

Health Impact Assessment of California's Proposition 49: After School Education and Safety Act of 2002

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I. Overview

“Improving after-school care is integral to improving child care across our country. Through after-school programs we can bring parents the peace of mind that comes from knowing their children are safe. We can teach our children to say ‘no’ to drugs, alcohol, and crime, and ‘yes’ to reading, sports, and computers.”

Bill Clinton, January 26, 1998¹

As exemplified by President Clinton’s statement above, after-school programs have been widely promoted as a means to improve educational performance, reduce crime and instill patterns of healthy behavior. California already supports after-school programs through a number of state and local funding mechanisms, but this support was greatly expanded recently when California voters approved Proposition 49 “The After School Education and Safety Program Act of 2002” in the November 2002 election. Once it becomes fully implemented, as early as 2004-2005,² Proposition 49 will set aside \$550 million per year in grants for after-school programs. This expansion of after-school programs has been projected to yield a host of benefits ranging from improved academic outcomes to crime reduction (Children Now, 2001; California Department of Education, 2002; U.S. Department of Education, U.S. Department of Justice, 2000; Brown et al, 2002). Secondly, these programs may produce a number of health benefits for participating children and other community members. Organizing the analysis along six major pathways through which the Proposition might impact health, this health impact assessment examines the health impacts of the Proposition related to:

- Education/earnings (SES)
- Crime reduction

¹ Quoted from Seligson, 1999.

² Funding under Proposition 49 may be delayed by budget shortfalls, but once fully implemented funding is locked in. It requires that the State first fully fund the Proposition 98 (general education) funding guarantee. Beginning July 1, 2004, annual funding of up to \$550 million for after-school programs will be the greater of: a) The amount appropriated in the prior year; or b) the amount appropriated in 2003-04 plus the amount by which current year

- Substance abuse prevention
- Physical activity
- Mental health
- Child-bearing (i.e. teen pregnancy) and sexually-transmitted diseases

The analysis compares the potential effects of several different models of after-school programs. For instance, programs emphasizing sports and outdoor play might be most effective in improving children's levels of physical fitness, whereas reductions in crime might be best achieved through programs that provide normative guidance and build networks of positive social support. Other outcomes are not contingent on program content; they would occur simply as a result of having students in a supervised setting during the immediate after-school hours. Although the Proposition does not specify program content, policy-makers and stakeholders may be able to use this information to design after-school programs that maximize those health benefits of most concern to their communities.

Not considered in this analysis are the fiscal effects of the Proposition on other items in the state budget. Much of the opposition to the Proposition in the election campaign focused on its action to lock in spending on after-school programs, regardless of any future changes in budgetary priorities or possible shortfalls in state revenue. As a voter proposition, it could not be modified by the state legislature to meet these or other fiscal contingencies. Only another proposition approved by a majority of voters would be able to modify the allocation of these funds. To even qualify for the ballot such a proposition would also require a substantial amount of money and time to gather sufficient signatures. The effect of the Proposition on state funding for other programs is difficult to estimate since the economic conditions, the political climate and

General Fund non-Proposition 98 appropriations exceed a defined base. The base is defined as the highest non-Proposition 98 appropriations level between 2000-01 and 2003-04 plus \$1.5 billion.

shifting societal priorities, which will together shape budgetary priorities, are impossible to predict with any certainty beyond the very near term. Thus, since this health impact assessment is limited to the analysis of empirical evidence, we will not speculate on the extent or location of the possible fiscal side-effects of the Proposition, other than to note that the Proposition may limit the flow of state funds to health care, public health and other health-related programs such as education and childcare (California Budget Project, 2002).

II. Major provisions of Proposition 49³

Proposition 49, the After School Education and Safety Program Act of 2002 was approved by California voters in the general election of November 5, 2002. It expands state funding of after-school programs to \$550 million per year and makes some minor modifications to the grant-based system that distributes these funds to local after-school program providers. Since the Proposition was approved directly by voters as a ballot initiative, it may be modified only by subsequent voter initiative and not by the state legislature.

The State's current after-school funding program, the Before and After School Learning and Safe Neighborhoods Partnerships Program (BASLSNPP), provides \$117.5 million per year to 1032 schools serving 128,869 students in after-school programs (California Department of Education, 2001). Funds are currently distributed to local educational agencies (i.e. school districts and local boards of education) for before- and after-school programs serving children in kindergarten through ninth grade. These school-based programs are conducted either at school sites or parks and recreation sites adjacent to schools. Priority is given to programs at schools with at least 50% of students eligible for free or reduced price school lunches. Programs must

³ Most of this comparison of Proposition 49 with the State's current funding program comes from the California Budget Project's Fact Sheet on Proposition 49 (California Budget Project, 2002)

include educational and literacy activities, as well as “enrichment” activities, such as recreational and other activities aimed at reducing risky behaviors.

Table 1: Current state-subsidized after-school programs versus Proposition 49

	Current Program	Programs under Proposition 49
Title	“Before and After School Learning and Safe Neighborhoods Partnerships Program” (BASLSNPP)	“After School Education and Safety Program” (ASESP)
Total annual budget	\$117.5 million	\$550 million
Number of students served	128,869	607,631 (estimated based on total funding level and per capita allocation)
Max. annual funding per site	Elementary: \$75,000 Middle sch/Junior high: \$100,00	Elementary: \$50,000 Middle school/Junior high: \$75,00
Funding per student per day	\$5 (state) + \$5 (local matching)	\$5 (state) + \$5 (local matching)
Types of programs	Before and after school	After school (surplus funds may fund before school programs)
Grade levels	K – 9	K – 9
Content of eligible programs	Education/literacy and enrichment (e.g. recreation/risk prevention activities)	Education/literacy and enrichment Computer training Fine arts Physical fitness
Eligible grantees	Local educational agencies (LEAs) (i.e. school districts, local boards of education)	LEAs City, county or nonprofit organizations in partnership w/ LEAs
Program sites	Schools, Recreation areas adjacent to schools	Any site meeting regulatory (e.g. safety) requirements applicable to similar school-based programs
Funding priority	Schools with at least 50% of students eligible for free/reduced price lunch	Programs meeting specified high quality criteria and serving high poverty areas
Procedure to modify	Approval by state legislature and governor	Approval of majority of voters in state ballot initiative process

Besides increasing the total amount of State funds available to support after-school programs, Proposition 49 makes several changes to the eligibility criteria for grant applicants as shown in Table 1. First, it allows any city, county or non-profit organization in partnership with a local educational agency to apply for funds. Under the Proposition, after-school programs are no longer limited to school grounds or adjacent recreation areas. Eligible after-school program

sites may include any site meeting the regulatory (e.g. safety) requirements applicable to similar school-based programs. Although per student funding levels would remain the same, the maximum annual allocation per site is reduced under Proposition 49 from \$75,000 per year to \$50,000 per year for elementary schools and from \$100,000 per year to \$75,000 per year for middle and junior high schools. Under the new law, before school programs receive the lowest funding priority.

