

DO ABSTINENCE EDUCATION PROGRAMS INFLUENCE HIGH-SCHOOL ACADEMIC PERFORMANCE?

Kenneth F. Ferraro, PhD
Karis A. Pressler, MA

Abstract:

Objectives: To determine if implementation of an abstinence education program is associated with academic performance.

Methods: Using a longitudinal design, this study compares the academic performance of 21 high schools with an abstinence education program to 21 matched schools without such a program.

Results: In comparison to matched controls, receiving the program was associated with a higher percentage of sophomores passing the state math achievement exam but was not associated with either percent passing the English exam or the attendance rate. Among the schools receiving the program, years of program intervention was associated with higher rates of passing both the state math and English achievement exams.

Conclusions: Sustained offering of abstinence education programs is associated with improved academic performance, especially on standardized math exams.

INTRODUCTION

Considerable research has evaluated the influence of abstinence-only sex education programs on sexual behaviors among high school students, but the results from many of these investigations are inconsistent. Some studies show that abstinence education programs do not deter sexual activity (Barnett & Hurst, 2003; Trenholm et al., 2007), while others report that abstinence education programs delay or prevent sexual activity by high school students (Denny & Young, 2006; Jemmott, Jemmott, & Fong, 2010) or reduce the number of sexual partners (Borawski, Trapl, Lovegreen, Colabianchi & Block, 2005). Although dozens of studies have examined whether abstinence education programs influence sexual attitudes and behavior, it is surprising that the academic consequences of these programs have not been investigated.

Schools are communities, and abstinence-only sex education programs may have an impact on schools that is beyond their originally stated aims. Some extracurricular or non-credit educational activities have been linked with better academic outcomes such as grade point average and verbal and numerical ability on aptitude tests (Eccles, Barber, Stone & Hunt, 2003), and school-based health centers have been shown to reduce early dismissals (Van Cura, 2010). Activities that supplement the formal curriculum may bolster educational achievement by creating favorable peer associations (Stewart, 2008),

aiding positive youth development (Eccles et al., 2003; Weissberg & O'Brien, 2004), and/or helping students avoid risky behaviors (Smith, Realini, Buzi, & Martinez, 2011). The purpose of this research, therefore, is to determine if abstinence-only sex education programs influence academic performance. Are they good, bad, or benign for academic performance?

There are several reasons why it is important that schools, local communities, and educational associations consider whether abstinence-only sex education programs influence academic performance. First, most abstinence-only sex education programs place value on marriage and socioeconomic achievement. Although the essence of these programs is delaying sex until marriage, the educational materials often seek to foster awareness that teen pregnancy makes it more difficult for the partners, especially the girl, to achieve personal and career goals. For example, many of the Community-Based Abstinence Education programs funded during the previous decade included an evaluation item such as: When a teenage girl gets pregnant, it hurts her chances to succeed in life (i.e., Likert item probing agreement). Moreover, there is considerable evidence that unplanned teen pregnancies often derail life plans—at least temporarily—and result in more complicated pathways to socioeconomic status attainment and a lower probability of high school and college graduation (Klepinger, Lundberg, & Plotnick, 1995). As

Kenneth F. Ferraro, PhD, is a distinguished Professor of Sociology at Purdue University. Karis A. Pressler MA, is a PhD candidate in Sociology and affiliated with the Center on Aging and the Life Course at Purdue University. Please address all correspondence to: Kenneth Ferraro, PhD, Department of Sociology, Purdue University, 700 West State Street, West Lafayette, IN 47907-2059, Email: ferraro@purdue.edu

such, abstinence-only educational programs that focus on status attainment may enhance academic performance.

Second, many abstinence-only sex education programs, as well as many comprehensive sex education programs, prioritize personal control and a future-time orientation. Perhaps this emphasis, especially coupled with valuing socioeconomic status attainment, may contribute to a more mature and studious approach to school life (Kirby, 2002).

