

# Social Determinants of Health: Out-of-School-Time Academic Programs

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## Task Force Finding and Rationale Statement

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## Task Force Finding and Rationale Statement

### Context

Overall, children from low-income and racial and ethnic minority populations in the United States have lower academic achievement levels than children from the higher-income and majority populations. As a long-term consequence, these children often grow to be adults with lower income levels and poorer health, perpetuating a "cycle of poverty" (Duncan et al., 1998). Out-of-school-time academic programs aim to interrupt this cycle by assisting children who are at risk for low academic achievement.

### Intervention Definition

Out-of-school-time academic programs are programs provided outside of regular school hours to students in grades K-12 who are either low-achieving or at risk of low achievement. Out-of-school-time academic programs are offered during the school year—usually after school hours—or during summer recess.

These programs **must include** an academic component, which can range from minimal academic content, such as supervised time for students to complete their homework or receive homework assistance to more intensive tutoring or remedial classes focused on specific subjects, such as reading or math. To address other goals, programs also **may include** sports and recreation, snacks, or counseling. Attendance is most often voluntary, though students may be required to participate under certain circumstances (e.g., to avoid retention in grade).

### Task Force Finding (December 2013)

The Community Preventive Services Task Force issued separate findings for four types of out-of-school-time academic programs.

- **Reading-focused** out-of-school-time academic programs are recommended on the basis of strong evidence of effectiveness in improving the reading achievement of academically at-risk students in grade levels K-3.
- **Math-focused** out-of-school-time academic programs are recommended on the basis of sufficient evidence of effectiveness in improving the math achievement of academically at-risk students. Effects appear greater for older students (grade levels 7-12), compared with younger students (grade levels 2-5), although the number of studies is too small to draw a conclusion.
- **General** out-of-school-time academic programs that do not focus on one specific subject are recommended on the basis of sufficient evidence of effectiveness in improving the reading and math achievement of academically at-risk students, though the magnitude of each effect is smaller than those from reading- and math-focused programs.
- **Out-of-school-time academic programs with minimal academic content** have insufficient evidence to determine the effectiveness of these programs which typically only provide homework assistance or time to complete homework.

The achievement gains apparent after out-of-school-time academic programs do not, themselves, guarantee academic achievement in later years. Ongoing school and social environments that support learning and development are essential.

Because academic achievement is linked with long-term health, and because out-of-school-time academic programs are commonly implemented in racial and ethnic minority or low-income communities, these programs are likely to improve

health equity. Equity in health is the widespread, achievable, equality in health *and* in the major social determinants of health in all the principal social divisions of a population.

## Rationale

### Basis of Finding

The time available during a routine school day may not be enough for teachers to address adequately the needs of students, particularly those at risk for low academic achievement. Out-of-school-time academic programs aim to compensate for this by providing these students with supplemental academic instruction.

Out-of-school-time academic programs also have the benefit of providing students a safe learning environment that may shelter them from such harmful environmental influences as drugs, violence, and other forms of delinquency. This may be particularly true for programs offered after regular school hours, as juvenile crime peaks during this time (Fox et al., 2003).

Summer vacations also can be important times to provide out-of-school-time academic programs, as they are periods during which academic achievement gaps generally widen between children from lower- and higher-income families. This gap most likely occurs because children from higher-income families often have greater access to supportive learning environments and opportunities than do their peers from lower-income families (Cooper et al., 1996).

The United States government has developed and funded several out-of-school-time academic programs to address the needs of low-income, racial and ethnic minority, low-achieving, and otherwise at-risk students. The Twenty First Century Community Learning Centers program has funded out-of-school-time academic programs for schools failing to meet the Adequate Yearly Progress requirements of the No Child Left Behind Act. The program has most often funded schools in low-income regions of the country that have high proportions of children from racial and ethnic minority families (U.S. Department of Education, 2012a). The Supplemental Educational Services program has funded free tutoring services for students in failing schools (U.S. Department of Education, 2012b). And federal programs such as Upward Bound, and Upward Bound Math and Science have provided supplementary educational services for low-income and racial and ethnic minority students to improve the likelihood of high school graduation, entry into and completion of college, and, in the latter program, increased engagement in sciences and math (U.S. Department of Education, 2012c; 2012d). Evaluations of these programs, specific projects funded by them, and additional proprietary and nongovernmental out-of-school-time academic programs provide the basis for this Community Guide review.

