A small-group abstinence-based intervention focusing on mental health can have some impact on adolescents' attitudes and relationships (particularly with their parents). Long-term evaluations are important for determining the effects of an intervention, as it is difficult to change adolescent risk behavior.*

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Recent reports of drops in teenage birthrates are welcome news. Questions continue to be raised, however, about which kinds of programs will best affect the U.S. adolescent birthrate, which remains one of the highest among industrialized nations.¹ Adolescents continue to initiate intercourse at an early age, many long before they are emotionally and psychologically prepared to deal with its consequences.² In addition, despite public health, media and educational campaigns to prevent the spread of HIV, a significant proportion of preadolescents and early adolescents, particularly those residing in inner cities, engage in sexual behaviors that place them at high risk for HIV or sexually transmitted disease (STD) transmission.³

In this article, we discuss the evaluation of an abstinence-based, small-group approach to preventing pregnancy and STDs that took place in three New York City middle schools. Schools have been the primary site of formal sexuality education programs over the past several decades. However, while some curricula have demonstrated promising results, no sin-

gle school-based approach has been shown to markedly reduce adolescent sexual activity, risk-taking or pregnancy.⁴

A review of the literature reveals conflicting findings about the successes and failures of a variety of programs, ranging from abstinence-based models to multifaceted programs that offer comprehensive sexuality education with links to school-based health clinics.⁵ Evaluations suggest that programs providing a comprehensive focus on sexuality produce positive outcomes and do not increase sexual activity, but few have been able to demonstrate significant long-term reductions in the onset of sexual activity or in the number of sexual partners, or increases in contraceptive use.⁶

In addition, no credible published studies have suggested that programs promoting abstinence only, without addressing risk reduction, do any better.⁷ Further, few school-based sexuality curricula discuss sexual exploitation or violence,⁸ despite the fact that for many students, choices about sexual behavior are blurred by experiences of sexual abuse and victimization.⁹

During early adolescence, uncertainty about oneself, puberty, heightened interpersonal sensitivity and awareness of changing physical appearance often result in self-criticism, fear of displeasing others and other forms of psychological distress.¹⁰ These factors make the middle school or junior high school years a period of emotional fragility for many young people, at a time when they are also faced with difficult choices with respect to sexual and other risk behaviors.

A variety of emotional and social issues influence adolescent behavior. Teenagers with higher levels of depression, greater hopelessness and a lower sense of control over events in their lives are more likely to initiate sexual intercourse at very young ages.¹¹ Poor self-concept is associated with earlier onset of sexual activity for both male and female adolescents.¹² Adolescents who report having more friends who are sexually active are also more likely to engage in such behavior.¹³ Sexual abuse and victimization increase the risk of early sexual behavior. Finally, adolescents often demonstrate multiple risk behaviors. The ability of young adolescents to negotiate this difficult period can make a critical difference in their social and sexual choices.¹⁴

Several factors appear to protect young people against multiple risk behaviors, including strong family connections, high self-efficacy or personal power, social problem-solving skills, and external support systems that encourage coping and positive values and provide high expectations and positive norms.¹⁵ A variety of studies suggest that the quality of family relationships and communication are strongly linked with early sexual activity. Lower rates of adolescent sexual activity are associated with having parents who demonstrate a combination of tradition-

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al attitudes toward sexual behavior and effective communication practices,¹⁶ with positive relationships and a sense of acceptance by the adolescent,¹⁷ and with higher levels of family attachment, involvement and supervision.¹⁸

Moreover, our clinical experience consistently shows that young people want to be able to talk to their parents and families about sex and sexual involvement.¹⁹ Furthermore, many studies support the importance of teenagers' having caring relationships with adults outside of their families,²⁰ suggesting that young people can benefit from mentoring and support from adults—including those at their schools—who take their concerns seriously.

The evaluation discussed here involved students who participated in Inwood House's abstinence-based program, Project IMPACT. The project's small-group mental health model (which is described below) uses trained social workers in a group-counseling model that focuses on relationships and communication, skills-building and positive mental health, as well as providing up-to-date and accurate information about sexuality and about pregnancy and disease prevention. The topics and approach were designed to address the developmental needs of adolescents, to encourage healthy communication skills and family relationships, and to strengthen young people's sense of self and control over their lives and decisions as a means of preventing early and risky sexual behavior.

Data and Methods

The Program

Inwood House is a multiservice agency providing residential and offsite care and services for pregnant and parenting teenagers in New York City. In addition to these direct services, Inwood House also delivers targeted pregnancy preven-

tion programs to New York City's youth. For the past 21 years, Inwood House has conducted a pregnancy and disease prevention program called Teen Choice among students in New York City high schools and middle schools. In 1995, Inwood House received funding for an Adolescent Family Life Demonstration grant to begin the Project IMPACT (Inwood House Model of Pregnancy Prevention and Care for Teenagers) program and evaluation.

Project IMPACT is an abstinence-based model of the Teen Choice small-group mental health program. It is conducted in three New York City middle schools—two in Brooklyn and one in the Bronx. At these schools, the Project IMPACT curriculum focuses on the importance of abstaining from sexual intercourse. Topics include male and female anatomy; understanding pressure to have sex; coping with peer pressure and pressure from the media; risks of early sexual involvement; and STDs, HIV and AIDS. Contraception is discussed, but abstinence is emphasized as the best choice,* and discussions are held about the failure of contraceptives to provide complete protection against pregnancy and STDs.†

Project IMPACT staff are invited by classroom and physical education teachers to make presentations to students, during which they describe the program and invite students to join a small group. Students self-select into the groups and are required to obtain parental permission.