III. Types of After-School Programs and Expected Effects

After-school programs range from supervised play periods to highly structured remedial classes. The Proposition broadens the scope of after-school programs supported by the state to include programs offered by private groups on school grounds or in recreational facilities adjacent to schools, not just school-operated programs, as had been the case previously. Eligible after-school programs could include Boy Scout troops, Boys and Girls Clubs, varsity sports, computer clubs, science enrichment classes and remedial tutoring. Even church-sponsored programs may be eligible. While any one program may offer a variety of activities, programs typically emphasize one of several models – academic, sports, youth development or simply custodial, each emphasizing different goals and content. The effects of a given after-school program can be expected to be a function of its specific content - tutoring programs should lead to improvements in academic performance, sports programs should improve physical fitness, and youth development programs should develop social skills and instill norms of responsible behavior. Although the Proposition does not specify program content, for the purposes of this analysis it will be useful to compare the impacts of different models of after-school programs.

Generic effects – Custodial Care

While many effects of after-school programs are contingent on program content, some effects may occur simply as a result of having children in supervised settings in the immediate after-school hours. As a result of a number of social changes, including but not limited to the increase in working mothers, the phenomenon of “latch-key” children has garnered much publicity (e.g. National Institute on out-of-school time, 2001; Zill, Nord and Loomis, 1995). Public anxiety about youth-perpetrated crime has further focused attention on the time children spend in the after-school hours among peers without adult supervision. Children’s “self-care,” as it is usually referred to in the academic literature, has been reported to be associated with increased risk of crime victimization, crime perpetration, gang involvement and illicit drug use (e.g. National Institute on Out-of-School Time, 2001). Thus, an important “selling point” for after-school programs has been the contention that getting kids “off the street” and into adult-supervised settings will lower crime rates. Another putative effect of after-school programs in general is that they can provide a setting for social interaction for youth who might otherwise be at home alone. Evidence supporting these contentions will be discussed in the health effects section below.

Academic programs

Much of the impetus for after-school programs has come from efforts to boost students’ academic performance (i.e. skills, grades and standardized test scores) and attainment (i.e. graduation rates and college attendance) (Fashola, 1998). After-school programs focusing on these goals range from minimally-supervised homework halls to intensive tutoring. They are

often targeted to students who are seen in need of remedial services, but they may also be available to the general student population.

Sports and physical activity programs

After-school sports programs are not limited to the traditional inter-mural team sports, such as football, basketball, baseball and soccer. They also include non-team sports, such as gymnastics, and non-competitive physical activity such as dance, roller-skating and physical conditioning. Other types of after-school programs, such as those focused on academics, may also integrate recreation periods with physical activity into their schedules.

Youth development programs

After-school programs under this rubric vary widely in their specific purpose and content, but share a common focus on developing children's social and cultural competencies. They are sometimes also referred to as "enrichment" programs. This approach to after-school programming is exemplified by Boys and Girls Clubs, YMCAs and Scouting organizations. Activities may include some of those used in academic and physical activity programs, but there is an emphasis on personal development and social relations, instead of performance in academics or sports.

Outcome-dependent effects

Many of the effects of after-school programs, especially the educational effects and reductions in crime perpetration, hinge on the successful recruitment and retention of high-risk youth. Most projections of effects, such as the educational effects projected by Bissell (2002) and the crime reduction effects projected by Brown et al. (2002) are based on extrapolations of

the results of small, high intensity demonstration projects (e.g., Perry Preschool Project and QOP), with high-risk youth.⁴ Most evaluations of after-school programs show that failure to reach high-risk, high-need students is a persistent problem (Fashola, 1998; Halpern et al, 2000). In their review of eight after-school programs in Maryland Weisman and Gottfredson (2001) found that at-risk students were more likely to drop out of after-school programs. Evaluators of the MOST (Making the Most of Out-of-School Time) program operating in Boston, Chicago and Seattle, found that only a small percentage of low-income children participated in after-school programs. Only 10 to 15 percent of the low-income children in Boston and Chicago schools regularly participated in these programs. In Seattle this proportion was substantially higher, 33%, but it was still a minority of low-income students (Halpern et al, 2000). The evaluators of the MOST program suggest low participation rates among low-income students is attributable to the cost of programs, transportation difficulties, insufficient parental awareness and lack of parental motivation to enroll their children in after-school programs. If after-school programs attract only children who already excel in academics and are unlikely to be involved in criminal activities, then many of the projected benefits of after-school programs will remain unrealized.

IV. Characteristics of the targeted student population

Who are the youth targeted by after-school programs? Who actually participates? While some after-school clubs and activities may be designed for better performing students and other programs are targeted to youth who are performing poorly in school, the primary target group as set forth in legislation, including Proposition 49, is youth who are low-income and unlikely to have adult supervision in the after-school hours of 3 p.m. to 6 p.m.. Depending on the data and

⁴ In the context of after-school programs the terms “high-risk” and “at-risk” usually refers to youth who are from low-income families, have low academic performance and/or have disciplinary problems in school.

definitions used, there are approximately one to 1.5 million, such youth in California (Children Now, 2001). As shown in Table 2, state- and federally-subsidized after-school programs currently serve about 625,000 youth aged 5 to 14, with 18% of these in the state-supported BASLSNPP programs, 21% in federally-supported 21st Century Learning Centers and 61% in state-supported childcare. Of the children in the state’s BASLSNPP programs, 63% are in elementary school and 27% are in middle or junior high school.

Table 2: Participation and Need for After-School Programs in California

	Number ⁵	%
Children ages 5-14 in California		
Total ¹	5,568,000	100
Enrolled in public schools	4,264,000	76.6
With both parents or their single parent working at least 30 hours per week ¹	2,783,000	50
Eligible for free/reduced price school lunches and parents working ¹	1,531,000	27.5
Number of “latchkey” children ²	1,017,000	18.3
Current enrollment in subsidized programs:		
state-supported after-school programs (BASLSNPP) ³	113,000	18
federally-supported “21 st century learning centers” ¹	132,000	21
state-subsidized childcare ¹	380,000	61
Total	625,000	100
Grade level of students in BASLSNPP after-school programs		
Elementary	71,000	63
Middle School	42,000	37
Total	113,000	100
Currently on waiting lists for state-subsidized after-school programs ¹	42,000	
Projected enrollment in state-supported after-school programs under Proposition 49 ⁴	607,631	

Notes:

1. Estimates from Children Now, 2001.
2. Estimate from the National Institute on Out-of-School Time, 2001.
3. Estimate from California Department of Education, 2002.
4. Projected enrollment calculated using total Prop. 49 allocation and per student spending of \$5/student/day.
5. Rounded to the nearest thousand.

No data could be found that identified the proportion of youth participating in these programs that are considered at-risk according to the state's criteria, but evaluations have generally found that at-risk youth are recruited and retained by after-school programs at lower rates than their more advantaged youth (Halpern, 2000; Weisman and Gottfredson, 2001). One program that seems to have been relatively successful in reaching at-risk youth is L.A.'s BEST. In their evaluation that tracked students over five years Huang et al. (2000) found that 79.5% of program participants were eligible for free/reduced lunch (an indicator of low family income) compared to 70.5% of non-participants in the same schools. No data was reported on indicators for the other criteria of need – parental work status and arrangements for after-school care.

