

## Do After School Programs Reduce Delinquency?

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After school programs (ASPs) are popular and receive substantial public funding. Aside from their child-care and supervision value, ASPs often provide youth development and skill-building activities that might reduce delinquent behavior. These possibilities and the observation that arrests for juvenile crime peak between 2 p.m. and 6 p.m. on school days have increased interest in the delinquency prevention potential of ASPs. This study examined effects of participation in ASPs conducted in Maryland during the 1999–2000 school year and the mechanism through which such programs may affect delinquent behavior. Results imply that participation reduced delinquent behavior for middle-school but not for elementary-school-aged youths. This reduction was not achieved by decreasing time spent unsupervised or by increasing involvement in constructive activities, but by increasing intentions not to use drugs and positive peer associations. Effects on these outcomes were strongest in programs that incorporated a high emphasis on social skills and character development.

**KEY WORDS:** after school programs; delinquency prevention; substance abuse prevention.

After school programs (ASPs) are increasing in number and popularity. A poll of Maryland residents found that more than 75% of voters in the state favored expanding the use of ASPs (Advocates for Children and Youth, 1999). States are creating mechanisms to provide public support (such as after-school tax credits) for parents who send their children to such programs (Advocates for Children and Youth, 1999; Vandell & Shumow, 1999). Federal funding for ASPs is also on the rise: The 21st Century Community Learning Center program, authorized under Title X, Part I, of the Elementary and Secondary Education Act, was a component of the Clinton administration's effort to help families and communities keep their children "safe and smart." It is now a major aspect of the recent "No Child Left Behind Act," of which the Bush administration was a proponent. These

Centers are meant to enable school districts to operate public schools as community education centers that focus on providing academic assistance, drug and violence prevention programming, technology education, art, music, recreation, and character education. The U.S. Department of Education (2000) has funded over 6,800 schools in more than 1,400 communities to become community learning centers. Congress appropriated \$200 million to the 21st Century Community Learning Centers in 1999 and has increased the level of funding every year to \$1 billion in 2002 (<http://www.ed.gov/21stcclc>).

Public support for ASPs is fueled by two main factors: The need for quality care and supervision created by the changing nature of the work force, and evidence that young people are more likely to be arrested during the after school hours than at any other time. Currently, 69% of all married-couple families with children ages 6–17 have both parents working outside the home. In 71% of single-mother families and 85% of single-father families with children ages 6–17, the custodial parent is working. The gap between parents' work schedules and their children's school schedules can amount to 20–25 hr per week (U.S. Departments of Education and Justice, 2000). Public opinion polls

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show that many people view ASPs as a way to provide constructive activities or meaningful roles to young people during this time (Farkas & Johnson, 1997).

Interest in ASPs as a delinquency prevention mechanism rose dramatically after Snyder *et al.* (1996, Sickmund *et al.*, 1997) reported that juvenile crime, as measured by arrest rates, peaks during between 2 p.m. and 6 p.m. on school days—just after-school is dismissed. D. C. Gottfredson *et al.* (2001) found a similar pattern, although less marked, in youths' self-reports of delinquent behavior. The incidence of arrests during the after school hours has drawn the attention of prevention practitioners and policy-makers and encouraged the exploration of the potential of ASPs for reducing delinquency.

#### A MODEL RELATING ASP PARTICIPATION AND DELINQUENT BEHAVIOR

The most common understanding of the reason for higher rates of crime during the after school hours is that youths experience lower levels of adult supervision during these hours. Students are more likely to be unsupervised during the hours between school dismissal and when parents return from work. Children and adolescents who are not supervised by an adult for extended periods of time are at elevated risk for engaging in problem behavior. Richardson *et al.* (1989) showed that eighth-grade children who care for themselves for 11 or more hours per week without an adult present are twice as likely to use drugs as those who are always supervised. The researchers found that this was true even when youth characteristics that might explain the relationship—for example, socioeconomic status and living with a single parent—were statistically controlled. Their statistical model implied that the higher levels of drug use among the unsupervised teens might be explained in large part by their greater association with delinquent peers. This finding is consistent with the broader literature on family risk and protective factors which has shown repeatedly that parental supervision is related to lower levels of delinquent behavior, substance use, and high risk sexual behavior (Biglan *et al.*, 1990; Block *et al.*, 1988; Cernkovich & Giordano, 1987; Dishion *et al.*, 1991; Gottfredson & Gottfredson, 1999; McCord, 1979) and that greater parental supervision decreases association with delinquent peers, which is the largest predictor of subsequent problem behavior (Dishion *et al.*, 1991).

Many ASP advocates believe that ASPs will also reduce delinquent behavior by providing constructive alternatives to misbehavior. A prominent theory of delinquency causation (social control theory; Hirschi, 1969) initially predicted that involvement in constructive activities would protect against involvement in delinquent activities, but the data have failed to support this component of the social bond. Hirschi (1969) found that time spent on activities which reflect an underlying commitment to conventional pursuits (e.g., hours spent on homework) is related to the commission of *fewer* delinquent acts, while time spent on activities which reflect a premature orientation to adult activities (e.g., time spent riding around in cars) is related to the commission of *more* delinquent acts. But Hirschi found that adolescent activities that have no apparent connection to these poles (e.g., clubs, volunteer and service activities, youth organizations, sports, hobbies, television, etc.) are *unrelated* to the commission of delinquent acts. Simply spending time in these activities is unlikely to reduce delinquent behavior.