The small group is the essential component of Project IMPACT. This approach differs from more traditional classroom-based sex education, in that group discussions guided by a trained and trusted adult help young people incorporate new ideas and openly discuss with their peers the issues they face as teenagers. Small groups that provide knowledge and life-skills building activities have been shown to work well for youth in a variety of settings.²¹

The Project IMPACT groups work to build communication skills, support healthy adult-child and peer communications, and attempt to create peer groups in which new behavior patterns become acceptable and desirable.²² Furthermore, the experience is meant to enhance young people's ability to adopt or reject new ways of thinking by providing the opportunity to question and apply new information through guided interaction with significant others—i.e., people whose opinions matter, such as peers or a respected adult.²³

The Project IMPACT groups typically have 8–12 members and meet for 12–14 sessions over one semester. Each session lasts for one class period (35–45 minutes) and follows a curriculum providing activities, discussion and informational guidance. Students who volunteer to participate are expected to attend all sessions. (The average rate of attendance during the evaluation presented in this article was 87%, or 11.3 sessions.)

Groups are single-sex or coeducational, depending both on the comfort and maturity level of the students and on the logistics of recruitment. Project IMPACT social workers have a master's degree in social work or its equivalent, have extensive training in adolescent development, group work and human sexuality, and meet weekly with each other, the project director and a clinical supervisor for in-service training and supervision.

Study Design

Our study is based on pretest, posttest and one-year follow-up surveys, using both intervention and comparison cohorts. For both intervention and comparison groups, pretest data were collected at the beginning of the spring semester (late February or March 1996). A posttest was conducted at the end of the same semester (May or June 1996) for both groups, with an interval of 3–4 months from pretest to posttest. The follow-up was conducted approximately one year after the posttest (starting in April 1997 and ending with some mail-in surveys in August 1997). Thus, the actual interval from pretest to follow-up varied from 14 to 18 months.

Intervention and comparison students were from the same schools. Comparison students, however, were recruited from different wings or areas of the school that were not eligible to participate in the program because of scheduling or programmatic requirements. While intervention students were recruited through classroom presentations by Project IMPACT workers, comparison students were recruited by our data collection staff. Both intervention and comparison students were required to obtain written parental consent, and all students participated on a voluntary basis.‡

To collect the long-term follow-up data, we located the students who had completed a pretest and a posttest, with the help of middle-school guidance counselors and administrators, based on information students provided on the pretest survey cover sheets. Most of the sixth and seventh graders were at the same

*The funding for this program preceded current abstinence-only guidelines; as a result, the program described here is distinct from current federally funded abstinence programs, in that discussion of contraceptives is permitted.

†Under federal funding guidelines, Project IMPACT workers are prohibited from making referrals for contraceptive services. Additionally, all posters and curriculum materials must be approved by the federal funding agency to assure that they meet the abstinence-focused guidelines.

‡Notably, the incentive for participation differed for the two groups. While intervention students were receiving services in an ongoing semester-long program, comparison students received gift certificates for participating in the pretest and posttest. At the one-year follow-up, students from both groups were offered gift certificates as an incentive for completing the survey.

schools where they had participated in Project IMPACT the year before. With the help of the Project IMPACT workers and staff at the Project IMPACT schools, these students were given the follow-up surveys in large groups at their schools.

However, nearly half of the original sample had been in eighth grade during the first year of the study. By the time of the one-year follow-up, these eighth graders were dispersed across the city into more than 60 high schools in Manhattan, Brooklyn, the Bronx and Queens. We contacted guidance staff at each of these high schools, produced the signed parental consent forms and arranged logistics with each individual school to have our data collection staff survey the students in their high schools—in small groups or individually. The majority of high schools cooperated with the research effort. If students could not be reached at their school, we mailed surveys to those for whom we had an accurate address.

Study Hypotheses

We hypothesized that participants in Project IMPACT would report significant positive changes from pretest to posttest and from pretest to follow-up in the following areas: psychosocial measurements of self-esteem, locus of control and self-efficacy; ability to communicate with their parents or other adults about sexuality and other concerns; attitudes consistent with postponing sexual activity; attitudes consistent with preventing pregnancy; intentions to engage in sexual intercourse in the next six months; and onset of sexual intercourse. Finally, we anticipated that participants in Project IMPACT who were or who became sexually active during the program would be less likely at follow-up than comparison students to engage in sexual behaviors that could lead to unintended pregnancy or STD infection.

Survey Instrument

The survey instrument included variables from existing school-based sexual attitude and behavior surveys,²⁴ items from existing standardized scales²⁵ and several new items. We pilot-tested the survey with 25 young people who were not members of a Project IMPACT group at two schools in the same school districts as the Project IMPACT schools, and followed this with a focus-group discussion. Sample scale items and reliability coefficients (Cronbach's alpha) are summarized in Table 1. Alphas for the scales were moderate to high (.64–.87) for all but two scales. The Parental Sex Attitudes scale, which

consisted of only two items, had an alpha of .54, and the pregnancy attitudes scale, which consisted of four items, had an alpha of .58. Thus, findings related to these two scales must be interpreted with caution.

Sexual activity and sexual behavior questions were modified versions of questions from the New York City High School AIDS Evaluation Study and the ENABL study.^{26*} In addition, both students who were sexually active and those who were not were asked about their intention to have sex within the next six months.