Another indicator of need is academic performance. Although it is not used as an explicit indicator of need in Proposition 49, the goal of improving students' academic performance makes this an important implicit indicator of need. Among the 4.2 million students ages 5-14 in public schools in California, 30% scored below the 25th national percentile in standardized reading tests and 26.4% scored below the 25th percentile in math. Of these from 3.4% to 3.6% enrolled in state-supported after-school programs. As shown in Table 3 below, on average participants in the state's ASLSNPP programs had lower standardized test scores and were at greater risk of being retained a year (i.e. not promoted to the next grade level), than students not enrolled in these programs.

Table 3: Average Percent of Students Scoring below the 25th Percentile* on SAT-9 Tests (2000-2001)

	Reading	Math
State-supported after-school program (ASLSNPP) participants	41.3	34.4
Statewide	30.0	26.4

* Percentile scores based on national average.

Somewhat different from the issue of need based on the state’s definition of “at-risk,” is the issue of demand. One indicator of unmet demand for after-school programs is that 42,000 students statewide are currently on waiting lists for state-subsidized after-school programs. It is crucial to keep in mind, however, that “demand” is not the same as “need,” and that this distinction has significant implications for the eventual effectiveness of after-school programs in achieving stated objectives in the areas of crime reduction and education. Youth considered “in need” may not participate in after-school programs (i.e. in need but no expressed demand), while at the same time youth who are not officially in need may choose to participate (expressed demand but not in need). Programs generally do not restrict participation to only those youth meeting the income and parental work criteria that comprise the official definition of need. Priority may be given to programs serving high-need schools and communities, but this does not guarantee that all participants are high-need, except for subsidized childcare programs, which have stricter eligibility requirements for individual participants. On the other hand, waiting lists may also underestimate demand among students in need since communities and schools with students in need but without after-school programs will not have waiting lists.

Analysis of Health Impacts

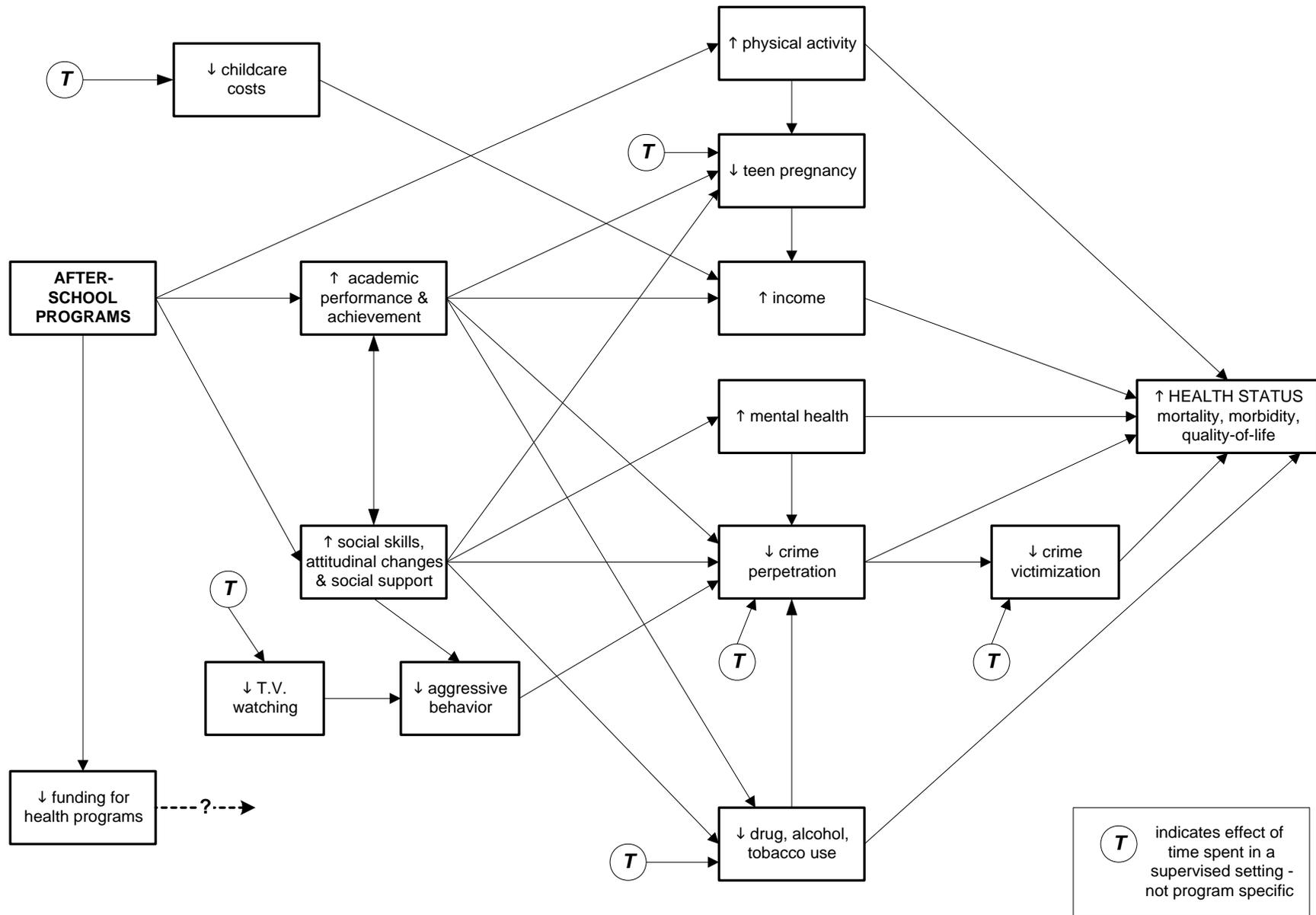
Pathways through which after-school programs may impact health

Figure 1 illustrates the major pathways through which after-school programs may impact health status. This diagram offers a heuristic to guide thinking about possible health effects. The linkages reflect theoretical causal relations, but are not necessarily supported by empirical evidence in every case. Although the interacting effects of after-school programs on health status would probably best be represented as a causal web, for the sake of simplicity the effects may be organized into six major pathways:

- Education/socio-economic status,
- Crime reduction (including both crime perpetration and victimization),
- Substance abuse,
- Mental health,
- Reproductive health (i.e. teen pregnancy, STDs, HIV),
- Physical activity.

While the health status of individuals is the ultimate outcome of concern, the intermediate effects shown in each of these pathways may be seen as determinants of health that serve as useful proxy indicators of health in their own right. Evidence on how after-school programs impact health through each of these pathways, including both generic and content-specific effects, is discussed below.

Figure 1: Pathways through which After-School Programs may impact health



A. Health effects of improved educational performance

One expected outcome of after-school programs is improved academic performance and achievement. With the recent emphasis on school accountability and standardized test scores, schools are increasingly looking at a number of options, within and beyond the hours of the normal school day, to boost students' academic performance. By effectively lengthening the school day, providing opportunities for academic enrichment in the form of special-interest activities, such as computer clubs and performance arts groups, and offering remedial tutoring services, after-school programs may be able to play an important role in achieving these educational goals. In turn, improved educational outcomes may eventually translate into improvements in health.