Subsequent research on this potential mechanism has been mixed. Survey research has shown that greater involvement in extracurricular activities is related to lower levels of delinquent behavior among high risk youths (Mahoney, 2000), is unrelated to delinquent behavior (Gottfredson, 1984) or is related to higher levels of delinquent behavior (Polakowski, 1994). Similarly, some studies have found that substance use is higher among students who report no involvement in extracurricular activities (Jenkins, 1996; Shilts, 1991; Van Nelson *et al.*, 1991; Yin *et al.*, 1996). Other studies have found that such involvement is unrelated to or is related to higher levels of substance use or substance-related risk behaviors (Carlini-Cotrim & Aparecida de Carvalho, 1993; Mayton *et al.*, 1991; Pope *et al.*, 1990). Because these correlational studies often do not control for potentially confounding factors, it is difficult to interpret their results. An inverse association between involvement and substance use might imply that involvement reduces use, that users avoid extracurricular activities, or both. Also, these studies are not entirely relevant for understanding the mechanisms that might relate participation in ASPs and problem behavior because involvement in extracurricular activities, as measured in the studies reviewed here, may or may not be as a result of participation in ASPs, and in fact may not even occur during the after school hours. Additional research is needed to better understand the role of involvement in reducing delinquent behavior and substance use,

but the existing research suggests that other mechanisms may be more important.

Many ASPs provide structured educational and “character development” activities that have delinquency prevention potential. Higher levels of academic performance, a belief system that supports conventional social norms, and social competency skills have been consistently related to a variety of forms of problem behavior (Bachman, 1975; Jessor, 1976; Jessor *et al.*, 1980; Kandel *et al.*, 1978; Smart & Fejer, 1971; Smith & Fogg, 1978; Wills & Shiffman, 1985). If these factors can be manipulated by ASPs, the programs may reduce delinquent behavior and substance use.

#### PRIOR EVALUATIONS OF ASPs

Little evidence is available to support claims that ASPs reduce problem behaviors. Child care research, somewhat relevant, has found that small amounts (1–3 hr per week) of adult-supervised, activity-oriented care was associated with more social competency and less externalizing behavior for elementary school-aged children compared with none or larger amounts (4 or more hours per week) of this type of care (Pettit *et al.*, 1997). This was especially true for girls. The results from this literature, summarized in more detail in D. C. Gottfredson *et al.* (2001), are consistent with the interpretation that self-care limits opportunities for the development of social competencies that are available with other forms of adult-care and activity-oriented day care situations, but that more than 3 hr per week of adult-supervised, activity-oriented care may be harmful.

More pertinent are the handful of experimental and quasi-experimental studies that have compared the levels of delinquent behavior for students who did and did not participate in ASPs. After school programs are often considered to be a subset of a larger class of community-based programs, some of which have been found to reduce problem behavior (e.g., Big Brothers/Big Sisters of America, Tierney *et al.*, 1995; Teen Outreach, Allen *et al.*, 1990; Youth at Risk Program, Delinquency Research Group, 1986). Although each of these activities takes place at least partially during the after school hours, they also contain school-based activities (e.g., Teen Outreach), a residential component (Youth at Risk) or an unusually intensive, one-on-one activity that extends beyond the after school hours (Big Brother/Big Sister). Because they are dissimilar to more typical ASPs, they will not be reviewed here.

Studies of more typical ASPs include both area- and individual-level studies.<sup>4</sup> Area-level studies compare measures of problem behavior for *areas* served by ASPs compared with areas not served by such programs. These evaluations show some positive area-level associations between having an ASPs and crime rates or substance use rates. One of these studies (Schinke *et al.*, 1992) reported that 13% fewer police reports of criminal activity were filed in beats that covered housing developments with Boys & Girls Clubs compared with beats that covered housing developments without Boys & Girls Clubs. Another study (Jones & Offord, 1989) reported a 75% decline in juvenile arrests during the course of a 32-month ASP and summer recreation program in a single housing project served by the program, and a 67% increase in a comparison housing project which provided only minimal services by a Boys & Girls Club. Note that the comparison housing project, which experienced an increase in crime, was served by a Boys & Girls Club—one of the most popular types of ASP. This study also found no differences between the groups in terms of teacher and parent ratings of child misbehavior. None of the four community-level evaluations of ASPs included controls for community or demographic factors which may have effected crime rates in the different areas of study. The presence of the ASPs are only one of many alternative explanations for the observed pattern of results. These studies *suggest* that ASPs may reduce crime in the areas in which they are located, but rival explanations for the findings limit the conclusions that can be drawn from the studies.

Several studies compare *individuals* who participated in ASPs with those who did not. Smith and Kennedy (1991) randomly assigned individuals to participate in the Friendly PEERSuasion program run by Girls Incorporated or be placed in a control group that would receive the program at a later time. They reported that the program significantly reduced the incidence of drinking among participants and the onset of drinking of participants who had not previously drunk alcohol. Treatment group participants were more likely to leave gatherings where people were drinking alcohol and they showed less favorable attitudes toward drinking. The findings on this program, which utilized various methods of teaching and practicing skills, are in line with Lipsey’s (1992) meta-analysis which indicated that structured and focused

<sup>4</sup>A detailed summary table of the prior literature is available from the authors.

treatments (e.g., behavioral, skill oriented) and multimodal programs are more effective in treating and preventing delinquent behavior.

Baker and Witt (1996) evaluated two school-based ASPs that included a range of academic and recreational activities. Findings indicated that although there were significant differences in academic and self-esteem scores between the participants and nonparticipants, there were no significant differences in terms of problem behaviors between the two groups following the program. Finally, Mahoney *et al.* (2000) investigated the effects of youth involvement in Swedish youth recreation centers and found evidence that such participation was linked to higher rates of juvenile offending and persistent offending, even after controlling for self-selection factors. Lack of structure in the centers and negative peer influence resulting from the concentration of delinquent peers in the centers were hypothesized to account for the negative findings.