A meta-analysis published in 2006 (Lauer et al., 35 studies, search period 1985–2003) met Community Guide standards in terms of intervention definition, outcomes assessed, and research methods. Of the 35 studies included in the Lauer et al. meta-analysis, this review synthesis excluded four studies, three of which reported only school grades, a relatively subjective measure of reading and math achievement, and one study that could not be retrieved. A separate updated search for research published between 2003 and 2011 identified 24 studies that met Community Guide standards for quality of study execution. Results from these 55 studies were quantitatively combined for reading and math achievement outcomes, as measured by standardized achievement tests. An additional, independent systematic review by Cooper et al. (2000) of summer school programs was reviewed, and provided complementary evidence.

The included studies were stratified by program focus:

- Reading

- Math
- General academic, including reading, math, and other subjects
- Other activities in which academics were a small component

Analysis showed that reading-focused programs were more effective than general academic programs (see Table). Math-focused programs also outperformed general academic programs, though the number of math-focused programs was small. Only one included study (not in Table) evaluated the effect of a minimal academic program on math and reading achievement, providing insufficient evidence to determine effectiveness of these programs.

#### Program Effects on Reading and Math Outcomes

<b>Program Focus (Number of studies)</b>	<b>Reading Effects</b>	<b>Math Effects</b>
<b>Reading (23)</b>	0.31 SD (IQI: 0.02 to 0.58)	Not Applicable (No reading-focused studies reported effects on math achievement)
<b>Math (5)</b>	Not Applicable (No Math focused studies reported effects on reading achievement)	0.12 SD (range of values: -0.32 to 1.33)
<b>General (21)</b>	0.09 SD (IQI: 0.00 to 0.26)	0.06 SD (IQI: -0.01 to 0.24)

IQI = Interquartile interval; SD = standard deviation

Stratification by temporal setting (i.e., summer and after-school) showed increased effectiveness of summer school compared with after-school programs, especially for general academic programs. For reading achievement, general academic summer programs yielded a median of 0.20 SD (interquartile interval [IQI]: -0.02 to 0.38) compared with a median of 0.05 SD (IQI: 0.00 to 0.09) for after-school programs. For math achievement in general academic programs, summer programs yielded a median of 0.22 SD (IQI: -0.05 to 0.29) compared with 0.04 SD (IQI: 0.00 to 0.24) for after-school programs.

Several studies from the update period also reported effects of out-of-school-time academic programs on high school completion, college participation, delinquency, and substance use. There was not enough evidence, however, to determine effectiveness of the intervention on these outcomes due to the small number of studies and inconsistent results.

Available evidence was used to assess several potential effect modifiers and dose-response relationships. Greater program effectiveness was found in studies that used untreated controls rather than treated controls or controls whose treatment conditions were not reported. Combined evidence from the Lauer et al. and update reviews suggested that programs solely providing individualized instruction (i.e., one-on-one tutoring, computer-assisted instruction, homework

assistance) had smaller effects than programs providing only group instruction, and that the greatest effects were found in programs that combined individualized and group instruction. However, this analysis does not account for academic focus.

Evidence was sparse on the effects of program duration and program participation (i.e., proportion of the program attended). Lauer et al. found that programs had to provide a minimum of 45 hours of instruction to see substantial improvements in reading and math achievement. Included studies showed little evidence on differential effects based on socioeconomic status (SES) of participants; however, Cooper et al. found that summer-time academic programs had greater benefit among middle-class than lower-class participants.

### **Applicability and Generalizability Issues**

Analysis of out-of-school-time academic program effects by student grade level indicated that reading-focused programs show effects only at lower grade levels. The median standardized mean difference in programs for students in grades K-3 is 0.43 (IQI: 0.11 to 1.05), and the median standardized mean difference for students in grades 4-12 is -0.02 (IQI: -0.06 to 0.06). The reverse appears to be the case for math-focused programs, although the number of studies is too small to draw a conclusion. Study populations were mostly racial and ethnic minority students, with high proportions eligible for free or reduced-price lunch—an indicator of poverty. All studies evaluated programs in the United States.