Education has been shown to be associated with decreased risk of all-cause and coronary artery disease mortality (Hardarson and Gardarsdottir, 2001), and improved physical functioning and self-rated health (Ross and Mirowsky, 1999). Part of this effect is due on the effect of education on personal income. Each additional year of educational attainment is associated with an increase in earnings⁵ (Day and Newburger, 2002). In a study of the effects of high school mathematics courses on health Rose and Betts (2001) found that net earnings at age 28 increase with each additional credit unit of high school math, with a 2% increase in earnings for each unit of algebra courses, and a 6% increase for each unit of calculus. In turn, increased income is associated with decreased mortality, particularly at incomes below the national median (Backlund et al., 1999). Education also benefits health through its effect on health-related behaviors. Individuals with more education are more likely to exercise, less likely to smoke, and more likely to be moderate drinkers (Ross and Mirowsky, 1999). Well-educated women are less

⁵ The effect of years of education on health is somewhat different for workers with professional degrees than for other workers since their credentials, not years of education, determine their income.

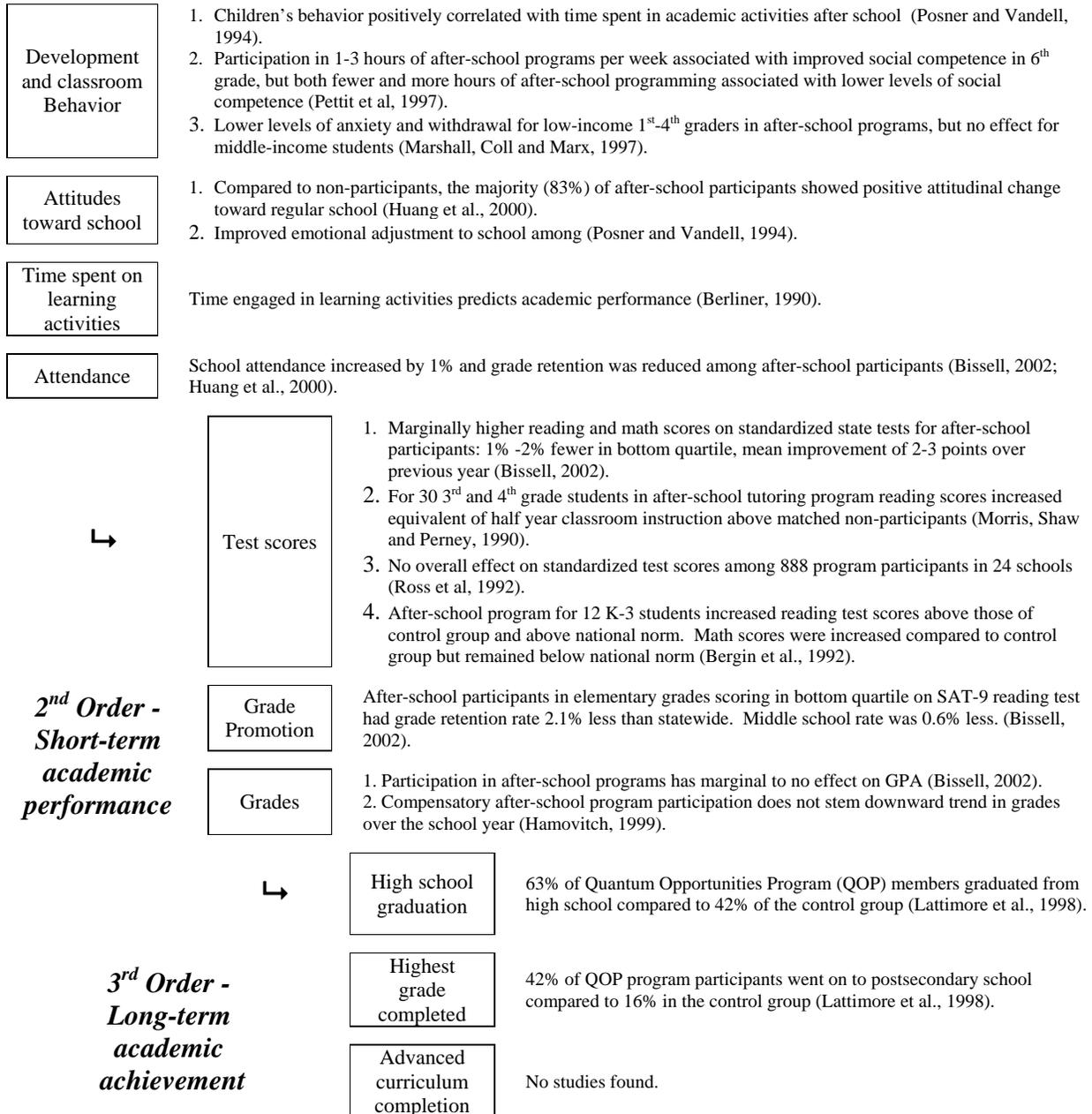
likely to be overweight (Ross and Wu, 1995). Although some part of the associations between education and earnings and health may be spurious or explained by reverse causality, that is higher socio-economic status and/or better health can confer educational advantages, most researchers agree that more education can lead to improvements in health. Thus, interventions that succeed in boosting educational achievement should eventually yield improvements in health.

While the education-income-mortality links appear to be significant and fairly well-established, data on the educational effects of after-school programs seem inconclusive, despite the claims of many after-school program proponents. Lacking measures of long-term impacts on educational achievement, such as graduation rates, college admission rates and years of education completed, evaluators may consider short-term performance indicators, such as standardized test scores, grades and grade retention (i.e. being required to repeat a grade), college admission rates and years of education completed. Precursors to these performance indicators may also be assessed, including attitudes towards teacher-rated classroom behavior, attitudes towards school and absenteeism.

Figure 2 below summarizes the evidence from research on the educational effects of after-school programs. These effects, including those on precursors, performance indicators and achievement outcomes are organized according to their expected causal order. For the most part significant effects were observed only in small studies of intensive programs. Large, multi-site studies found at best only modest improvements in educational effects.

Figure 2: Evidence of the educational effects of after-school programs

1st Order – precursors of academic performance



Effects on precursors of academic performance:

Of the three levels of outcomes examined the precursors of academic performance. After-school programs have been shown to improve classroom behavior (Posner and Vandell, 1994), psychosocial development (Marshall et al, 1997; Pettit et al, 1997) and attitudes towards school (Posner and Vandell, 1994; Huang et al, 2000). These effects appear to be strongest for younger and lower socio-economic status children, and in smaller programs with low student-teacher ratios (Vandell and Shumow, 1999). At least one study shows that moderate levels of after-school programming are optimal. Elementary school age children who spent one to three hours per week in after-school programs demonstrated higher levels of social competency in grade six than their peers who spent either fewer or more hours in after-school programs after controlling for competency levels in grade three (Petit et al, 1997). The effects of after-school programs on development, attitudes and classroom behavior were also relatively muted for children from middle-class backgrounds (Marshall et al, 1997).