Results of these studies are consistent with the interpretation that after school activities that involve a heavy dose of social competency skill development (as in the Friendly PEERsuasion program) may reduce problem behavior.

As noted earlier, ASPs serve real needs for parents. Even without evidence of crime prevention effectiveness, public expenditures on ASPs may be well-spent. Our review of the evidence relating to the effects of such programs on delinquent behavior and other problem behaviors, however, suggests that strong support does not now exist. We concur with Vandell and Shumow (1999) who suggest that the benefits of ASPs will depend upon features such as opportunities for the child to make choices and positive climate, which are probably linked to child-staff ratios and staff qualifications. The extent to which the programming incorporates features of more effective delinquency prevention programs, such as cognitive-behavioral skills training, is also likely to be a key moderating factor in the effectiveness of such programs. Overall, the existing research on ASPs is too sparse and methodologically weak to provide definitive evidence of effects (Fashola, 1998; Quinn, 1999; Sherman *et al.*, 1997). Nearly all studies suffer from selection bias (Fashola, 1998, Sherman *et al.*, 1997), and most provide little or no information on the mechanisms through which participation in ASPs might reduce problem behavior.

The present research examines the effects of participation in ASPs on delinquent behavior and examines the mechanism through which such partici-

pation might reduce delinquent behavior. It tests a model that specifies participation in ASPs reduces delinquent behavior by decreasing unsupervised after school time, by reducing negative and increasing positive peer associations, and by increasing involvement in constructive activities, antidrug attitudes and social skills. It also uses a comparison group of nonparticipants and statistically controls for preexisting differences between the groups to reduce selection bias.

## METHODS

### Data

Data come from an evaluation of Maryland's After School Community Grant Program (MASCGRP), an initiative of the Maryland Governor's Office of Crime Control and Prevention. Fourteen programs participated in the outcome evaluation of this initiative during the 1999–2000 school year. These programs are funded by Federal Safe and Drug-Free Schools and Communities Program monies awarded to the Maryland Governor's Office. Governor's Office staff, working with researchers at the University of Maryland, determined that the ultimate goals of the funding initiative would be to reduce delinquency and substance use among program participants. They examined research on factors related to these problems and, based on this research, selected six intermediate objectives for the programs: reduction in (a) unsupervised time during the after school hours, (b) favorable attitudes towards substance use and illegal behaviors, and (c) negative peer influence, and increase in (a) social bonding, (b) academic performance, and (c) social skills. Governor's Office staff further decided that all funded programs would be required to address these objectives by providing activities in three areas: academic assistance, social skill or character development, and recreational/leisure activities. Specific implementation standards were then developed for each of these programming areas as well as for the overall operation of the program, and a request for proposals (RFP) was issued statewide. This RFP described the program requirements (e.g., goals, objectives, and standards that would have to be met) and structure (e.g., number of youths to be served, duration and intensity of service) and the RFP required respondents to detail how their proposed program would satisfy the program requirements. Applicants were judged by a state-level review panel on the match between the program requirements and the proposed

activities, and the capacity of the organization (based on previous experience) to provide the required structured after school services to a “latch-key” population. Programs serving high-crime areas were preferred.

Fifteen programs were funded during the 1999–2000 school year but one did not provide outcome data and was therefore excluded from the outcome evaluation of this initiative. Nine of the participating ASPs were located in public schools and five were located in community centers. Programs were sponsored by county and state government agencies, public schools, youth agencies, a church, and private organizations. The programs each served between 22 and 45 students in grades four through eight. Six programs served only elementary school-aged youths, five only middle school aged youths, and three served both age groups. Programs operated between 3 and 5 days per week and ran two to six and one half hours each afternoon, averaging 3 hr each day. Fees for participation in the programs ranged from free (in six programs) to \$20 per week. All programs offered academic assistance, social skills training, and recreational or enrichment activities aimed at retaining the youths in the program. These activities consisted largely of sports and arts and crafts, although several programs also included specialty activities, such as entrepreneurial activities, karate, sailing, or soccer.

Twenty-six implementation standards were measured throughout the year in each of the programs. Performance on these standards was fed back to the program directors quarterly to assist them in strengthening the quality of their programs. Table 1 shows the average and range of performance on selected standards.<sup>5</sup> Middle school programs were expected to meet 3 days per week for a total of 90 program days, and elementary school programs were expected to meet 4 days per week for a total of 120 program days. The table shows that the middle school programs in general exceeded this standard by meeting for 116 days, and the elementary school programs fell short, meeting only 107 days on average. Students actually attended only 71% (middle) and 80% (elementary) of these program days. The mean number of days actually attended was 64 (middle) and 68 (elementary). Eighty-four and 77% of elementary and middle school students participated for more than 30 days. The table shows that recreation and leisure activities were provided most days, as expected, and academic

plans were developed for most youths. In the typical program, students actually received 1.7 hr of educational services per week and 1.8 (elementary) or 2.4 (middle) hr of social skills or character development training.<sup>6</sup> The table also shows that the majority of social skills and character development lessons covered the specific emotional, cognitive, and behavioral skills that were incorporated into the program standards based on previous research.<sup>7</sup> Of course, variability within program and across programs was observed in the extent to which the standards were met. No program implemented all aspects of the model flawlessly. Most notably, there was considerable variation in the quantity of social skills or character development training received, with elementary school programs spending less time on social skills and character development than middle school programs. The implication for program outcomes of this variation will be explored in subsequent analyses.