The Teenage Sex Attitudes scale was based on revised versions of questions from two existing sexual behavior surveys²⁷ and included concepts such as: "It's okay for people my age to have sex with a boyfriend or girlfriend." The Teenage Pregnancy Attitudes scale measured concepts such as "getting (someone) pregnant now would really mess up my future." Items were revised versions from an existing sexual behavior survey.²⁸

The Locus of Control scale measured students' perceptions of how much control they had over the events and circumstances of their lives. The Self-Efficacy scale measured students' perceptions of their abilities to say no to sex under a variety of circumstances. Both were taken from the New York City High School AIDS Evaluation Study.²⁹ The Kandel Depression Scale³⁰ measured the degree to which students had experienced a variety of symptoms of depression in the past six months. Self-esteem was measured using a modified version of the 10-item Rosenberg Self-Esteem Scale,³¹ but with more adolescent-friendly language (as determined by the pilot test).

The scales measuring the students' relationship and communication with their parents were taken from the New York City High School AIDS Evaluation Study. The Parental Talk scale measured students' assessments of the degree to which they could talk to their parents about a variety of problem areas, including drugs, alcohol, sex and school problems. The Parental Sex Attitudes scale measured students' perceptions of their parents' or guardians' attitudes about teenagers having sex, such as "My parents/guardians would be upset if they thought I was having sex." The Parental Respect scale measured the students' desire to follow their parents' guidelines, such as "I usually do what my parents/guardians want me to." The Parental Relationship Scale included all items in the Parental Respect, Parental Sex Attitudes

Table 1. Among scales used in one-year follow-up survey, number of items, range in scores, desired direction and alpha value

Scale	N of items	Range	Desired direction	Alpha
Depression	6	6–18	lower	.73
Self-esteem	10	10–40	higher	.79
Locus of control	5	5–20	higher	.64
Self-efficacy	3	3–12	higher	.64
Teenage sex attitudes	7	7–28	higher	.72
Teenage pregnancy attitudes	4	4–16	higher	.58
Parental relationship*	11	11–44	higher	.79
Parental respect	3	3–12	higher	.70
Parental sex attitudes	2	2–8	higher	.54
Parental talk	5	5–20	higher	.87

*Parental talk, parental sex attitudes and parental respect scales combined.

and Parental Talk Scales, plus one additional item that reflected an overall measurement of the parent-child relationship.

Among the limitations of the survey method are the difficulty of measuring complex attitudes and behaviors using a pencil-and-paper test, variations in literacy and the time constraints imposed by the school schedule. In anticipation, we simplified the language of the survey where possible, provided assistance to students who had difficulty reading the survey and made every effort to allow sufficient time to complete the survey. Furthermore, while standardized scales may have the advantage of extensive validity and reliability testing, we modified existing standardized measures to assure adolescent-friendly language and to increase students and school staff's comprehension of, comfort with and acceptance of the survey.³²

Retention Rates

In our pretest cohort, a total of 527 pretests were conducted among intervention and comparison students; 417 of these students completed posttests, for a retention rate of 79%. Some students who were not retained in the study dropped out of the intervention after one or two sessions, and thus were no longer eligible for the study (Table 2, page 240). Further, as this was the first year of the program, there was a higher rate of dropout from the early sessions of the groups than in subsequent program years.

*Sexual activity was defined by the response to the question "Have you ever had sexual intercourse (sex)?" Students could respond no, yes or "I have fooled around but I have never had sex." Sexually active students were defined as those who responded yes only; they were then asked a series of follow-up questions on age at first intercourse, number of partners, contraceptive use and other details regarding their sexual behavior.

Table 2. Numbers and percentages of study participants retained at various stages, by study group membership

Retention	All	Intervention	Comparison
No. in pretest	527	223	304
No. matched, pretest to posttest	417	168	249
% retained, pretest to posttest	79	75	82
No. matched, pretest to one-year follow-up	312	125	187
% retained, posttest to one-year follow-up	75	74	75
% retained overall, pretest to one-year follow-up	59	56	62

The 417 students were surveyed, either in person at their schools or by mail, at the one-year follow-up. (One-quarter of the 417 were mail-in follow-ups.) A total of 312 follow-up surveys were completed, for an overall retention rate from pretest to follow-up of 59%. (The response rate for mailed surveys was the same as that for school-based follow-up.) While this reflects a significant loss to follow-up, we feel that it represents a relatively high rate of retention, given the nature of the sample (with high levels of transience and absenteeism) and the fact that one-third of the sample moved from middle school to high school.

There were few differences between students who completed the pretest only and those who completed a pretest and a posttest. When we compared those who took pretests only with those who took a pretest, a posttest and a follow-up, we found (as would be expected) that those who were more troubled, less engaged in school and at higher risk were more likely to have been lost during the long-term follow-up period. Female students lost to follow-up were somewhat more likely to have cut school in the past 30 days, to use alcohol and to have repeated a grade in school. In addition, those lost to follow-up appeared more likely to have already engaged in sexual intercourse and to intend to have sex.

Likewise, among the male students, those who smoked, who already were sexually active, who intended to have sex and who reported having friends who were having sex were more likely to have been lost to follow-up. The loss of “higher risk” students to long-term follow-up, however, was similar in both the intervention and comparison groups, with only one exception—more young women lost to follow-up in the comparison group than in the intervention group reported that they had friends who were having sex.

Data Analysis

Data were entered and cleaned in an SPSS database, and impossible responses (e.g. pretest responses indicating that a student was sexually active and posttest responses indicating that the same student had never had sex) were reconciled. We used all data in the survey to make decisions about consistency, opting for missing data when the inconsistencies could not be reconciled. Any recoded items were flagged so we could conduct analyses to assure that this process did not yield systematic biases.