Effects on academic performance:

Only a handful of studies have examined changes in academic performance, for instance changes in scores on standardized tests, attributable to participation in after-school programs. The most dramatic improvements have been limited to small, intensive programs with very low student teacher-ratios, such as the Howard Street Tutoring program to assist low-level readers in elementary school. Large scale, multi-site evaluations have shown either no effect (e.g. Ross et al, 1992), or very small effects. The evaluation of California's After School Learning and Safe Neighborhoods Partnerships Programs found that among participants who had previously scored in the bottom quartile on standardized state tests, the percentage scoring in the bottom quartile decreased one to two percent in the next year, compared to students statewide (Bissell, 2002).

For this same group, the proportion held back one year was 2.1% lower for elementary students and 0.6% lower for middle-school students than the statewide average for students in the bottom quartile on standardized state tests (Bissell, 2002). No changes were observed in students' grades. The improvements reported by Bissell are difficult to interpret, however, since the outcomes for students above the bottom quartile on the standardized tests are not reported,⁶ nor are the mean test scores for any of the students.⁷ Although this evaluation did not follow up students long enough to observe changes in academic achievement, it seems unlikely that these small changes will be of sufficient magnitude so as to impact graduation rates, total years of education completed or other measures of long-term academic achievement.

Effects on academic achievement

A thorough review of the research literature, including searches of electronic databases of journal articles, searches of the internet and across citations, did not find any controlled studies that examined the effects of after-school programs on students' long-term academic achievement, except for the evaluation of the Quantum Opportunities Program (QOP), a small, intensive demonstration project with limited generalizability. In many cases there was simply insufficient follow-up time to observe changes in academic achievement, but such outcomes

⁶ Many of the effects reported in Bissell's evaluation of California's after-school programs are limited to effects among students scoring in the bottom quartile on standardized state tests, yet the after-school programs are not limited to this population. To understand the overall effectiveness of these programs it is essential to consider the effects among all students. Furthermore, the effect parameters estimated for high-risk students (i.e. those scoring in the bottom quartile on standardized tests) cannot serve as the basis for extrapolating effects to all of the states students, but this is seems to be what Bissell's group did in estimating the potential for after-school programs to reduce grade retention (students repeating a year in school).

⁷ Without data on test scores one cannot gauge the magnitude or significance of improvements in test scores. For example, two students previously scoring in the 24th percentile, with one subsequently scoring in the 26th percentile and the other scoring in the 75th percentile would be both classified as having moved out of the bottom quartile. The change in the first case is of little significance on two grounds. First, changes of such small magnitude could easily be due to chance. Second, by most measures scoring in the 26th percentile is still failure by most accounts and whether a student scores in the 24th versus the 26th percentile is of no practical import to their eventual academic achievement.

were also not reported in studies for which there seemed to be sufficient time to observe these changes – for instance in the decade-long evaluation of L.A.’s BEST (Huang et al, 2000). Although the absence of information on changes to academic achievement does not necessarily mean that there is no effect, the mixed and generally small magnitude of changes in academic performance and its precursors suggest that after-school programs are unlikely to yield substantial improvements in academic outcomes. This is not to say that individual students might not benefit from these programs or that no programs will be effective. As the experience with QOP suggests programs can produce significant long-term academic success, but this experience seems unlikely to be replicated on a large-scale.

A. Crime reduction

A major goal of after-school programs is to reduce crime. Juvenile crime rates show sharp peaks in the immediate after-school hours of 3 p.m. to 6 p.m. on school days. The rate of violent crime perpetrated by juveniles during this after-school period is four times higher than the rate from 10 p.m. to 6 a.m. The most likely time for a juvenile to commit a sexual assault is between 3 p.m. and 4 p.m. (National Center for Juvenile Justice, 1999). Juveniles are also at highest risk of being victimized by violent crime during the immediate after-school hours. One in five of all violent crimes with juvenile victims occurs between 3 p.m. and 7 p.m. (National Center for Juvenile Justice, 1999).

Analyses of the economic effects of after-school programs suggest that projected reductions in crime are by far the largest source of economic benefits from after-school programs (Brown et al, 2002). Given the magnitude of these economic benefits and the easily discernable links between crime, especially violent crime, and health, it seems reasonable that after-school programs may generate significant health benefits by reducing crime. As discussed below the economic benefits of crime reduction do not correspond exactly with the health benefits, but there is a good deal of overlap. The ways in which after-school programs could reduce crime and benefit health include:

1. Custodial care of potential youth victims: Providing a safe, supervised environment for young children who might otherwise be victims of crime during the immediate after-school hours;
2. Custodial care of potential youth perpetrators: Providing supervision of youth who might otherwise engage in criminal activity during the immediate after-school hours;

3. Program-specific effects on reducing crime victimization: Instilling potential perpetrators with socially positive attitudes and skills that will persist and prevent future criminal acts.
4. Program-specific effects on preventing criminal careers: Prevention of criminal careers with the attendant hazards of early mortality and imprisonment. (Same mechanism as #3 but with a focus on health benefits accruing to potential perpetrators).⁸

Despite the potential for health benefits from crime reduction, the likely health effects of after-school programs related to reductions in crime may be substantially smaller than suggested by estimates of the economic benefits. First, a substantial proportion of the economic costs of crime are comprised of costs that have only a tenuous bearing on health, such as criminal justice system costs (e.g., costs of operating police departments, courts and prisons), costs of property crimes, and many of the out-of-pocket costs incurred by crime victims. Second, the evidence on the effectiveness of after-school programs in reducing crime is less convincing than is often suggested (e.g. Brown et al., 2002).

Table 4: The Perry Preschool and Quantum Opportunities Projects: Two school-based interventions that reduced crime

	Perry Preschool Project (High/Scope, 2002)	Quantum Opportunities Project (QOP) (Taggart, 1995)
Population		
No. students in evaluation	123 (58 in program group, 65 in control group)	125
Age	3 to 4 years	Approx. 14 to 18 years

⁸ Interestingly, none of the economic analyses of crime prevention examined the benefits accruing to potential perpetrators (i.e. Aos, 2001; Brown, 2002; Greenwood, 1996; Karoly, 1998). The costs and benefits considered in these studies were limited to those affecting the criminal justice system and victims. This may be due to a desire to not value the ill-gotten gains of criminal activity (i.e. personal gain at the expense of societal good). In terms of health, however, this ethical problem is avoided since the effects of criminal careers tend to be negative for both perpetrators and victims (see for example Drucker, 2002; Freudenberg, 2001).