### Study Design

MASCGP programs were given the choice of implementing either a randomized control group or a comparison group evaluation design. Three of the programs (all serving elementary school students only) used a randomized control group design, in which a large pool of interested students was recruited and surveyed by the staff of the University of Maryland at the beginning of the 1999–2000 school year. Following completion of a pretest survey, we randomly assigned students into three study groups using a table of random numbers. Students were selected to participate in the program immediately (treatment group), remain on a waiting list and possibly participate later in the year as students withdrew from the ASP, or participate in a control group that would never receive regular services of the ASP during the 1999–2000 school year. The waiting list students were randomly ordered by the University of Maryland evaluators and admitted to the program accordingly. Students who were originally part of the waiting list

<sup>5</sup>Data on all standards, by project and overall, are available in the technical report for the project (Weisman et al., 2001).

<sup>6</sup>Data were also collected on the number of hours of services delivered as opposed to received. Because attendance was irregular, we opted to report hours of service actually received by students who were present in the programs.

<sup>7</sup>These skills were derived from research on effective programs. Among the targeted skills were: identifying and labeling feelings, expressing feelings, assessing the intensity of feelings, conducting “inner dialogue,” managing self, using steps for problem solving and decision making, and communicating effectively.

Table 1. Program Performance on Selected Implementation Standards by Primary Grade Level Served

Implementation measure	Elementary ( <i>N</i> = 6)		Middle ( <i>N</i> = 8)		All programs ( <i>N</i> = 14)	
	Mean	Range	Mean	Range	Mean	Range
Days operated	107	94–118	116	80–164	112	80–164
# days attended	68	53–84	64	41–117	65	41–117
% possible days attended	80	67–94	71	54–84	75	54–94
% days on which recreation/leisure activities offered	89	70–98	87	56–100	88	56–100
% youths for whom academic plan was developed	89	68–100	88	33–100	89	33–100
Hours of educational services received per week	1.7	1.5–2.6	1.7	0.9–2.9	1.7	0.9–2.9
Hours of social skills or character development training received per week	1.8	0.2–3.4	2.4	1.1–5	2.2	0.2–3.4
% social skills lessons covering at least one of the targeted skills	93	83–100	83	54–100	87	54–100
% character development lessons covering targeted character traits	84	21–100	91	50–100	88	21–100

but later participated in the program were transferred to the treatment group, while students who were never selected from the waiting list became part of the control group.

The remaining 11 ASPs used a comparison group design, in which students were nonrandomly assigned into three groups: treatment, waiting list, or comparison group. Many of the programs using the comparison group design recruited comparison group members from schools or areas outside of the population served by the program, specifically seeking populations without access to regular after school programming. A few used students from the same school or area that was served by the program. In two of these sites, substantial alternative services (e.g., a Friday ASP) were provided to the comparison group. Most other programs offered incentives, such as cash, movie tickets, gift certificates, raffles, and special events, to recruit and retain comparison and control group members.

A total of 375 students were assigned to the treatment group at the beginning of the school year. An additional 42 students were assigned to the waiting list and later participated in the program, which brought the total number of treatment students to 417. A total of 408 students were assigned to the control/comparison group, including students who were on waiting lists but were never recruited for participation in the programs. Ninety-seven percent of each group (404 treatment, 397 control/comparison) were pretested at the beginning of the school year.

Posttests were completed by 372 treatment and 355 control/comparison group members. Attrition from the study was very low, with only 11% of the treatment group and 13% of the control/comparison group missing posttest surveys. Attrition bias was ex-

amined for the treatment and comparison groups. For both groups, the highest risk students tended to be missing at posttest. This is consistent with analyses of attrition from previous years (Weisman & Gottfredson, 2001). These biases due to attrition were found to be similar for the treatment and comparison groups.

The younger ASP participants were 44% male and 64% non-White (primarily African American). The average age was 9.7 years old. The treatment and comparison groups for the younger children were equivalent in terms of ethnicity, gender, and age. The older ASP participants were 56% male and 76% non-White, and they were on average 12 years old. A higher proportion of treatment than control group students were male (56% vs. 50%), but this difference was not statistically significant. The treatment group had a larger proportion of non-White students (76% vs. 53%,  $p < .01$ ) than the comparison group. The groups were equivalent in terms of age. These differences, as well as pretest differences to be discussed below, are statistically controlled in the outcome analyses.

## Measures

Students completed a special version of the What About You? (G. D. Gottfredson & Gottfredson, 1999) survey at the beginning and end of the school year. Evaluators from the University of Maryland read aloud each of the survey questions and response choices to all of the students participating in the evaluation. Students circled their responses on the questionnaires, which were labeled with a confidential student identification code.

The survey measures students' rebellious and delinquent behavior, drug use, attitudes about drug use, and peer relationships. Items were added to the survey from the Social Skills Rating System (SSRS) Elementary Level Student Form (Gresham & Elliott, 1990). Further items were added to measure unsupervised after-school time and involvement in constructive activities. Items from the survey were used to score nine measurement scales.<sup>8</sup> Reliability coefficients in general range from .6 to .8. The longer scales generally provide more reliable measurement than the shorter scales, and the reliabilities are in general higher for older students, as might be expected. Considerable error is contained in the scales measuring Positive Peer Associations and Intentions Not to Use Drugs. Corrections for attenuation are made in the structural equations models.

Two of the measures contained more than 10% missing data: Intentions Not to Use Drugs and Hours/Week in Self Care. Many students selected the "not sure" option for the questions about self-care. For these two measures (both pre- and posttest), scores for the missing cases were estimated using the mean for subjects of the same age, project site, and experimental group. With these imputations, the number of valid cases for the scales ranged from 382 to 403 and 379 to 395 at pretest and from 354 to 371 and 339 to 353 at posttest for the treatment and comparison subjects, respectively. The number of valid cases varies by less than 5% across measures after this imputation. Pair-wise deletion of cases (following the imputation) is used for all covariance-based analyses.