We analyzed the data using SPSS-PC for Windows. Pretest descriptive data were used to compare intervention and comparison groups and to compare data from students who completed all three surveys with those who were lost to follow-up. We conducted tests of reliability of the participant survey, which included comparing data across different methods of data collection and from different questions on the survey, as well as testing the internal consistency of the scales.

We computed pretest-to-posttest change scores and pretest-to-one-year follow-up change scores for each of the outcome variables and scales. We used independent sample t-tests (two-tailed tests)

to determine the difference in change scores between intervention and comparison groups for both the short-term (pretest-posttest) and long-term (pretest-follow-up) periods.

The independent sample t-test method, focusing on the difference in change scores, accounts for both differences at pretest and differences in the direction of the changes between intervention and comparison students. Furthermore, this method is useful when the variance between groups is not homogeneous, as was the case for many of the variables.

We used chi-square analysis (Fisher’s exact test) for the dichotomous variables—onset of sexual behavior; contraceptive use at last intercourse; and having ever been pregnant. However, the extremely small cell sizes (several with an “expected count” of less than five) violated the assumptions of the chi-square test. Thus, data for the behavioral variables are mainly descriptive and provide information about areas for further exploration.

After analyzing the data for the total group, we conducted analyses separately for males and females and for students who were already sexually active at pretest and those who were not. In addition, we

Table 3. Selected means and percentages for characteristics at pretest of study participants who were surveyed at pretest, posttest and one-year follow-up, by sex

Characteristic	Female			Male		
	Intervention (N=103)	Comparison (N=107)	p	Intervention (N=22)	Comparison (N=80)	p
Mean age	12.8	12.9	.817	13.1	12.9	.292
Mean grade	7.3	7.4	.301	7.3	7.4	.852
% black/Caribbean	70.3	62.7	.267	64.7	68.0	.796
% Hispanic/Latino	19.8	23.5	.531	17.6	26.7	.444
% multiethnic/other	9.9	13.8	.696	17.6	5.3	.181
% who repeated a grade	18.4	7.5	.020	27.3	13.9	.213
% who cut class at least once in last month	18.6	15.8	.602	27.2	15.2	.194
Mean depression score*	11.27	10.24	.009	10.33	10.25	.996
% who live in two-parent household	45.3	39.4	.257	44.4	50.0	.539
% who live in a household where English is spoken about half of the time or less	24.5	25.2	.429	5.9	25.0	.017
% who report having been slapped, punched or kicked by a parent/guardian	25.4	9.9	.017	12.5	17.0	.673
% who used cigarettes in past 30 days	16.8	11.5	.269	5.0	5.1	.982
% who used alcohol in past 30 days	18.4	11.5	.177	10.0	11.4	.861
% who used marijuana in past 30 days	3.0	4.7	.545	9.5	6.4	.625
% who have been touched sexually when it was not desired	21.4	6.5	.002	0.0	3.8	.358
% who have been forced to have sex	8.7	2.8	.064	0.0	1.3	.600
% who report they will definitely/probably have sex in the next 6 months	18.0	19.8	.742	44.5	42.7	.893
% who were sexually active at pretest	10.8	8.5	.577	31.8	20.1	.296
% who have ever been pregnant or have ever caused a pregnancy	0.0	0.0	1.000	0.0	1.3	.384
% who report that a few/most/all of their friends have had sex	63.0	58.1	.462	65.0	49.4	.216
% who report that at least one friend who has been pregnant or has ever caused a pregnancy	44.6	43.3	.841	33.4	32.9	.970

*The mean depression score is based on a scale of six items, with possible scores ranging from 6 to 18.

Table 4. Mean values of scales for selected variables, by intervention and comparison group and by pretest, posttest and one-year follow-up, and significance and effect size for short-term and long-term outcomes, according to psychological variable, gender, sexual activity status and grade

Variable	Intervention			Comparison			Short-term outcomes		Long-term outcomes	
	Pretest	Posttest	One year	Pretest	Posttest	One year	p	Effect size	p	Effect size
Depression	11.11	10.86	10.92	10.24	10.33	10.22	.394	-0.854	.554	-0.592
Male	10.33	9.19	10.33	10.25	10.29	9.84	.429	-0.811	.556	0.591
Female	11.27	11.16	11.03	10.24	10.36	10.51	.499	-0.677	.151	-1.443
Not sexually active	11.02	10.73	10.86	10.19	10.30	10.28	.318	-1.002	.435	-0.782
Sexually active	11.75	11.50	11.25	10.64	10.57	10.00	.880	-0.153	.845	0.196
8th grade	11.06	10.51	10.81	10.44	10.47	10.65	.280	-1.088	.322	-0.994
Self-esteem	33.97	34.10	34.56	34.83	35.18	35.21	.545	-0.606	.685	0.407
Male	33.65	33.79	34.45	34.66	34.45	35.28	.854	0.185	.832	0.212
Female	34.04	34.17	34.59	34.95	35.72	35.16	.236	-1.190	.614	0.506
Not sexually active	33.77	33.96	34.76	34.79	35.21	35.15	.588	-0.543	.246	1.164
Sexually active	35.19	34.81	33.44	34.79	34.91	35.33	.713	-0.370	.105	-1.663
8th grade	34.98	35.73	35.04	35.14	35.28	35.10	.696	0.391	.902	0.123
Locus of control	14.61	15.19	15.61	15.46	15.52	15.63	.067	1.843	.010	2.598
Male	14.11	15.13	14.95	15.26	15.21	15.45	.046	2.032	.444	0.779
Female	14.71	15.20	15.74	15.60	15.72	15.74	.277	1.091	.022	2.306
Not sexually active	14.59	15.10	15.53	15.53	15.45	15.63	.072	1.814	.019	2.367
Sexually active	14.88	15.80	16.18	14.95	15.95	15.38	.748	0.325	.323	1.001
8th grade	15.08	15.74	16.10	15.51	15.77	15.66	.441	0.775	.085	1.737
Self-efficacy	10.49	10.07	10.91	9.90	10.10	10.35	.024	-2.265	.913	-0.109
Male	8.78	8.31	10.50	8.53	8.57	9.25	.344	-0.953	.167	1.396
Female	10.83	10.40	10.99	10.75	10.93	11.04	.025	-2.265	.674	-0.421
Not sexually active	10.61	10.05	10.91	10.26	10.31	10.46	.045	-2.021	.734	0.340
Sexually active	9.86	10.29	10.93	7.70	8.71	9.57	.356	-0.935	.382	-0.885
8th grade	10.76	10.19	10.98	9.70	9.89	10.43	.039	-2.087	.221	-1.230