Third, an important lesson learned from evaluating social programs is to distinguish the manifest from latent consequences. Program planners attempt to anticipate how programs will influence the social system but unintended or latent consequences are quite common. Although most school administrators probably view abstinence-only education programs as beneficial or benign, are there unintended consequences that might compromise academic performance? Could the priority given to delaying sex until marriage foster more traditional sex roles and perhaps suppress academic performance, especially among girls? We are not aware of any such evidence to support this thesis but feel that the question merits answering.

From another perspective, various members of the school community (e.g., parents, teachers, administrators, and school boards) are searching for programs that will boost academic performance on widely accepted indicators of scholastic achievement. Is there evidence that abstinence-only sex education programs are beneficial to academic performance?

Although there are grounds to hypothesize that abstinence-only education programs may influence academic achievement, theories of social change suggest that the change may be slow in coming. Many treatment programs are based on a dose-response paradigm, which presumes that outcomes are sensitive to the amount of the treatment (Lipsey & Cordray, 2000). Therefore, in order to evaluate the potential effects of abstinence-only education programs on school academic performance, it is appropriate to assess the quantity of the treatment.

METHODS

SUBJECTS

The subjects are high school students at 42 Indiana high schools, but all student information was gathered from school-level (aggregated) sources. Therefore, the unit of analysis is the high school. The study design involves matching 21 Indiana schools that received an abstinence-only education program with 21 schools in the state that did not receive the program.

To serve as matched-controls, 21 high schools that did not offer the program were identified on the basis of (a) school composition (high school only or

high school and junior high combined on one site), (b) school enrollment (< 100, 100-299, 300-499, 500-999, 1,000-1,999, and >2,000), (c) community size (large city, mid-size city, urban fringe of large city, urban fringe of mid-sized city, large town, small town, rural—outside of metropolitan statistical area, and rural—inside of metropolitan statistical area), and (d) percent of White students.

Table 1 displays the matching criteria and descriptive statistics for schools that had the intervention and matched controls. The first three matching criteria (school composition, school size, and community size) are categorical variables, and there was at least one match for all 21 schools. The fourth matching criterion, percent of White students, is a continuous variable so matches were defined by a difference of less than five percent. The Table displays the racial composition of the schools along with descriptive statistics for percent of students receiving reduced-price lunches, poverty rate, and graduation rate. Bivariate statistical tests comparing the intervention schools to matched controls revealed no significant differences ($p > .05$).

The majority of the schools are stand-alone high schools with an enrollment less than 1,000 students. As shown in Table 1, most of these schools are located in rural areas or small towns; only 8 of the 42 schools are located in mid-sized or large cities.

INSTRUMENTS

To measure academic performance over time, data were obtained from a public archive of the Indiana Department of Education, including information on attendance and the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+) (Indiana Department of Education, 2010). ISTEP+ is administered to all students in grades 3 through 10 to assess knowledge and academic functioning at each grade level. The annual test, generally administered over three mornings and requiring 4.5 to 6.5 hours to complete, is also designed to check on progress toward graduation and determine if remedial help is needed. During 10th grade, a section of the ISTEP+ serves as the Graduation Qualifying Exam (GQE) in the state of Indiana. (Students who do not pass the GQE as sophomores are given additional opportunities to take the exam during their junior and senior years.)

The three measures of academic performance, obtained from the public archive, are: (1) Percent of sophomores passing the English ISTEP+; (2) Percent of sophomores passing the math ISTEP+; and (3) Attendance rate (Indiana Department of Education, 2010).