### Structural Equations Modeling Procedures

All structural equations models (SEMS) were estimated using LISREL v 7.16 (Jöreskog & Sörbom, 1988). In these models, measures of delinquent and rebellious behavior and substance use, all measured at posttest, are treated as multiple indicators of a latent "Delinquent Behavior" variable. This decision was made based on theoretical (M. R. Gottfredson & Hirschi, 1990) and empirical (Elliott *et al.*, 1989; Huizinga & Jakob-Chien, 1998) grounds. According to these perspectives, multiple problem behaviors are conceptualized as indicators of a more general tendency towards risky, self-gratifying behaviors. To be

effective, interventions should target this general predisposition rather than a single indicator of it. The decision to combine these indicators was also justified in the data: The full model (described below) was estimated once using the three measures of problem behavior as single indicators of three different problem behavior constructs and once using them as multiple indicators of one underlying construct. Comparisons of fit measures for these alternative models suggested that the GFI (Goodness of Fit Indicator) was higher for the model using multiple indicators (.93 and .94 for multiple indicator models for elementary and middle, respectively, versus .89 and .90 for single indicator model for elementary and middle school models). Also, the reduction in the chi-square values for the multiple indicator versus the single indicator model (91.5 for elementary and 181.4 for middle) far exceeded the difference in the degrees of freedom for the two models (16) for both age groups.

In the models, all theoretical intervening factors are also measured at posttest and are treated as observed single indicators of their constructs. All structural equations models are computed using covariance matrices which have been corrected for attenuation. Each model includes statistical controls for each endogenous variable measured at the pretest as well as gender and race. Finally, only individuals who completed both the pretest and the posttest (319 and 405 for the younger and older students, respectively) are included in the SEM models.

## RESULTS

In preparation for estimating the model of ASP participation described earlier, checks were conducted to determine whether the model was homogeneous across gender, race, and age groups. Interactions were also examined for experimental versus nonexperimental design projects. For each outcome variable, regressions were run which tested for the incremental variance explained in each outcome variable (measured at Time 2) by an interaction term computed by multiplying a dummy variable for participation in ASP programs by variables measuring age, race, gender, and whether or not subjects had been randomly assigned to the treatment and control conditions. These interaction terms were entered separately into regression equations which contained the dummy for participation, the dependent variable measured at Time 1, and the demographic or design variable. *F*-tests for the increment to variance

<sup>8</sup>Tables showing the number of items, alpha reliability, and range of possible responses for each scale, separately for younger and older youths, are available from the authors.

Table 2. Means and Standard Deviations on All Measures

Outcomes	Younger students (Grades 4–5)						Older students (Grades 6–8)					
	Pretest			Posttest			Pretest			Posttest		
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Delinquent behavior												
Treatment	0.027	0.070	163	0.037	0.088	142	0.045	0.094	234	0.058	0.115	223
Comparison	0.040	0.108	186	0.036	0.076	174	0.039	0.096	199	0.071	0.127	177
Rebellious behavior												
Treatment	0.285	0.386	157	0.338	0.325	137	0.352**	0.323	233	0.370	0.321	223
Comparison	0.266	0.303	186	0.310	0.309	172	0.261	0.267	198	0.407	0.352	177
Last-year variety of drug use												
Treatment	0.014	0.094	160	0.036	0.107	137	0.036	0.119	234	0.038**	0.127	222
Comparison	0.014	0.065	181	0.024	0.084	170	0.053	0.146	199	0.086	0.198	173
Intentions not to use drugs												
Treatment	0.762	0.333	164	0.852	0.248	143	0.812**	0.248	239	0.780**	0.280	228
Comparison	0.774	0.294	194	0.824	0.269	176	0.717	0.332	201	0.672	0.342	177
Hours/week in self care												
Treatment	7.065	5.594	164	3.821**	4.459	142	7.628**	5.291	239	5.737	4.691	228
Comparison	6.473	5.554	194	5.181	5.229	176	6.208	5.056	201	6.035	4.840	177
Involvement in constructive activities												
Treatment	0.782	0.269	158	0.852	0.249	138	0.785	0.281	228	0.839**	0.242	217
Comparison	0.783	0.290	186	0.819	0.275	170	0.793	0.285	196	0.753	0.315	175
Social skills												
Treatment	1.547	0.308	154	1.511	0.366	138	1.424*	0.329	228	1.405	0.343	218
Comparison	1.588	0.318	184	1.516	0.353	164	1.491	0.357	195	1.402	0.394	175
Positive peer associations												
Treatment	0.802	0.162	160	0.739	0.194	137	0.720	0.190	232	0.686	0.192	217
Comparison	0.779	0.178	183	0.758	0.168	167	0.728	0.204	198	0.667	0.216	175
Peer drug models												
Treatment	0.071	0.160	161	0.094	0.171	138	0.107	0.195	230	0.137**	0.218	224
Comparison	0.068	0.139	182	0.089	0.168	170	0.147	0.243	195	0.205	0.267	176

\*Treatment and comparison group means differ at this time point,  $p < .05$ .

\*\*Treatment and comparison group means differ at this time point,  $p < .01$ .

explained showed that the interaction terms involving race never added significantly to the explanation of variance in any of the dependent variables. The interaction term involving design type explained a significant amount of variation in hours per week in self-care, and regressions run separately for randomized and nonrandomized studies showed that although participation was inversely related to hours of week spent in self-care in projects using both types of designs, the coefficient was larger in the randomized design sites. Utilizing nonrandomized designs therefore did not upwardly bias the estimates of the effects of ASP participation. The interaction term involving gender explained a significant amount of variation in involvement in constructive activities, and regressions run separately by gender showed that participation increased involvement significantly for females but not for males. The interaction term involving age added significantly ( $p < .05$ ) to the explanation of variance in several of the dependent variables. For this reason,

results are presented separately for younger (grades 4 and 5) and older (grades 6 through 8) students, and data from the three program sites that used an experimental design are collapsed with the nonexperimental design sites.