Selection process Other characteristics	3 to 4 year old at-risk children randomly assigned to program or control <ul style="list-style-type: none"> ▪ African-American ▪ Living in poverty ▪ IQ between 80-85 ▪ School district drop-out rate 1998-99: 4.5% 	High school students selected at random from list of low-income students <ul style="list-style-type: none"> ▪ Students receiving public assistance from high schools nearest to community target area where the agency operated
Intervention Hours # of years Cost/youth/yr Student to teacher ratio Other characteristics	Mon. to Fri., 1.5 hrs/day 2 yrs (began in 1962) \$7,550(2001 dollars) 6:1 <ul style="list-style-type: none"> ▪ Home visits, with parental involvement, 1.5 hours/week ▪ Teachers with MA in Child Development 	750 hrs/year (school year and summer) 4 yrs (from 1989-1993) \$3,532-\$4,741 (2001 dollars) (Greenwood, et al. 1996 & Aos et al. 2001) 25:1 <ul style="list-style-type: none"> ▪ Education: computer-assisted + peer tutoring ▪ Development: cultural, life skills training, college planning, job preparation ▪ Service: comm. service, public events, volunteering at non-profit orgs ▪ Performance-based incentives for students and staff (cash and scholarship)
Effects Academic Child bearing Mental health Economic Number of arrests	At age 27 <ul style="list-style-type: none"> ▪ 66% on-time high school grad vs. 45% for control group 57% had births out of wedlock vs. 83% in control group <ul style="list-style-type: none"> ▪ 15% treated for mental impairment vs. 34% in control group ▪ 29% earned \$2,000+ monthly vs. 7% in control group ▪ 36% earned own home vs. 13% in control ▪ 41% never on welfare as adult vs. 20% of control ▪ Avg. 2.3 arrests vs. 4.6 arrests in control 	Two years after intervention (appx. age 20) <ul style="list-style-type: none"> ▪ Avg. academic skill levels increased more than 3 grade levels for 27% program group vs. 14% in control group ▪ Program group more likely to graduate from high school, be in a post-secondary school, and less likely to dropout ▪ 24% of program participants had children vs. 38% of controls No data No data <ul style="list-style-type: none"> ▪ 2 years post-program participants had half the arrests of controls (Taggart, 1995)

As with the projected educational effects, most of the crime reduction effects are based on extrapolations from two relatively small studies - the High/Scope Perry Preschool project (Barnett, 1993; High/Scope, 2002; Parks, 2000) and the Quantum Opportunities Program (Lattimore et al, 1998). Despite having been completed a decade or more ago, there has been no

documented replication of their effects in the publicly available literature. Furthermore, as evident from Table 4, the generalizability of the results of these programs to after-school programs is especially questionable since the Perry Preschool Project was not even an after-school program, and since the QOP program targeted an older age group, high-school youth, who are at much greater risk of both crime victimization and perpetration than the elementary and middle school age children targeted by after-school programs under Proposition 49. In addition, QOP was an intensive, multi-component intervention that included elements unlikely to appear in programs funded under Proposition 49, such as cash incentives, job training and mandatory community service.

This is not to say, however, that the health benefits from this pathway are likely to be insignificant. Well-supported alternative effect estimates, such as those from Aos et al (2001), make it seem reasonable to assert that after-school programs will reduce crime. Crime victimization may be reduced somewhat by keeping children in adult-supervised settings during the immediate after-school hours. Of course, this assumes that measures will be taken to protect after-school participants from bullying, sexual harassment, petty theft and other forms of crime that might occur in these settings as well as schools. Again, crime victimization rates among the pre-adolescent youth that will make up the majority of after-school program participants are already low, so large reductions in crime victimization rates cannot be expected. Similarly, crime perpetration rates are also relatively low in this age group, but perpetration of crimes in the future could be prevented if after-school programs are able to instill positive social attitudes and skills that persist through the young adult years and help youth avoid criminal involvement when they are at higher risk. Intensive programs such as QOP show that this is possible, but these require a level of intensity and commitment that seem unlikely to be replicated on a large scale.

B. Substance abuse prevention

One potential avenue through which after-school programs may improve health is by reducing substance abuse. The issue of adolescent substance abuse is of concern for several reasons. First, abuse and addiction can harm the physical and mental well-being of individuals. Long-term abuse of alcohol and other drugs increases risks of liver disease, lung disease, neuropsychological deficits and traumatic injuries, etc. (USDHHS, 1997). Patterns of abuse that eventually lead to poor health outcomes are often established in adolescence. Early-onset alcohol and drug use are especially likely to have deleterious health effects (Aaron et al, 1999). Even relatively infrequent alcohol or drug use during adolescence may denote poor psychological health and may be associated with depression, low self-esteem, and lack of a sense of purpose in life (Kinnier, et al., 1994).

A second reason for concern about adolescent substance abuse is its association with crime. As discussed in the previous section, violent crime in particular can significantly impair health. Many studies have found high rates of prevalence of drug use among offenders (e.g. Dembo, Williams and Schmeidler, 1992; U.S. Department of Justice, 1994). According to a 1999 U.S. national report on juvenile offenders and victims, juveniles are at highest risk of being the victim of a violent crime in the immediate after school hours of 2 p.m. to 6 p.m., and crime victimization and illegal behavior is more common for those who used drugs (Snyder and Sickmund, 1999). One study has shown that attending a middle school with comparatively high levels of cigarette and marijuana use is associated with increased risks of involvement in

violence, and that students' early drug use and peer drug use are associated with increased levels of predatory violence (Ellickson and McGuigan, 2000).

Substantial uncertainty persists about the direction and nature of the causal relation between crime and substance abuse - substance abuse may contribute to the perpetration of other crimes or conversely high rates of crime may increase the risk of substance abuse. Most research on the link between crime and substance abuse has only shown an association without elucidating the causal relation, however a 2002 Canadian study states that 40-50% of serious crimes in Canada are "in a significant way determined" by the use of psychoactive substances, with 15-20% of serious crime attributable to alcohol use, 10-15% attributable to use of illicit drugs, and 10-20% attributable to the combined use of alcohol and illicit drugs (Pernanen, et al., 2002). While generalizing across national borders is difficult, similarities between the U.S. and Canada suggest that the proportions of crime attributable to drug use are similar in the U.S.

How effective then are after-school programs in curbing substance abuse? In general, there is little evidence to support the notion that after-school programs reduce substance abuse. Even those educational interventions explicitly designed to prevent substance abuse, such as the popular Drug Abuse Resistance Education (DARE) program, have demonstrated little success. Large, prospective evaluations of DARE programs have found that at best they produce only short-term, transient reductions in drug use (Clayton, Cattarello and Johnstone, 1996; Lynam et al, 1999). If targeted interventions, such as DARE, are ineffective in curbing substance abuse, then the prospects for the success of after-school programs in this regard seem even less likely.

Besides changing substance abuse behavior through motivation, as is attempted in targeted education programs such as DARE, another way in which after-school programs could reduce substance abuse is by reducing exposure to harmful social environments and

opportunities to use drugs. If youth are kept in supervised settings in the immediate after-school hours they will have that many fewer hours to observe drug use, come in contact with drug dealers and use drugs. Studies have shown that adult supervision in the immediate after-school hours, whether in the home, at school or other setting, is associated with less substance use for all children attending schools (Flannery, Williams and Vazsonyi, 1999; Richardson, et al., 1993). Other research has shown that the intensity of the self-care experience was significantly associated with adolescent smoking behavior irrespective of the typical setting of the adolescents' after-school activities (Mott et al. 1998).