The outcomes were assessed at two time points: baseline and the 2009 school year. For selected analyses, we incorporate baseline scores on each out-

Table 1. Comparison of Schools Offering the Intervention and Matched Controls

	Received Intervention	Matched Controls
School Composition		
Grades 7-12	6	6
Grades 9-12	15	15
High School Enrollment		
<1,000	16	16
1,000-1,999	2	2
>2,000	3	3
Community Size		
Rural	12	12
Small Town	5	5
Urban Fringe of Large City	2	2
Mid-size City	1	1
Large City	1	1
Race		
White	90.09	88.50
Black	4.67	6.17
Hispanic	2.48	2.67
Lunch		
Paid	71.33	69.71
Reduced	8.86	8.61
Free	20.95	21.55
Poverty		
% Families Below Poverty Line in 2000	7.40	8.59
Graduation Rate	85.48	84.65
Years of PEERS	5.48	0

come (prior to the intervention) to compare whether change in the outcomes is sensitive to the length of the intervention.

INTERVENTION

The abstinence-only sex education program studied is the Peers Educating and Encouraging Responsible Sexuality (PEERS) program, which uses high-school mentors to lead instructional sessions on the consequences of sex before marriage and the value of saving sex for marriage. Originally developed in Indiana, PEERS is also offered in Missouri, New Mexico, New York, and Washington.

The PEERS program is offered free of charge in both middle schools and high schools throughout the state of Indiana, but this study is limited to high schools that offered the program during the 2008-

2009 academic year. A total of 21 high schools were identified as delivering the PEERS program for at least one year. The number of years that PEERS was offered at these schools, ranging from one to 10, was also identified to account for potential differences due to the duration of program administration.

The PEERS program is delivered in high schools to students principally in the 9th and 10th grades (via enrollment in health or physical education classes). Each year of the program involves approximately 150 minutes of classroom instruction on topics such as sexually transmitted diseases, sexual responsibility, healthy relationships, “abstain to attain,” and love. Mentors make use of video presentations, role-playing, and testimonials in delivering the program. The idea is to demonstrate modeling, foster positive youth development, and counter the idea that “ev-

erybody's doing it."

PEERS' area coordinators recruit high school students to be mentors and manage the logistics of program delivery. Mentors represent a wide range of students—male and female, White and non-White—but all receive training regarding the content of the program and ways to effectively present it to fellow students. When delivered in high schools, most mentors are juniors or seniors.

PROCEDURE

High schools offering PEERS in Indiana during 2009 and matched controls were identified. Information on academic performance over multiple years was gathered from public websites. The study was approved by the Institutional Review Boards of St. Vincent Hospital, Indianapolis, and Purdue University.

DATA ANALYSIS

Descriptive statistics, analysis of variance, and multiple regression analyses were estimated with Stata 10SE. Analysis of variance was used to compare the influence of the intervention on the outcomes. Given the variability in how long the program was administered in the various schools, multiple regression analysis was used for the 21 schools that received the program to assess whether the length of the intervention (how many years it was offered at each school) affected the outcomes.

RESULTS

Table 2 provides descriptive statistics for each of the outcome variables used in the analysis, stratified by whether or not the schools had PEERS. One-way analysis of variance was performed for each of the six outcomes. As anticipated, the matched schools did not differ significantly from those receiving the program on any of the baseline measures ($p > .05$). For

the 2009 outcomes, however, the percent passing the math exam was significantly higher in the schools that received the intervention (72.62%) than for the matched schools (67.14%), $F(1, 41) = 5.12$, $p = .03$, $\eta^2 = .11$. The percent passing the English exam was not significantly higher, $F(1, 41) = 2.40$, $p = .13$, $\eta^2 = .06$, and attendance rates were almost identical for the two groups, $F(1, 41) = 0.72$, $p = .029$, $\eta^2 = .02$.

The final phase of the analysis is to consider the role of years of treatment on the outcomes. These analyses are restricted to those schools that received the program intervention ($n=21$). Each of the outcomes was regressed on the initial level of the variable and the years of the intervention. The analysis revealed that years of the intervention was related to change in both the percent passing the English exam ($b = 1.47$, $SE = .52$, $\beta = .52$, $t = 2.81$) and the percent passing the math exam ($b = 1.40$, $SE = .56$, $\beta = .48$, $t = 2.5$). Thus, each year that the program was administered at these 21 schools was associated with an almost 1.5 percent increase in the pass rate for the state's achievement tests (both English and math). Change in the attendance rate was not affected by the years of the intervention ($p > .05$).