Most ASP participants (72% of elementary and 86% of middle school students) reported that they had been left unsupervised in the after school hours. At the pretest, the average number of hours per week spent in self-care was 7.1 for younger and 7.6 for older students. A substantial percentage of youths (34% and 43%) reported spending 10 or more hours in self-care per week, but many students (38% and 37%) also spent less than 5 hr per week in self-care. The programs therefore attracted a mixture of students, some who might be considered “latch-key” (e.g., at home with no adult present) and others who had alternative care arrangements.

Table 2 shows the means, standard deviations, and number of cases for each measure, by age



level, experimental status, and measurement point. Younger ASP participants and nonparticipants were similar at the time of the pretest—none of the pretest measures differed significantly across these groups. Among older youths, comparison students reported lower levels of rebellious behavior ( $p < .01$ ), higher levels of social skills ( $p < .05$ ), and fewer unsupervised hours per week ( $p < .01$ ) than did the treatment students at the pretest. On the other hand, the treatment students had greater intentions not to use drugs ( $p < .01$ ) than did the comparison students. With the exception of the last measure, pretest differences indicate the middle-school-aged treatment group was more at-risk for delinquent behavior than the comparison group. At the end of the year, the only significant difference between the elementary school participants and nonparticipants was that the participants reported significantly ( $p < .01$ ) fewer hours in self-care. Among the middle school groups, the three preexisting differences favoring the comparison group were diminished and in some cases had reversed direction by the time of the posttest (i.e., they were no longer statistically significant and the direction favored the treatment group), the preexisting difference favoring the participants on intentions not to use drugs persisted ( $p < .01$ ), and three additional differences favoring the participants emerged: ASP participants reported significantly greater levels of involvement in constructive activities ( $p < .01$ ), and they reported using fewer different drugs and having fewer drug-using friends (both  $p < .01$ ). Differences across groups at the posttest always favored the ASP participants among middle school students, but differences on only four of the 10 measures favored elementary-aged ASP participants.

Comparison of the number of hours in self-care reported at the time of the pre- and posttests shows that the number of hours in self-care declined for ASP youths by about three (3.2) and two (1.9) during the program for elementary and middle school students, respectively. The reductions for comparison students were much smaller: 1.3 and 0.2 hr per week for elementary and middle school students. It is noteworthy that even at the time of the posttest, ASP participants still reported substantial self-care. Although participation reduces the amount of time in self-care, this reduction is relatively small for middle school students, who report spending nearly 6 hr per week unsupervised even while participating in the program.

A “reduced form” SEM model (e.g., one in which none of the proposed mediating factors or their Time 1 controls are included) of delinquent behavior on

Table 3. Reduced Form Structural Equations Model Relating Time 2 Delinquent Behavior to Time 1 Predictors

Predictor variables	Younger ( $N = 319$ )	Older ( $N = 405$ )
Participation in ASP	.046	-.147**
Gender	.064	-.007
Race	.048	.010
Delinquent behavior	.245**	.343**
Rebellious behavior	.337**	.362**
Last year variety of drug use	.007	.172**
$\chi^2/df$	4.84	8.75
Goodness of fit index (GFI)	.960	.948
Root mean square residual	.004	.003

Note. Standardized solution. Based on covariance matrix corrected for attenuation. Time 1 measurement model paths relating observed variables to unobserved constructs fixed at “1” and error variances fixed at “0.” Time 2 measurement model estimated with one lambda parameter fixed at “1.” \*\*  $p < .01$ .

after school participation was estimated for older and younger students. These models controlled for each of the indicators of delinquent behavior at Time 1 as well as race and gender. Results are shown in Table 3. The table shows that for older but not for younger students, ASP participation significantly ( $p < .01$ ) reduces delinquent behavior at Time 2. Subsequent models tested the mechanism through which ASP influences delinquent behavior for older students. Because no outcome effect was observed for younger students,<sup>9</sup> these mediation models are tested for older students only.

The initial full model estimated paths from each of the theoretical intervening variables measured at Time 2 to delinquent behavior at Time 2.<sup>10</sup> It also estimated paths for all of the control variables measured

<sup>9</sup>To check for the possibility that the null effects for younger students were due to insufficient variation or low base rate in the dependent variable when the more serious acts of delinquent behavior and drug use were included, we reestimated the models using the Rebellious Behavior scale (a measure of less serious problem behavior which showed greater variability) as the sole indicator of delinquent behavior for younger students. These models also showed no effect of ASP. In fact, ASP participation was found to be unrelated to each of the Time 2 measures of problem behavior as well as for all but one of the measures of theoretical intervening variables. ASP significantly reduced only self-reports of time spent in self-care at Time 2.

<sup>10</sup>One exception was made. In the initial models which included both Time 1 and Time 2 measures of Peer Drug Models, the effect of the Time 1 measure on delinquent behavior was negative and significant, although the zero-order correlation was positive .41. We found that the Time 1 and Time 2 measures were very highly correlated (.51), and that including them both in the model resulted in multicollinearity. Therefore, only the Time 1 Peer Drug Model measure was included in this model.