Notes: Ns are 312 for all study participants, 102 for males, 210 for females, 267 for those not sexually active, 43 for those sexually active and 138 for those in 8th grade.

separately examined students who were in eighth grade at the time of the intervention, given the potential importance with respect to risk behaviors of the transition from middle school to high school.

For several reasons, we decided to use a change-score method and analyze by subgroup rather than use a multivariate method that would adjust for pretest scores and would use subgroups as covariates (e.g., analysis of covariance). First, the unequal cell sizes of the different subgroups would create unbalanced models; in addition, preliminary tests showed significant nonhomogeneity of variance, which violates a primary assumption of analysis of covariance.

These same two factors also made it difficult for us to conduct analyses that would have controlled for pretest differences in risk characteristics between the intervention and comparison groups (i.e., repetition of a grade, sexual victimization and depression for the females, and English language spoken at home for the males). Thus, we conducted additional t-test analyses for the subgroups when the intervention and comparison groups differed, to determine if the significant findings or the direction of changes differed from those of the overall groups. (Such an outcome would have suggested that the findings might have resulted from pretest group differences rather than the intervention.)

A great number of statistical tests were calculated; thus, by chance alone, approximately 5% of these (using $p < .05$ criteria)—or seven of the 142 comparisons—would be statistically significant, and these would be distributed randomly. Despite the strong possibility of Type I error in the individual comparisons, however, a total of 18 tests were significant (13% of those calculated), and they were logically related to each other and in a clearly interpretable pattern.

Results

The Study Sample

The 312 intervention and comparison students who completed a pretest, posttest and one-year follow-up survey were predominantly black or Caribbean (approximately two-thirds) or Latino (about one-fifth) (Table 3). Approximately two-thirds were female, and the mean age at pretest was 12.9 years.

While the demographic characteristics of the intervention and comparison groups did not differ, the intervention appears to have attracted needier and more troubled students, particularly among the females. Young women in the intervention group had higher mean depression scores than those in the comparison group (11.3 vs. 10.2) and were more likely to have repeated a grade (18% vs. 8%), to have been touched sexually when it was not desired (21% vs. 7%) and

to have been slapped, punched or kicked by a parent or guardian (25% vs. 10%).

Among the males, similar patterns occurred, with what appear to be somewhat higher percentages of intervention males having repeated a grade and reporting having sexually active friends. None of these differences were statistically significant, however, due in part to the small sample size of the intervention group.

Overall, nearly two-thirds of the intervention group and one-half of the comparison group reported that a few, most or all of their friends had had sex. One-third of the males and 44% of the females reported having at least one friend who had been pregnant or had caused a pregnancy.

Outcome Analyses

•*Short-term outcomes.* There were a few statistically significant ($p < .05$) short-term differences between groups. As can be seen in Table 4, there were no changes from pretest to posttest on the psychosocial variables (depression and self-esteem). Locus of control changed significantly among the males only ($p = .046$), with the intervention group showing higher locus of control at posttest than at pretest (a change in the desired direction) and the comparison group lower locus of control.

Notably, in some areas, intervention students appeared to be doing worse than comparison students in the short term. These included self-efficacy in the total

Table 5. Mean values of scales for selected variables, by intervention and comparison group and by pretest, posttest and one-year follow-up, and significance and effect size for short-term and long-term outcomes, according to sexual attitudes or intentions and parental variables, and gender, sexual activity status and grade