DISCUSSION

Although dozens of studies have examined the effects of abstinence-only sex education programs on sexual attitudes and behavior, the influence of these programs on academic performance has not been systematically examined. Seeking to address this gap, the present analysis considered whether a mentor-led abstinence-only sex education program might help or harm high school academic performance in Indiana. Three main findings emerged from the longitudinal analysis.

First, in comparison to matched controls, high schools that received the abstinence-only sex education program had higher passing rates for

Table 2. Comparison of Schools Offering PEERS and Matched Controls with F Test for Outcomes

	Had PEERS	Matched Controls	F Test ^a	Prob.
Baseline ISTEP Scores				
% Pass English	72.67	70.52	0.75	0.39
% Pass Math	71.19	66.62	3.39	0.07
Baseline Attendance Rate, Grades 9-12	95.72	95.68	0.02	0.88
2009 ISTEP Scores				
% Pass English	71.48	68.00	2.40	0.13
% Pass Math	72.62	67.14	5.12*	0.03
2009 Attendance Rate, Grades 9-12	95.97	95.74	0.72	0.40

* $p < .05$ (analysis of variance)

the state math achievement examination. The 21 schools with the program did not differ from the 21 matched schools at the start of the intervention, but performed significantly better on the math exam in 2009. Thus, regardless of how many years the school had the program, the intervention was associated with one of the three outcomes of interest—percent passing the state’s standardized math exam.

Second, when closely examining the 21 schools that received the intervention, we uncovered a dose-response effect of the intervention on the percent passing the achievement exams. For each year that a school had the program, there was about a 1.5 percent increase in the passing rate on the standardized exams for both English and math. Given that the intervention is influencing a school community, this finding suggests that most programs intended to improve academic performance will likely take more than one or two years to yield a meaningful impact (Kirby, 2002).

Third, there was no evidence from these analyses that an abstinence-only sex education program is harmful to a school’s academic performance. Attendance was unaffected by the intervention, even if it was received for many years, but there was no evidence that the intervention resulted in either lower attendance rates or poorer test scores. Rather, significant gains in percent passing the standardized math exams were observed for the schools that received the program. These findings imply that the educational risk of such programs is low to nonexistent and that the educational benefits may be substantial.

Although it is impossible to identify precisely why this abstinence-only sex education program is beneficial to some measures of academic performance, two points merit consideration. First, the gains are not likely due to the attendance rate, which was unaffected by the intervention. Second, the organization of the PEERS program itself may be consequential to the findings. Most abstinence-only sex education programs rely on adults—teachers, especially health teachers, or community members—to administer the program. The PEERS program is distinctive in that adults organize the program, but high school students deliver the content. Perhaps the message, “abstain to attain,” has more gravity when delivered by a fellow student than by an adult, especially if the adult is an employee of the school district.

In interpreting these results, three limitations should be recognized. First, ISTEP+ scores were

designed as a “check-up” on student progress toward graduation. The outcomes here were limited to the percent passing these tests, not to the full distribution of scores. The percent passing is clearly related to the full distribution of scores, but it is a more limited measure of performance. One should not infer that the intervention will further boost standardized test scores among students who are likely to pass; rather, the intervention raises the passing rate for the school, meaning that more students at risk of failing are able to pass the exam after the intervention has been administered for multiple years.

A second limitation of the study is external validity. The findings are limited to the state of Indiana and to schools that have implemented the abstinence-only educational program. The majority of the high schools studied have fewer than 1,000 students and are located in rural areas and small towns. Although the matched comparison design accounts for the distribution across the types and locations of the schools that offered the program, conclusions about the influence of the intervention on larger, predominantly urban schools should be considered with caution.