Table 4. Full Structural Equations Model, Older Youths

Predictor variables	Time 2 variables					
	1 <sup>a</sup>	2	3	4	5	6
Participation in ASP	-.092*	.108*	-.077	.178**	—	—
Gender	—	—	—	—	—	—
Race	—	—	—	—	.104*	—
Time 1 variables						
Delinquent behavior	.282**	—	—	—	—	—
Rebellious behavior	.251**	—	—	—	—	—
Last year variety of drug use	—	—	—	—	—	—
Intentions not to use drugs	-.109*	-.154**	.362**	—	—	—
Hours/week in self care	—	.012	—	.341**	—	—
Involvement in constructive activities	—	.094*	—	—	.489**	.104*
Social skills	—	-.309**	—	—	.089*	.476**
Positive peer associations	—	-.278**	.124**	—	—	.341**
Peer drug models	—	—	-.148**	—	—	-.132**

Note.  $N = 405$ ; GFI = .924; Root mean square residual = .007;  $\chi^2/df = 3.54$ . Path coefficients are from the standardized solution. Based on covariance matrix corrected for attenuation. “—” denotes path constrained to “0.” Measurement model paths relating observed variables to unobserved constructs fixed at “1” and error variances fixed at “0” for all constructs except Time 2 delinquency, which has multiple indicators. Numbers associated with Time 2 variables: 1. Delinquent behavior; 2. Intentions not to use drugs; 3. Hours/week in self care; 4. Involvement in constructive activities; 5. Social skills; 6. Positive peer associations.

<sup>a</sup>First column contains effects for Time 1 measures. Second column contains effects for Time 2 measures.

at Time 1 that were included in the reduced form model (see Table 3) as well as all of the Time 1 measures of the theoretical intervening variables. ASP participation was allowed to influence delinquent behavior both directly and indirectly through the theoretical intervening variables. The GFI for this model (with 44 degrees of freedom) was .937, and the ratio of the chi-square to the degrees of freedom was 6.24. Many of the estimated paths were nonsignificant and trivial. A second model was estimated in which all nonsignificant structural paths from the Time 1 variables to the Time 2 variables were constrained to “0.” The GFI for this model (with 97 degrees of freedom) was .924, the ratio of the chi-square to the degrees of freedom was 3.54, and the root mean square residual was .007. The parameters from this model are shown in Table 4.

Table 4 shows that the ASP effect on delinquent behavior is partially mediated by the predicted intervening variables. The direct effect of ASP participation is reduced from negative .147 in the reduced form to negative .092 in the full model, but a significant direct effect persists.

ASP participation significantly increases intentions not to use drugs. It does not significantly influence social skills or positive peer associations, although the paths are in the expected direction and, for positive peer associations, approaches significance ( $p = .10$ ). ASP also increases involvement in

constructive activities ( $p < .01$ ). The path relating hours per week in self-care and ASP participation is in the expected direction, but it does not reach nominal significance levels. As expected, positive peer associations, social skills, and intentions not to use drugs are most highly related to reductions in delinquent behavior (all  $p < .01$ ). Involvement in conventional activities is *positively* related to delinquent behavior ( $p < .05$ ), and hours peer week spent in self-care is unrelated to problem behavior.

ASP participation reduces delinquent behavior in part by increasing intentions not to use drugs and positive peer associations, according to the model. Although the effect of ASP on positive peer associations is not statistically significant, the reduction in direct effect when the positive peer mediator is introduced is substantial because of the sizeable effect of positive peer associations on delinquent behavior. In other words, even a small effect on positive peer associations has the effect of reducing delinquent behavior. The persistent direct effect of ASP on delinquent behavior also implies that the mediating variables included in this study are not sufficient to explain all of the ASP effect on delinquent behavior.

As noted earlier, programs were required to offer academic, social skill development, and recreational services. The degree of emphasis on these different activities varied across program sites, however. In particular, considerable variation across sites was observed

Table 5. Effect Sizes for Measures of Problem Behavior, by Emphasis on Social Skills — Programs Serving Older Youths ( $N = 8$ )

Program	Problem behavior		
	Delinquent behavior	Rebellious behavior	Variety of drug use
All ( $N = 8$ )			
<i>M</i>	.09*	.35	.05*
CI	-.106-.290	.155-.555	-.147-.252
Low social skills emphasis ( $N = 3$ )			
<i>M</i>	-.16	.29	-.18
CI	-.496-.168	-.048-.621	-.516-.150
High social skills emphasis ( $N = 5$ )			
<i>M</i>	.23	.39	.18
CI	-.013-.481	.143-.642	-.065-.439

\*Q-between statistic is significant,  $p < .10$ .

in emphasis on social skills and character development training, and programs serving middle school students placed noticeably greater emphasis on this component than did programs serving younger students. The implementation data shown in Table 1 imply that middle school participants received approximately 30 more hours of social skills and character development lessons over the course of the program than elementary participants. Also, among middle school programs, the hours per week spent on such instruction ranged from 1.1 to 5. We examined whether emphasis on social skills moderated the effectiveness of the programs in reducing delinquent behavior using meta-analytic techniques (Lipsey & Wilson, 2001). Small-sample-size-bias corrected effect sizes were calculated for each of the eight programs serving middle school students<sup>11</sup> for each of the indicators of problem behavior. Five of these programs provided greater than the average number of hours of social skills/character education training (83 or more hours offered), and three provided less (below 83 hr offered). Table 5 shows the results of this analysis. The combination of the small number of cases contributing to each effect size and the small number of effect sizes leaves the statistical significance tests with little power, but the pattern is clear: For the measures of delinquent behavior and substance use, the Q-statistic (used to assess homogeneity of effect sizes across studies) was significantly reduced (using a one-tailed test) when the sample was

split according to the level of social skills emphasis.<sup>12</sup> Effect sizes for each of the three indicators of problem behavior are considerably larger in those programs emphasizing social skills training.