Variable	Intervention			Comparison			Short-term outcomes		Long-term outcomes	
	Pretest	Posttest	One year	Pretest	Posttest	One year	p	Effect size	p	Effect size
Attitudes about teenage sex	22.78	22.66	23.01	22.80	22.66	21.85	.793	0.263	.057	1.918
Male	19.25	20.86	22.58	20.68	20.42	19.74	.160	1.44	.001	3.511
Female	23.53	22.92	23.11	24.00	23.75	23.05	.771	-0.292	.459	0.744
Not sexually active	23.24	22.81	23.19	23.54	23.18	22.17	.852	0.187	.056	1.932
Sexually active	20.36	21.89	22.09	17.33	18.60	19.42	.911	0.114	.830	-0.217
8th grade	22.26	21.52	22.26	22.63	22.12	21.65	.870	0.164	.348	0.948
Attitudes about teenage pregnancy	14.60	14.24	14.48	14.24	14.23	14.38	.063	-1.869	.404	-0.835
Male	13.63	12.79	14.06	14.09	13.74	13.95	.107	-1.636	.378	0.887
Female	14.79	14.47	14.56	14.33	14.49	14.66	.104	-1.633	.141	-1.477
Not sexually active	14.64	14.15	14.35	14.41	14.43	14.44	.021	-2.320	.349	-0.938
Sexually active	14.50	14.64	15.36	13.17	13.00	13.96	.579	0.561	.943	0.072
8th grade	14.66	14.32	14.41	14.40	14.34	14.41	.165	-1.398	.577	-0.559
Sex intentions	1.66	1.70	1.81	1.76	1.78	2.06	.815	0.234	.171	-1.373
Male	2.18	2.07	2.12	2.09	2.26	2.41	.599	-0.527	.195	-1.304
Female	1.57	1.64	1.75	1.52	1.44	1.82	.238	1.185	.368	-0.902
Not sexually active	1.54	1.65	1.69	1.57	1.60	1.92	.595	0.532	.127	-1.532
Sexually active	2.50	2.00	2.50	2.92	2.92	3.00	.360	-0.927	.838	-0.206
8th grade	1.79	1.93	2.13	1.91	1.97	2.15	.683	0.409	.604	0.521
Parental relationship	34.94	34.43	35.40	37.29	37.31	36.31	.780	-0.280	.055	1.929
Male	32.31	30.73	35.94	36.62	37.16	35.84	.208	-1.276	.078	1.873
Female	35.46	35.01	35.30	37.71	37.39	36.61	.883	0.148	.264	1.121
Not sexually active	35.50	34.16	35.38	37.50	37.50	36.21	.220	-1.235	.146	1.461
Sexually active	32.07	36.09	35.79	35.80	35.63	36.50	.130	1.620	.150	1.475
8th grade	34.21	34.78	36.67	36.95	36.42	35.61	.440	0.780	.001	3.376
Parental respect	10.42	10.22	10.48	10.91	10.87	10.64	.430	-0.792	.167	1.39
Male	10.00	9.60	10.78	11.00	10.83	10.71	.295	-1.055	.038	2.114
Female	10.51	10.34	10.42	10.84	10.89	10.58	.460	-0.741	.557	0.589
Not sexually active	10.48	10.21	10.45	10.88	10.93	10.59	.158	-1.420	.323	0.990
Sexually active	10.14	10.31	10.79	11.00	10.42	10.83	.100	1.700	.278	1.118
8th grade	10.04	10.36	10.56	10.83	10.69	10.37	.221	1.231	.011	2.584
Parental attitudes about sex	6.78	6.58	6.62	6.62	6.70	6.41	.271	-1.104	.814	0.236
Male	5.63	5.64	6.50	6.15	6.15	5.77	.937	-0.079	.021	2.349
Female	6.99	6.74	6.64	6.92	7.01	6.82	.173	-1.367	.270	-1.106
Not sexually active	6.90	6.58	6.65	6.84	6.82	6.49	.179	-1.348	.657	0.445
Sexually active	6.14	6.79	6.64	5.26	5.79	5.87	.819	0.231	.864	-0.172
8th grade	6.73	6.79	6.73	6.59	6.55	6.41	.783	0.276	.552	0.596
Parental talk	14.53	13.94	14.92	16.32	15.95	15.61	.942	-0.073	.021	2.315
Male	14.39	13.60	15.89	15.95	16.21	15.86	.276	-1.097	.199	1.326
Female	14.56	14.00	14.71	16.56	15.80	15.44	.593	0.536	.025	2.254
Not sexually active	14.97	13.84	14.99	16.27	16.10	15.49	.189	-1.319	.114	1.586
Sexually active	12.00	14.67	14.50	16.45	14.79	16.14	.023	2.401	.086	1.811
8th grade	14.24	14.29	15.82	16.21	15.53	15.11	.293	1.055	.000	3.823

Notes: Ns are 312 for all study participants, 102 for males, 210 for females, 267 for those not sexually active, 43 for those sexually active and 138 for those in 8th grade.

group, among females, among eighth graders and among those not sexually active (Table 4), and attitudes toward teenage pregnancy among students who were not sexually active (Table 5).

There were no short-term differences between groups in attitudes about teenagers having sex or in intentions to have sex. Finally, among the sexually active subsample, the intervention group became more likely to talk with parents (with an increase in score from 12.0 to 14.7), while the comparison group became less likely.

•*Long-term outcomes.* The long-term outcome findings were more impressive, with no significant findings in an unex-

pected direction. There continued to be no significant change in depression and self-esteem (Table 4), whereas locus of control differed significantly between study groups overall ($p=.010$), for all females ($p=.022$) and for all non-sexually active students ($p=.019$). In each case, the intervention group had lower scores than the comparison group at pretest, but at the one-year follow-up the intervention group reported scores higher than before, while the comparison group's scores were similar to pretest.

There were no significant long-term findings for self-efficacy (Table 4), intentions to have sex or attitudes about teenage pregnancy (Table 5). Long-term, males

in the intervention group differed significantly ($p=.001$) from those in the comparison group regarding attitudes about teenagers having sex: The intervention males moved from lower scores at pretest to higher scores at the one-year follow-up (from 19.3 to 22.6), while the comparison males moved from higher to lower scores (from 20.7 to 19.7).