### **Data Quality Issues**

Because of rapid developmental processes in children, it is critical to compare the intervention population with a similar population not receiving the intervention or receiving a different intervention; thus, the review only included studies with comparisons. Of the 25 studies from the updated search period, 10 were randomized controlled trials. The remaining 15 studies often controlled for confounding or used propensity score matching. However, in the absence of randomization, self-selection and the motivation to participate could be independent determinants of achievement outcomes.

Studies provided limited information about specific interventions and exposures experienced by comparison populations. In addition, low attendance in many programs and substantial participation crossover by both "treatment" and "control" subjects were common problems.

### **Economic Evidence**

Fourteen studies were included in the economic review, all of which reported only program cost. Monetary values are reported in 2012 U.S. dollars.

Program costs varied largely according to program operation hours. Eleven of the included studies provided enough information to calculate hourly costs per student and indicated that costs ranged from \$3.06 to \$13.17. Annual costs of the out-of-school-time academic programs evaluated in the 14 studies ranged from \$623 to \$8,705 per student. Program costs varied largely according to program operation hours. Major cost drivers of out-of-school-time academic programs include salaries for teachers and staff, costs for facilities and utilities, and costs for transportation, with salaries being the largest expense. Based on distribution of hourly costs per student, the most expensive programs are intensive ones that include case management or have more than one major cost driver.

### **Other Benefits and Harms**

An additional benefit of out-of-school-time academic programs reported in the literature is the possibility of extra work time, and thus income, for parents whose children attend programs and are thus occupied during working hours

(Cannon et al, 2006). Other potential benefits include providing a safe environment for children during non-school hours and improving nutrition for students who receive healthy food as part of the program.

Potential harms from the intervention include reductions in unstructured play time and family time (Halpern, 2002). Decreased part-time work opportunities for students may be a benefit, as part-time student work has been associated with increased risk behavior (Lustig & Liem, 2010). On the other hand, part-time work also may provide an opportunity for students to increase self-confidence and responsibility and to supplement family income.

### **Considerations for Implementation**

Researchers reported several critical challenges to implementation of out-of-school-time academic programs. Student participation—a prerequisite for program effectiveness—is often low, particularly among those students most in need (Weiss, 2004). Low participation may be associated with the voluntary nature of most out-of-school-time academic programs. Participation by some students may also require transportation services.

Compliance has been a particular challenge with out-of-school-time academic programs. It is widely reported that specific programs do not consistently comply with program requirements or adequately implement interventions. In addition, compliance with program requirements may not be enforced (Dynarski et al., 2004). Despite requirements to do so, programs often fail to announce their services broadly in the community, resulting in substantial underuse of programs (Heinrich et al., 2010). There also may be challenges with staff, including high turnover, inadequate training, and lack of time to complete program requirements (Black et al., 2009).

### **Evidence Gaps**

It would be useful to identify features of successful out-of-school-time academic programs, such as curriculum, pedagogy, training, and exposure time. Program duration and program participation (e.g., percentage of full participation) should be examined simultaneously, as either without the other is unlikely to be effective. Means of improving implementation and attendance in out-of-school-time academic programs should be explored. In-school alternatives to out-of-school-time academic programs for low-achieving and at-risk students should be assessed as they may reduce implementation and attendance problems. Long-term effects of out-of-school-time academic programs also should be assessed.

The available evaluation of the Twenty First Century Community Learning Centers program was completed prior to full implementation of an increased academic focus and the transition to state administration; therefore, a reevaluation would be worthwhile.

*The data presented here are preliminary and are subject to change as the systematic review goes through the scientific peer review process.*

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### Disclaimer

The findings and conclusions on this page are those of the Community Preventive Services Task Force and do not necessarily represent those of CDC. Task Force evidence-based recommendations are not mandates for compliance or spending. Instead, they provide information and options for decision makers and stakeholders to consider when determining which programs, services, and policies best meet the needs, preferences, available resources, and constraints of their constituents.

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