Third, the number of schools studied was small. We identified 21 schools in one state that received the program and matched them to 21 other schools in the same state. The fact that there were significant differences on the outcomes among only 42 schools suggests that the estimates of program impact reported here are conservative, most likely an underestimate of the relationship.

Although these findings are limited to the influence of abstinence-only sex education programs, can similar findings be observed for comprehensive sex education programs? If not, then the distinctive messages of delayed gratification and status attainment common to abstinence education programs may be what is associated with notably better academic performance. If parallel results are obtained by comprehensive sex education programs, however, then it may be something about the discussion of sexuality that is consequential to academic performance—perhaps the emphasis on personal control and a future orientation (Ross & Broh, 2000) or information on sexually transmitted diseases (Smith et al., 2011). Studies that compare the influence of abstinence-only and comprehensive sex education programs on academic performance would be very informative for interpreting the findings presented herein.

REFERENCES

- Barnett, J. E., & Hurst, C. S. (2003). Abstinence education for rural youth: An evaluation of the Life’s Walk Program. *Journal of School Health, 73*(7), 264-268.
- Borawski, E. A., Trapl, E. S., Lovegreen, L. D., Colabianchi, N., & Block, T. (2005). Effectiveness of

- abstinence-only intervention in middle school teens. *American Journal of Health Behavior*, 29(5), 423-434.
- Denny, G., & Young, M. (2006). An evaluation of an abstinence-only sex education curriculum: An 18-month follow-up. *Journal of School Health*, 76(8), 414-422.
- Eccles, J. S., Barber, B. L., Stone, M., & Hunt, J. (2003). Extracurricular activities and adolescent development. *Journal of Social Issues*, 59(4), 865-889.
- Indiana Department of Education. (2010). Indiana K-12 Education Data. Retrieved December 29, 2010, from <http://www.doe.in.gov/data/> .
- Jemmott, J. B., Jemmott, L. S., & Fong, G. T. (2010). Efficacy of a theory-based abstinence-only intervention over 24 months. *Archives of Pediatrics and Adolescent Medicine*, 164(2), 152-159.
- Kirby, D. B. (2002). Effective approaches to reducing adolescent unprotected sex, pregnancy, and childbearing. *Journal of Sex Research*, 39(1), 51-57.
- Klepinger, D. H., Lundberg, S., & Plotnick, R. D. (1995). Adolescent fertility and the educational attainment of young women. *Family Planning Perspectives*, 27, 23-28.
- Lipsey, M. W., & Cordray, D. S. (2000). Evaluation methods for social intervention. *Annual Review of Psychology*, 51, 345-375.
- Ross, C. E., & Broh, B. A. (2000). The roles of self-esteem and the sense of personal control in the academic achievement process. *Sociology of Education*, 73, 270-284.
- Stewart, E. B. (2008). School structural characteristics, student effort, peer associations, and parental involvement: the influence of school- and individual-level factors on academic achievement. *Education and Urban Society*, 40(2), 179-204.
- Smith, P. B., Realini, J. P., Buzi, R. S., & Martinez, M. (2011). Students' experiences and perceived benefits of a sex education curriculum: a qualitative analysis. *Journal of Sex and Marital Therapy*, 37(4), 270-285.
- Trenholm, C., Devaney, B., Fortson, K., Quay, L., Wheeler, J., & Clark, M. (2007). *Impacts of four Title V, Section 510 abstinence education programs*. Princeton, N.J.: Mathematica Policy Research.
- Van Cura, M. (2010). The relationship between school-based health centers, rates of early dismissal from school, and loss of seat time. *Journal of School Health*, 80(8), 371-377.
- Weissberg, R. P. & O'Brien, M.U. (2004). What works in school-based social and emotional learning programs for positive youth development. *ANNALS of the American Academy of Political and Social Sciences*, 591, 86-97.

American Journal of Health Studies

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