There were several significant long-term findings in parental relationship variables, all in the expected direction—that is, the intervention group had higher scores, whereas the comparison group had lower scores. Between-group differences in parental talk were significant overall ($p=.021$), as well as for females ($p=.025$)

and for eighth graders ($p=.000$). Parental respect was significant among boys ($p=.038$) and among eighth graders ($p=.011$). Between-group differences in perceptions about their parents' attitudes about adolescent sex were significant for males ($p=.021$), and the between-group difference for the overall parental relationship scale was significant ($p=.001$) among eighth graders.

Among the few students ($n=43$) who were already sexually active at pretest, we found no significant long-term differences between groups on any of the psychosocial, attitudinal or parental relationship variables.

We performed additional analyses to separate the subgroups on the basis of pretest characteristics on which the intervention and comparison group differed (i.e., depression, sexual victimization, repetition of a grade and use of English at home). These findings were similar: Either the same variables were significant, or the associations were in the same direction as in the overall analyses, suggesting that the significant differences were not due solely to the characteristics differentiating the intervention and comparison groups.

•*Onset of sexual activity.* With respect to the initiation of sexual activity (Table 6), we found no significant differences between groups in the overall sample. Among the entire group of students who were not already sexually active at the pretest, 8% of the intervention group and 3% of the comparison group reported sexual activity at posttest. At the one-year follow-up, an additional 11% of the intervention group and 14% of the comparison group reported having sex, for a total onset between pretest and follow-up of 18% and 16%, respectively.

Among the male students, a total of 40% of those in the intervention group had initiated sex (20% by posttest and 20% by the one-year follow-up), compared with a rate of 20% (3% and 17%, respectively) in the comparison group. The between-group short-term difference was significant among the males ($p=.045$), although at the long-term follow-up the difference between the intervention and comparison groups was no longer statistically significant.

Among the female students, overall rates of onset of sexual activity were 14% for the intervention group (6% at posttest and 8% at the one-year follow-up) and 13% (2% and 10%, respectively) for the comparison group. These differences were not statistically significant.

•*Condom use at last intercourse.* At pretest, there were no significant differences in condom use at last intercourse or in use

Table 6. Percentage of students who engaged in a specified behavior, by membership in intervention or control group and by gender, according to type of behavior

Behavior	Total			Females			Males		
	Inter-vention	Com-parison	χ^2 test*	Inter-vention	Com-parison	χ^2 test*	Inter-vention	Com-parison	χ^2 test*
SEXUAL ACTIVITY									
All students with data	(N=124)	(N=186)	na	(N=102)	(N=106)	na	(N=22)	(N=80)	na
Sexually active at pretest	14.5	13.4	.867	10.8	8.5	.640	31.8	20.0	.258
Not sexually active at pretest	(N=106)	(N=161)	na	(N=91)	(N=97)	na	(N=15)	(N=64)	na
Began sexual activity between pretest and posttest	7.5	2.5	.070	5.5	2.1	.269	20.0	3.1	.045
Began sexual activity between posttest and one-year follow-up	10.6	13.5	.558	8.0	10.4	.799	20.0	17.2	.687
Began sexual activity between pretest and one-year follow-up	17.6	16.1	.738	13.7	12.5	1.000	40.0	20.3	.176
CONDOM USE AT LAST SEX									
Sexually active at pretest	(N=15)	(N=24)	na	(N=9)	(N=9)	na	(N=6)	(N=15)	na
Used a condom	73.3	70.8	.870	77.8	80.0	1.00	66.7	66.7	1.00
Used nothing	13.3	29.2	.265	11.1	22.2	1.00	16.7	33.3	.623
Sexually active at one-year follow-up	(N=30)	(N=47)	na	(N=19)	(N=22)	na	(N=11)	(N=25)	na
Used a condom	79.3	80.4	.907	78.9	90.9	.390	81.8	73.1	.695
Used nothing	6.7	10.6	.699	10.5	12.0	1.000	0.0	12.0	.538
EVER BEEN PREGNANT/ MADE SOMEONE PREGNANT									
All students with data	(N=124)	(N=186)	na	(N=102)	(N=106)	na	(N=22)	(N=80)	na
At pretest	0.0	0.5	1.000	0.0	0.0	na	0.0	1.3	1.000
At one-year follow-up	4.0	2.7	.503	4.8	3.7	1.000	0.0	1.3	1.000

*Using Fisher's exact test (two-tailed). Note: na=not applicable.

of "nothing to prevent pregnancy" (Table 6). Among all students who were sexually active by the end of the study, there were no significant differences in condom use or in the use of nothing to prevent pregnancy. The ability to draw conclusions about this group is limited by the small number of students who were sexually active, however.

•*Reported pregnancies.* Finally, we found no difference between intervention and comparison females at the one-year follow-up regarding pregnancies. Nine pregnancies were reported between the pretest and the one-year follow-up—five in the intervention group and four in the comparison group.* At the one-year follow-up, no young males in the intervention or comparison groups reported having caused a pregnancy.

Conclusion

Study Limitations

The quasi-experimental design that we used here controls for some threats to validity (i.e., history and maturity) that are of great relevance to this type of prevention work. However, in the context of a program that was successful in attracting the target group (students at the highest risk of early sexual activity and pregnan-

cy) to join, the challenge of finding an ideal comparison group was even greater. The self-selection process in which students joined both the intervention and comparison group further challenged the design, since students had different incentives, and thus different motivations, to join either group.

We could not randomly assign students to groups, given the voluntary nature of Project IMPACT and the need for long-term follow-up. While the students in the intervention and comparison groups were from the same neighborhoods and schools and had a wide variety of behaviors and risks, the self-selection produced some differences between the intervention and comparison groups. The result was a somewhat "needier" intervention group.