From the cross-sectional research on the link between substance abuse and lack of adult supervision in the after-school hours it seems reasonable to infer that by providing custodial care after-school programs can reduce substance abuse, however after-school programs may be of only limited effectiveness in this regard since the youth most at risk are less likely than others to participate in after-school programs. A persistent problem identified in evaluations of after-school programs is that they have little success in attracting and retaining high-risk youth (Halpern et al, 2000; Weisman and Gottsfredson, 2001).

A third pathway through which after-school programs might be effective in reducing substance abuse is by addressing the underlying psychosocial issues that predispose youth to substance abuse. Numerous studies have demonstrated that adolescent substance abuse is associated with other behavior problems. Vulnerable adolescents with multiple risk factors (e.g., positive attitudes toward drinking) often exhibit emotional distress and symptoms of mental health disorders that may not be sufficiently severe to meet diagnostic criteria, but may nonetheless increase risk of substance abuse (Hallfors and VanDorn, 2002). The 1996 National Household Surveys on Drug Abuse found that adolescents with high problem scores on

emotional distress were more likely to have used cigarettes and marijuana or engaged in binge drinking than those with low problem scores (Substance Abuse and Mental Health Services Administration, 1999). Therefore, to the extent that after-school programs may improve the psychosocial well-being of youth may be an effective means of reducing substance abuse.

Evaluations of after-school programs have shown that they have some positive effects on such psychosocial factors as self-esteem, personal competency and pro-social behavior. Students in the “Be a Star” in St. Louis demonstrated gains in family bonding, pro-social behavior, self-concept, self-control, decision-making, emotional awareness, assertiveness, confidence, cooperation, negative attitudes about drugs and alcohol, self-efficacy, and school bonding, as measured by the Revised Individual Protective Factors Index (Pierce and Shields, 1998), compared to students in control groups. Another study tested the effectiveness of a 2-year multi-component after-school substance abuse prevention program for high-risk second- and third-grade children. Results showed positive effects on program children's personal competency skills including: refusing wrongdoing, solving peer and school problems, showing courteousness to teachers and other school personnel, and behaving ethically (St. Pierre, et al, 2001). Other studies such as the Quantum Opportunity Program (QOP) also showed a similar positive pattern in improving students’ personal competency measures (Lattimore et al, 1998). Despite these successes in improving the putative precursors of substance abuse, none of these programs has been shown to significantly decrease substance abuse, with the exception of the somewhat unusual QOP program discussed in the previous section on academics. In fact, some after-school programs may expose youth to peer pressure that actually encourage substance abuse. For instance, participation in varsity sports is associated with increased alcohol consumption among high school males (Eccles and Barber, 1999).

Although intensive after-school programs, such as QOP, that include such supplemental components as mentoring and home visits, may sufficiently modify underlying risk factors so as to make long-term reductions in substance abuse, most programs are unlikely to have any more than a short-term impact. To the extent that after-school programs have any effect on rates of substance abuse, it is likely to occur as a result of providing relatively safe, supervised settings for youth in the immediate after-school hours. How effective they are in this regard will be determined by their success in recruiting and retaining high-risk youth. If after-school programs only reach youth who are already at low risk of substance abuse, as is often the case, they are unlikely to reduce the incidence of substance abuse. This is especially problematic for substance abuse prevention for after-school programs funded under Proposition 49 since these programs do not reach youth in their high school years when substance abuse peaks. In terms of current risk, the Kindergarten through eighth grade students enrolled in after-school programs funded under Proposition 49 are for the most part already at low risk. For the most part, keeping these younger age children “off the street” will not lower their rates of substance abuse. In terms of their future substance abuse, there is little evidence that the cognitive and attitudinal effects of these programs will persist sufficiently to reduce future drug use. This is not to say that programs will not deter drug use among a few early initiators or make a difference in the lives of a few youth who might otherwise abuse drugs in the future, but on the aggregate these effects will most likely be very small.

C. Mental health

Research evidence points to three major pathways through which after-school programs may benefit children's mental health: (1) long-term gains in socio-economic status resulting from increased levels educational achievement and attainment, (2) development of social skills and increased opportunities for meaningful social interaction, and (3) protection of children from deleterious influences in after-school settings without adult supervision.

Cross-sectional surveys have demonstrated that higher levels of education are associated with higher levels of self-rated mental health (Ross and Van Willigen, 1997). The prevailing hypothesis explaining this association is that education contributes to an improved sense of well-being by increasing access to non-alienated paid work and economic resources that boost individuals' sense of control and access to stable social relationships, such as marriage, with attendant increases in social support (Ross and Van Willigen, 1997). Thus, mental health would be expected to improve as a result of increases in educational achievement. There is little evidence, however, to support the premise that after-school programs boost students' long-term academic achievement. Therefore, it seems unlikely that after-school programs will significantly improve long-term mental health through this pathway. On the other hand, after-school programs have been shown to produce a number of attitudinal changes towards school that may benefit psychological adjustment in the short-term. For instance, participation in after-school programs has been shown to improve children's adjustment to the classroom environment and decrease the manifestation of emotional and behavioral problems in class (Pierce et al, 1997).

After-school programs may also benefit children's mental health by developing their social skills and providing opportunities for social interaction conducive to high levels of social support. For example, the social skills obtained from such programs equip children with the

ability to seek out support when needed. Improvements in social support are particularly likely in the case of after-school programs based on a youth development model, since these emphasize engaging students in group problem-solving, peer interaction, and social skill development. Pierce et al (1997) found that first-graders participating in after-school programs demonstrated improved social skills with peers. Other research has shown that after-school participants have reduced levels of anti-social behavior and better school adjustment (Mahoney et al, 2002), particularly if a mentor is available. Among adolescents active in after-school programs, those with higher levels of perceived support from an adult activity leader reported lower levels of depressed mood when compared to their counterparts not who did not perceive high support (Mahoney et al, 2002).

Even custodial care programs may contribute to improved mental health by protecting children from engaging in potentially damaging behavior, such as substance abuse and violence that children might be exposed to in after-school settings without adult supervision. For instance, lack of supervised care after school has been shown to be associated with ninth graders' susceptibility to substance use, depressed mood and risk taking (Richardson et al, 1993). Similarly, in a survey of fourth and sixth graders, children in self-care ("latch-key") were significantly more socially isolated than children with adult supervision, reporting fewer opportunities to play outside or have friends visit at their homes (Berman et al, 1992). While any after-school program with adult supervision may produce these benefits, programs with a strong youth development component that fosters foster peer interaction and social skill development will likely be particularly effective in this area, since they often emphasize providing positive adult role models.

Although current evidence suggests that after-school programs have a salutary effect on mental health, research in this area has largely been cross-sectional and has not demonstrated strong associations. It remains unclear whether better mental health status among after-school program participants is actually a result of the programs or simply a reflection of greater participation by students with better mental health compared to those who are socially isolated or depressed.