The same SEM models shown in Tables 3 and 4 were rerun for the 243 middle school-aged youths in the five programs having a higher emphasis on social skills. These models showed the same pattern of effects as for the entire sample, but the effects were generally larger. The reduced form model showed an ASP effect of  $-.241$  ( $p < .01$ ) on delinquent behavior (as opposed to  $-.147$  for all programs). In the model including the mediating variables, a significant negative ( $p < .05$ ) direct effect of ASP on delinquent behavior was again observed. Also, significant ASP effects (all  $p < .01$ ) were found for intentions not to use drugs (+), hours per week in self-care (-), involvement in constructive activities (+), and positive peer associations (+), and these effects were in general larger than reported for the full model. The same mediating variable effects on delinquent behavior as reported for the full model were observed, except that the positive effect of involvement on delinquent behavior was reduced to nonsignificance. These results, coupled with the effect size results summarized above, suggest that ASPs that emphasize social skill and character development are more effective at reducing delinquent behavior than are programs lacking such an emphasis, and that part of the effect of ASP participation in these programs is mediated through improved attitudes pertaining to substance use and more positive peer associations.

## DISCUSSION

Results of the study imply that participation in the ASPs reduced delinquent behavior for middle-school but not for elementary-school-aged youths. In the younger age group, no significant effects of participation were observed for any of the measures of problem behavior or any of the mediating variables except for decreased hours per week in self-care. For the older youths, a portion of the effect of ASP participation on delinquent behavior was mediated through increases in intentions not to use drugs and positive peer associations. The study also found that effects of

<sup>11</sup>Analyses conducted for the sites serving elementary school students only yielded no significant effect sizes for any measure of problem behavior, regardless of the level of emphasis on social skills.

<sup>12</sup>These analyses were conducted using the "METAF" macro for the meta-analysis analog to the One-way ANOVA for Effect Size written by David B. Wilson and available at <http://mason.gmu.edu/~dwilsonb/ma.html>.

ASP participation on delinquent behavior are greatest in the subset of programs that incorporated a high emphasis on social skills and character development instruction and practice. The pattern of results was consistent with the conclusion that one reason for the absence of positive results in the elementary school programs was that these programs tended not to emphasize social skills and character development.

The examination of mediating mechanisms provided no support for the hypothesis that ASPs reduce delinquent behavior by decreasing time spent unsupervised or by increasing involvement in constructive activities. Only about half of the youths who participated in the ASPs spent substantial amounts of their after school hours in self-care before participating in the program. The typical ASP participant spent 7.4 hr per week in self-care during the year prior to program participation, compared to 5 hr per week during the year in which they participated in the ASP. The ASPs included in this study therefore did not take a large bite out of unsupervised time during the after school hours because (a) they did not succeed at recruiting a large population of latch-key youths; (b) latch-key students were more likely to drop out of the program or to participate infrequently; (c) comparison students also experienced after school activities to some degree; and (d) attendance in the ASP programs was not perfect, suggesting program participants may have been unsupervised for many days. Reductions in unsupervised time of the magnitude realized through these programs did not translate into reductions in delinquent behavior.

The evidence also does not support the hypothesis that these ASPs reduced delinquent behavior by providing constructive alternative activities for youths. As noted earlier, prior research has been mixed on this issue. This study suggests that ASPs increase involvement in constructive activities as measured by students reporting they spend more time in special hobbies, interests, or activities during the after school hours, but no evidence links this increase to a reduction in delinquent behavior. To the contrary, the evidence suggests that at least for older youths such involvement *increases* delinquent behavior. The mechanism through which increased involvement in constructive activities increases delinquent behavior is not clear, but it is interesting that this effect is smaller and nonsignificant in programs that emphasize social skills and character development. These programs generally teach youths strategies for resisting negative peer influence. It is possible that increasing involvement exposes youths to greater amounts

of negative peer influence, but that coupling this exposure with appropriate resistance skill training counteracts this negative effect. Unfortunately, the data do not enable further exploration of this effect because the questionnaires did not ascertain the nature of the activities about which the youths were reporting. It is not clear, for example, whether the increased involvement was in clubs and activities outside of the ASP or as part of the ASP. More detailed questions regarding a wide range of after school activities were added to the evaluation of the 2001–2002 school year MASCGP program to enable further exploration of this issue.

The direct effect of ASP on delinquent behavior that remains after the mediating variables have been added also requires further exploration. ASP participation may influence delinquent behavior via other mediators not included in this study such as improved academic performance, commitment to education, or attachment to prosocial others. Alternatively, the measures of intervening variables that were included in the study may be imperfect. The measure of social skills is especially suspect. We anticipated that this measure, although not influenced by ASP participation in general, would be the main mechanism through which participation in ASPs emphasizing social skills would influence delinquent behavior. Instead, it was the only mediating factor that was not influenced by participation in this subset of programs. The content of the scale used in this study most likely is too general to capture the more specific skills targeted by the ASP programs. The programs tended to cover more specific skills, such as identifying and labeling feelings, expressing feelings, assessing the intensity of feelings, conducting “inner dialogue,” managing self, using steps for problem solving and decision making, and communicating effectively. Future studies should employ more precise measures of the skills targeted in the programs.

The study suggests that ASPs may have promise as delinquency prevention tools. It further implies that ASPs will have greater effects to the extent that they incorporate activities that alter attitudes about substance use and help youths cope with peer influence. Among the MASCGP programs, those that included a high emphasis on social skills instruction and practice were most effective for altering these factors and for reducing delinquent behavior. These programs were more likely to incorporate structured programming utilizing social competency skill instruction components that had been shown to be effective in other research, such as self-control, stress-management,

responsible decision-making, social problem-solving, and communication skills. This finding adds to the growing body of research from school-based prevention (D. C. Gottfredson *et al.*, 2002) and delinquency prevention more generally (Lipsey, 1992, Lipsey & Wilson, 1998) suggesting that structured preventive interventions that focus on social competency or interpersonal skill development are effective for reducing problem behavior.

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