Those who were in the original cohort and those who remained one year later differed somewhat, although there were few systematic differences between intervention and comparison students in loss to follow-up. Some students in the follow-up were reached by mail, rather than at their

*None of the nine pregnancies reported at the one-year follow-up resulted in live births. In the intervention group, three females reported miscarriages and two had abortions. In the comparison group, one young woman had a miscarriage and three had abortions.

schools. While this approach offered less control over the circumstances under which the survey was completed, the mail survey approach was the only way to reach students who would otherwise have been completely lost to follow-up. When we assessed critical variables such as sexual activity rates for mail surveys vs. in-school surveys, we found no significant differences in reporting of risk behaviors.

The samples used in these analyses were small, and the various subgroups differed in size. Furthermore, our analyses included only students with valid data at all three test points; this reduced group sizes even more and increased discrepancies in cell sizes. These factors resulted in low power and made it more difficult to achieve statistically significant results.

Interpretation

The challenge for adolescent pregnancy and disease prevention programs is to develop interventions that encourage students to delay the onset of sexual activity, address the needs of young people who are already sexually active to reduce their risk, instill knowledgeable, responsible and healthy attitudes toward sex, and support positive parent-child communication. The small-group model presented here, which is based on social cognitive theory, may be better suited than traditional classroom education to addressing sensitive areas of adolescent development. We hypothesized that because it focused on mental health issues and on building skills and strengths in young people, this approach would have the most impact on psychosocial variables, parental communication and relationship variables, and attitudes related to sexual activity. (We also recognized that the potential for a short-term, in-school intervention to have an impact on behavior would be limited.)

Our evaluation results support some, but not all, of these hypotheses. The approach was associated with long-term positive gains among intervention students in a sense of control over their lives, in attitudes about the appropriateness of teenage sex and, notably, in their self-reported relationships and communication with their parents one year after participating in the program. Although the data suggested short-term outcomes in the opposite of the desired direction for a few variables, these differences were not significant one year later.

The continued challenge of changing attitudes about teenage pregnancy among a group of young people who are in a social context in which adolescent parenting

is common, the difficulty of addressing mental health issues of depression and self-esteem in a short-term school intervention and the challenges of changing adolescent sexual behavior are all evident in our data. Furthermore, the lack of significant outcomes among the students who were already or who became sexually active suggests that these students are an especially challenging group, whose needs may not be met within the context of an abstinence-focused, school-based program.

A variety of studies have shown that affecting sexual behavior within a school-based program is consistently difficult. The evaluation described here was further challenged by a study population with numerous risk factors: early sexual activity, truancy, repetition of a grade in school, coresidence with a single parent, and substance use, as well as the extent to which sexual behaviors and risks are commonplace in their peer cultures.

Particularly troubling was the number of students who reported forced sexual activity. Clearly such activity has implications for pregnancy-prevention programs, particularly abstinence-based programs. Seven in 10 women who initiated sex before the age of 13 had unwanted or nonvoluntary sex the first time.³³ In fact, the younger the women were at first intercourse, the more likely they were to report it as unwanted or nonvoluntary. Few school sexuality curricula address these issues.³⁴ Thus, programs that emphasize the decision to remain abstinent must recognize the many students for whom initiation of sexual activity is not a personal choice.

The improved findings at the long-term follow-up on a variety of measures may reflect the dynamics of the small-group approach and point to the importance of including long-term follow-up in evaluations. During the group sessions, participants discuss, reflect on and are challenged to come to terms with their own values, attitudes, environment and behavior. Thus, some effects may have taken time to manifest themselves and may not have been evident at posttest, while "undesired effects" (e.g., some changes in self-efficacy) in evidence in the short-term results diminished over the long term. The apparently increased onset of sexual activity among males during the short pretest-to-posttest period, which also was not significant over the long term, again illustrates the importance of taking a long-term view when assessing behavior change in a very high-risk group.

With respect to parent-child relationships, our outcomes were particularly en-

couraging. Our data suggest that discussions initiated in the small-group sessions at school may have spilled over into the home up to one year after exposure to the program. Data have suggested that young people want to communicate with their parents about sexuality, and that family relationships and communication are strongly associated with early sexual activity and with risk reduction behavior, such as condom use.³⁵ Recent studies further illustrate the importance of family communication: Adolescents whose mothers talk with them about condom use before they initiate sexual intercourse are more likely than others to use a condom at first intercourse and to remain more consistent condom users,³⁶ and social support for contraception—particularly by a parent—is a strong influence in consistent condom use.³⁷

Conclusions

Our findings suggest the need for in-depth study, over a longer term, that addresses the needs of young people at the highest risk of teenage pregnancy. We are currently engaged in an evaluation that follows a larger group of eighth graders who participated in one of three variations of the small-group program (the abstinence-based approach, a more comprehensive approach and a multicomponent approach that links the comprehensive program with other community-based services) and a comparison group through the 11th grade.

It is encouraging that one year after participating in the program, the young women in the intervention group were no more likely than those in the comparison group to be sexually active or to have become pregnant (despite their higher risk status at pretest). It is also heartening to find that a small-group mental health program, based in schools, can affect adolescents' self-reported communication and relationship with their parents. Even when young people are hesitant or unable to approach their parents about sex, they can benefit from the mentoring and support of a trained and experienced adult. Furthermore, the small group provides young people with the opportunity to explore a variety of issues (not just sex) that they face as teenagers, and to engage in mutual problem-solving with their peers.

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