D. Reproductive health (i.e. teen pregnancy, STDs, HIV)

After-school activities have the potential to reduce teenage pregnancy via three pathways:

- by keeping youth in supervised settings during the immediate after-school hours when teenage sexual activity usually takes place (Cohen et al, 2002),
- by boosting girls' educational attainment and aspirations that increase incentives for avoiding pregnancy, and
- by increasing levels of self-esteem and sense of responsibility, which have been shown to be associated with lower pregnancy rates among teens (Crockenberg and Soby, 1989).

These potential reductions are unlikely to be realized under Proposition 49 for several reasons. First, after-school programs funded under Proposition 49 serve children only through 8th grade (i.e. 13-14 years old), but pregnancies among 13-14 year-olds comprise only 7% of the total number of pregnancies to girls less than 18 years-of-age (MMWR, 2000). Teen sexual activity and pregnancy are primarily issues of older, high-school age teens who are not served by these after-school programs. Keeping younger teens in supervised settings will do little to

reduce rates of sexual activity or teenage pregnancy since they are already relatively low for this age group.

Although after-school programs serve youth who have little current risk of pregnancy, they could potentially reduce future rates of teen pregnancy by inducing behavioral changes that persist into the later teen years, yet these effects, represented by the second and third pathways discussed below, are also likely to be modest at best. The second pathway for potential reductions in teenage pregnancy, mediated by improved educational achievement and changes in attitudes toward school, is unlikely to have much effect since evaluations of after-school programs have demonstrated small, if any, gains in academic performance. While it is possible that programs may change school-related attitudes without changing academic performance, it is unlikely that these attitudinal changes will be either large or persistent enough to change health-related behaviors without concomitant changes in more tangible outcomes such as graduation rates, college entry rates, etc.

The third pathway through which after-school programs may reduce teenage pregnancy is suggested by findings from cross-sectional surveys that have shown teen pregnancy to be positively associated with low self-esteem and low sense of responsibility (Crockenberg and Soby, 1995). Thus, it is reasoned that after-school programs can reduce teenage pregnancy by boosting participants', especially female participants', self-esteem and sense of responsibility. While there is no evidence that either confirms or disconfirms this contention, on the whole research findings suggest that after-school programs are unlikely to be effective in this regard. First, as with the education-related outcomes discussed in the preceding paragraph, such changes in attitudes are unlikely to be large or persistent without other changes in participants' lives, such as improved educational performance, demonstrated success in activities such as sports, or

changes in the social environment, but there is neither confirming nor disconfirming evidence to support the contention that after-school programs change these attitudes.

E. Physical Activity

After-school programs could have major impact on children's physical fitness, especially if they are designed to encourage physical activity. The percentage of children who are overweight has almost doubled in the past twenty years (Troiano and Flegal, 1998; USHHS, 2000). Among the many health consequences of the childhood obesity epidemic is type II diabetes mellitus. From a nearly unknown entity in the pediatric population, it has increased 33% among children in the past decade (Kaufman, 2002). While dietary changes are partly responsible for the rise in childhood obesity, it is largely the result of increasingly sedentary lifestyles among youth (Schlicker et al, 1994; USHHS, 2000). Children aged two to seventeen spend an average of two and a half hours per day watching television. Another two hours per day are spent stationary in front of other electronic screens watching videos, playing video games and using computers (Annenberg, 2000). Reducing the number of hours spent watching television has been shown in a randomized controlled trial to reduce children's body fat and body mass index (Robinson, 1999). By encouraging physical activity during times that children would otherwise be watching television or engaging in other sedentary activities, after-school programs should produce similar health benefits. Furthermore, by introducing children to new and varied physical activities and by emphasizing fun in a way that traditional physical education classes might not, after-school programs can instill interest in participation in physical activities that will persist for life, not just the school-age years.

To date few evaluations have been conducted on the effects of after-school programs on children's levels of physical fitness. In part this reflects the dearth of evaluations on all outcomes of these programs, but it is also due to the fact that education and crime reduction, not physical fitness, have been the major impetuses behind the after-school movement. While crime reduction programs that emphasize participation in sports or other physical activity may have secondary benefits in terms of physical fitness, programs that emphasize academic performance and consist mainly of homework assistance and tutoring are unlikely to yield improvements in physical fitness. In one after-school program that did focus on physical activity, twelve-weeks of participation, three days per week enhanced the physical, psychological/emotional, and social aspects of health of the early adolescent girls it served (Colchico et al, 2000). An important aspect of this program was its emphasis on changing girls' self-perceptions, since these perceptions are positively associated with physical activity (Colchico et al, 2000).

Conclusion and recommendations

Table 5 summarizes the estimated health effects for four models of after-school programs that might be implemented under Proposition 49 – custodial care, academic programs, sports programs and youth development programs. The likelihood of programs having significant health effects are rated “low,” “moderate,” or “high.” In this rating system effects may be rated “low” either because they are unlikely to occur or because they are very small. For instance, academically-oriented after-school programs are likely to have some academic effects but these effects will be mostly small, and certainly too small to induce secondary effects related to health such as improved mental health. It is important to keep in mind that these ratings refer to aggregate effects. Having little benefit on the aggregate level is not the same as having no effect for all participants. Even programs that are unlikely to produce significant aggregate effects may significantly benefit a few individuals.

Some ratings are presented as a range, for instance “low-moderate.” In many cases the likelihood and magnitude of health effects depends on the success of programs in attracting and retaining high-risk students. Indeed, it will probably be the extent and effectiveness of outreach as much or more than program content that will determine the degree to which after-school programs produce significant health benefits. Without such outreach, programs will have only marginal health impacts, although they may still be quite popular among youth, parents and politicians.

Outreach will also determine the social distribution of funds. If programs are successful in attracting and retaining high-risk youth, who also tend to come from low-income families, then the Proposition will in effect re-distribute wealth from higher income Californians who pay a relatively large portion of State taxes to lower-income students. If special outreach efforts are

not made then after-school programs will tend to draw the most advantaged students, then the re-distribution of wealth will be minimal.

Table 5: Likelihood of Significant Health Effects

Effects	Program Model			
	Custodial No specific activities	Academic³ From remedial tutoring to academic enrichment, also academically-oriented clubs	Sports³ Intra-mural and extramural sports, also physical activity clubs (e.g. dance, running, etc.)	Youth Development³ Varied activities that focus on developing character and social skill development (e.g. Boys & Girls Clubs)
Academic	Low	Low-moderate ¹	Low	Low
Crime perpetration	Low-moderate ^{1,2}	Low-mod	Low	Low-high ¹
Crime victimization	Low-moderate ¹	Low	Low	Low
Substance abuse	Low-moderate ¹	Low	Mixed	Low
Mental health	Low	Low	Low-moderate	Low-high ¹
Teen pregnancy	Low	Low	Low	Low
Physical activity	Low	Low	Moderate-high	Low

1. Effect depends on whether high-risk students enroll in the program.
2. Effects of custodial care on crime perpetration are likely to be low since the 5-14 age group targeted by these after-school programs is unlikely to perpetrate crime.
3. Estimated effects of academic, sports and youth development programs are those not linked to the custodial effects that all after-school programs will have regardless of content.

Dimensions of effects

1. Likelihood
2. Magnitude of direct effect
3. Significance on health
4. Locus of effects (participating child or society)

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